

Latest Developments

Week-To-Week Snapshot

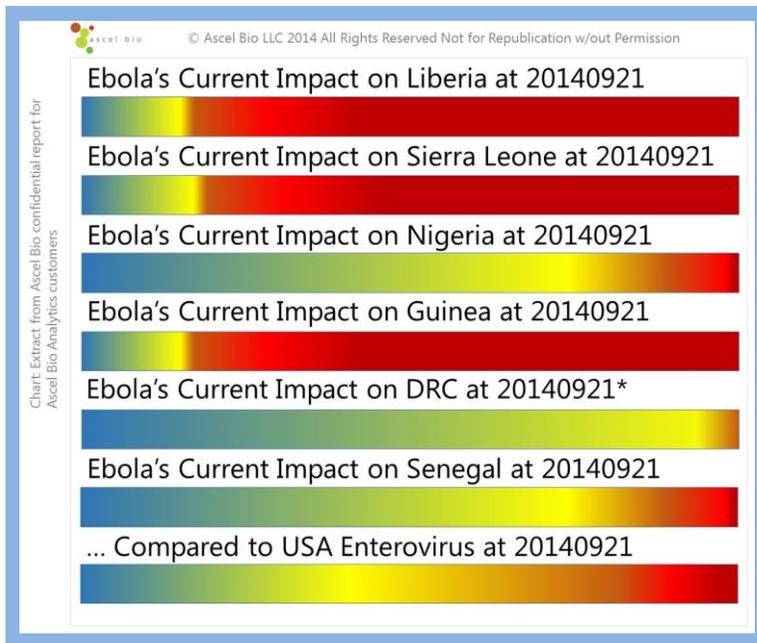
Information suppression is suspected to have taken hold in some of the involved West African countries. This is dangerous, given the failure to control the Ebola disaster.

- Ascel Bio assesses the situation in West Africa is largely unchanged. Ascel Bio ranks these countries by the level of Ebola-caused community disruption [from worst to best]:
 - (6/5) Liberia and Guinea conditions are the worst;
 - (4) Sierra Leone community disruption is only slightly less than Liberia and Guinea;
 - (3/2) Conditions in Nigeria and Senegal are better than Liberia, Sierra Leone and Guinea; and
 - (1) Ascel Bio is monitoring conditions in DRC, where reports are sparse but suggestive of better conditions.
- Over the past two weeks, Ascel Bio has become increasingly concerned about information suppression, which interferes with accurate assessments. In the week ending 20140913, Ascel Bio noted an insistence by Nigeria to journalists to soften their reporting on Ebola, citing fear and panic as unnecessary side effects. In the week ending 20140921, both Liberia and Guinea reported a similar insistence on reducing media coverage, with the government restriction on media being called “an alarming assault on press freedom.”
- On 20140921, Ascel Bio’s assessment of the Ebola outbreaks in Nigeria is that containment is probable, however Ascel Bio will continue to monitor the country very closely given its connectivity to the rest of the world.

Watch Notice

The Watch Notice is maintained for Ebola virus activity in West Africa

Chart 1: Current IDIS probabilities for Ebola vs. current USA Enterovirus outbreak.



The level of crisis caused by the current Ebola outbreak remains far more severe on a relative basis than the level of crisis caused by any other disease anywhere else in the world, measured by Ascel Bio. To demonstrate the difference, Infectious Disease Impact Scale (or “IDIS”, see Page 3) measurements of outbreak impact on a country-by-country basis are provided in the following “Impact Heat Bars”.

At left, a graphical representation of the spectrum of probabilities that Ebola is causing an Infectious Disease Impact Scale Category 2 to Category 6 level crisis in each country. The IDIS scale is described on the final page of this report. Blue is lowest level of crisis, yellow is bad but still relatively normal. The oranges and deep reds are indications of serious crisis. A typical influenza season has no more than 5-6 percent orange, with no red and just 30% yellow.

Ebola community impact here is contrasted with an unusual Enterovirus outbreak in the United States.

