

# The Socio-Economic Impacts of Ebola in Sierra Leone

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*Results from a High Frequency Cell Phone Survey*

*Round 3*

*June 15, 2015*



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## Overview

As of June 7, 2015, Sierra Leone had reported more than 12,900 cases of Ebola Virus Disease (EVD), and over 3,900 deaths since the outbreak began. In recent months, substantial progress has been made, with a maximum of 15 new cases per week reported following a nationwide lockdown and information campaign at the end of March.

The Government of Sierra Leone, with support from the World Bank Group, has been conducting mobile phone surveys with the aim of capturing the key socio-economic effects of the virus. Three rounds of data collection have been conducted, in November 2014, January-February 2015, and May 2015. The survey was given to household heads for whom cell phone numbers were recorded during the nationally-representative Labor Force Survey conducted in July and August 2014. Overall, 66 percent of the 4,199 households sampled in that survey had cell phones, although this coverage was uneven across the country, with higher levels in urban areas (82 percent) than rural areas (43 percent). Of those with cell phones, 51 percent were surveyed in all three rounds, and 79 percent were reached in at least one round. The results for the third round of the survey, which contacted 1,715 households, focus mainly on employment, agriculture, food security and prices, and health service utilization, covering predominantly urban areas where cell phone coverage is highest, but including rural areas as much as possible given the sample available.

Based on the third round of data collection in early May 2015, the economic situation in Sierra Leone continues to improve, with employment levels among respondents returning to levels seen in the July-August 2014 Labor Force Survey baseline. This is particularly good news in Freetown, which had seen a nine percentage point decline in employment at the height of the outbreak in November 2014, and in other urban centers outside Freetown, which have experienced even higher levels of recovery. Those who are self-employed, including a disproportionate number of youth in Freetown, have seen improvement; more people re-entered than exited this sector between rounds 2 and 3.

The economy has not, however, fully recovered. Despite returns to work, the hours that people work are still below baseline levels, and in rural areas, even though land preparation and rice planting has begun in many parts of the country, this is even more acute. Additionally, despite the encouraging news in self-employment, for those operating non-farm household enterprises—nearly one-third of the country's workforce—revenues remain markedly lower than they were at the baseline in July-August 2014, signaling that recovery in this sector is lagging. Moreover, even though the share of households reporting having closed a business in the last six months has slowed down, the reasons cited for business closure show substantial differences from those experienced immediately after the initial outbreak. In round 1 the crisis impacted business operations mainly through channels directly related to EVD and measures put in place to slow infection, in round 2 and even more so in round 3, knock-on effects related to the economic slowdown are dominant. Lack of capital is the most common reason cited for business closure in round 3 (57 percent), compared to 9 percent in round 1 and 29 percent in round 2.

Agriculture is showing positive signs as the new planting season begins. Yields for the 2014 harvest were comparable to previous harvests, and the accompanying sales and hiring of seasonal labor indicate that

rural commodity and temporary labor markets are returning to normal. Across all three rounds of data collection, approximately two-thirds of households surveyed were food insecure, but the frequency of the use of individual coping strategies to mitigate food insecurity decreased, pointing to improving conditions.

Use of basic social services continues to increase. Maternal health care service utilization in particular has shown signs of improvement; for example, the share of households reporting that a member gave birth in the two months prior to the survey and did so in a hospital or clinic increased from 28 percent in November 2014 to 64 percent in January/February 2015, and then to 89 percent in May.

A majority of school-aged children, meaning those between ages 6 and 17, have returned to school. Of those households surveyed, both rural and urban, that include at least one school-aged member, 87 percent report that all of those children are attending. For those students not attending, only less than two percent of households said that the school was unsafe or still closed due to Ebola. In addition, despite schools being open, more than 70 percent of households with school-aged children indicate that at least one child is still listening to educational programs on the radio, and of households in which at least one child is out of school, nearly 85 percent reported listening to school on the radio.

While the main focus of the government and its partners remains on getting to zero cases of Ebola in Sierra Leone, this third round of data collection highlights the most urgent socioeconomic concerns and important lingering impacts of Ebola on households across the country, with a view toward the country's eventual economic recovery.

# Map

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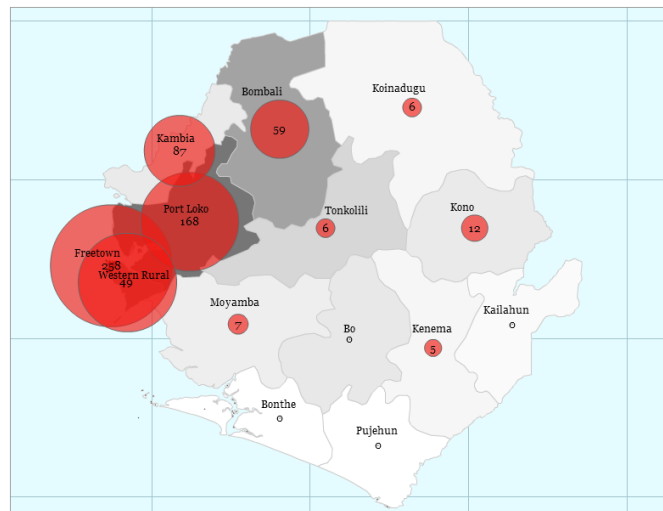
## Background

Since the initial appearance of the Ebola Virus Disease (EVD) in rural Guinea in December 2013, the virus has caused more than 11,000 deaths with over 27,000 cases in the region.<sup>1</sup> Sierra Leone has reported the highest level of cases of the three most affected countries, with 12,901 infections as of June 7, 2015, and 3,915 deaths. Substantial progress, however, has been made in recent months in controlling the outbreak. A second nationwide lockdown and information campaign took place from March 27 to March 29, and following this, a maximum of 15 new cases per week have been reported. The trajectory of the outbreak has also evolved. While the initial epicenter was in the Kenema and Kailahun districts, the total number of cases in these districts by May 2015 was below average. Kenema had only five confirmed cases between February 1 and June 7, and there were no cases in Kailahun over this period. The areas which have seen the largest number of cumulative cases are in the Western region, including Freetown and its environs, and in Bombali and Port Loko districts. In the week preceding June 7, there were new cases in only Port Loko and Kambia districts, and most, though not all, were within the contact tracing system. This also marked the first week since August 2014 in which there were no new cases in Freetown.

In response to the improving epidemiological situation, many of the restrictions in place to slow the spread of EVD were lifted by May 2015. Nearly all schools reopened on or close to April 14<sup>th</sup>, with the exception of a small number of private schools in Freetown, which decided to wait until the next academic year beginning in September. Restrictions on gathering for social or religious reasons have also been lifted. Certain obstacles to transportation, however, still remain. Restrictions continue on the number of passengers permitted per vehicle. While the international land border was reopened by Liberia on February 23, the border with Guinea was closed on March 30 in response to a number of new cases in border regions.<sup>2</sup> Three international carriers have service to Sierra Leone as of May 2015, Brussels Airlines, Royal Air Maroc and Air Côte D'Ivoire, with service from Kenya Airways scheduled to restart in June.

In addition to the EVD crisis, the Sierra Leonean economy has also been impacted by falling prices for iron ore, its main international export. The two main iron ore mines are currently idle. The Tonkolili mine ceased production in December 2014, though most workers are still being paid a

Figure 1: Total and recent (since February 1 2015) incidence of EVD



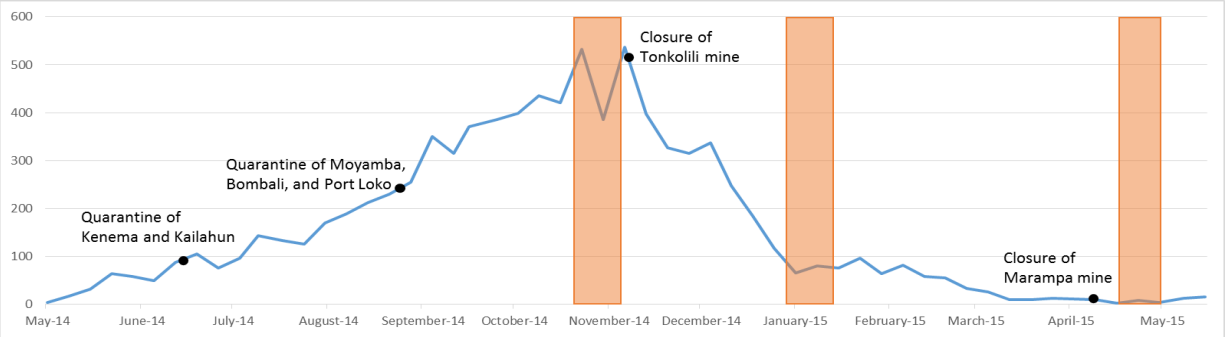
Source: World Health Organization Situation Report June 3, 2015. Grey shading represents the incidence of the total number of cases and the red circles and figures indicate the number of cases from February 1 – June 7, 2015.

