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The Impact of the August 2021 Earthquake in Haiti:

Evidence from the Social Registry's Shock Module¹

Pascal Jaupart, Aditi Kharb, Ailo-Klara Manigat, Caroline Tassot², Cornelia Tesliuc

Abstract

We examine recently collected data from Haiti's social registry new shock module to measure the scale of the August 2021 earthquake's impact on households and assess the adequacy of the relief response. In the aftermath of the earthquake, a survey module was promptly developed for the national social registry to evaluate the impacts and consequences of wide-reaching exogenous shocks as well as the needs of affected households. Using this rich unique dataset covering the full population of the Grande Anse Department in Haiti, we find that more than two-thirds of households were affected in one way or another by the August 2021 earthquake. Overall and consistently across dimensions, the impact of the earthquake was more severe for the more socioeconomically disadvantaged households. Less than 10 percent of all earthquake-affected households reported obtaining assistance from a government body or a non-governmental organization. The findings from the data analysis provide important lessons on disaster relief to inform future emergency responses.

JEL Codes: H84, H75, C83, P36, Q54.

Keywords: Coping Mechanisms, Haiti, Housing, Humanitarian Assistance, Natural Disasters, Social Registry, Social Protection, Vulnerability

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² Task-team leader (TTL) of this report.

I. Introduction

Haiti is highly exposed to climate-related shocks and earthquakes with limited infrastructure and systems in place to anticipate and respond to these shocks. Between 1972 and 2020, Haiti was hit by more than 170 disasters, which caused the death of at least 240,000 persons and affected the lives of 1.7 million people (World Bank 2022a). In August 2021, a magnitude 7.2 earthquake struck Haiti's southern peninsula with devastating effects on a region still reeling from the passage of Hurricane Matthew in 2016. Haiti's fragility increases its vulnerability to natural disaster shocks, which in turn reinforces its fragility. Insufficient disaster risk management (DRM) capacity and emergency response preparedness result in high human and economic losses when natural catastrophes occur. In recent years the government of Haiti (GoH) has been seeking to strengthen its capacity to respond to large scale exogenous adverse shocks. The development of an adaptive and shock-responsive social protection system has been identified as one policy measure to achieve this objective.

This paper analyzes recently collected data from Haiti's social registry new shock module with the objectives to measure the scale of the August 2021 earthquake impact, assess the adequacy of the relief response, and better understand the management of shocks by households. In the aftermath of the August 2021 earthquake that struck Haiti's southern peninsula, a survey module was developed with the aim to evaluate the impacts and consequences of wide-reaching exogenous shocks, and the needs of households affected. This new shock survey module was included in the national social registry survey and rolled out for the first time in the Grande Anse Department between 2021 and 2022. This paper presents the data and findings emerging from this rich dataset reflecting the household perspective for a sample representing the full population of the Grande Anse Department.

This analysis provides four main contributions to the economics and social sciences literature on natural disasters. First, the social registry's shock module data provide a household perspective in the aftermath of a major earthquake, offering a unique opportunity to analyze how households were affected by and coped with a major shock. Due to the census-sweep nature of the household survey these estimates can be interpreted as population estimates. Second, these data offer a complement to rapid evaluations conducted via various methods (including through drone imagery and rapid surveys) as part of the Post Disaster Needs Assessment (PDNA) process, thereby offering a possibility to cross check the validity of some of these estimates. Third, the analysis of geo-located and housing material information offers a rare insight into the major source of damages during earthquakes.

Fourth, the analysis covers the response offered to households in terms of assistance, providing important lessons learned on disaster relief to inform future responses.

The main findings of the paper can be summarized as follows. More than two-thirds of the households from the Grande Anse Department reported to have been affected in one way or another by the August 2021 earthquake. Overall and consistently across dimensions, the impact of the earthquake was more severe for the more socioeconomically disadvantaged households. The houses of close to 5,900 households were completely destroyed during the earthquake representing 9 percent of the affected population, and more than 22,000 households had to leave their houses after the shock. The earthquake's impact on housing conditions was more severe for the more vulnerable households. Around 850 households (1 percent of the earthquake affected population) reported that a household member died after the earthquake, with more vulnerable households being again more affected. Close to half of the households impacted by the earthquake and classified as more vulnerable saw their capacity to generate income hindered and their access to food obstructed. Regarding the relief response, less than 10 percent of all earthquake-affected households report having obtained assistance from a government body or a non-governmental organization (NGO).³ Further, the nature of the assistance provided does not appear to fully reflect the needs of households. The assistance could have potentially been much more efficient by relying more heavily on cash transfers rather than in-kind assistance.

The remainder of the paper is structured as follows. Section 2 introduces the country context, the SIMAST social registry, and the shock module developed after the August 2021 earthquake. The data collection process and general sample characteristics are presented in Section 3. The multifaceted impacts of the earthquake on households and their coping responses are discussed in Sections 4 and 5, respectively. The last Section concludes and provides policy recommendations.

