

## I. Infectious diseases and international security

PETER CLEVESTIG

The unprecedented scale of the Ebola virus disease (EVD) outbreak in West Africa, which continued throughout 2014, was a stark reminder of the international security threats posed by emerging infectious diseases.<sup>1</sup> EVD cases were initially limited to Guinea, Liberia and Sierra Leone. Sporadic, limited incidences of infection later arose in Europe and the United States, primarily when infected health care workers were brought back to their home countries for treatment.<sup>2</sup> As of 7 January 2015 more than 20 000 confirmed, probable and suspected EVD cases had been reported, resulting in over 8000 deaths.<sup>3</sup> This was the largest outbreak in history since the first cases of the virus were recorded in 1976.<sup>4</sup> The mortality rate of this strain has varied from 50 per cent to 70 per cent, while previously observed mortality rates of EVD during past outbreaks have varied from 25 per cent to 88 per cent among the five known strains of the virus.<sup>5</sup> Had the disease been more contagious, the security and health consequences could have reached catastrophic proportions.

On 18 September 2014 the United Nations Security Council unanimously adopted a resolution stating that the EVD outbreak in Africa constituted a threat to international peace and security.<sup>6</sup> This was a significant development as it was one of the rare occasions when the UN Security Council met to discuss a public health crisis. The previous notable examples of it adopting resolutions with regard to public health issues were in response to the particular threats posed by the HIV/AIDS pandemic.<sup>7</sup>

The UN Security Council based its EVD resolution on the recognition 'that the peacebuilding and development gains of the most affected

<sup>1</sup> Touray, M. and Hollis, M., 'Spreading fear: Ebola epidemic affects security in West Africa', *Jane's Intelligence Review*, vol. 26, no. 12 (Dec. 2014), pp. 8–15.

<sup>2</sup> Additional African countries with clinical cases of EVD include: Nigeria (20), Mali (9) and Senegal (1). 'Outbreak outlook', 5 Feb. 2015, International SOS, <[https://www.internationalosos.com/ebola/index.cfm?content\\_id=421&language\\_id=ENG](https://www.internationalosos.com/ebola/index.cfm?content_id=421&language_id=ENG)>. European countries with EVD cases are: France (2), Germany (3), Italy (1), the Netherlands (1), Norway (1), Spain (3), Switzerland (1) and the UK (2). Ashkenas, J. et al., 'How many Ebola patients have been treated outside of Africa?', *New York Times*, 26 Jan. 2015.

<sup>3</sup> World Health Organization (WHO), 'Ebola situation report', 7 Jan. 2015, <<http://www.who.int/csr/disease/ebola/situation-reports/en/>>.

<sup>4</sup> Pattyn, S. et al., 'Isolation of Marburg-like virus from a case of haemorrhagic fever in Zaire', *The Lancet*, vol. 309, no. 8011, 12 Mar. 1977, p. 573. Other recent outbreaks occurred in Sudan and the Democratic Republic of the Congo, followed by over 10 sporadic outbreaks, including in Gabon and Uganda.

<sup>5</sup> The current known strains are: Bundibugyo, Reston, Sudan, Tai Forest and Zaire.

<sup>6</sup> UN Security Council Resolution 2177, 18 Sep. 2014, <<http://www.un.org/en/sc/documents/resolutions/>>.

<sup>7</sup> E.g. UN Security Council Resolution 1308, 17 July 2000 and UN Security Council Resolution 1983, 7 July 2011.

countries concerned could be reversed in light of the Ebola outbreak'. It also underlined 'that the outbreak is undermining the stability of the most affected countries concerned and, unless contained, may lead to further instances of civil unrest, social tensions and a deterioration of the political and security climate'.<sup>8</sup> This was echoed by Liberia's Information Minister, Lewis Brown, who believed that the lack of urgency from the international community could contribute to societal breakdown that in turn could lead to conflict in the region.<sup>9</sup>

The responses to this outbreak during 2014 highlighted the strengths and weaknesses of international, regional and local capacities to react to threats posed by infectious diseases. They also provided context and discussion points regarding the World Health Organization's (WHO) implementation of its 2005 International Health Regulations (IHR), by which the 196 states parties have agreed to establish core capacities to detect, assess, report and respond to potential public health emergencies of international concern under the coordination of the WHO and the global health community.<sup>10</sup>

Notably, certain states and organizations felt it necessary and desirable to issue their own guidelines or coordinate collaborative actions. In February 2014 officials from the US Department of Health and Human Services unveiled the Global Health Security Agenda (GHSA) together with 28 other countries, the WHO, the UN Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE).<sup>11</sup> The objective was to accelerate and promote international progress and collaboration on improving prevention, detection and response to infectious disease threats, whether natural, accidental or intentional.<sup>12</sup> In September the North Atlantic Treaty Organization (NATO) issued a risk assessment for EVD and revised EVD outbreak management guidelines.<sup>13</sup> While the IHR, the GHSA and, to some extent, NATO's guidelines have similar aims and

<sup>8</sup> United Nations (note 6).

