

The Socio-Economic Impacts of Ebola in Liberia

Results from a High Frequency Cell Phone Survey

Round 4

February 24, 2015



WORLD BANK GROUP

GALLUP®

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Overview

As of February 18, 2015 Liberia has reported over 9,000 cases of Ebola Virus Disease (EVD), and 3,900 deaths. Since the previous round of data collection, in December 2014, Liberia continues to show progress toward getting to zero cases, and in the 21 days leading up to January 28, there were only 20 confirmed cases nationally, down from 92 in the 21 days ending on December 31, 2014, and a high of 546 in late August / early September. It is believed that all those currently infected are seeking care in Ebola Treatment Units (ETUs), some of which have begun to close in recent weeks as a result of declining need.

The World Bank Group, with the Liberia Institute of Statistics and Geo-Information Services and the Gallup Organization, has continued to monitor the socio-economic impacts of EVD on households through a series of mobile-phone surveys conducted in October, November, and December 2014, and January 2015. As the health crisis continues to abate in Liberia, it will be crucial to tackle the important medium- and long-term economic and welfare impacts of Ebola on households.

Though a large percentage of the population is still not working, there has been a substantial return to work since the previous round of data collection. Nearly 41 percent of household heads who were working at the start of the Ebola crisis are still out of work, down from 48 percent in December. This was mainly driven by those in the wage employment sector, but also by non-farm self-employment in urban areas and a moderate increase in agricultural employment in rural areas. Improvements in this area do not necessarily mean that incomes have remained the same as before the crisis, however, so the longer-term welfare impacts of Ebola may still be of concern even for those who have returned to work. Those in self-employment continue to be the most heavily impacted by the crisis.

The outlook for agriculture has improved slightly, but concerns remain. Nearly 65 percent of agricultural households surveyed in this round believed that their harvest would be smaller than it had been in the previous year, down from 80 percent in December. Labor shortages and inability to work in groups, however, continue to pose a problem for agricultural households. In this harvest season, 26 percent of households indicated that at least one member participated in a traditional labor gang, down from 31 percent in the previous season, with over half citing fear of infection as the main reason. If the fear persists into the new season beginning in April, it could impact the amount of land under cultivation, as the clearing process is more labor intensive than the harvest.

Food insecurity persists nationwide, with slight decreases in urban areas offset by increases in rural areas. Nearly three-quarters of households indicated that they were worried at some point in the previous week that they would not have enough to eat; this has remained relatively unchanged since the previous round, and households continue to cite a lack of money as the main constraint.

The use of economic coping strategies appears to be increasing, and poses a threat to long-term household welfare. Nearly 85 percent of those surveyed in December and January report having sold assets, sold or slaughtered livestock, borrowed money, sent children to live with relatives, spent savings, or delayed investments in order to cope since the start of the crisis.

Two other areas of concern, health care service utilization and security, do not appear to have deteriorated since the crisis. Households continue to treat common ailments, such as childhood diarrhea, at about the same rate as the baseline, though there has been an increase in those seeking care in private or religious providers. With regard to security, nearly 80 percent indicated that they felt as safe or safer with respect to physical violence in their community, and approximately 70 percent indicated they felt as safe or safer about the security of their households' goods compared with the same period last year.

As Liberia continues on the path to eradicating Ebola, it will be important to identify and support those who are most vulnerable to the sluggish economy and whose long-term welfare may be negatively impacted by coping decisions made in the name of immediate stability. As households send their children back to school in the next month, the World Bank Group and partners will continue to monitor the crisis and work to support the Liberian government and its people as they move into economic recovery.

*“We are operating but not like before. We need to get back like it was.”
– 38 year old man in Margibi county.*

Map

IBRD 33435R2



JULY 2007

Objective

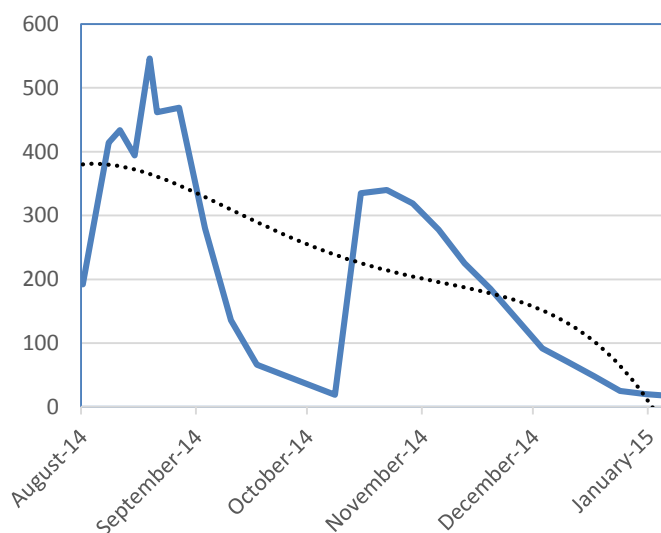
The Economic Impact of Ebola survey is a high frequency cell phone survey designed to monitor the socio-economic impacts of the ongoing Ebola crisis in Liberia. The survey has been conducted in four rounds from October 2014 to January 2015. The sample is based on the nationally representative Household Income and Expenditure Survey (HIES) implemented from February to August 2014 by the Liberia Institute of Statistics and Geo-Information Services (LISGIS). This effort was designed to provide rapid indicators of well-being from households across the country at a time when conducting a traditional face-to-face survey is extremely challenging. The survey was conducted by phone, and attempted to contact all households that participated in the HIES and for which cell phone numbers were recorded. As in the previous three rounds, low response rates hinder the representativeness of the survey.