<sup>1</sup> These figures are from June 10, 2015, WHO Situation Report, available at: <http://apps.who.int/ebola/en/current-situation/ebola-situation-report-3-june-2015>

<sup>2</sup> <http://www.usnews.com/news/world/articles/2015/03/30/guinea-shuts-border-with-sierra-leone-in-effort-to-end-ebola>

reduced salary. The Marampa mine, in Port Loko district, ceased production in April 2015, with the majority of workers being laid off. Though the direct impact on employment of these mines is limited, affecting up to 7,500 employees, a large number of businesses that were suppliers to the mining operations have also been adversely affected. According to the most recent IMF Country Report, the Sierra Leonean economy is projected to suffer a substantial contraction in 2015, with the magnitude largely dependent on the iron ore sector. Estimates range from 13 percent, in a scenario where operations resume in the near future and return to full capacity quickly, to almost 25 percent if operations do not resume in 2015. The contraction has implications both for employment, with more limited opportunities in a smaller overall economy, and for government revenues to meet the expanded needs in the wake of the EVD crisis.

Figure 2: Number of infections per week and periods of data collection



Source: World Health Organization Situation Reports. Orange shading identifies dates of data collection.

## Objectives & Methodology

To monitor the socioeconomic impacts of the EVD crisis, the Government of Sierra Leone conducted a series of cell phone surveys. With funding provided by the World Bank, three rounds of data collection were conducted by Statistics Sierra Leone: the first from November 12 to November 25, 2014; the second from January 22 to February 4, 2015; and the third from May 1 to May 12, 2015. This report provides results from the third round of these surveys.

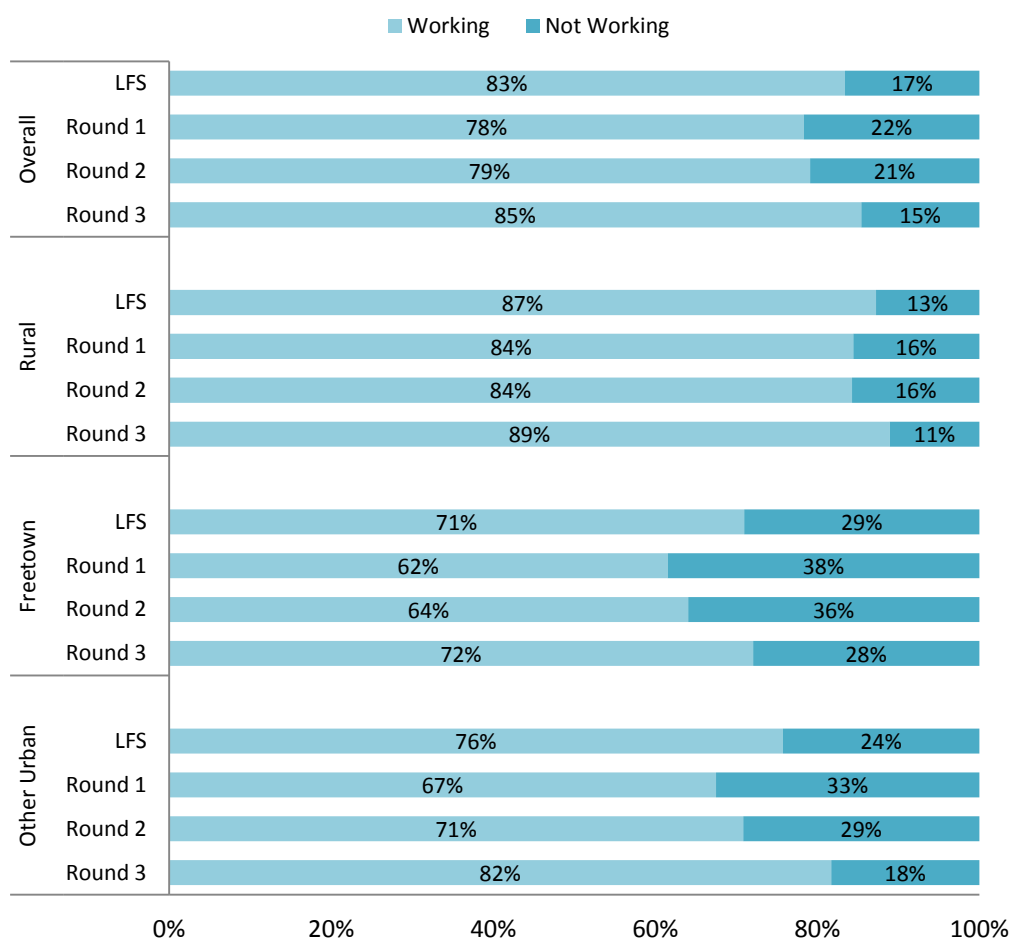
The survey was given to household heads for whom cell phone numbers were recorded during the nationally-representative Labor Force Survey (LFS) conducted in July and August 2014. Overall, 66 percent (2,764) of LFS households had cell phones, although this coverage was uneven across the country, with higher levels in urban areas (82 percent) than rural areas (43 percent). Of those with cell phones, 69 percent were reached during round 1, 68 percent in round 2, and 62 percent in round 3. Fifty-one percent of LFS households were surveyed in all three rounds, and 79 percent were reached in at least one round. Throughout the report, LFS data presented are for those who responded either in at least one of the cell phone survey rounds (see the methodology appendix for more detail).

The report is structured in eight sections covering employment, agriculture, food security and prices, social assistance, remittances, migration, education, and health facility utilization. As in the previous report, the main level of disaggregation is into three groups: rural areas, Freetown, and other urban areas.

## Employment<sup>3</sup>

**Employment rates in Sierra Leone have returned to pre-EVD levels.** As documented in the previous reports, a large number of Sierra Leoneans stopped working during the EVD crisis. But as the health crisis wanes, people are returning to work, and as of May 2015, national employment rates are very similar to those recorded by the Labor Force Survey in July-August 2014. In both Freetown, the area most affected in terms of employment by the EVD outbreak, and in rural areas, which were the least affected parts of the country, employment rates in round 3 are statistically equivalent to the 2014 LFS. This represents a substantial recovery for Freetown as the employment rate fell to nine percentage points below the baseline at the peak of the outbreak. In other urban centers, which also suffered large declines in employment rates, there has been a statistically significant increase in employment above both the peak of the outbreak and the baseline, from 76 percent in the LFS to 82 percent in round 3.

Figure 3: Employment rates



Source: Sierra Leone LFS (July-August 2014) and cell phone surveys round 1 (November 2014), round 2 (January-February 2015) and round 3 (May 2015).

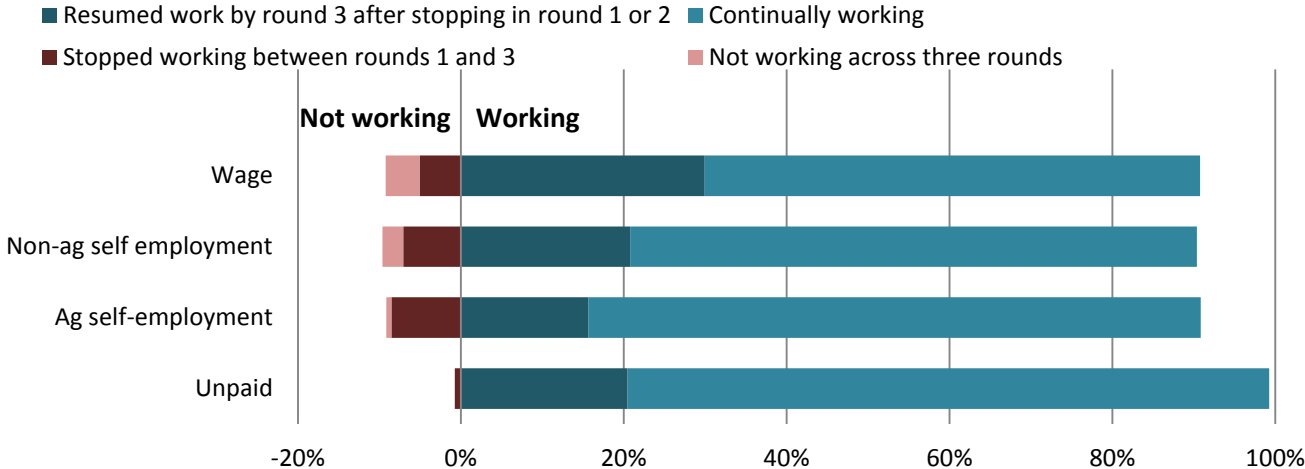
<sup>3</sup> Estimates for round 1 and 2 in this report are slightly different from those in the previous reports because of: (i) the additional households added to the sample in round 3, which are then also added to LFS baseline estimates, and (ii) a slightly revised geographical classification.