<sup>9</sup> 'Liberia fears Ebola crisis will spark war', Al Jazeera, 24 Sep. 2014, <<http://www.aljazeera.com/news/africa/2014/09/ebola-liberia-war-201492485447852773.html>>.

<sup>10</sup> WHO, *International Health Regulations (2005), Second Edition* (WHO: Geneva, 2008). Core capacities are set out for 13 areas. The latest consolidated information on the status of implementation is from 2013. However, there is great regional variation, as well as variation among states. None of the African states had achieved 70% of the targets as of 2013. A 2-year extension for WHO member states was issued in June 2014. See WHO, 'IHR core capacities implementation status: IHR core capacities implementation status, 2013, WHO African Region', [n.d.], <[http://www.who.int/gho/ihr/monitoring/region\\_africa/en/](http://www.who.int/gho/ihr/monitoring/region_africa/en/)>.

<sup>11</sup> Monaco, L., 'Making the world safer from pandemic threats: A new agenda for global health security', White House Blog, 13 Feb. 2014, <<http://www.whitehouse.gov/blog/2014/02/13/making-world-safer-pandemic-threats-new-agenda-global-health-security>>.

<sup>12</sup> US Department of Health and Human Services, 'Global Health Security Agenda: Toward a world safe and secure from infectious disease threats', [n.d.], <<http://www.globalhealth.gov/global-health-topics/global-health-security/GHS%20Agenda.pdf>>.

<sup>13</sup> North Atlantic Treaty Organization (NATO), Centre of Excellence for Military Medicine (MILMEDCOE), *2014 Ebola Outbreak West Africa Risk Assessment* (NATO MILMEDCOE: Munich, 24 Sep. 2014).

objectives, how each will complement the others and how progress will be measured remains unclear.<sup>14</sup>

The following section sets out a timeline of the EVD outbreak, outlining key regional and international developments. The final section discusses the main implications of the outbreak, including potential regional security challenges.

## The Ebola outbreak

### *Early cases*

The index case for the latest outbreak probably occurred in December 2013 when a two-year-old boy died of EVD infection in the village of Meliandou in south-eastern Guinea.<sup>15</sup> The boy may have become infected while playing in a hollow tree containing free-tailed bats, which may have been the source hosts of the virus (the actual mode of transmission remains unknown). The EVD infection spread to the boy's mother, sister and grandmother—all of whom later died.<sup>16</sup> The disease then rapidly spread to neighbouring countries.

On 18 March 2014 health authorities in Guinea reported 35 case fatalities of an unknown haemorrhagic fever and confirmed 49 cases with 29 fatalities of EVD in the Guéckédou, Kissidougou, Macenta and Nzérékoré districts. The authorities reported 3 suspect cases, including 2 deaths, in Conakry on 22 March.<sup>17</sup> On 24 March the Liberian Health and Social Welfare Minister, Walter Traub Gwengale, confirmed 1 case (a fatality) originating in Foya (Lofa County) in the north.<sup>18</sup> At around the same time, Médecins Sans Frontières (Doctors Without Borders, MSF) established the first EVD isolation centre in Guinea (Guéckédou) and the WHO published its official situation report on the outbreak.<sup>19</sup>

<sup>14</sup> Katz, R. et al., 'Global health security agenda and the international health regulations: Moving forward', *Biosecurity and Bioterrorism*, vol. 12, no. 5 (Sep.–Oct. 2014), pp. 231–38.

<sup>15</sup> 'Index case' is an epidemiological term denoting the first case of a condition or syndrome in a population. Baize, S. et al., 'Emergence of Zaire Ebola Virus Disease in Guinea', *New England Journal of Medicine*, vol. 371, no. 15 (9 Oct. 2014), pp. 1418–25.

<sup>16</sup> Pourrut, X. et al., 'Large serological survey showing cocirculation of Ebola and Marburg viruses in Gabonese bat populations, and a high seroprevalence of both viruses in *Rousettus aegyptiacus*', *BMC Infectious Diseases*, vol. 9, no. 159 (28 Sep. 2009); and Roberts, M., 'First Ebola boy likely infected by playing in bat tree', BBC News, 30 Dec. 2014, <<http://www.bbc.com/news/health-30632453>>.