The report begins with an update of the situation in Liberia with regards to the Ebola Virus Disease (EVD) crisis and response at the time of the fourth round of data collection (January 19 – 27, 2015). This is followed by updates on employment, prices, food security, and coping strategies, and has new brief sections on health and education. This report is meant as a stand-alone document based on the round 4 data, but further context and methodological information on data collection and weight calculations can be found in the previous reports covering rounds 1 and 2 and round 3.

Background

Since the previous round of data collection, Liberia has shown continued progress in controlling EVD. In the 21 days leading up to January 28, there were only 20 confirmed cases nationally. This is down from 92 in the 21 days ending on December 31, 2014, which coincided with the previous survey round, and a high of 546 in late August / early September. It is believed that all those currently infected are seeking care in Ebola Treatment Units (ETUs), some of which have begun to close in recent weeks as a result of declining need. In the three weeks to early February only Montserrado county (which contains the capital city Monrovia) reported new cases. The curfew was lifted on February 22, and markets that were closed have reopened. Domestic travel restrictions have been relaxed, although health checkpoints remain in place across the country. Most government employees have returned to work – though most notably teachers remain at home, with educational institutions reopening progressively from February 2. International land borders were closed at the time of the survey but reopened February 22; commercial flights remain limited to three carriers with reduced schedules.

Figure 1. Number of Confirmed Ebola cases in previous 21 days



Source: Humanitarian data exchange (accessed February 2, 2015)

Employment

There has been a substantial return to work since the previous round. Between rounds 3 and 4, the estimated percentage of those working in the baseline that are currently not working decreased from 48 percent to 41 percent. This change was led by a sizable increase in wage work, and to a lesser extent non-farm self-employment, in urban areas, and a moderate increase in agriculture in rural areas. Rural areas show small decreases in wage and self-employment but these changes are not statistically significant. While this is an encouraging sign of the beginnings of economic normalization, there remain a large percentage of the population that are still not working, particularly in the self-employment sector. Also the return to work does not necessarily mean that workers are generating as much income as prior to the crisis, and at least some portion of the negative welfare impacts of the crisis likely remain even for those who have returned to work.