Detailed Assessment

The WHO declared Ebola a public health emergency on 20140808. Crisis conditions in the region had been worsening week-by-week, with scores of new outbreaks springing across in West Africa regional countries including Nigeria. On the eve of the WHO’s declaration, Ascel Bio projected that Ebola could be brought under control by mid-February 2015:

*The smallest and best contained outbreaks can be brought under control in 1-2 months. On average prior Ebola outbreaks took 3-4 months to fully contain. The Sierra, Liberia, and Guinea outbreaks are likely to take at least another 30-60 days to contain. WHO intervention will have a positive impact.**

In the weeks that followed, Ascel Bio measured an ebb-and-flow of crisis conditions worsening and then improving and then worsening again. Conditions had not improved in the month following the WHO’s declaration and on 20140907 Ascel Bio declared that, in Liberia and Sierra Leone, crisis conditions were “the worse ever seen during an Ebola crisis since 1995”.†

As at 20140921, it is clear that, despite copious media coverage of international pledges of support, ground manifestation of that support lags tremendously.

Chart 2: Ascel Bio IDIS Impact Measurements, Liberia

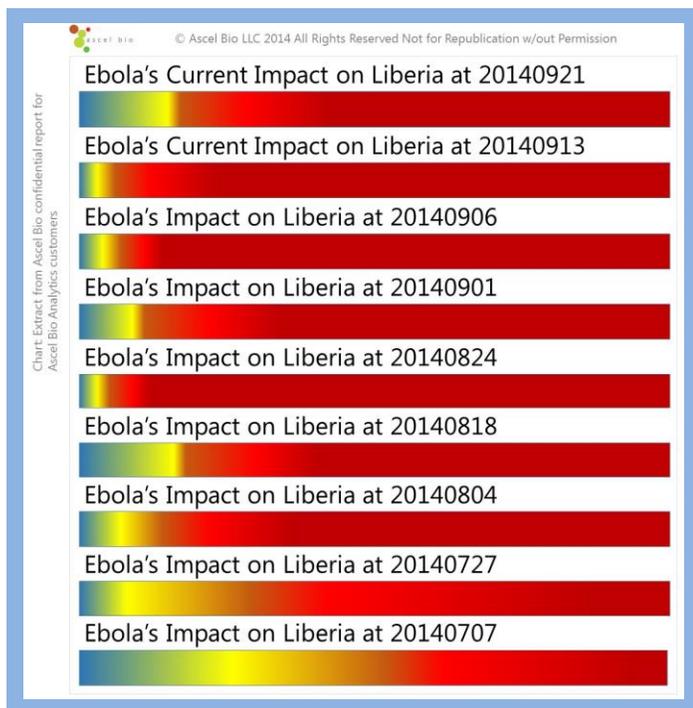
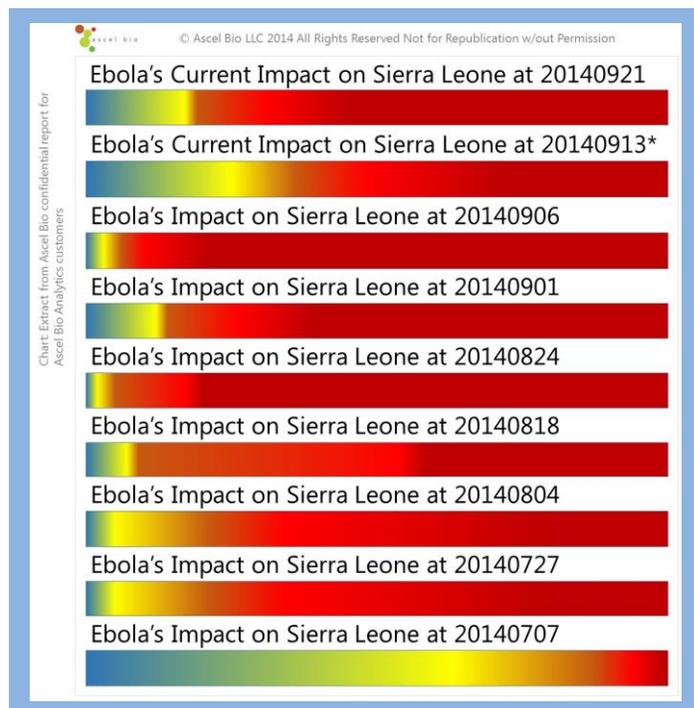


Chart 3: Ascel Bio IDIS Impact Measurements, Sierra Leone



We note that disruption levels had actually appeared to have begun to decline across the region sometime in the 7-day period ending 20140913. But Ascel Bio was suspicious of measurements of improvement on 20140913 and has been carefully examining the situation.