**More respondents returned to work than exited since round 2, particularly men and wage workers.**

Among the respondents working in LFS and present in all three rounds of the cell phone survey, 91 percent report being employed in round 3, a significantly higher share than in round 1 (84 percent) or round 2 (86 percent). The majority of workers in the LFS, 72 percent, were employed in all three rounds, while 19 percent returned to work by round 3 after reporting being out of work in either round 1 or round 2, and 7 percent stopped working in rounds 2 or 3 and never re-entered. Only two percent report not working in any of the three rounds. Male respondents are more likely to be working than female respondents, 95 percent compared 80 percent. By round 3 the same percentage of respondents were working across the wage, non-agricultural and agricultural self-employment sectors. Despite substantial initial losses in the sector, 30 percent of wage workers who left work in round 1 or 2 have resumed working by round 3, while approximately 9 percent remain out of work. Also around nine percent of those who reported being self-employed in agriculture in the baseline report not working in round 3, but overall it appears there was less of a drop in agricultural work as virtually no one in this sector reports not working in all the three rounds (Figure 4). It is not possible, however, to judge how unusual this level of movement into and out of work is in non-crisis years as no nationally representative surveys on labor market outcomes had been conducted in almost 30 years prior to the LFS in 2014.

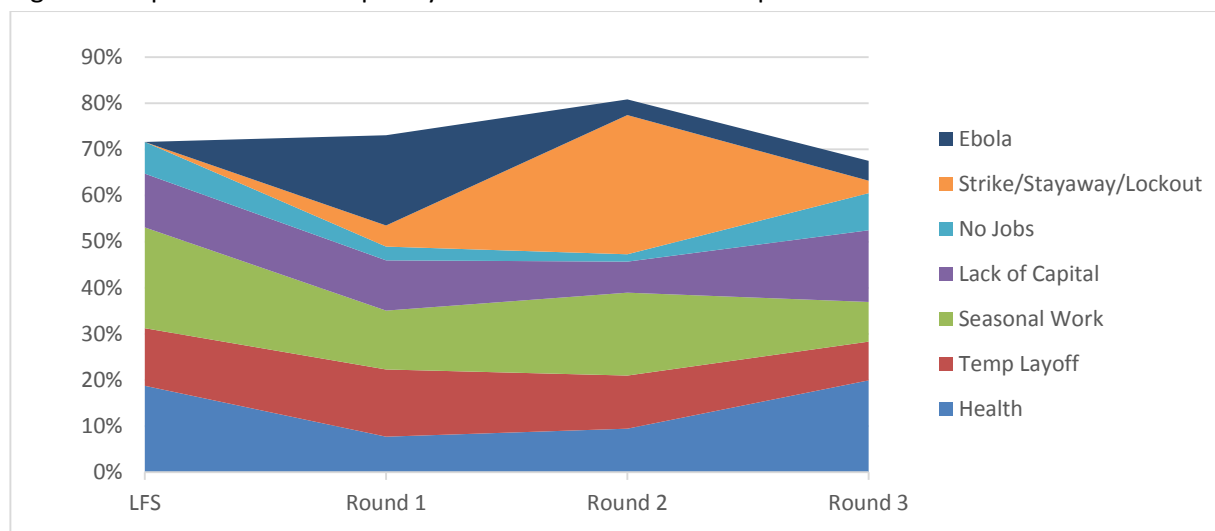
Figure 4: Employment inflow and outflow by sector



Source: Cell phone surveys round 1 (November 2014), round 2 (January-February 2015), and round 3 (May 2015). An individual’s sector is defined by their sector of employment in the LFS.

**Main reasons for temporary absence in round 3 are similar to pre-crisis levels.** In round 1, Ebola specifically was the most commonly cited reason for a temporary absence from employment. In round 2 the main reason cited was “strikes, stayaways, and lockouts,” many of which were closures related to EVD. One-quarter and one-third of those absent from work during the week before the survey cited one of these two reasons in round 1 and round 2, respectively. In round 3, only seven percent cite one of these two as the primary reason for temporary absence. Overall the reasons cited in round 3 are similar to those found in the LFS baseline. Health reasons are cited by approximately 20 percent of the respondents in round 3, similar to the share in the LFS, and unlikely to be related to EVD as there were less than 15 cases reported nationally during the round 3 data collection period. Seasonal work is cited

Figure 5: Top reasons for temporary absence from work in the past week

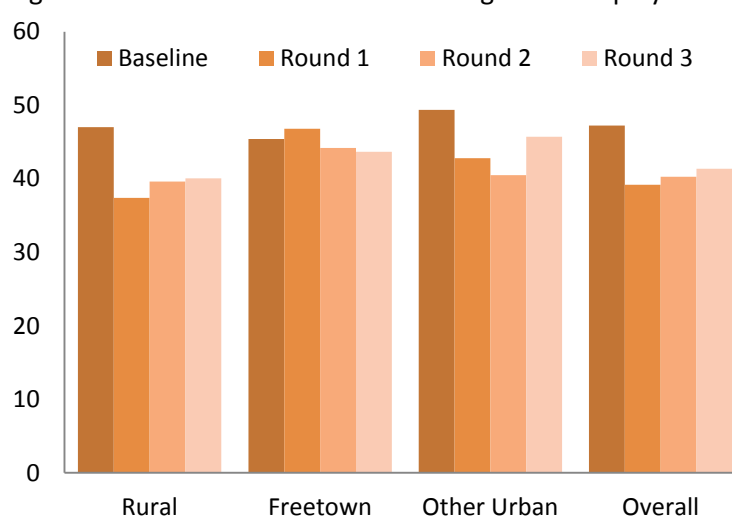


Source: Sierra Leone LFS (July-August 2014) and cell phone surveys round 1 (November 2014), round 2 (January-February 2015), and round 3 (May 2015).

by nine percent, substantially lower than the LFS, but this may be related to the onset of the labor-intensive planting season. Other important reasons for absence mentioned in round 3 are lack of capital (16 percent), temporary layoffs (8 percent), and lack of jobs (8 percent), but these shares are all very similar to those reported in the LFS. Overall the results indicate that by round 3 the Sierra Leonean workforce saw the reason for temporary absence to be mainly unrelated to EVD and instead cited reasons more common to the pre-crisis economy.

**Despite the return to work, hours remain lower, particularly in rural areas.** After the initial drop from 47 hours per week in the LFS to below 40 hours in round 1, the overall average number of hours remain lower than in the LFS. In urban areas outside Freetown, after progressive drops to a low of 40 hours in round 2, average hours worked per week increased to 46 hours in round 3, but remain below the 49 hours found in the LFS. The increase between rounds 2 and 3 is driven by the wage sector, in which working hours in May 2015 were the same (in statistical terms) as the LFS. Respondents engaged in self-employment and unpaid work, however, continue to work fewer hours in round 3, similar to the results in the previous rounds.

Figure 6: Hours worked last week among those employed



Source: Sierra Leone LFS (July-August 2014) and cell phone surveys round 1 (November 2014), round 2 (January-February 2015), and round 3 (May 2015).

Consistent with the above findings and the high prevalence of self-employment, workers in rural areas continue to work fewer hours, despite the start of planting activities in many areas. Hours in Freetown remain statistically similar to the LFS and to previous rounds.

**Earnings among wage workers remain substantially lower than in the baseline.** Though the wage employment sector represented only a small portion of the Sierra Leonean workforce, six percent according to the 2014 LFS, these jobs were comparatively higher paid positions in public and non-farm private sectors (83 percent of wage employment). Among wage workers responding in all three rounds of the cell phone survey, average monthly nominal earning declined from 698,000 Leones (USD 159) in the LFS to 527,000 Leones (USD 120) in round 3.<sup>4</sup> While the decline could be explained by the recent job losses and wage reductions in the mining sector, this accounts for only approximately seven percent of total wage employment. Indirect effects of the general economic slowdown related to EVD and the decline of the mining sector are more likely to be the root causes of lower earnings.

**The non-farm household enterprise sector continues to be disrupted.** The share of households reporting having closed a business in the last six months increased progressively from 4 percent in the LFS to 13 percent in round 1 and then to 22 percent in round 2. Although the rate of closure has slowed to 13 percent in round 3, fewer respondents report operating a business in the six months preceding the survey, decreasing to 58 percent from 69 percent in round 2. The reasons cited for business closure show substantial differences from those experienced immediately after the initial outbreak. In round 1 the crisis impacted business operations mainly through channels directly related to EVD and measures put in place to slow infection, with respondents citing the outbreak of Ebola and a lack of labor as the main constraints. In round 2 and even more so in round 3, knock-on effects related to the economic slowdown are dominant. Lack of capital is the most common reason cited for business closure in round 3 (57 percent), compared to 9 percent in round 1 and 29 percent in round 2. This suggests during the crisis some households depleted their productive capital to meet immediate needs and are now having difficulties finding resources to restart businesses, which may be additionally compounded by low demand (lack of customers) that makes reopening more risky.