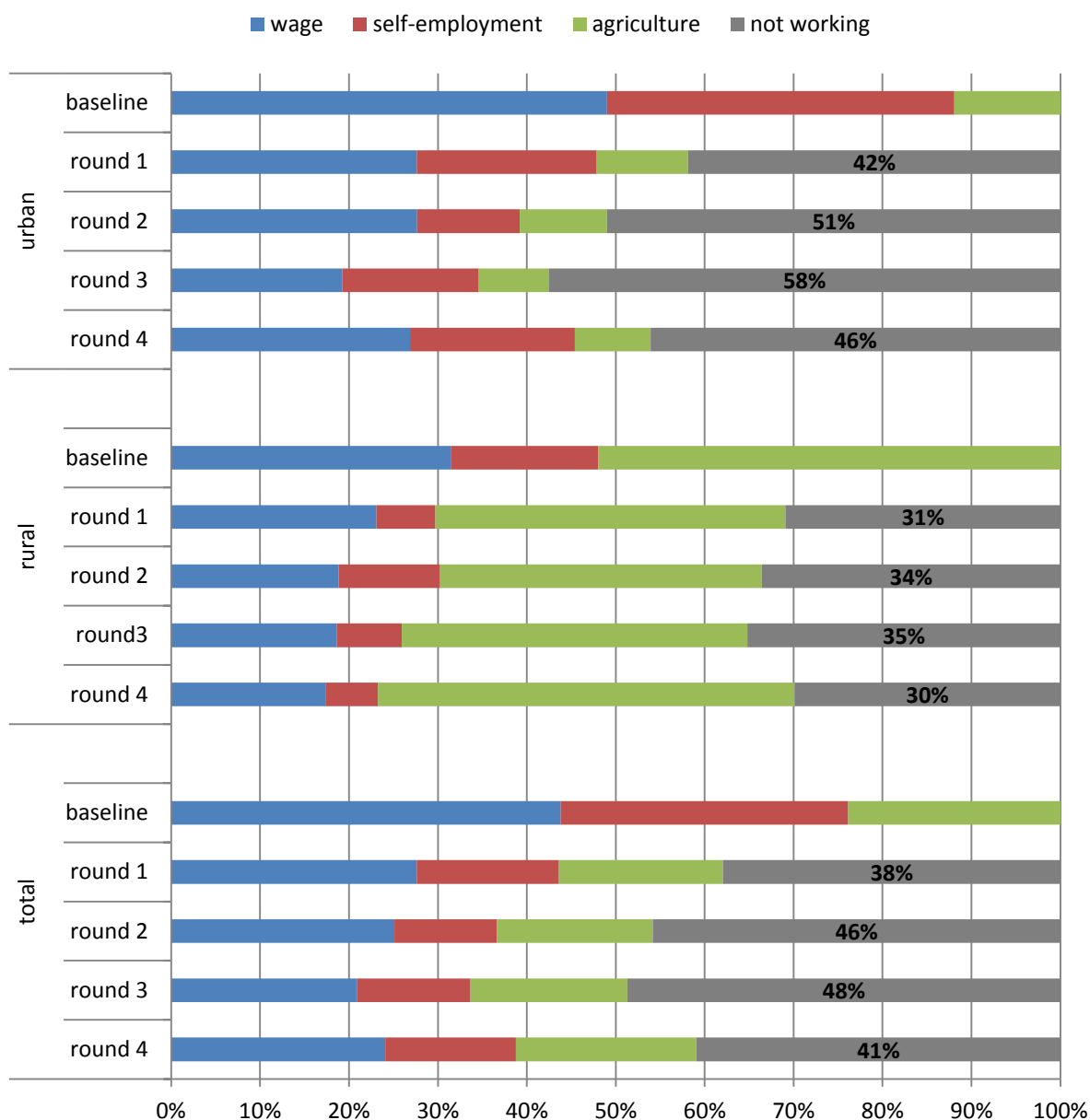
Of those wage workers that remain not working, the reasons cited are less EVD-specific than in previous rounds. Of those engaged in wage employment in the baseline, approximately half were engaged in wage employment by round 4, and 45 percent were not working. The remaining five percent had either moved into self-employment or did not provide sufficient information for their new job to be classified into a sector. For those that stopped working between rounds 3 and 4, less than 20 percent directly cited the EVD situation as the reason. The majority cited reasons related to an economic slowdown, such as a reduction in business or a more general inability to find work, or conditions related to the job market generally, such as seasonal employment or a lack of connections to find a job.

Self-employment remains the sector most strongly impacted by EVD. Despite the general recovery in employment, less than half of those engaged in non-agricultural self-employment at the baseline reported working in round 4. As described in the previous report, working capital appears to be the main constraint to remaining in business or reopening, compared to round 1, in which more than three-quarters cited market closures or transportation issues as the main reason. In round 4 a lack of capital and a lack of customers were cited by 34 percent and 15 percent, respectively, as the main reason for stopping self-employment activities between rounds 3 and 4, and by 58 percent and 39 percent, respectively, as the largest obstacle to reopening businesses.

A lack of capital and lack of customers were also the main constraints to the expansion of those enterprises which remained in business. More than half of respondents cited one of these two reasons as the main constraint. Though there is no comparable baseline to determine what percentage of these issues are related to EVD, many respondents noted that their level of operation had not yet returned to pre-crisis levels. In contrast to the previous round, however, a growing number of respondents cited unrelated issues, such as difficulty with large capital expenses (buildings, vehicles, and machines), and difficulties in bill collection and contract enforcement. While not conclusive, this points to a normalizing business climate.

*“I am trying to do hard work to get back into business. My credit dropped. My financial [situation] is not yet like the way it was. I had 1000 now I am down to 800. The business is not running like before.”
– 24 year old woman in Monrovia on the main obstacle to improving her business.*

Figure 2. Impact by sector and location on those respondents working at baseline



Source : Results from HIES baseline survey (January – August 2014) and three rounds of high frequency phone survey (October 2014 – January 2015)

Note: Approximately five percent of respondents have switched sectors between baseline and round 4, but many with new jobs do not provide sufficient information to determine their new sector so the true percentage may be higher. Due to the method used to present the above findings, it is difficult to show these changes on the graph and therefore those that have switched are presented as still part of their original sector. Because the high frequency survey attempts to contact all potential respondents in every round of the survey, the composition of respondents varies in each round. To compare estimates across rounds, the share of the original baseline population that is working at the time of each round is estimated for each sector. This percentage is then applied to the baseline share of that sector. For example, 60 percent (weighted) of baseline wage workers were still working by round 1. Wage workers represented 44 percent (weighted) of all workers at baseline. Therefore, 26 percent is reported as the share of baseline workers who are wage workers in Round 1.