Careful examination of the model outputs has been undertaken by Ascel Bio’s subject matter experts to prepare the charts found for the week ending 20140921. Measurements have been undertaken with heavy involvement of Ascel Bio’s senior-most operational biosurveillance analyst, with careful consideration of the following:

* Ascel Bio 20140804 Ebola Report.
 † Ascel Bio 20140907 Ebola Report.

- Ascel Bio researchers have found reports from Nigeria, Guinea, and Liberia of government-coordinated efforts to suppress negative news.
- Ascel Bio analysts are also concerned that there is an absence of negative news in some locations because they are 'dead zones', heavily affected but unreached and unobserved.
- Media fatigue is likely taking effect, which is a common finding during protracted complex humanitarian disasters.
- Lack of security to support roving media teams, where the story of eight people including journalists were killed in southern Guinea by a mob.
- Widespread military-controlled roadblocks in Sierra Leone and Liberia.
- Shift in media focus away from local impact to mobilization of international support.

Foreign Nations Attempting Goldilocks Approach to Ebola Intervention

On 20140920, Bloomberg reported the CDC was preparing new assessments of worst-case scenarios of "550,000 or more infections" by January 2015, a projection, "which vastly outstrips previous estimates".[‡] Ascel Bio notes that the CDC's estimate appeared to assume a worst case would involve "no additional aid or intervention by governments or relief agencies". Further, all of the academic models currently being highlighted by the media are limited due to tremendous uncertainty regarding the accuracy of the case counts and fatalities. Case counts and associated fatality rates are biased to urban areas with presence of humanitarian workers, which overlooks the rural experience. As members of the Ascel Bio team directly observed during Haiti's cholera disaster, there were orders of magnitude difference in the statistics reported from the United Nations versus what was being observed in the rural areas. In summary, transmission of Ebola occurs in an uncontrolled manner in some isolated rural areas, with very high (70-90%) case fatality rates versus the urban areas where medical care is available. That said, the US Department of Defense's mission is to mobilize the creation of auxiliary medical units to support the already-inundated medical infrastructure in Liberia. **Ascel Bio urges its clients to regard all publicized model outputs as the grossest of approximations.**

But while this scenario has made headlines over the weekend, it should be noted that aid and intervention *is ramping up*. Over the past week, United Nations Secretary General Ban Ki Moon has taken up the cause of prodding all governments to do more. On 20140916 President Barack Obama visited the US Centers for Disease Control and Prevention to announce military and US Public Health Service deployment to Africa (Liberia), and called on Congress to authorize new funding to support these efforts. The UK, France, and China and other countries have also already pledged their support. **It is important to note that pledges precede action, and in all of the core involved countries (Guinea, Sierra Leone, and Liberia) deployed pledged assets have not fully materialized.**

These responses are assessed by Ascel Bio as significant but measured steps to respond to the crisis. The Obama administration has not declared a Public Health Emergency in the US as of 20140921. On 20140804 Ascel Bio had noted that the August WHO declaration could have had the effect of triggering the US government to declare a Public Health Emergency, which would enable a variety of funding mechanisms and the call-up of medical personnel. This has not occurred, and other countries are taking equally measured steps.

Whether these measured responses will be "just right" or will fall short of what is needed remains to be seen.

[‡] <http://www.bloomberg.com/news/2014-09-19/ebola-worst-case-scenario-has-more-than-500-000-cases.html>

Towards Containment (Part 1)

Containment and reduction of the crisis will need to address medical infrastructure strain. International responses have been focused on this issue.