<sup>17</sup> Samb, S. et al., 'Mystery hemorrhagic fever kills 23 in Guinea', Reuters, 19 Mar. 2014, <<http://www.reuters.com/article/2014/03/19/us-guinea-fever-idUSBREA2IOQM20140319>>; and WHO, 'Ebola virus disease in Guinea', 23 Mar. 2014, <<http://www.afro.who.int/en/clusters-a-programmes/dpc/epidemic-a-pandemic-alert-and-response/outbreak-news/4063-ebola-virus-disease-in-guinea.html>>.

<sup>18</sup> Johnson, A. M., '2 of 5 test positive for Ebola in Liberia', *Daily Observer* (Liberia), 31 Mar. 2014.

<sup>19</sup> Médecins Sans Frontières, 'Guinea: Ebola epidemic declared', 24 Mar. 2014, <<http://www.msf.org.uk/article/guinea-ebola-epidemic-declared>>; and WHO, 'Ebola virus disease in Guinea (situation as of 25 March 2014)', 25 Mar. 2014, <<http://www.afro.who.int/en/clusters-a>>.

*Ebola is 'out of control' in West Africa*

On 21 June the MSF declared the outbreak to be 'out of control', surpassing the 1976 outbreak death toll of 280 in the Democratic Republic of the Congo and severely stretching the limited resources at its treatment centres in Guinea and Sierra Leone.<sup>20</sup> By this time Sierra Leone had closed its border with Guinea and Liberia, and deployed military personnel to enforce quarantine.<sup>21</sup> In July the WHO reported a total of 1603 confirmed cases of EVD with 887 deaths in the affected countries. At this point the outbreak had reached the capital cities of Guinea, Liberia and Sierra Leone, and Nigeria had reported its index case (an American-Liberian who died on 24 August).<sup>22</sup>

There were calls for immediate international assistance from organizations such as the MSF and the International Committee of the Red Cross (ICRC). The MSF also criticized some governments and the lack of prompt, coordinated action by the WHO.

On 4 August the World Bank pledged \$200 million in emergency assistance to the affected countries.<sup>23</sup> A few days later the WHO officially declared the EVD outbreak a Public Health Emergency of International Concern (PHEIC). A PHEIC is defined under the IHR as 'an extraordinary event which is determined, as provided in these Regulations: to constitute a public health risk to other States through the international spread of disease; and to potentially require a coordinated international response'.<sup>24</sup> The decision was taken unanimously by the WHO's IHR Emergency Committee, which considered the outbreak to fulfil all the criteria of a PHEIC.

programmes/dpc/epidemic-a-pandemic-alert-and-response/outbreak-news/4065-ebola-virus-disease-in-guinea-25-march-2014.html>.

<sup>20</sup> Médecins Sans Frontières, 'Ebola in West Africa: Epidemic requires massive deployment of resources', 21 June 2014, <<http://www.msf.org/article/ebola-west-africa-epidemic-requires-massive-deployment-resources>>.

<sup>21</sup> 'Sierra Leone, Liberia deploy troops for Ebola', News24, 4 Aug. 2014, <<http://www.news24.com/Africa/News/Sierra-Leone-Liberia-deploy-troops-for-Ebola-20140804>>.

<sup>22</sup> The capital cities are: Conakry (Guinea), Monrovia (Liberia) and Freetown (Sierra Leone). WHO, 'Ebola virus, West Africa—update 4 August 2014', 4 Aug. 2014, <<http://www.afro.who.int/en/clusters-a-programmes/dpc/epidemic-a-pandemic-alert-and-response/outbreak-news/4239-ebola-virus-disease-west-africa-4-august-2014.html>>; and Wilson, J., 'Ebola fears hit close to home', CNN, 30 July 2014, <<http://edition.cnn.com/2014/07/29/health/ebola-outbreak-american-dies/>>.

<sup>23</sup> World Bank, 'Ebola: World Bank group mobilizes emergency funding to fight epidemic in West Africa', Press release, 4 Aug. 2014, <<http://www.worldbank.org/en/news/press-release/2014/08/04/ebola-world-bank-group-mobilizes-emergency-funding-for-guinea-liberia-and-sierra-leone-to-fight-epidemic>>.

<sup>24</sup> WHO, 'Statement on the 1st meeting of the IHR emergency committee on the 2014 Ebola outbreak in West Africa', 8 Aug. 2014, <<http://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/>>; and WHO, 'IHR procedures concerning public health emergencies of international concern (PHEIC)', [n.d.], <<http://www.who.int/ihr/procedures/pheic/en/>>.