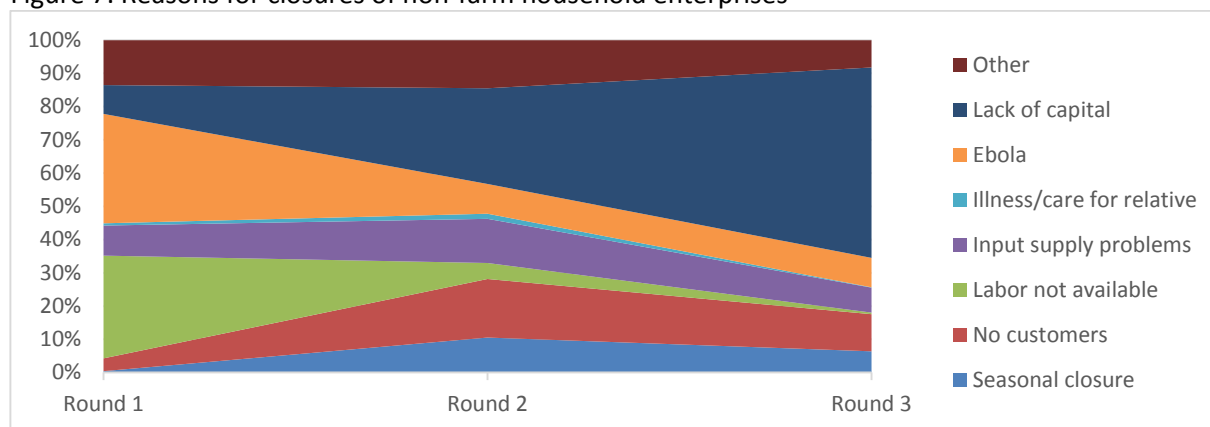
**Revenues from non-farm household enterprises remained significantly below the pre-crisis levels.** The drop in business revenues seen in round 1, equivalent to an almost 65 percentage decrease, and round 2, was statistically unchanged in round 3. Average monthly revenues among non-farm household businesses declined from approximately 1.6 million Leones (USD 336) in the LFS to 570,000 Leones (USD 131) in round 3.<sup>5</sup>

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<sup>4</sup> As with many similar surveys, the cell phone survey had high attrition among top earners. Of the top one percent of wage earners in the LFS, 100 percent responded in round 1, 68 percent in round 2, and 32 percent in round 3. This is likely reflective of the increasing opportunity cost of their time as they return to work. The survey therefore does not report cross sectional estimates of earnings, which would be biased by the loss of the top earners. By using only the panel data, the overall trends are likely to be robust as attrition was more uniform across the remainder of the distribution.

<sup>5</sup> The decline is robust to different definitions of business revenues. See details in Methodological Appendix.

Figure 7: Reasons for closures of non-farm household enterprises



Source: Sierra Leone LFS (July-August 2014) and cell phone surveys round 1 (November 2014), round 2 (January-February 2015), and round 3 (May 2015).

**Many workers in non-farm self-employment in the LFS are working in different sectors in round 3.** For those working in both LFS and during round 3, overall 35 percent were working in a different sector in round 3 than in the LFS. Among those in non-farm self-employment in the LFS almost half reported working in a different sector in round 3. Twenty-four percent are employed in agricultural self-employment, 19 percent in the wage sector, and the remaining 6 percent in unpaid activities. Switching sectors was less common for workers in wage employment and agriculture self-employment. The most common shift for those in wage employment was to non-farm self-employment (15 percent) and for agricultural self-employed workers was to unpaid activities (15 percent). The large shifts for the self-employed likely represent a combination of the seasonal rise in agricultural casual labor for the planting season and the need to seek out other employment amid continuing declines in household enterprise, but it is not possible to determine from the cell phone survey data the extent to which this is linked to the EVD crisis or economic slowdown as this type of sector switching is common in places with largely informal economies.

**Youth employment has rebounded but revenue from youth-owned non-farm enterprises remains low.**

Although overall youth employment rates did not change significantly since the LFS in previous rounds, youth (ages 15-35) in Freetown experienced a decline in employment from 76 percent in the LFS to 60 percent by round 2. By round 3, however, there are no statistically significant differences in youth employment rates compared to the LFS either within or outside Freetown. While the percentage of young respondents reporting a household enterprise no longer operating decreased from 25 percent in round 2 to 9 percent in round 3, monthly revenue is well below the LFS levels and showed no signs of improvement between rounds 2 and 3. Depending on the definition used (see details in the Methodological Appendix), revenues in round 3 are between 50 and 65 percent lower than in the LFS for both youth- and non-youth operated businesses. Also similar to the wider population, the average number of hours worked per week among youth in round 3 remains lower (41 hours) than the pre-crisis level (48 hours). This trend is mainly driven by a substantial drop in hours worked by youth in rural areas, from 48 hours in the LFS to 39 hours in round 3, though average hours worked in round 3 in Freetown (44 hours) and in other urban centers (46 hours) were similar to the LFS.

## Agriculture

**The 2014 rice harvest has been completed and total harvests are comparable with previous data.** Of those households cultivating rice in the previous season, 95 percent said that the harvest was complete by May 2015. The overall production for these households is estimated at 632 kilograms in round 3, which is slightly higher than the 605 kilograms in round 2, though this difference is not statistically significant. The value is also similar to the 697 kilograms per household estimated by the Agriculture Household Tracking Survey (AHTS), collected in 2010. A possible reason for higher totals in round 3 is delays in completing the harvest due to abnormal rainfall, as 70 percent of households with rice still in the field in round 2 indicated the rice was not yet ready for harvest. Alternatively, extra time may have been needed to complete larger harvests due to labor shortages, cited as the second most common reason for not completing the harvest in round 2.

**Rice sales have increased with completion of harvesting activities.** The percentage of households selling at least some portion of their crop increased from 16 percent in November to 26 percent in January and then to 36 percent in May. The average household indicated having sold about half of their total rice crop, to traders (58 percent), neighbors (26 percent), weekly markets (8 percent), and relatives (7 percent). In the 2010 AHTS, the percentage selling to traders was higher, approximately 70 percent, but the limited sample size in the cell phone survey means the difference is not statistically different. Rice-growing households in Bo, Tonkolili, and Bombali districts are most likely to sell to traders in round 3, while those in Moyamba, Kenema, Pujehun, Bonthe, Koinadugu, and Kono districts are most likely to sell to neighbors or relatives. Sales at luma (or periodic markets) are relatively rare nationally but most common in the frontier district of Kambia, the traditional center of trade with Guinea, and in Pujehun and Kailahun, both bordering Liberia, which has experienced higher rice prices during the EVD crisis. The above results, however, should be interpreted with caution as those responding in the cell phone survey are likely to be less remote and thus more connected to markets, and may also be wealthier or larger producers than non-respondents.

**New rice planting activities did not appear to be disrupted by the EVD crisis.** Of the households which planted rice last year, less than two percent said that they would not plant in the upcoming season. For this small percentage, the majority cited reasons related to labor shortage, either in the household or the wider community. Labor markets, however, did appear to be functioning, as nearly 40 percent of agricultural households indicated hiring labor in the last two weeks to assist with rice planting. Of those that planned to cultivate rice in the coming season, approximately 15 percent had already planted, mainly in Tonkolili and Port Loko districts. In addition, there are substantial new entrants into cultivation. Of the one-quarter of agricultural households that did not cultivate rice in the previous season, over half said they would cultivate this season. The cause of the increased number of rice farming households cannot be clearly determined from the cell phone data. While the majority of new farmers were Kono, Tonkolili, and Western rural districts, about 20 percent were in Kenema and Kailahun, areas in which the first infections in May 2014 coincided with the planting season. These households could therefore be those which generally plant rice but did not last year due to EVD, though there were less than 50 total cases in Sierra Leone by mid-June 2014. For those in other districts, increased prices for rice in rural areas and in neighboring countries may lead to increased planting. Also, agricultural households may plant rice, either

instead of or in addition to cash crops, as a means of reducing risk and guaranteeing food sources if the economic slowdown persists.

**There continues to be no evidence of disruption in cocoa markets.** As the cocoa season generally goes from August to January, nearly three-quarters of the limited sample of 91 cocoa farmers have not harvested any cocoa in the current season. Of those that have harvested, most of the cocoa had been dried, with a small portion still in pods. All of the respondents with dried cocoa indicate at least some of the harvest had been sold, as had the majority of those whose harvest is still in pods. The high percentage of off-season sales may be attributed to higher international prices following a poor harvest in nearby Ghana. This supports evidence from the first round that showed minimal disruption to the cocoa trade, with no differences between quarantine and non-quarantine districts in cocoa sales, and the second round, which showed increasing sales among those that had harvested.