Agriculture

Households with later harvests are more likely to report larger harvests than the previous year, though labor shortages continue to be an issue. Between the third and fourth rounds, the percentage of agricultural households reporting having completed their harvest increased from half to three-quarters. The third round results indicated that more than 80 percent of agricultural households believed that the food crop harvest would be smaller than it had been in the previous year. For those reporting in the fourth round, this percentage was 65 percent. The percentage of households that thought the harvest would be larger than the previous year also increased from 18 to 29 percent. This suggests that those harvesting later are harvesting more, and that a portion of the delay in bringing in the harvest was due to the fact that it was larger for some farmers. If the remaining 25 percent which said the harvest was yet to be completed, the main reasons remain the same as the previous round: the inability to work in groups and difficulties in hiring outside labor.

Fewer households participated in the traditional “kuu” labor gangs this year, due mainly to concerns about infection. Thirty-one percent of households indicated that at least one member of their household participated in a labor gang during the previous agricultural season, compared with 26 percent during the current agricultural season. This difference is statistically significant, and includes 21 percent of households that participated in both years. More than half of those that participated in the previous year but not this year cited concerns about infection as the main reason for not participating. The other two main reasons, each cited by 20 percent, were travel restrictions and no work available / opportunity was not available this year. This situation, if it continues into the upcoming planting season in April and May, could have substantial negative impacts on the next agricultural season as the traditional labor system plays a larger role in those activities.

Cash crops, in particular rubber cultivation, remain an area of concern. As noted in the previous report, rubber is a continuously harvested cash crop and an important source of household income. Also similarly to the previous round, only about half of those households which harvested rubber in the previous agricultural year indicated that they have been able to harvest rubber since the start of the Ebola crisis, though substantial recent declines in rubber prices have likely also contributed to the reduced harvesting. The situation appears to be better with regard to cocoa, the other main cash crop. Of the households that harvested cocoa in the previous agricultural year, nearly 90 percent indicated that they have harvested or would harvest this year. There are, however, important concerns regarding the sale of cocoa. The December 2014 FEWS NET survey of market traders finds reduced cash crops sales of at least 20 percent across the country.¹ Of those cocoa farmers that have harvested in the cell phone survey, about half have not sold any, approximately one-quarter having sold some, and one-quarter having sold all. It should again be noted that these conclusions are based on an extremely small sample size and should therefore be interpreted with considerable caution.

¹ See full report at :

http://www.fews.net/sites/default/files/documents/reports/Liberia%20Trader%20Report_Round4_01312015.pdf

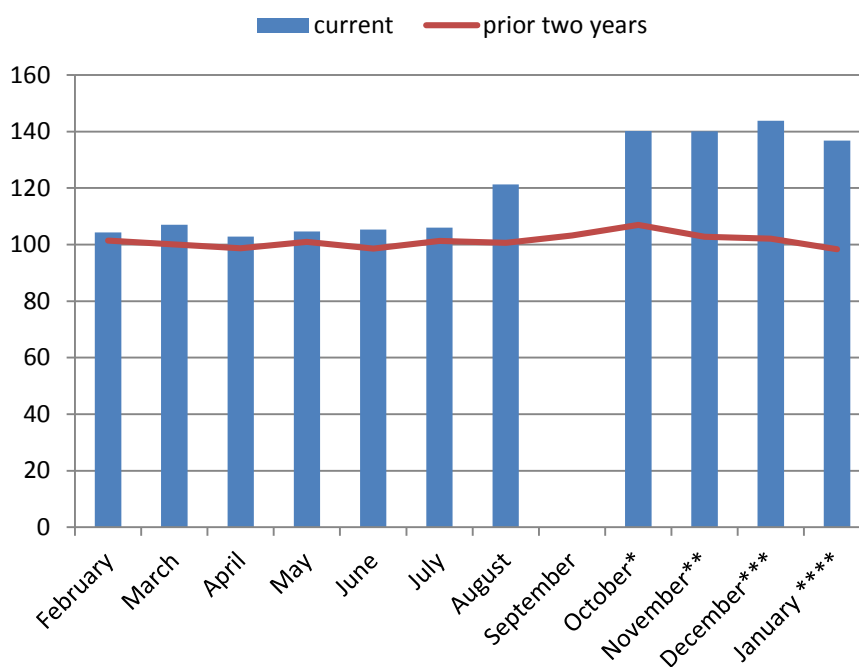
Prices

Though rice prices remain well above average for the prior two years there has been a decrease since the last round. The average estimated price for a 50 kg bag of imported rice has declined by nearly 5 percent from 3,291 LD in round 3 to 3,130 LD in round 4. This change is statistically significant and likely driven by the completion of most harvest activities, which would reduce demand for imported rice. Based on the

limited price data available, January has historically had the lowest prices of the year, yet prices remain more than 35 percent above the January 2014 baseline. Figure 3 shows the estimated price change by month for a 50 kg bag of rice from a January baseline in 2014 as well as the monthly average over the previous two years.²

There continue to be regional price differentials for rice. Montserrado county, and Monrovia—the capital city in particular, continue to show lower average prices than the rest of the country. Among the highest prices in the country were found among those living in Maryland, River Gee, River Cess, Grand Gedeh, and Nimba counties. These areas were also identified by the December FEWS NET survey as having reduced market functioning. The report finds that the highest percentage of traders reported reduced weekly market functioning in River Cess and Grand Gedeh, reduced daily market functioning in Grand Gedeh, River Gee, and Maryland, and reduced market activities resulting from high transportation costs in Nimba and River Gee.