*Ebola moves beyond Africa's borders*

In August 2014 two US citizens were evacuated from Liberia to the Emory University Hospital in Atlanta, Georgia, where they recovered after being given the experimental treatment ZMapp.<sup>25</sup> On 7 August an infected Spanish national was evacuated from Sierra Leone to Madrid, Spain, for treatment but died five days later.<sup>26</sup> At the end of August both Germany and the United Kingdom evacuated their first EVD patients for treatment in Hamburg and London, respectively.<sup>27</sup>

October saw a spate of cases of transmission of EVD to health care workers in Europe and the USA. A nurse treating a patient evacuated from Sierra Leone to a hospital in Madrid tested positive for EVD on 6 October, becoming the first case of EVD transmission outside of West Africa.<sup>28</sup> The first cases of domestic transmission of EVD in the USA occurred around the same time. Two nurses at a Texas hospital became infected with EVD while treating a patient who had recently returned from Liberia.<sup>29</sup> These cases led to criticism of both the hospital where the incident took place and the US Centers for Disease Control and Prevention (CDC).

The Director of the CDC, Tom Frieden, blamed the infections on 'breaches of protocol' at the hospital. However, infection control experts criticized these comments in media reports, pointing out that US hospital staff generally lacked proper training to deal with EVD patients and that the CDC's published guidelines needed revisions.<sup>30</sup> A Texas nurses union,

<sup>25</sup> ZMapp is an experimental drug composed of chimeric monoclonal antibodies towards EVD developed by Mapp Biopharmaceutical, <<http://mappbio.com/>>. Qiu, X. et al., 'Reversion of advanced Ebola virus disease in nonhuman primates with ZMapp', *Nature*, vol. 514, no. 7520 (29 Aug. 2014), pp. 47–53; Gupta, S. and Dellorto, D., 'Experimental drug likely saved Ebola patients', CNN, 6 Aug. 2014, <[http://edition.cnn.com/2014/08/04/health/experimental-ebola-serum/index.html?hpt=hp\\_t2](http://edition.cnn.com/2014/08/04/health/experimental-ebola-serum/index.html?hpt=hp_t2)>; and US Centers for Disease Control and Prevention (CDC), 'Two US patients recover from Ebola, discharged from hospital', Media statement, 21 Aug. 2014, <<http://www.cdc.gov/media/releases/2014/s0821-ebola-patient.html>>.

<sup>26</sup> 'Muere el religioso español Miguel Pajares a causa del ébola' [Spanish priest Miguel Pajares dies from Ebola], RTVE.es, 12 Aug. 2014, <<http://www.rtve.es/noticias/20140812/muere-religioso-espanol-miguel-pajares-causa-del-ebola/991420.shtml>>.

<sup>27</sup> Hudson, A. et al., 'Senegalese WHO doctor with Ebola arrives for treatment in Germany', Reuters, 27 Aug. 2014, <<http://www.reuters.com/article/2014/08/27/us-health-ebola-germany-idUSKBN0GROM720140827>>; and 'British Ebola patient arrives in UK for hospital treatment', BBC News, 24 Aug. 2014, <<http://www.bbc.com/news/uk-28919831>>.

<sup>28</sup> 'Ebola outbreak: nurse infected in Spain', BBC News, 6 Oct. 2014, <<http://www.bbc.com/news/world-europe-29514920>>.

<sup>29</sup> Fernandez, M., '2nd Ebola case in US stokes fears of health care workers', *New York Times*, 12 Oct. 2014; and CDC, 'Texas reports positive test for Ebola in one additional healthcare worker', Media statement, 15 Oct. 2014, <<http://www.cdc.gov/media/releases/2014/s1015-texas-second-health-care-worker.html>>.

<sup>30</sup> The CDC has published detailed health care guidelines on EVD management for hospitals, including work with laboratory specimens, handling infectious waste and proper use of protective equipment. CDC, 'Infection prevention and control recommendations for hospitalized patients under investigation for Ebola virus disease in US hospitals', Media statement, [n.d.], <<http://www.cdc.gov/vhf/ebola/healthcare-us/hospitals/infection-control.html>>; CDC, 'CDC update on Dallas response, 10-12-2014', Press briefing transcript, 12 Oct. 2014, <<http://www.cdc.gov/>>

meanwhile, condemned the hospital for having substandard protocols on handling EVD patients. The union stated that existing procedures were deficient on the proper use of personal protective equipment and thus may have contributed to the two secondary infections.<sup>31</sup>

*The USA outlines a targeted approach*

On 25 September 2014, at a meeting of the UN, US President Barack Obama outlined a stronger, more focused effort to counteract the EVD outbreak in West Africa. He noted that the CDC was mounting the largest international disease response effort in its history and announced the creation of a military command in Monrovia, Liberia, along with an air transport hub in Senegal to stream supplies and personnel into the afflicted areas.<sup>32</sup> In the same month, CDC Director Frieden stated that the EVD outbreak emphasized the importance of the GHSA with particular regard to: (a) the prevention of avoidable catastrophes and epidemics; (b) early threat detection of diseases; and (c) rapid and effective responses to disease outbreaks.<sup>33</sup>