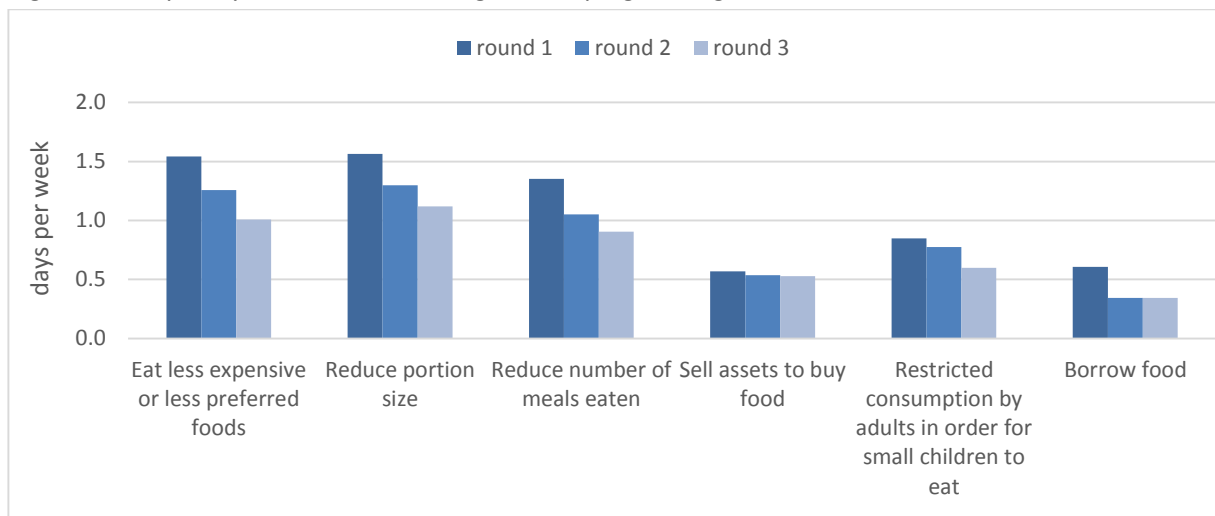
**Access to agricultural support services has been limited.** Of agricultural households, about eleven percent indicate receiving aid or advice from agricultural business centers (ABC), NGOs, farmer-based organizations (FBO), cooperatives, or other providers in the previous six months. One-quarter of these households are in the Kailahun district, which was one of the districts that was initially most impacted by EVD, but also had the highest incidence of involvement with extension agents in the 2010 AHTS, and it is therefore difficult to attribute the relative impacts. With regard to different types of interventions, around seven percent indicated receiving agricultural inputs, including seeds, nearly all of which are distributed by NGOs. A large percentage of those receiving seeds are in the Kailahun district, as well as smaller percentages in Koinadugu, Port Loko, Kenema, and Western rural districts. Just under four percent of agricultural households indicate receiving agro-processing equipment or tools, again mainly distributed by NGOs in Kailahun with smaller percentages in Kono, Kenema, and Western rural districts. Just over ten percent of agricultural households indicate receiving extension advice, with the largest percentage in Kailahun and Port Loko districts. Similar to agricultural input distribution, NGOs provide the majority of extension services, though ABCs and FBOs contribute as well. Of those receiving support or services, more than half of households indicate receiving more than one of the above services.

## Food Security and Prices

**Households used food insecurity coping strategies less frequently in round 3.** Overall, about one-third of households report using at least one strategy to cope with insufficient food in the week prior to the survey, a figure that remains unchanged since rounds 1 and 2. In round 3, in the previous week 49 percent of households ate less expensive or less preferred foods, 49 percent of households reduced portion size, 43 percent reduced the number of meals they ate, 34 percent restricted consumption by adults in order for small children to eat, 31 percent had to sell assets to buy food, and 19 percent borrowed food, and more may have taken other actions not specifically included in the questionnaire. These percentages were virtually unchanged from round 2, and since comparable baseline data does not exist, it is not possible to tell how much of this would have taken place even in the absence of EVD. The frequency of use of these negative coping strategies, however, has decreased. The number of days in the last seven in which the household used a given food coping strategy significantly decreased for all categories except selling assets to buy food (Figure 8). This suggests marginal improvements in food security levels likely

related to the combination of factors, including completion of the harvest in rural areas, the improving employment situation in urban areas, and ongoing food distribution efforts.

Figure 8: Frequency of households using food coping strategies

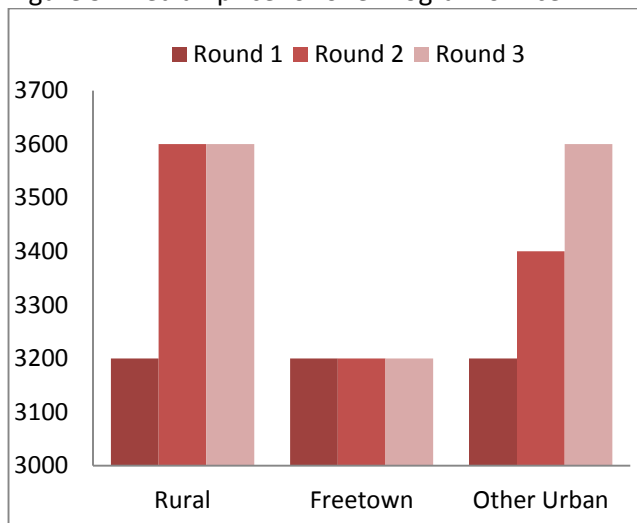


Source: Cell phone surveys round 1 (November 2014), round 2 (January-February 2015) and round 3 (May 2015).

**Despite the completion of the harvest, rice prices have risen since November outside of Freetown.**

Historic data from the national Consumer Price Index shows the lowest prices for local rice in January, which then steadily rise to a peak in July and August before declining again, while prices for imported rice are more steady throughout the year. Though the cell phone survey does not distinguish between local and imported rice, the median price in Freetown is constant at 3200 Leones across the three rounds, consistent with most rice consumed there being imported. Outside Freetown, where households are more dependent on historically more expensive local supplies, there have been increases since November. The median price for a kilogram of rice increased from 3200 Leones in rural areas in November to 3600 Leones in January - February, and remained constant in May. In urban areas outside Freetown, the price increased from 3200 Leones to 3400 Leones between rounds 1 and 2, then further increased to 3600 Leones by round 3. The unseasonably high prices in round 2 are likely related to the late harvest and to transportation restrictions and market closures that disrupted commerce. Further data collection will be necessary to determine if price have now returned to normal seasonal patterns.

Figure 9: Median price for one kilogram of rice



Source: Cell phone surveys round 1 (November 2014), round 2 (January-February 2015) and round 3 (May 2015).

## Remittances

**The share of households receiving remittances remains unchanged from round 2, but the average value has decreased.** In the month preceding round 3, 13 percent of households surveyed reported receiving remittances from either domestic or international sources in the month prior to the survey. This is not statistically different from the previous two rounds. The average value of remittances for those household which received them is 330,000 Leones, compared to 400,000 Leones in round 2 and 275,000 Leones in round 1. The decrease between rounds 2 and 3 can potentially be attributed to holiday giving, captured in round 2, and an appreciation in the exchange rate since January, though values remain well above those in round 1. Without historical data on the seasonal giving patterns, it is difficult to attribute the increases to EVD, though it is possible that the higher amounts were related to the ongoing crisis. In addition, different households received remittances. Of the households in all three rounds, about 20 percent reported receiving remittances in at least one round, but of those receiving, less than 10 percent received in all three rounds.

## Migration

**Migration into and out of districts appears to be**

**temporary and not systematically related to the incidence of EVD.** Overall 93 percent of respondents indicate living in the same district as in the LFS, of whom six percent reported having lived in a different district in either round 1 or round 2 of the cell phone survey but returning to their original LFS district by round 3. The Western Urban district, comprising Freetown, has both the highest number of cases and positive net in-migration. Other districts show net out-migration despite having a comparatively moderate number of cases. The district with the largest percentage of out-migration is Tonkolili, where the major iron ore mine ceased production in December. This supports the hypothesis that most migration was economic in nature rather than related to the fear of infection. It should be noted though that the remote nature of the cell phone survey makes the measure of migration challenging because respondents do not always accurately self-report their location (see round 2 appendix for details). In addition, the sample sizes for individual migration patterns within districts are very limited, and therefore the trends should be taken only as indicative of the overall patterns.