II. Context

Haiti is the poorest and among the most unequal countries in the Latin America and Caribbean (LAC) region. In 2012, the last year for which official poverty rate estimates were calculated, the overall poverty headcount was estimated at about 59 percent and extreme poverty at 24 percent of the

³ Given a lag of several months between the earthquake and the data collection, this low level of emergency assistance cannot be attributed to the field work intervening before potential humanitarian assistance receipt.

population. The Gini inequality coefficient was estimated at 0.61. Poverty is predominantly a rural phenomenon, albeit some urban neighborhoods also have a high share of highly vulnerable populations. Marginal progress in poverty reduction recorded between 2012 and 2018 has been erased by the combined effect of the protracted political crisis, the COVID-19 pandemic, and the deterioration of the economic and security conditions observed in the last few years. Further, high food inflation, currency depreciation, and reduced employment opportunities have contributed to worsening food insecurity (World Bank 2022a). According to the Human Capital Index, a child born in Haiti today will be 45 percent as productive when she grows up as she could be if she enjoyed complete education and full health (World Bank 2022b).

Natural disasters regularly hit Haiti, with disproportionately adverse impacts on the poor. Haiti is one of the most exposed countries in the world to natural hazards and climate change, and these risks appear to be increasing. The main natural hazards Haiti faces are hurricanes, floods, landslides, droughts, and earthquakes. Over 93 percent of the territory and more than 96 percent of the population are exposed to at least two types of hazards. Climate change is expected to aggravate this exposure through increased frequency of extreme weather-related events and rising sea levels. Higher temperatures, sea level rise, and increases in hurricane frequency and intensity are all expected to materialize by 2050. Disasters tend to affect disproportionately the poor and marginal populations settling in Haiti's flood zones, coastal areas, and living in vulnerable self-built dwellings (World Bank 2015, 2022a).

With support from the World Food Programme (WFP), World Bank⁴, and other donors, the Ministry of Social Affairs and Labor (*Ministère des Affaires Sociales et du Travail*, MAST) has embarked on the development of a comprehensive social registry. The MAST's social registry, named the Information System of the Ministry of Social Affairs and Labor (SIMAST) and conceived in 2014, is the main government database of households in situations of deprivation and vulnerability. As of September 2023, the SIMAST covers about 620,000 households or 22 percent of the Haitian

⁴ The World Bank approved in March 2021 a US\$75 million grant to the Republic of Haiti to implement the Adaptive Social Protection for Increased Resilience (ASPIRE) Project. Implemented over six years, the project supports Haiti's efforts to establish an adaptive social safety net system capable to respond to shocks, including COVID-19, and to reduce household vulnerability to food insecurity and future disasters. As part of the MAST capacity building activities included in the project, the World Bank is financing the expansion and improvements of the SIMAST.

population⁵. The SIMAST methodology relies on door-to-door households visits conducted as census sweeps to collect demographic and socio-economic data. The census sweeps are prioritizing municipalities with high concentration of households at risk of food insecurity as measured by the Integrated Phase Classification (IPC). After data is collected, a proxy-means test (PMT) algorithm is run to determine the Haitian Deprivation and Vulnerability Index (HDVI) score for each household. The Index, based on 20 socioeconomic and demographic indicators, classifies households by degree of vulnerability into four categories: non-vulnerable, less-vulnerable, mid-vulnerable, and most-vulnerable. All households covered in the social registry are georeferenced allowing the SIMAST to map vulnerability across space, a critical dimension for disaster response, and to be used by social protection and promotion programs for targeting beneficiaries.

On August 14, 2021, a 7.2 magnitude earthquake struck the Southern Peninsula of Haiti. The disaster left 2,246 casualties and 12,763 injured. Beyond the human toll, the earthquake directly or indirectly affected an estimated 690,000 people, representing 45 percent of the total population of the three Departments of the Southern Peninsula. In addition, and only a few days after the disaster, the Southern Peninsula and the Sud-Est Department were hit by Tropical Storm Grace. A rapid assessment of the earthquake estimated that more than 83,000 homes were slightly or severely damaged, and nearly 54,000 homes were completely destroyed. The estimated damages and losses amounted to 11 percent of GDP according to the Post-Disaster Needs Assessment (GoH 2021).

In response to the August 2021 earthquake, a shock module was designed and added to the SIMAST questionnaire. The regular social registry questionnaire developed in 2014 contained 7 modules covering demographics, health, education, labor, income, housing, and hunger aspects. In 2017, a module on food security and nutrition was added. In the few weeks following the August 2021 earthquake, staff from the MAST, WFP, and World Bank developed and tested a questionnaire module intended to gather information on exogenous shocks affecting households (earthquakes and other natural disasters, insecurity, epidemics and pandemics). Through a series of logically articulated questions, the module collects data on the type of shocks experienced by households over the past twelve months preceding the interview, the nature and extent of the impacts of these shocks, coping

⁵ More than 2.6 million individuals are covered by SIMAST as of September 2023. The 22 percent population coverage rate is based on the IHSI statistical office's nationwide population estimate for 2021.

mechanisms used by households, assistance received and unaddressed household needs. The full shock module's questions and answer options can be found in Annex 1.