US Department of Homeland Security rules went into effect on 8 October, which routed all travellers from Guinea, Liberia and Sierra Leone to one of five international airports for enhanced screening.<sup>34</sup> On 27 October the CDC also updated its guidance for monitoring the movement of individuals who had potentially been exposed to the virus.<sup>35</sup> It recommended actions for individuals according to five categories: (a) 'symptomatic individuals in the high, some, or low (but not zero) risk categories'; (b) 'asymptomatic individuals in the high risk category'; (c) 'individuals in the some risk category'; (d) 'asymptomatic individuals in the low (but not zero) risk category'; and (e) 'individuals in the no identifiable risk

media/releases/2014/t1012-ebola-reponse-update.html>; Steenhuysen, J., 'U.S. CDC head criticized for blaming "protocol breach" as nurse gets Ebola', Reuters, 13 Oct. 2014, <<http://www.reuters.com/article/2014/10/13/us-health-ebola-usa-nurse-idUSKCN0I206820141013>>; and Fernandez, M. et al., 'CDC rethinking methods to stop spread of Ebola', *New York Times*, 13 Oct. 2014.

<sup>31</sup> Shoichet, C., 'Nurses' union slams Texas hospital for lack of Ebola protocol', CNN, 31 Dec. 2014, <[http://edition.cnn.com/2014/10/15/health/texas-ebola-nurses-union-claims/index.html?hpt=hp\\_t1](http://edition.cnn.com/2014/10/15/health/texas-ebola-nurses-union-claims/index.html?hpt=hp_t1)>.

<sup>32</sup> White House, 'Remarks by President Obama at UN meeting on Ebola', Press release, 25 Sep. 2014, <<http://www.whitehouse.gov/the-press-office/2014/09/25/remarks-president-obama-un-meeting-ebola>>.

<sup>33</sup> Frieden, T., 'Ebola requires the world's united action', White House Blog, 26 Sep. 2014, <<http://www.whitehouse.gov/blog/2014/09/26/ebola-requires-world-s-united-action>>.

<sup>34</sup> The airports included: John F. Kennedy International Airport, Newark Liberty International Airport, Washington Dulles International Airport, Hartsfield-Jackson Atlanta International Airport and Chicago O'Hare International Airport. US Department of Homeland Security, 'Enhanced Ebola screening to start at five US airports for all people entering US from Ebola-affected countries', Press release, 8 Oct. 2014, <<http://www.dhs.gov/news/2014/10/08/enhanced-ebola-screening-start-five-us-airports-all-people-entering-us-ebola>>.

<sup>35</sup> CDC, 'Interim US guidance for monitoring and movement of persons with potential Ebola virus exposure', 27 Oct. 2014, <<http://www.cdc.gov/vhf/ebola/pdf/monitoring-and-movement.pdf>>.

category'.<sup>36</sup> The guidelines provide parameters for 'active and direct' monitoring of potentially infected individuals by regional and local authorities in the USA (e.g. they call for the use of daily temperature readings taken by designated third parties and give clarification as to the principles of 'controlled movement', 'isolation' and 'quarantine').<sup>37</sup> The guidelines also indicate parameters for the 'equitable and ethical' use of public health orders, including possible compensation for individuals who sacrifice their 'liberties and freedoms for public good'.<sup>38</sup>

At the end of October President Obama issued a statement cautioning that the USA should not be 'defined by fear', but should 'react based on facts and judgments and making smart decisions'.<sup>39</sup> He also reiterated that the outbreak would be brought under control.<sup>40</sup> Obama's comments may have been aimed at authorities in New York and New Jersey where state officials had indicated that they would implement mandatory quarantine policies that were stricter than WHO or CDC guidelines.<sup>41</sup>

In the same month, the USA also began to implement 'controlled monitoring' for 21 days of some military personnel returning from EVD response operations in West Africa.<sup>42</sup> The personnel were quarantined at a base near Venice, Italy; this prompted a political controversy in Italy, with officials and members of the public arguing that the US personnel should spend their isolation time on US territory.<sup>43</sup>

### *Renewed international response efforts*

In the latter half of 2014 states and international organizations increasingly started to enter into unilateral and multilateral consultations and actions. The most notable multilateral consultation with regard to the outbreak was the special meeting of the UN Security Council on 18 September, which resulted in Resolution 2177 (2014).<sup>44</sup> The UN Security Council was also called for an emergency meeting at the initiative of the USA during talks on the UN Mission in Liberia (UNMIL), the mandate of which was extended to December 2014.<sup>45</sup> The UN Mission for Ebola Emergency Response

<sup>36</sup> CDC (note 35).