Figure 3. Price index for rice for previous year compared to average for two years prior



Source: 2014 HIES, high frequency phone survey, WFP VAM

Notes: January 2014 = 100, * Oct 1 - 7, 2014 ** Oct 21 - Nov 7, 2014

Dec 2 - Dec 8, 2014 * January 19 – 27, 2015

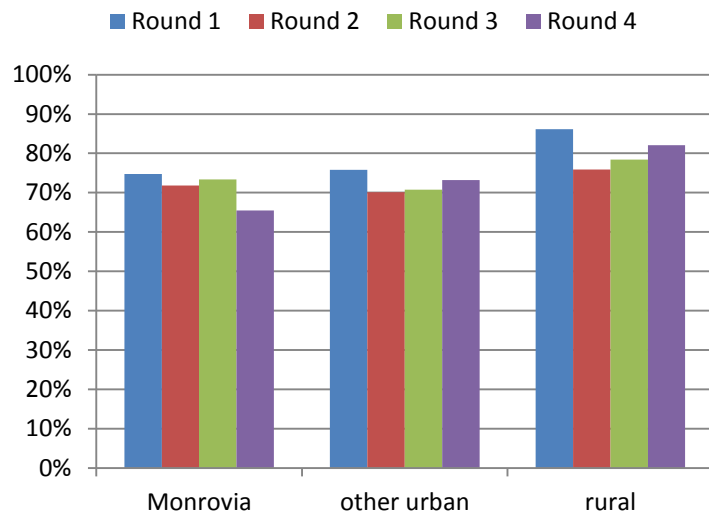
² In the HIES the question refers specifically to imported rice while in the first two rounds of high frequency phone survey, the question was more general. As local rice is generally less expensive than imported rice any bias in the measure would understate levels in October and November. This impact, however, is likely to be small due to the large percentage (estimated by FAO to be up to 80 percent) of Liberia rice which is imported. The third and fourth round questionnaires specifically refers to imported rice, though do not make the distinction between Asian rice and more expensive US parboiled rice, and report the prices as average for all imported rice.

“I don't have money to buy the rice, for the Ebola crisis the schools are closed until February 2nd but now the schools will reopen. After the schools closed they did not pay us our money, they stopped paying until now that we are speaking. They stopped giving our money all year. They don't give money July, August, September, November, December, [and] January”. – Private school teacher in Maryland county on why he cannot buy enough rice for his household.

Food Insecurity

There is continued evidence of widespread food insecurity, including an increasing trend in rural areas. Nationally, about three-quarters of households indicated that they were worried at some point in the last week that they would not have enough to eat. This is relatively unchanged from the previous round. There has, however, been a statistically significant decrease in food insecurity in Monrovia, offset nationally by small increases in rural and other urban areas. The counties which showed significantly higher percentages of food insecurity in

Figure 4. Food insecurity across rounds



Source: Cross sectional estimates from cell phone survey

round 4 as compared to Montserrado were Bomi, Grand Gedeh, Grand Kru, Maryland, and Sinoe. The continued high prices and reduced functioning of markets, along with a delayed return to pre-crisis levels of economic activity, are likely to be contributing factors, but the absence of comparable baseline data means it is not possible to determine the amount directly attributable to EVD.

As in previous rounds, a lack of money, rather than availability or high prices, continues to be the main problem with meeting rice needs. Across all four rounds of the cell phone survey, about 65 percent of households indicated that they were not able to purchase enough rice to meet their needs at some point in the previous two weeks. The main reason continues also to be that the household did not have enough money, rather than the price being too high or rice being unavailable. The percentage citing a lack of money has increased from 66 percent in round 1 to 76 percent in round 2 to 80 percent in round 3, and finally to 88 percent in round 4. In round 4, no households cited a lack of availability as the main problem. This indicates that as availability returns and prices begin to come down, households will still have difficulties meeting food needs without a rebound in employment or some social protection intervention from the government.

Only a small percentage of households indicate receiving food aid or cash transfers. Approximately eight percent of households indicated receiving food aid in the previous seven days, the majority of which were in Nimba and Montserrado counties. The most common sources of food aid were the World Food

Programme and the government, though in addition to government and international organizations, a small number of respondents also cited sources such as employers and landlords. A smaller percentage, less than five percent, indicated receiving cash transfers, nearly all of whom live in Monrovia.

The need for various food insecurity coping strategies have remained the same or decreased since the previous round. The largest decline was for restricting adult consumption for small children to eat, though there had been a spike in the previous round and overall there has been a downward trend since round 1. Despite the decreases, however, households on average use each of the strategies more than twice a week. The incidence of food insecurity coping strategies are highest in rural areas and lowest in Montserrado, with restricting adult consumption being the most commonly used strategy in rural and other urban areas, and reducing portions at meal times being the most common in Montserrado. There is also a high incidence of reliance on less preferred foods, most likely cassava, in rural areas as compared to urban.