Figure 10: Households receiving remittances

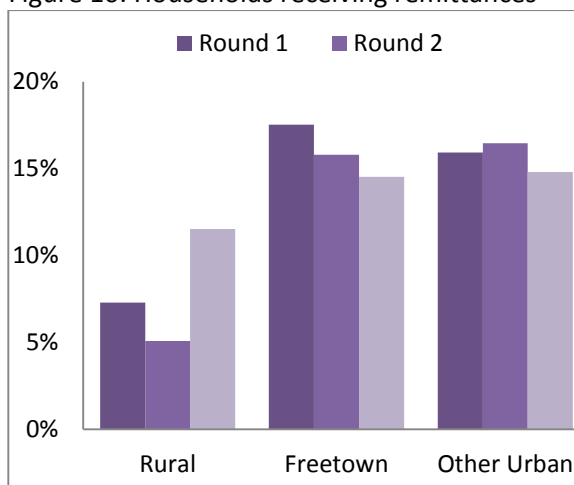
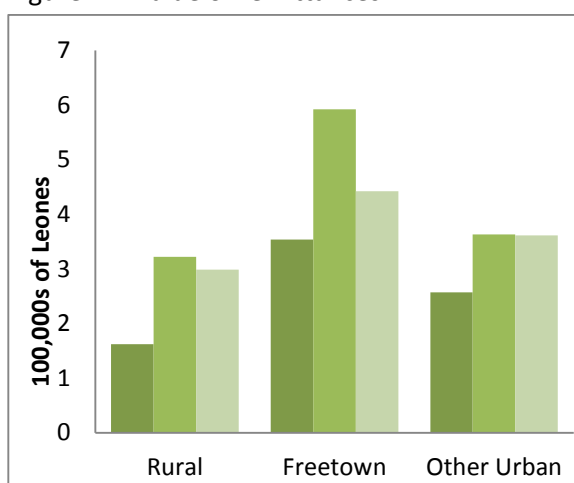


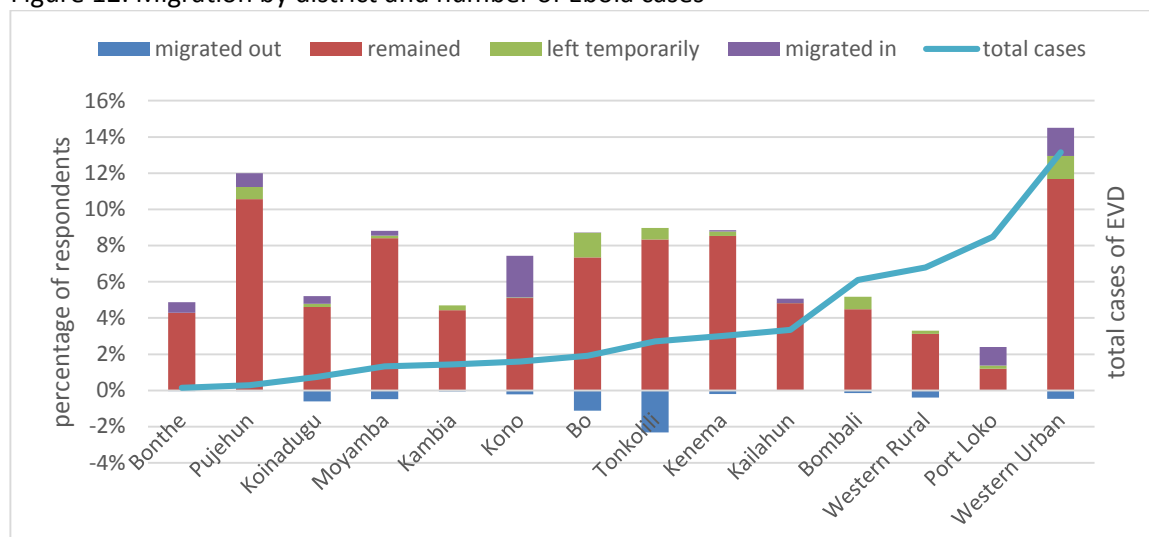
Figure 11: Value of remittances



Source: Cell phone surveys round 1 (November 2014), round 2 (January-February 2015) and round 3 (May 2015).



Figure 12: Migration by district and number of Ebola cases

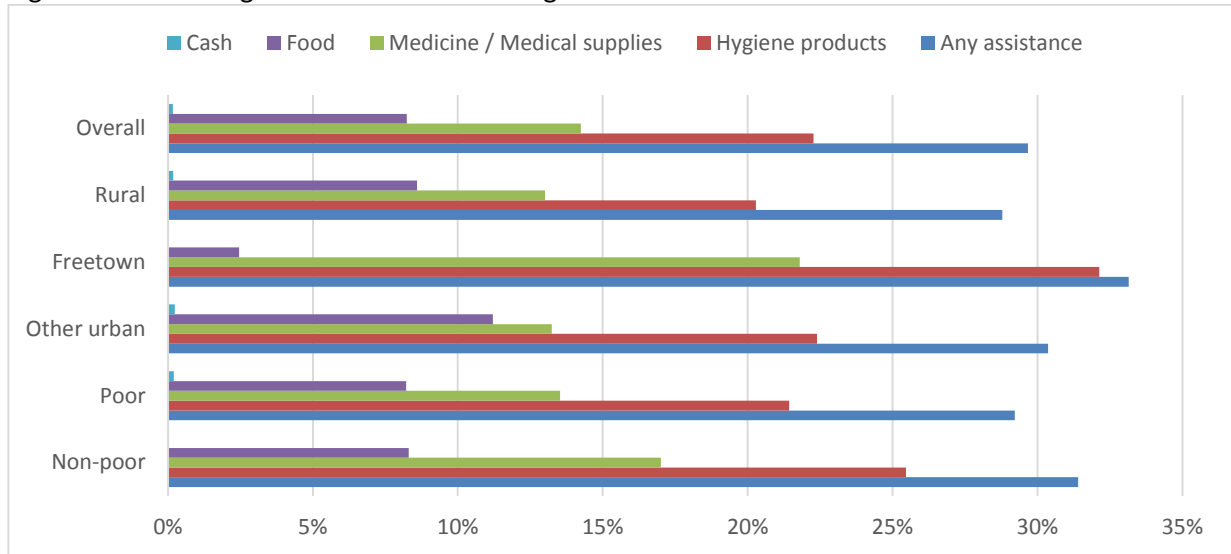


Source: Labor Force Survey (July-August 2014), cell phone survey round 3 (May 2015) and Ebola Situation Report June 3, 2015 (World Health Organization).

## Social assistance

**Social assistance continues to be mostly non-poverty targeted in-kind transfers, and there is little evidence beneficiaries paid fees in return for the support.** In the six months prior to the round 3 survey, national coverage of social assistance remained unchanged, with eight percent of households reporting receiving any social assistance either in the form of cash transfers, cash for work, food for work, free food, or subsidized food. Nearly all of this assistance was in the form of free food, with cash assistance, including cash for work, comprising less than two percent of households. The incidence of social assistance was highest outside Freetown (nine percent compared to two percent of households in Freetown), but there is no difference between urban and rural areas outside of Freetown. In addition, many households report receiving in-kind support. Overall 22 percent of households received hygiene products (soap, chlorine, and other and disinfectant products), and 14 percent received medicine or medical supplies. In-kind support was most common in Freetown, with 33 percent of households receiving one or both types of aid, compared to 23 percent outside Freetown. Also, there were no statistically significant differences in the proportion receiving assistance between poor and non-poor groups, as defined by the median score of a wealth index, for either cash, food, or in-kind support. This estimate may be biased, however, if the poor are systematically missed by the cell phone survey due to lower cell phone coverage. Additionally, nearly all those receiving assistance (98 percent) report that they did not have to pay any fees, even if small, to receive cash or in-kind support.

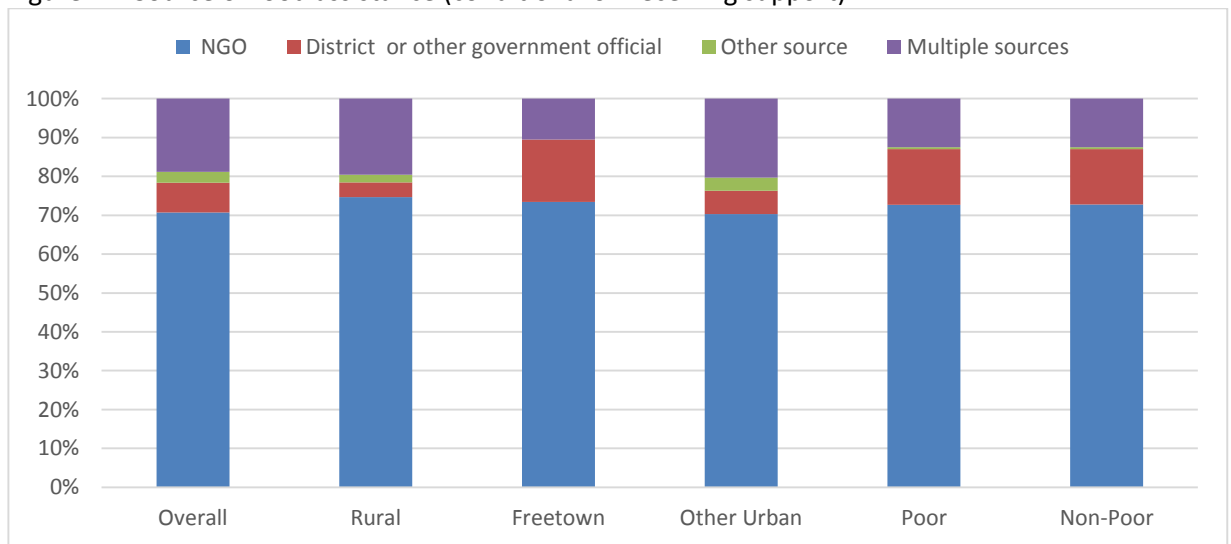
Figure 13: Percentage of households receiving social assistance in the last 6 months



Source: Cell phone survey round 3 (May 2015).