Ascel Bio has been monitoring medical infrastructure degradation. On 20140915, Ascel Bio analyzed: (i.) the initial collapse of the medical infrastructure in Kikwit in 1995; (ii.) medical infrastructure strain conditions in Sierra Leone in 2014 and the progressive collapse without signs of resolution; (iii.) conditions in Liberia in 2014 showing progressive collapse similar to that observed in Sierra Leone; and, (iv.) tracking in Guinea showing initial collapse that quickly resolved with intervention by MSF, followed much later by a return of high medical infrastructure strain with incursion of cases from Sierra Leone and Liberia.

Chart 4: Presence of Relevant Indicator Kikwit 1995

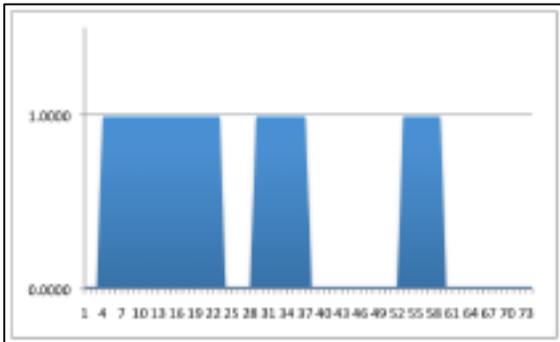


Chart 5: Presence of Relevant Indicator Sierra Leone 2014

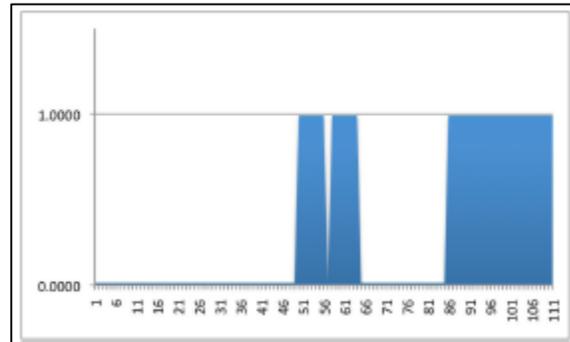


Chart 6: Presence of Relevant Indicator Kikwit 1995

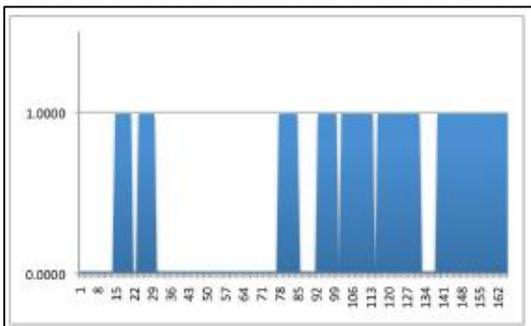
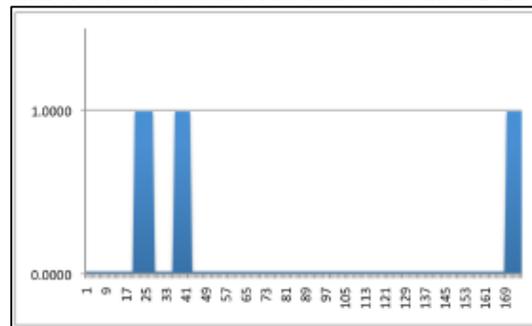