Table 1. Coping strategies for food insecurity

	In the past 7 days, how many days have you or someone in your household had to...				
	...rely on less preferred and/or less expensive foods?	...limit portion size at meal-times?	...reduce number of meals eaten in a day?	... restrict consumption by adults in order for small children to eat?	... borrow food, or rely on help from a friend or relative?
Round 1	2.9	3.0	3.4	3.3	2.1
Round 2	2.6	3.1	2.6	2.8	2.3
Round 3	2.7	2.9	2.3	3.1	2.2
Round 4	2.4	2.5	2.2	2.5	2.2

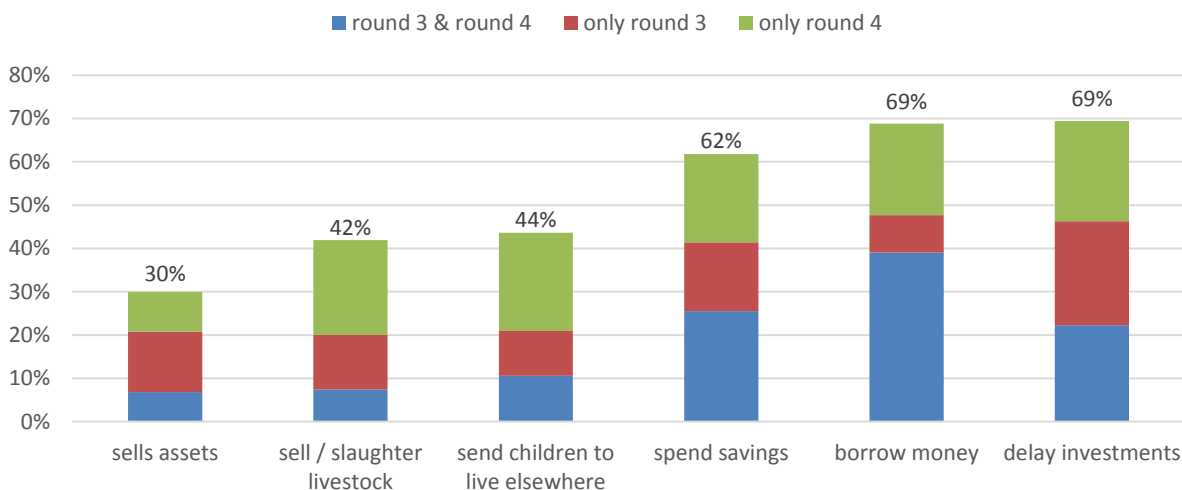
Source: Cross sectional estimates from high frequency phone survey (October 2014 – January 2015)

Other economic coping strategies continue to be prevalent and remain a threat to long-term household well-being. If households are forced to sell or consume productive assets, they are less likely to be able to maintain or improve their welfare levels in the future. Of those that were part of the survey in either the third or fourth rounds, nearly eighty-five percent indicated having taken one or more of the following actions since the Ebola crisis began: sell assets, such as tools, furniture, machines, jewelry, etc.; sell or slaughter livestock; borrow money from others; send children to live with other relatives; spend savings; delay investments. More than half of respondents indicated having to borrow money from others since the start of the crisis, with almost as many indicating having to spend savings or delay investments. Though the use of these strategies has been widespread nationally, Bomi, Bong, Grand Kru, Margibi, and River Gee have shown relatively higher incidences.

The use of economic coping strategies appears to be increasing. Figure 5 shows the percentage using economic coping strategies of those which responded for both rounds 3 and 4. In the third round, respondents were asked if they had used each strategy since the start of the crisis, while in the fourth round, these respondents were asked about the previous six weeks (time since previous round). A higher percentage of households reported using coping strategies in the last six weeks in round 4 than had

reported since the start of the crisis in round 3. While the holidays may have necessitated additional expenditure, it seems that households have been increasingly forced to take these measures as the economy remains sluggish.

Figure 5. Percentage of households undertaking economic coping strategies



Source: Panel data estimates from high frequency phone survey (December 2014 and January 2015)

Education

Households with school-age children are well-informed about the re-opening of schools. Of those households with children aged 6 to 12, more than 90 percent indicated that they had been informed when schools would re-open. Of that group, more than 80 percent correctly indicated February. As the normalization of the education system is an important step in the recovery process, the next round of the high frequency survey will include additional questions on this topic.