**The majority of food distribution continues to be carried out by non-governmental organizations.** Of households receiving food assistance, 82 percent report receiving food distributed by an NGO, 26 percent report receiving food from district or other government officials, and about 3 percent from other sources (including traditional leaders, faith- and community-based organizations). Nineteen percent indicate receiving food from multiple sources, possibly indicating over-coverage of food distribution in certain areas.

Figure 14: Source of food assistance (conditional on receiving support)



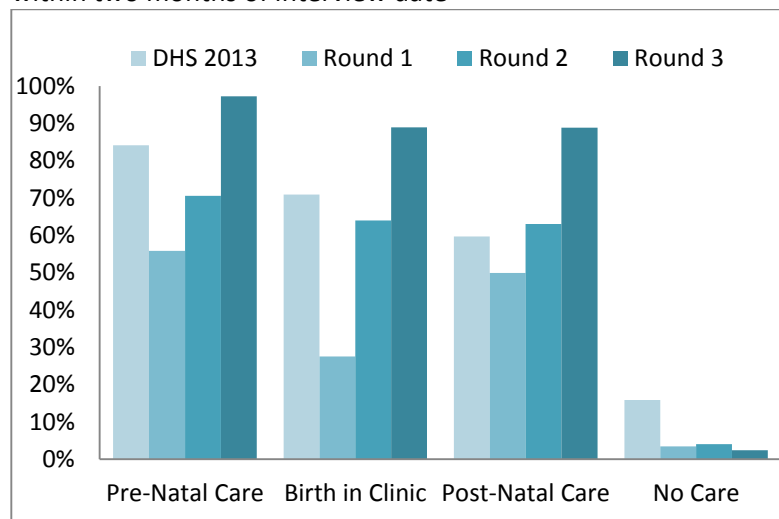
Source: Cell phone survey round 3 (May 2015).

## Health Facility Utilization

### Utilization of maternal care services continues to rise.

The share of households reporting a member gave birth in the two months prior to the survey and did so in a hospital or clinic increased from 28 percent in November 2014 to 64 percent in January/February 2015, and then to 89 percent in May. This is compared to 71 percent among households owning a cell phone in the 2013 Demographic and Health Survey (DHS). The return to health care facilities by expectant mothers is likely driven by declining infection rates, particularly among health

Figure 15: Pregnancy related visits for mothers of babies born within two months of interview date



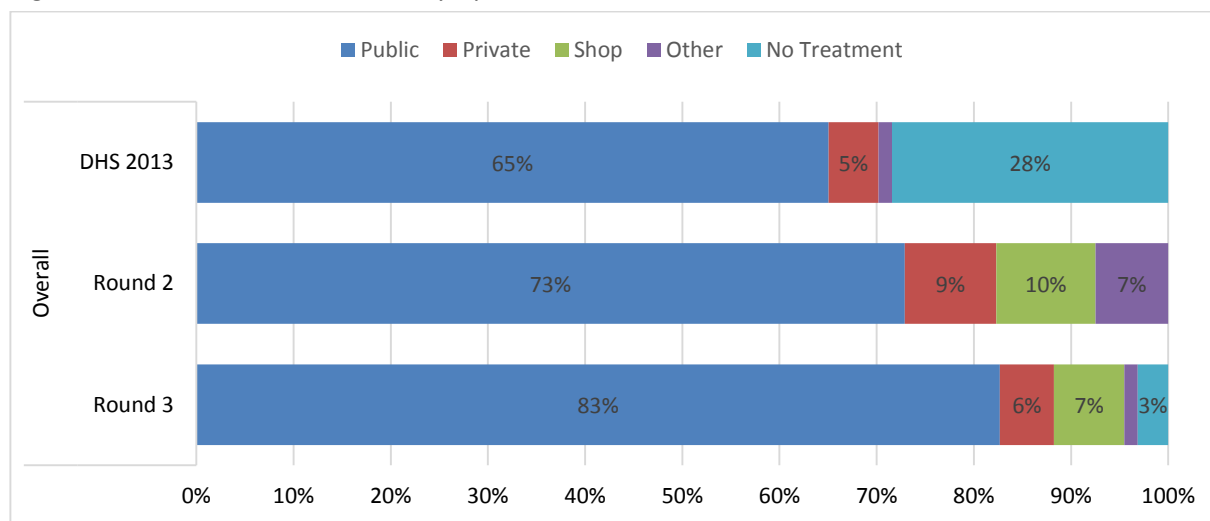
Source: Households with cell phones only, DHS (2013) and cell phone surveys round 1 (November 2014), round 2 (January-February 2015), and round 3 (May 2015).

professionals, improved triage, and by a continued reduction in health worker's fears of infection during deliveries due to improved training and supplies. Similarly, pregnant women who received at least one prenatal visit increased from 56 percent in November to 71 percent in January/February to 97 percent in May, compared to 84 percent in the DHS, and postnatal care visits among those who have given birth in the last two months increased from 50 percent in November to 63 percent in January/February to 89 percent in May. This is compared to 60 percent in the DHS. The increase from round 2 to round 3 is due to sharp increases in the use of these facilities in rural and other urban centers outside Freetown, while use in Freetown remained statistically unchanged. The round 3 levels outside Freetown are now substantially higher than both previous rounds and the 2013 DHS, though the explanation for these increases cannot be determined from the data. One possibility is that expanded access through the Free Healthcare Initiative and greater awareness of health issues following EVD have increased usage rates above the DHS baseline. There is also likely an element of selection bias in the respondents as even among cell phone owning households, those which respond are likely to be better-off than average as they have sufficient resources to keep phones charged and numbers active. This would be particularly true outside Freetown, where electricity is scarce.

### There is no evidence in round 3 of a change in the reliance on government health care facilities for the treatment of diarrhea among children under five.

The percentage of children under 5 reporting experiencing diarrhea in the previous two weeks increased from seven percent to nine percent between rounds 2 and 3. Of these 97 percent were treated in round 3, compared to 100 percent in round 2, though all round 3 cases in Freetown were treated. The location of treatment shows continued reliance of government facilities (including district hospitals and government clinics), though none of the differences above are statistically significant due to the limited sample size.

Figure 16: Source of treatment for symptoms of diarrhea



Source: Households with cell phones only, DHS (2013) and cell phone survey round 2 (January-February 2015) and round 3 (May 2015).

## Education

**A large majority of school age children have returned to classrooms.** Nearly 90 percent of households report having at least one school age member (age 6 – 17), and of these households, 87 percent report all children are attending. This percentage is consistent across urban and rural areas. In less than one percent of households the head indicated that none of the children were attending. For those students not attending, the main reasons given is that the child was too young (38 percent), followed by not being able to afford school (29 percent), and working / learning a trade (12 percent). Less than two percent of households said that the school was unsafe or still closed due to EVD. As with the health findings above, it is likely that there was some selection bias towards better-off households, and that the percentage of children attending nationwide is lower. Additionally, despite the reopening of schools, more than 70 percent of households indicate that at least one child is still listening to the educational programs on the radio. Of households in which at least one child is out of school, nearly 85 percent reported listening to school on the radio.

## Conclusions

The economic situation in Sierra Leone continues to improve following the sharp reduction in new cases in recent weeks. Overall employment levels, as measured from May 1 to May 15, 2015, have returned to levels similar to those found in the July-August 2014 LFS baseline. Employment in Freetown, which had suffered the largest decline in employment rates, rebounded to LFS levels, after having declined by nine percentage points at the peak of the outbreak in November 2014. Other urban centers outside Freetown have even higher levels of recovery. Non-farm self-employment activities, the sector most impacted by the crisis, also show increasingly positive signs with more people re-entering than exiting between rounds 2 and 3. This is particularly important for youth in Freetown, which work disproportionately in self-employed activities and had seen high job losses at the height of the crisis.

There are, however, signs that the economy has not yet fully recovered. Hours worked per week remain below baseline levels. This is particularly true in rural areas even though land preparation and rice planting has begun in many parts of the country. Also, despite encouraging news in non-farm self-employment, those households which have not yet reopened businesses are more likely to cite a lack of capital than prior to the onset of EVD. If business owners were forced to consume their working capital to meet basic needs in the initial stages of the crisis, they may find it difficult to reopen even as the economy continues to improve. Revenues for operating non-farm household enterprises also remain significantly below baseline levels, indicating this sector, which employs one-third of the country's workforce, is yet to achieve full recovery.

Agriculture shows increasingly positive signs as the new planting season begins. Between rounds 2 and 3, the 2014 harvest was completed, with total harvests being comparable to previous yields. Higher levels of sales accompanying the completion of the harvest and a large percentage of households hiring additional labor to assist in the planting indicate rural commodity and temporary labor markets are also normalizing. A substantial percentage of agricultural households that did not grow rice in the previous year indicate planning to plant in the coming season, which may be related to higher rice prices in rural areas or greater diversification against the risk of an uncertain economic situation. The overall incidence of food insecurity remains high at approximately two-thirds of households across all three rounds of data collection, but the frequency of use of individual strategies decreased, pointing to improving conditions.