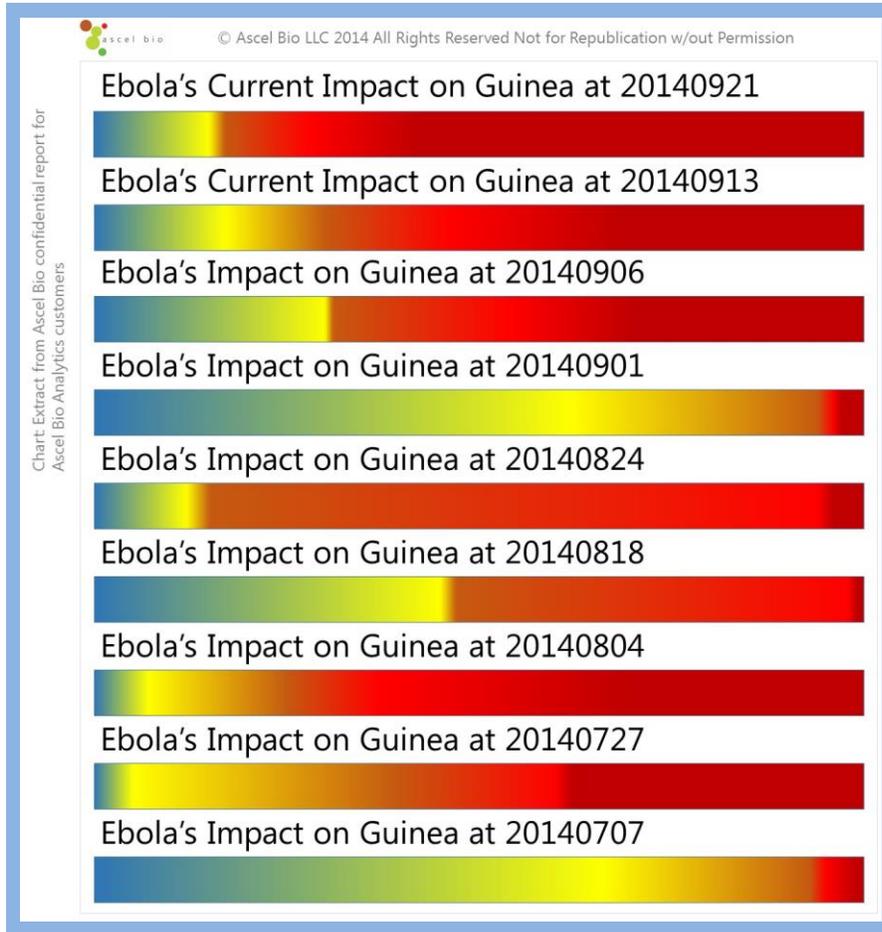
Chart 7: Presence of Relevant Indicator Guinea 2014



Legend: On the Y axis, presence of the indicator is denoted by a "1", and absence is noted by a "0".

The case of Guinea shows the need for coordination and the potential for disease resurgence. In the week ending 20140913, Ascel Bio had found infrastructure strain but *not* a strong signal of international community medical aid exhaustion in Guinea. Reports from Guinea in the week up to 20140913 had shown a resurgence in areas where the international community had helped Guinea achieve containment of Ebola (such as in the Macenta region), and Doctors Without Borders in Guinea was reporting the need to re-open as a result of new outbreaks linked to refugees from Liberia and Sierra Leone.

Chart 8: Ascel Bio IDIS Impact Measurements, Guinea

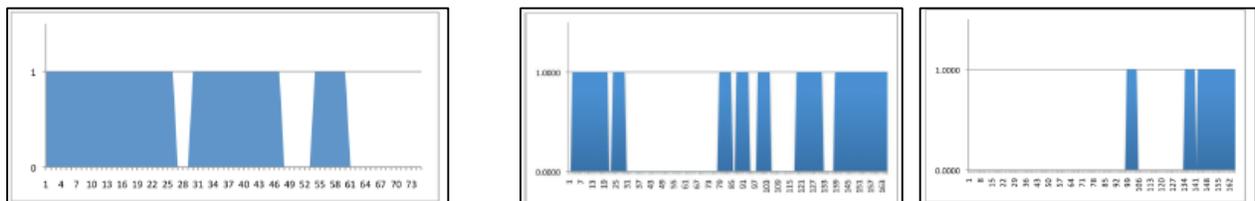


Towards Containment (Part 2)

Containment and reduction of the crisis will need to address social unrest. Ascel Bio notes that America’s military-first response in Liberia would appear to be best able to support a reduction of these indicators.