<sup>37</sup> CDC (note 35).

<sup>38</sup> CDC (note 35).

<sup>39</sup> White House, 'Remarks by the President on Ebola', Press release, 28 Oct. 2014, <<http://www.whitehouse.gov/the-press-office/2014/10/28/remarks-president-ebola>>.

<sup>40</sup> White House (note 39).

<sup>41</sup> See e.g. US State of New Jersey, Department of Health, 'New Jersey mandatory quarantine and screening protocols', 31 Oct. 2014, <<http://www.state.nj.us/health/news/2014/approved/20141031b.html>>.

<sup>42</sup> Starr, B., 'Army major general, troops quarantined after Ebola aid trip', CNN, 28 Oct. 2014, <[http://edition.cnn.com/2014/10/27/politics/soldiers-monitored-ebola/index.html?hpt=hp\\_t1](http://edition.cnn.com/2014/10/27/politics/soldiers-monitored-ebola/index.html?hpt=hp_t1)>.

<sup>43</sup> 'Uproar over US troops' Ebola quarantine in Italy', The Local, 29 Oct. 2014, <<http://www.thelocal.it/20141029/us-soldiers-ebola-quarantine-in-italy-sparks-alarm>>.

<sup>44</sup> United Nations (note 6).

<sup>45</sup> Power, S., Remarks by Ambassador Samantha Power, U.S. Permanent Representative to the United Nations, at a stakeout following a Security Council session on Libya and Liberia, 15 Sep. 2014,

(UNMEER) was established the following day as a result of Resolution 2177 and the adoption of General Assembly Resolution 69/1 as ‘a temporary measure to meet the immediate needs related to the unprecedented fight against Ebola’.<sup>46</sup>

On 10 October the WHO agreed a range of actions in Brazzaville, Republic of Congo, to strengthen preparedness of states not yet affected by EVD.<sup>47</sup> The participants discussed developing and agreeing a ‘tool kit’, with the aim of implementing a comprehensive checklist of core principles, standards, capacities and practices. The checklist included ‘infection prevention control, contact tracing, case management, surveillance, laboratory capacity, safe burial, public awareness and community engagement and national legislation and regulation’.<sup>48</sup> The meeting also agreed a framework to permit international partners to assess certain milestones as part of ongoing peer review processes.<sup>49</sup> The meeting agreed lists of ‘priority countries’ on the basis of their geographical proximity to already affected countries, and trade and migration patterns.<sup>50</sup>

#### *Projections and developments moving into 2015*

In October 2014 a WHO Ebola Response Roadmap Situation Report stated that a total number of 8997 confirmed, probable and suspected cases of EVD had been reported in 7 countries.<sup>51</sup> The WHO also issued communications projecting the possibility of between 5000 and 10 000 new cases of EVD per week in December if the epidemic maintained its current rate of progression.<sup>52</sup> Meanwhile, a CDC response-modelling tool indicated that if effective prevention was not scaled up, the number of infections could reach 1.4 million people in West Africa by 20 January 2015 (taking into account projected under-reporting of cases).<sup>53</sup> A key conclusion of the

<<http://usun.state.gov/briefing/statements/231673.htm>>; and UN Security Council Resolution 2176, 15 Sep. 2014.

<sup>46</sup> United Nations, ‘Global Ebola response’, <<http://ebolaresponse.un.org/>>; and United Nations (note 6).

<sup>47</sup> WHO, ‘WHO and partners agree on a common approach to strengthen Ebola preparedness in unaffected countries’, Press release, 10 Oct. 2014, <<http://www.afro.who.int/en/media-centre/press-releases/item/7079-who-and-partners-agree-on-a-common-approach-to-strengthen-ebola-preparedness-in-unaffected-countries.html>>.

<sup>48</sup> WHO (note 47).

<sup>49</sup> WHO (note 47).

<sup>50</sup> The ‘highest priority countries’ were: Côte d’Ivoire, Guinea-Bissau, Mali and Senegal. ‘High priority countries’ were: Benin, Cameroon, Central African Republic, Democratic Republic of the Congo, Gambia, Ghana, Mauritania, Nigeria, South Sudan and Togo. WHO (note 47).

<sup>51</sup> WHO, *WHO: Ebola Response Roadmap Situation Report* (WHO: Geneva, 15 Oct. 2014).

<sup>52</sup> Sengupta, S., ‘New Ebola cases may soon reach 10,000 a week, officials predict’, *New York Times*, 14 Oct. 2014.

<sup>53</sup> CDC, ‘New modelling tool for response to Ebola Virus Disease’, Media statement, 23 Sep. 2014, <<http://www.cdc.gov/media/releases/2014/s0923-ebola-model-Factsheet.html>>; and Meltzer, M. I. et al., ‘Estimating the future number of cases in Ebola epidemic—Liberia and Sierra Leone, 2014–2015’, *Morbidity and Mortality Weekly Report*, vol. 63, no. 3 (26 Sep. 2014).