Health

The survey found no conclusive evidence that households were avoiding health care providers for non-Ebola related illness. In the fourth round, the high frequency survey included questions as to whether children under the age of five had experienced diarrhea in the previous week, and, if so, what if any actions taken. These questions were identical to those included in the baseline HIES survey. Since the respondents in cell phone survey were mainly in urban areas and there are different usage rates, albeit small, between urban and rural areas, the comparison with the HIES is limited to the urban sample. In both the HIES and the cell phone survey, more than 85 percent indicated that there was at least one child under the age of 5 living in the household, about 11 percent of these children had experienced diarrhea on the previous week, and about 60 percent of those children had received treatment. In the HIES, 42 percent of those who received treatment went to a government hospital or clinic, compared to 31 percent in the cell phone survey, though the sample size is too small to detect statistical significance. The survey

does find a significant increase in the percentage seeking care at private or religious facilities, up from 27 percent in the HIES to 66 percent in the cell phone survey. This increase was mainly at the expense of those seeking care at dispensaries or pharmacies. While this finding is difficult to interpret without additional information, the shift may be due to households being more likely to treat diarrhea more seriously as it may be a symptom of EVD.

Security

Respondents do not currently perceive their communities to be less safe than prior to the outbreak.

Given the history of conflict in Liberia, there are special concerns that stress from the EVD outbreak, the disease containment measures, and economic slowdown, could degrade the security situation. While these are difficult measures to estimate, the fourth round of cell phone survey included two questions related to the perceived safety. Nearly 80 percent indicated that they felt as safe or safer compared to the same time last year with respect to physical violence in their community. Of those that indicated that they felt less safe, about 40 percent lived in Montserrado County, though overall Montserrado residents did not feel less safe than respondents generally. With regard to the safety of goods owned by the household, approximately 70 percent indicated they felt as safe or safer compared with the same period last year. Again, the largest percentage, about 30 percent, that indicated they felt less safe were in Montserrado County, but in this case, Montserrado residents generally felt safer with regard to their property than the country generally. It is worth noting that these questions had higher rates of refusals than other questions in the survey.³

Conclusion

The fourth round of the high frequency cell phone survey has found a substantial improvement in the percentage of household heads that reported they were working, increasing from 52 percent to 59 percent since the December survey. These changes were driven to a large extent by urban wage workers, with smaller contributions from urban self-employment and rural agriculture. Despite this, there remain a number of areas of concern. The majority of those in non-agricultural self-employment at the baseline have not yet returned to work, with many citing capital constraints and a lack of customers as the main constraints. This is particularly true in rural areas. Also, even for those that have returned to work, many said their business is not yet operating at pre-crisis levels, raising concerns of lingering income effects.

Rice prices declined about five percent since the previous round, but still remain well above average. There are also substantial price differences among counties, with the lowest prices found in Monrovia and

³ The question on physical violence had refusal rate of 21 percent and the question on the safety of goods had a refusal rate of 16 percent, compared to around five percent on average. Refusals for these questions, as with other questions from the survey, are coded as missing and excluded from the analysis. It is believed that the refusal rates are related to difficulties in understanding between the American interviewers and the Liberian respondents. In this case, the higher refusal rates may be related to the more abstract nature of the questions, and therefore greater difficulty in understanding, or they may point to discomfort on the part of the respondents in discussing these sensitive topics with outsiders. If it is the case of the latter, then these responses may underestimate these indicators, but the trends would be robust.

the highest in Maryland, River Gee, River Cess, Grand Gedeh, and Nimba counties. This corresponds with those areas identified by FEWS NET as having limited market functioning. Food insecurity also remains widespread with nearly three-quarters of households worrying at some point in the previous week that they would not have enough to eat. The round 4 results show a significant decline in food insecurity in Montserrado, but a steady increase in rural areas since round 2. Even though food aid was most common in Montserrado and Nimba counties, the decline in Montserrado is unlikely to be directly related as only eight percent of households reported receiving food aid in the previous week. At the time of round 4, compared to Montserrado, the counties which showed significantly higher percentages of food insecurity were Bomi, Grand Gedeh, Grand Kru, Maryland, and Sinoe.

The survey also found that the harvest process has advanced substantially though labor shortages remain an issue; that parents were well-informed about the reopening of schools; that there was no evidence of household avoiding health services for non-EVD conditions, at least related to treatment of child diarrhea, and that respondents do not believe their communities are less safe with regard to physical violence of personal property since the start of the outbreak.

Overall round 4 of the high frequency cell phone survey shows that Liberia is moving into economic recovery, with an improving employment situation. Also, at least at this stage, worries regarding the avoidance of health services and increasing insecurity do not appear to be supported by these data. There remain areas of concern, however, particularly related to self-employment, food insecurity, and rice prices, which will continue to be monitored in subsequent rounds of the survey.

“I went down financially after the Ebola crisis and I am still down.” – 44 year old man in rural River Cess county on the main obstacle to improving his business.

Annex

Response Rates and Non-Response Adjustment

For a full description of the survey methodology and the implementation, see the methodological annex of the first report.