Ascel Bio has been monitoring social unrest. On 20140915, Ascel Bio analyzed: (i.) social unrest indicators for Kikwit 1995; (ii.) the indicator tracking log through 20140913 for the current Liberia epidemic, where we note the resurgence of reporting on public-official tension; and (iii.) tracking in Liberia of food shortages reported in areas forcibly quarantined by police.

Charts 9-11: Presence of Social Unrest Indicators for Kikwit 1995 (first) and Liberia 2014 (latter two).



Legend: On the Y axis, presence of the indicator is denoted by a “1”, and absence is noted by a “0”.

Towards Containment (Part 3)

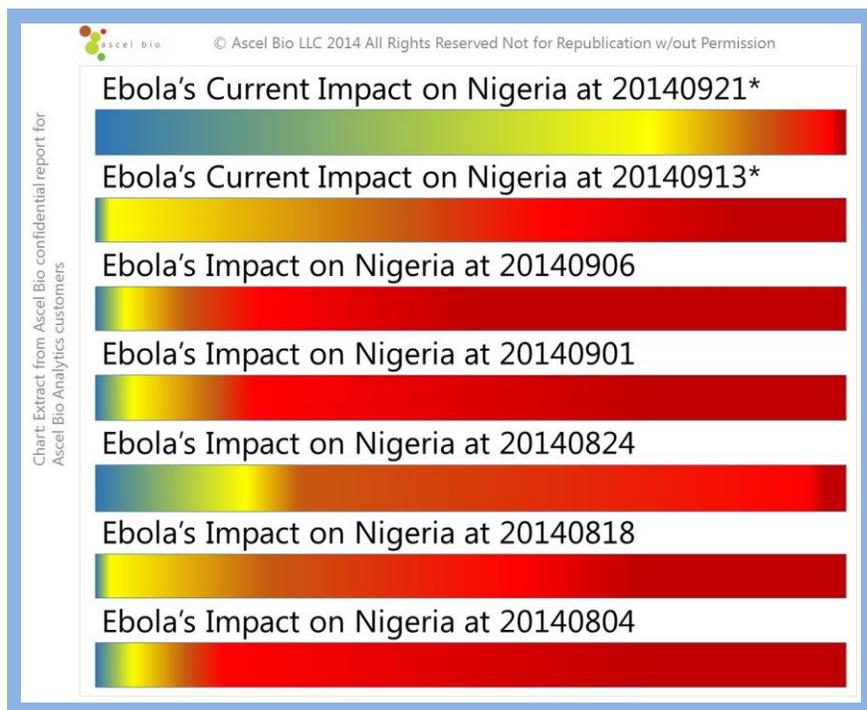
Ensuring that international spread does not occur is also a key part of any successful strategy. Here, Ascel Bio has also been monitoring the risk of international spread, in particular through Nigeria.

While the number of cases in Nigeria has been low, Ebola poses substantial risks to Nigeria’s large and globally interconnected population. Ascel Bio has been monitoring reports of 76,000 Muslim Nigerians who are planning to attend the Hajj in KSA. Thus far, of the 6,000 approved for travel to KSA, none have been identified as suspect Ebola patients. Direct discussions between members of Ascel Bio’s team and Saudi physicians indicates a high degree of anxiety in trusting the Nigerians to screen these pilgrims prior to departure to KSA. KSA’s official stance is not to deny access to the Hajj so long as they meet screening criteria prior to departure.

Triggers for intra-national disease spread could include transmission in schools. In Nigeria schools are expected to re-open on Monday 22 September 2014, earlier than the Minister of Education Ibrahim Shekarau’s originally announced resumption date of 13 October 2014. The decision to close the schools was controversial. Local government officials and the teachers’ union have met the declaration by the national government to reopen the schools earlier with resistance. The basis of contention is due to >264 individuals still under surveillance in Port Harcourt. In Lagos, 4 people are still on the surveillance list.

On 20140921, Ascel Bio’s assessment of the Ebola outbreaks in Nigeria is that containment is probable, however Ascel Bio will continue to monitor the country very closely given its connectivity to the rest of the world.