CDC's projection report was that, in order to stop the epidemic effectively as it then existed, up to 70 per cent of patients needed to enter Ebola Treatment Units or be placed in community settings in which the risk of disease transmission was reduced and safe burials were carried out.<sup>54</sup> This would have required a substantial increase in prevention efforts, including improved logistics and putting in place sufficient personnel with proper containment expertise.

By the start of 2015, however, it became evident that the WHO's and the CDC's projections were wide of the mark. On 17 October 2014 Senegal was declared free of EVD, followed by Nigeria on 20 October.<sup>55</sup> The WHO declares a country to be free of EVD when no new case of the virus is reported over a 42-day period from the time that the last infected individual in the country has either died or recovered.<sup>56</sup> On 23 October the WHO's IHR Emergency Committee also reiterated its recommendation that there should be 'no general ban on international travel or trade'.<sup>57</sup> Liberia, one of the worst affected countries, ended its state of emergency on 13 November.<sup>58</sup>

### Implications of the Ebola outbreak

The outbreak underlined the continuing threat posed by pathogens to jump species and adapt to human populations. Until 2014, only one case of EVD was ever reported in West Africa—in Côte d'Ivoire, where a Swiss ethologist contracted EVD during the necropsy of a chimpanzee found in the Taï Forest in 1994.<sup>59</sup> The fact that EVD was not endemic to the worst affected West African countries was a major contributing factor to the rapid progression of the outbreak. Previous outbreaks had been limited to remote regions of Central Africa.<sup>60</sup> There is still much uncertainty regarding the virus's aetiology in non-human reservoirs of infection, although handling of

<sup>54</sup> CDC, 'Questions and answers: Estimating the future number of cases in the Ebola epidemic—Liberia and Sierra Leone, 2014–2015', Public statement, 26 Sep. 2014, <<http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/qa-mmwr-estimating-future-cases.html>>.

<sup>55</sup> WHO, 'WHO congratulates Senegal on ending Ebola transmission', Press release, 17 Oct. 2014, <<http://www.who.int/mediacentre/news/statements/2014/senegal-ends-ebola/en/>>; and WHO, 'WHO declares end of Ebola outbreak in Nigeria', Press release, 20 Oct. 2014, <<http://www.who.int/mediacentre/news/statements/2014/nigeria-ends-ebola/en/>>.

<sup>56</sup> WHO, 'How is the end of an Ebola outbreak decided and declared?', Information note, Oct. 2014, <<http://www.who.int/csr/disease/ebola/declaration-ebola-end/en/>>.

<sup>57</sup> WHO, 'Statement on the 3rd meeting of the IHR Emergency Committee regarding the 2014 Ebola outbreak in West Africa', WHO statement, 23 Oct. 2014, <<http://www.who.int/mediacentre/news/statements/2014/ebola-3rd-ihc-meeting/en/>>.

<sup>58</sup> 'Ebola outbreak: Liberia president lifts state of emergency', BBC News, 13 Nov. 2014, <<http://www.bbc.com/news/world-africa-30044418>>.

<sup>59</sup> Le Guenno, B., Formenty, P. and Boesch, C., 'Ebola virus outbreaks in the Ivory Coast and Liberia, 1994–1995', *Current Topics in Microbiology and Immunology*, vol. 235. (1999), pp. 77–84.

<sup>60</sup> Gire, S. K. et al., 'Genomic surveillance elucidates Ebola virus origin and transmission during the 2014 outbreak', *Science*, vol. 345, no. 6202 (12 Sep. 2014), pp. 1369–72.

infected meat (typically ‘bush meat’ from wild animals) is viewed as a possible source of many earlier outbreaks. The natural host of the virus remains to be scientifically proven, but antibodies to the virus and viral genes have been found in species of the African fruit bat, and in primates (that may become infected from bat droppings) in areas where EVD outbreaks occur.<sup>61</sup>

As noted above, the WHO’s IHR Emergency Committee declared the outbreak to be a PHEIC in August 2014 and identified the following challenges for affected African states: (a) fragile health systems with significant deficits in human, financial and material resources, resulting in a compromised ability to mount an adequate EVD outbreak control response; (b) inexperience in dealing with EVD outbreaks—misperceptions of the disease, including how the disease is transmitted, are common and continue to be a major challenge in some communities; (c) highly mobile populations and documented instances of cross-border movement of travellers with infection; (d) several generations of transmission in the capital cities of Guinea, Liberia and Sierra Leone; and (e) a high number of infections among health care workers, highlighting inadequate infection control practices in many facilities.<sup>62</sup>