Table A1. Number of respondents by round

round 1 only 127	round 2 only 29	round 3 only 132	round 4 only 122
round 1 & 2 84	round 1 & 3 45	round 1 & 4 38	round 2 & 3 12
round 2 & 4 6	round 3 & 4 88	round 1,2 & 3 110	round 1,2 & 4 60
round 1,3 & 4 26	round 2,3 & 4 13	round 1,2,3 & 4 159	total 1,051

Table A2. Regional distribution of households

geography	% households (census)	round 1		round 2		round 3		round 4	
		% households survey (unweighted)	n	% households survey (unweighted)	n	% households survey (unweighted)	n	% households survey (unweighted)	n
Bomi	3.1	4.0	26	4.7	22	5.4	31	4.5	23
Bong	10.4	6.3	41	5.5	26	8.1	47	7.6	39
Grand Bassa	7.1	6.2	40	5.5	26	6.9	40	6.7	34
Grand Cape Mount	3.6	3.9	25	3.0	14	2.8	16	2.7	14
Grand Gedeh	2.7	7.6	49	7.6	36	7.6	44	5.9	30
Grand Kru	1.3	2.6	17	2.1	10	2.6	15	2.2	11
Lofa	7.4	3.4	22	3.8	18	4.0	23	3.3	17
Margibi	6.7	8.6	56	8.1	38	7.4	43	6.3	32
Maryland	2.9	4.2	27	3.4	16	4.2	24	5.5	28
Montserrado	34.7	37.7	244	40.7	192	33.9	196	38.4	196
Nimba	12.0	3.9	25	5.7	27	5.2	30	6.7	34
River Cess	2.1	2.3	15	3.0	14	2.4	14	2.5	13
Sinoe	2.4	3.6	23	1.9	9	3.8	22	2.7	14
River Gee	1.5	2.6	17	2.8	13	2.3	13	1.6	8
Gbarpolu	2.2	3.2	21	2.3	11	3.5	20	3.5	18
Urban	56.2	71.5	463	74.2	350	69.2	400	73.6	357
Rural	43.8	28.6	185	25.9	122	30.8	178	26.4	128
Total	100.0	100.0	648	100.0	472	100.0	578	100.0	511

Table A3: Regression coefficients for logit response model

	round 3		combined 3 & 4	
	coef	se	coef	se
Respondent Characteristics				
female	-0.267**	0.133	-0.309***	0.109
age	0.041	0.026	0.017	0.020
age squared	-0.000	0.000	-0.000	0.000
Sector of Employment (Reference : Wage)				
self-employment	-0.055	0.140	-0.060	0.116
agriculture	-0.229	0.157	-0.456***	0.123
unpaid family work	0.419	0.418	0.248	0.352
other	0.046	0.198	-0.030	0.170
Geographic Strata (Reference : Monrovia)				
Bomi Urban	-0.748	0.474	-0.981**	0.384
Bomi Rural	-0.594**	0.269	-0.718***	0.221
Bong Urban	-0.244	0.278	-0.116	0.234
Bong Rural	-0.593*	0.324	-0.734***	0.261
Grand Bassa Urban	-0.159	0.271	-0.158	0.237
Grand Bassa Rural	-1.906***	0.485	-1.718***	0.315
Grand Cape Mount Urban	-1.006	0.646	-1.275**	0.511
Grand Cape Mount Rural	-1.292***	0.303	-1.606***	0.242
Grand Gedeh Urban	-0.190	0.241	-0.340	0.210
Grand Gedeh Rural	-1.854***	0.482	-1.475***	0.296
Grand Kru Urban	-0.428	0.596	-0.709	0.488
Grand Kru Rural	-2.100***	0.438	-1.908***	0.276
Lofa Urban	-0.869**	0.369	-0.870***	0.286
Lofa Rural	-1.842***	0.542	-1.410***	0.333
Margibi Urban	-0.415	0.280	-0.525**	0.233
Margibi Rural	-0.925***	0.319	-1.095***	0.250
Maryland Urban	-0.445*	0.257	-0.803***	0.217
Maryland Rural	-1.696***	0.488	-2.363***	0.421
Montserrado Urban	0.310	0.462	0.257	0.459
Montserrado Rural	1.337**	0.562	1.088*	0.563
Nimba Urban	-0.613**	0.279	-0.823***	0.227
Nimba Rural	-1.228***	0.463	-1.130***	0.337
River Cess Urban	-0.117	0.561	-0.169	0.479
River Cess Rural	-1.187***	0.331	-1.453***	0.261
Sinoe Urban	-0.338	0.407	-0.629*	0.348
Sinoe Rural	-1.494***	0.331	-1.656***	0.249
River Gee Urban	-1.217***	0.424	-1.121***	0.302
River Gee Rural	-2.144***	0.478	-3.004***	0.438
Gbarpolu Urban	-0.184	0.469	-0.508	0.401
Gbarpolu Rural	-1.400***	0.379	-1.309***	0.273
Constant	-1.272**	0.587	0.321	0.463
N	2324		2616	
Pseudo R-squared	0.0791		0.1054	

note: *** p<0.01, ** p<0.05, * p<0.1