Social support continues to have relatively low coverage in round 3. Social assistance reached less than 10 percent of respondents, and most of this assistance was in the form of medical or hygiene supplies distributed by NGOs. Less than 15 percent of households report receiving remittances in the month preceding the survey, and the average value of these remittances decreased since round 2. Overall, migration remains limited with only seven percent of respondents reporting living in a different location than in the LFS, with a further six percent relocating temporarily in either rounds 1 or 2, but returning to their original district by round 3.

Utilization of basic social services appears to be increasing, with substantial increases in the percentage of pregnant women and new mothers seeking medical care and the stabilization of the share of households seeking treatment at public facilities for children under five with diarrhea. The percentage of households that indicate school-age children have returned to class is also quite high. Also those that are not using health or education services cite financial reasons rather than the fear of infection. These findings, however, may be impacted by selection bias resulting from those who are the poorest and most remote being the least likely to use health or education services, as well as the least likely to respond to the cell phone survey.

## Methodological Appendix

The third round of the high frequency socio-economic impact of Ebola survey was conducted by Statistics Sierra Leone (SSL), with funding and technical assistance from the World Bank's Poverty and Social Protection Global Practices, to estimate the impact on well-being of the Ebola Virus Disease (EVD) crisis. The first round was conducted from November 12 to November 25, 2014, the second round from January 22 to February 4, 2015, and the third round from May 1 to May 15, 2015. This note describes changes in the survey methodology since round 2 and any comparability concerns between the baseline and subsequent rounds.

### Questionnaire

*Agriculture* – Questions on whether households had received any services or support from agricultural extension agents in the previous six months, and if so, what was the nature of the service / support and who provided the service / support. Additional questions were also included on the planting season, including whether the household planned to plant rice, whether planting had yet begun, and if any labor had been hired for the planting.

*Social Assistance* – The social assistance section was expanded to include further disaggregated categories on the type of assistance received and how the assistance was distributed.

*Education* – Questions on school attendance were added.

*Trust* – The trust questions were dropped in the third round as they were unlikely to have moved substantially between rounds.

*Tracking* – Questions were added on additional re-contact information for the household beyond the phone number for the household head.

### Response Rate

Round 3 contacted 1,715 (67.9 percent) of the 2,764 households which provided cell phone numbers in the LFS and 40.8 percent of the total LFS households. Of these 1,405 households appeared in both rounds. Of the households reached, 93.6 percent were household heads in round 1, 92.3 were household heads in round 2, and 90.1 were household heads in round 3. If the respondent was not an original household member, the call was ended and an incorrect number was recorded. Table A2 shows the distribution of employment and geographic locations for the three rounds of the cell phone survey respondents and the original LFS sample.

### Weights

Note that there are a number of different sets of weights. There is a set of weights for each repeated cross section of data used in this report, i.e. four sets, one each for LFS, cell phone survey round 1, cell phone survey round 2, and cell phone survey round 3. There is a separate set of weights for the 4 period panel of households (i.e. the set of households that are in all three rounds of LFS, cell phone survey round 1, cell phone survey round 2, and cell phone survey round 3).

## Definitions

*Eligible households* – For most of the report, the LFS and the three rounds of the cell phone survey are used as repeated cross sections and not as a panel. To be as consistent with the round 1 report as possible, the repeated cross sections were created as follows. The round 1, round 2, and round 3 households are the full sample of households for which cell phone survey data was collected in November 2014, January – February 2015, and May 2015, respectively. The LFS cross section includes all the households that were surveyed in any of the three cell phone rounds, even if not in all rounds. This means that for the employment section, the sample is slightly different in each of the three reports. There are some household heads in the cell phone survey for whom there is no employment data in LFS dataset as they were considered not part of the labor force during the LFS. In this report, for the employment section, the round 1, round 2, and round 3 samples are restricted to those household heads for whom employment data was collected in the LFS. Most of the results in the employment section are based on using repeated cross sections, except for two sub-sections where the sample is restricted to being the panel sample of households across all three rounds (i.e. the sample of households that are in LFS, round 1, round 2, and round 3). The two sub-sections where the panel sample is used are those on employment transitions and earnings.

*Employment Definition* – Given the high frequency nature of the four surveys used and the nature of the EVD crisis, a slightly modified definition of employment was used in the analysis. Household heads were categorized as in the labor force in any given round of the surveys if they were working, looking for work or expected to return to work. For the round 1 report, if a household head was in the labor force in either the LFS or round 1 of the cell phone survey, he was categorized as in the labor force in both rounds. This was done because both rounds of the survey were conducted within three months or less of the previous round and it is unlikely that someone who was working in the LFS suddenly decided to exit the labor force rather than become unemployed due to EVD. Such high frequency labor force surveys are contrary to most other employment surveys and thus necessitate different definitions of labor force participation. In this report, to be consistent with the round 1 and round 2 report's approach and because of the high frequency nature of these employment surveys, a household head was categorized as in the labor force in all four rounds of surveys if they were in the labor force in any one round. As a result, none of the changes observed in employment rates are due to changes in the composition of the labor force.

*Calculation for monthly wage earnings* – Most wage workers report earnings in monthly terms, and therefore results associated with wage earnings are reported this way. For respondents who report wage income in other time units, the analysis translates their wages into monthly terms under the assumption they work at a standard capacity, i.e., 8 hours a day, 22 days or 4.3 weeks a month, and 12 months a year. The earnings data was not collected in round 1 in a way that allowed direct comparison to the LFS, which is the reason only LFS and round 2 are compared. Since earnings data tend to be noisy and a few large outliers can have a big impact on average wages, the figures reported here exclude earnings for the highest 5 percent. As a robustness check, median earnings were also analyzed and the same trends held.

*Correction of outliers in household enterprise revenues* – Business revenues are noisy so the main results in the report have the top percentile of revenues trimmed. As LFS has the highest revenues a large fraction of the outliers are from LFS. For this reason this report presents results based on an alternative approach, i.e. the top 1 percent of revenues in each round is trimmed. As a robustness check, revenues have also been calculated by excluding the top 1 and 5 percent. Same trends emerged from the analysis of these alternative measures.

*Pregnancy definitions in the DHS* - In the DHS each woman in the household was interviewed individually whereas in the cell phone surveys the respondent was the household head. It is possible that the cell phone survey underreports utilization if household heads are not always aware of clinic visits made by household members. It is also possible that the cell phone survey over reports pregnancies if the household head misremembers dates of birth and include pregnancies and child births that took place more than 2 months prior to the interview. A final difference is that while the DHS reports on current pregnancies and births in the last 2 months the cell phone survey captures anyone who was pregnant in the last two months i.e., the cell phone survey also captures visits from those who had miscarriages or abortions in the last 2 months while these are not include in the DHS utilization figures.

*Table A1: Geographical Distribution of LFS and Sample*

	<b>Labor Force Survey</b>		<b>% of LFS Found in Nov 2014</b>	<b>% of LFS Found in Jan-Feb 2015</b>	<b>% of LFS Found in May 2015</b>
	Freq.	Percent			
Kailahun	210	5.0	17.6	19.1	19.0
Kenema	420	10.0	51.0	49.8	48.1
Kono	420	10.0	58.1	56.0	51.9
Bombali	330	7.9	47.6	47.3	43.3
Kambia	181	4.3	32.6	37.6	33.7
Koinadugu	180	4.3	31.1	29.4	30.6
Port Loko	179	4.3	27.4	28.5	24.6
Tonkolili	180	4.3	25.6	25.6	22.2
Bo	421	10.0	43.9	44.7	39.0
Bonthe	269	6.4	42.0	37.9	37.2
Moyamba	180	4.3	34.4	40.0	32.8
Pujehun	180	4.3	24.4	28.3	25.0
Western Rural	288	6.9	51.7	37.9	40.6
Western Urban	761	18.1	63.2	64.3	56.1
Total	4,199	100.0	45.2	44.7	40.8



Table A2: Employment Status Distribution of LFS and Sample

	Employment Status in LFS		Employment Status in Nov 2014	Employment Status in Jan-Feb 2015	Employment Status in May 2015
	Freq.	%	%	%	%
Employee regular	535	17.1	22.7	22.4	24.1
Employee, casual or seasonal	119	3.8	7.8	7.2	8.9
Self-employed, without regular employee	2,165	69.4	58.7	53.2	56.9
Self-employed, with regular employees	98	3.1	5.3	5.4	3.9
Member of producer's cooperative	7	0.2	0.1	0.1	0.1
Help without pay in own or another house	29	0.9	1.2	3.1	2.0
Help without pay in own or another house	137	4.4	2.5	6.3	2.7
Paid apprenticeship	30	1.0	0.7	1.2	0.8
Unpaid apprenticeship	2	0.1	1.4	1.0	0.9
Total	3,122	100	100	100	100