Factors that impeded efforts to track and contain the outbreak included poor barrier-nursing practices, leading to many of the new cases of EVD occurring among health care providers, and quarantine challenges as early EVD symptoms have many similarities with those of endemic malaria.<sup>63</sup> This outbreak also highlighted the challenges posed by social and political beliefs among affected populations. For example, it is common practice in the most severely affected states for communities to wash the bodies of the deceased and care for afflicted family members inside the home. Reports also indicate an underlying distrust of government representatives among rural populations in the region (particularly in eastern Sierra Leone).<sup>64</sup>

The most notable complicating factor in the response was the considerable lack of available resources and expertise to cope with an outbreak of such magnitude. Guinea, Liberia and Sierra Leone were coping with food insecurity before the outbreak, and the FAO and the World Food Programme (WFP) estimated that around half a million people were severely food insecure in December 2014. Food shortages were exacerbated by

<sup>61</sup> Gonzales, J. P., Pourrut, X. and Leroy, E., ‘Ebola virus and other filoviruses’, *Current Topics in Microbiology and Immunology*, vol. 315 (2007), pp. 363–87.

<sup>62</sup> WHO, ‘Statement on the 1st meeting of the IHR Emergency Committee on the 2014 Ebola outbreak in West Africa’, WHO statement, 8 Aug. 2014, <<http://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/>>.

<sup>63</sup> Pronyk, P., ‘Is it Ebola or malaria? A diagnostic challenge’, UNICEF Connect, 20 Oct. 2014, <<http://blogs.unicef.org/2014/10/20/is-it-ebola-or-malaria-the-diagnostic-challenge/>>.

<sup>64</sup> ‘Ebola in West Africa, death and disbelievers’, *The Economist*, vol. 412, no. 8898 (2–8 Aug. 2014), p. 26.

border closures and quarantine measures, and by reduced output in farming areas, which were among the worst hit by the outbreak.<sup>65</sup> The issues around food security have put significant strain on the governments in the region and there is now a higher potential risk of them collapsing, which would lead to the type of civil unrest recognized by the UN Security Council in Resolution 2177 in September.<sup>66</sup> This is of particular concern in a region affected by decades of civil war. While this scenario has not played out so far, civil disorder did occur throughout the region mainly due to the quarantine restrictions. For example, residents of West Point, Monrovia, clashed with local police in August 2014 as they protested the quarantine measures and how they were hindered from work and access to food.<sup>67</sup> There was also civil unrest in Guinea in September: eight people, including three doctors, three journalists and local officials, were murdered by villagers in Wome, Nzérékoré, during an EVD awareness-raising campaign; and protesters in Forécariah destroyed an ICRC vehicle in protest of how a deceased EVD victim was handled.<sup>68</sup> With the FAO and the WFP projections, the growing food shortage may lead to further violence and civil unrest during 2015.

EVD continues to be a serious threat to human health and security in West Africa. West African health care systems were stretched and sub-standard before the outbreak, and the initial and sustained response to it relied heavily on assistance from non-governmental organizations such as the MSF.<sup>69</sup> The UN Deputy Secretary-General, Jan Eliasson, stated on 2 September that the current EVD outbreak is 'going to be a test of multilateralism; a test of international solidarity for people in dire need right now'.<sup>70</sup> Maintaining and strengthening capacity and response mechanisms to such disease outbreaks will remain priorities for national and international bodies for the foreseeable future.

<sup>65</sup> World Food Programme, 'Ebola leaves hundreds of thousands facing hunger in three worst-hit countries', News release, 17 Dec. 2014. <<http://www.wfp.org/news/news-release/ebola-leaves-hundreds-thousands-facing-hunger-three-worst-hit-countries>>.

<sup>66</sup> United Nations (note 6).

<sup>67</sup> 'Ebola crisis: Liberia police fire at Monrovia protests', BBC News, 21 Aug. 2014, <<http://www.bbc.com/news/world-africa-28879471>>.

<sup>68</sup> 'Ebola outbreak: Guinea health team killed', BBC News, 19 Sep. 2014, <<http://www.bbc.com/news/world-africa-29256443>>; and 'Ebola-affected West African countries likely to reschedule debt payments, raise taxes, and face civil disorder threat', *Jane's Intelligence Weekly*, 28 Sep. 2014.

<sup>69</sup> 'The Ebola crisis: Much worse to come', *The Economist*, 18 Oct. 2014.

<sup>70</sup> Eliasson, J., Press conference by Deputy Secretary-General Jan Eliasson at United Nations headquarters, 2 Sep. 2014, <<http://www.un.org/press/en/2014/dsgsm792.doc.htm>>.