Chart 10: Ascel Bio IDIS Impact Measurements, Nigeria



Research & Chart Preparation Notes

The above charts and other assessments found in this note were prepared through Ascel Bio's updated review of English and French language news articles archived by and available online, and our continued reference the historic Ebola library going back to 1994. Ascel Bio has analyzed these historic records of reports on Ebola outbreaks using Ascel Bio's Exigence software⁵. Ascel Bio outbreak analysts have then conducted a review of the outputs, with a particular focus on measuring the level of disruption Ebola outbreaks have had on communities over time, and circumstances that contributed to disruption.

The above rankings and assessments are made by Ascel Bio with knowledge of key headlines:

- Nigeria has not reported a case in the past week. While reactive measures are still occurring, i.e. training of response capacity, school closures, and surveillance, there are no cases. The IDIS categorization of disruption has dropped significantly and will remain at this level should no new cases be reported.
- The DRC has produced minimal reporting on Ebola in the past week; the outbreak is being declared as heading toward containment. The IDIS levels are significantly less than CAT 3. A resurgence in cases is possible, based on prior outbreak experience.
- Senegal has not reported a new case of Ebola since its initial case was confirmed on 20140829.
- Guinea, Liberia, and Sierra Leone are all indicating reduced IDIS disruption levels, away from CAT 6. This could be due to a number of factors:
 - Over the past week, reporting on the outbreaks has shifted from the pace and severity of disease transmission to the strength of international response. With scores of countries donating money, time, and resources to the outbreak, the focus of reporting on levels of reported disruption are beginning to wane.
 - Reports over the past week have also been focused on disruption external to viral transmission, i.e. a lockdown issued by Sierra Leone, running through 20140922, and requiring all citizens to remain indoors while volunteers go house to house educating and searching for cases. In Guinea, violence erupted as villagers attacked a team of politicians and journalists educating on Ebola, leaving 7 people dead.
 - In Liberia, cases continue to pound the local infrastructure, but increasing international military intervention and foreign aid is seeking to curb the outbreak.
- In the week ending 20140913, Ascel Bio noted an insistence by Nigeria to journalists to soften their reporting on Ebola, citing fear and panic as unnecessary side effects. In the week ending 20140921, Liberia reported a similar insistence on reducing media coverage, with the government restriction on media being called "an alarming assault on press freedom."

⁵ Exigence is Ascel Bio software that provides a text analytics tagging tool and enables contextualization of significant biological events. Exigence's proprietary Boolean language enables reliable tagging of text reports. Ascel Bio provides its proprietary taxonomy of indicators that captures approximately 200 infectious diseases and 150 indicators for indigenous countermeasures, medical and veterinary response, clinical impact, epidemiological features, and social response.

Senior Researcher Comments & Additional Notes From Various Sources

Here are the relevant additional observations from the countries as Ascel Bio saw them:

- The US, UK, French, Germans, Spanish, and Dutch now have all reported citizens infected (all of them had contact with Ebola positive patients). Evacs to home countries have been / are in the process of being done. This is being noticed by indigenous Africans who have asked for similar quality treatment for their infected physicians (but WHO has denied their request, instead opting for specialized care directed to them on the ground).
- Nigeria- Ascel Bio has heard a report of an influx of travelers from Sierra Leone and Liberia showing up in Ekiti State. Unclear how they got there, but it caused a stir.
- Senegal- There are reports of mass migrations from Guinea, where they are finding themselves constantly deporting refugees. Some locals disagree with the total border closure, citing concerns about the economy. Senegal is the top consumer of Guinean produce, so this is impacting both countries. The Guinean patient has recovered, but 67 are still under surveillance. The French and Germans are converging on Senegal as an air logistics support site to Guinea, SL, and Liberia.
- Guinea- their national soccer team is in Uganda and under tight surveillance. Ascel Bio has assessed no issues for Uganda given their long history dealing with Ebola outbreaks in the past.
- Sierra Leone- apparently, SL was Africa's fastest growing economy, according to the IMF. Of course, this growth has been stymied. IFRC is setting up the first Ebola-dedicated treatment facility in their history (IFRC has never taken the lead in managing an Ebola before in any country, according to reports). This is an immediate risk, where we know that healthcare workers (HCWs) who are not experienced dealing with Ebola isolation wards are at higher risk of HCW exposures (despite MSF training). IFRC apparently trained 35 local staff members, but 15 pulled out due to concerns about safety. There are reports of a 10x increase in military enforced checkpoints on all of Sierra Leone's major highways, however there are reports of human traffic in and out of the most-affected areas of the country. The medical infrastructure is grossly overwhelmed and in a state of collapse. Collapse of routine medical functions reported. HCWs have been stigmatized by their own families. HCWs went on strike and encouraged patients to leave the isolation ward in an attempt to scare officials into paying them for taking the risks they are taking in caring for these patients. The Chinese, UK, and Cubans are converging on SL with support. 3-day controversial nationwide lockdown concludes today. Food shortages and a 30% increase in food prices noted.
- Liberia- reportedly down to only 2 airlines servicing Liberia. Businesses closed, not paying taxes. Government officials are being re-purposed to public health from other unrelated departments. All non-essential personnel are on furlough. Some government officials fled the country, refusing to return- they were all fired. All borders and schools are closed. 14/15 counties are actively reporting cases. Burial teams are overwhelmed, being attacked by communities, and are exhibiting signs of PTSD. Medical infrastructure is grossly collapsed. Many clinics have increased their fees to treat patients and are reusing PPE. Foreign workers are fleeing the country. Economic recession now being called worse than what was observed during their civil war. Monrovia under curfew, with military enforced roadblocks. Uganda, Rwanda, DRC, Nigeria, and Ethiopia, under the African Union, has sent experts to assist. Major indicators of information suppression noted. *Positive indicators: some reports of better community cooperation with officials and a significantly ramped up diagnostic capacity.
- Ascel Bio has a sense that international response assets were being plugged into SL more than Liberia, where the US has taken the lead. The reasons for this may relate to the greater economic standing of SL versus Liberia? (see IMF comment above)
- There are MAJOR drivers for mass migration from Liberia due to uncontrolled transmission of Ebola, sentiment of abandonment by the international community, food shortages, and deepening economic recession.

| WILSON—INFECTIOUS DISEASE IMPACT SCALE (IDIS) | |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 | The unreported infectious disease event: Daily, routine infectious diseases; provision of warning about these are not recognized to be non-routine and are considered negligible. |
| 1 | The reported infectious disease event: A typical infectious disease event reported by a community reflects sensitivity to public health or medical significance. |
| 2 | The infectious disease event associated with routine organized response: Often reflecting locally well-known diseases that nevertheless generate a demand for routine, local organization-level time-sensitive action. |
| 3 | Infectious disease event associated with non-routine organized response: These are essentially the beginnings of a community crisis, where there is a recognized requirement for time-sensitive, <i>non-routine</i> organization-level decisions that may affect a local community's activities of daily living. |
| 4 | Infectious disease event associated with social disruption due to human intervention: Humans themselves, through the use of aggressive public health countermeasures, may impact a community to the point of straining various aspects of vital processes that promote community integration such as work, education, organized activities, social play of children, healthcare, the ability to buy consumer products, maintenance of physical facilities, and protection from criminal acts. |
| 5 | Infectious disease event associated with social disruption due to direct effect of pathogen transmission: Some pathogens, through mass transmission and incapacitation of patients, may impact a community to the point of straining various aspects of vital processes that promote community integration. The key difference between Category 4 and 5 is in the former human action is disrupting community integration, whereas in the latter the pathogen itself is degrading community function. |
| 6 | Infectious disease event associated with disaster conditions: This is the typical modern day end-point of strain induced by an infectious disease event when cultural protections fail and individuals of a community physically abandon their dwellings or those vital processes necessary for community integration. |
| 7 | Infectious disease event associated with apocalyptic indicators: Typically reserved for historical examples such as isolated indigenous peoples confronting an insurmountable infectious disease threat. The community involved begins to exhibit loss of community integration to the point of even abandoning family members. |