III. Dataset

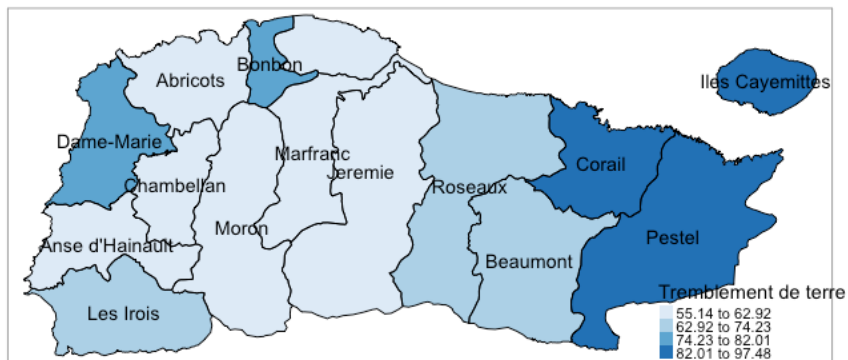
The shock module questionnaire was rolled out in the Grande Anse Department between late 2021 and mid-2022, as an additional module to the regular SIMAST survey for all households interviewed after the earthquake to inform the targeting of social programs. In wake of the earthquake, the data in the social registry was outdated and could not be used to target households for allocating assistance. As a result, the decision was made to conduct a full census sweep and update the data for the entire Department. Through five field deployments that occurred between November 2021 and August 2022, SIMAST enumerators interviewed households across the 14 municipalities of the Grande Anse Department to carry out regular HDVI surveys and implement the new shock module (Table 3.1). In all municipalities except Jeremie, data were collected through population census sweeps. In the municipality of Jeremie (the capital (*chef-lieu*) of the Department) geographic targeting was used to identify urban areas at high risk of poverty and interview households living in these areas, while census sweeps were conducted in Jeremie's rural areas to interview all households. The first three municipalities targeted for data collection were the ones most affected by the 2021 earthquake, namely Cayemites, Corail, and Pestel (Figure 3.1⁶). Due to the destruction caused by the earthquake, various logistical difficulties, capacity constraints in survey teams, and insecurity, it took twelve months to survey the whole Grande Anse Department. The time needed to collect data from the municipalities in the third, fourth and fifth deployments might therefore have affected the accuracy of the responses provided by households with respect to the damage caused by the earthquake and the assistance received due to recall bias. Moreover, the households who relocated to other locations out of the Grande Anse department were not included in the survey, which adds another potential source of bias.

⁶ Percentage of households responding that they were affected by the 2021 earthquake (SIMAST 2022).

Table 3.1: SIMAST deployments

Deployment	Municipalities	Fieldwork completion
1	Pestel, Cayemites, Corail	November 2021
2	Anse d'Hainault, Les Irois, Dame Marie	January 2022
3	Beaumont, Bonbon, Roseaux	March 2022
4	Jeremie, Marfranc	May 2022
5	Abricots, Chambellan, Moron	August 2022

Source: SIMAST (2022).

Figure 3.1: Percentage of households affected by the earthquake⁷

A total of 104,241 households and 441,562 individuals were interviewed in the Grande Anse Department. Based on the latest census projection estimates for 2015, this corresponds to more than 94 percent of the of 468,301 individuals believed to reside in the Department.⁸ The true percentage figure is probably somewhat lower given the expected population growth between 2015 and 2022. With close to 27,000 resident households, Jeremie is by far the most populated municipality of the Department. Population size ranges from 1,400 inhabitant households (Cayemites) to 10,000 households (Pestel) in the other 13 municipalities. The population of the Grande Anse is largely rural with 77 percent of households living in rural areas. The municipality of Cayemites grouping the two

⁷ Source: SIMAST (2022). Self-reported by households.

⁸ Population census projections conducted in 2015 by the National Statistical Office (Institut Haitien de Statistique et d'Informatique, IHSI) put the population of Grande Anse at 468,301 individuals and 98,289 households.

islands of Grande Cayemite and Petite Cayemite is an outlier with a 76 percent urban⁹ population (Table 3.2).

Table 3.2: Population size

	(1)	(2)	(3)	(4)	(5)	(6)
Municipality	Households (number)	Households (in % of total department)	Individuals (number)	Rural area (in % of municipality population)	Households most- vulnerable (in % of municipality population)	Households most- vulnerable (in % total department)
Abricot	6,865	6.6	30,736	92.5	39.2	8.0
Anse d'Hainaut	7,135	6.8	29,579	76.3	29.5	6.2
Beaumont	6,661	6.4	26,046	80.4	31.2	6.2
Bonbon	1,867	1.8	8,175	82.3	39.0	2.2
Cayemites	1,397	1.3	5,604	23.8	25.3	1.0
Chambellan	4,821	4.6	21,423	83.7	42.1	6.0
Corail	4,781	4.6	18,665	79.9	34.3	4.9
Dame Marie	8,130	7.8	32,749	68.6	27.7	6.7
Les Irois	4,626	4.4	18,218	73.4	36.7	5.0
Jeremie	26,730	25.6	116,164	59.6	23.7	18.8
Marfranc	8,251	7.9	38,460	89.9	46.7	11.4
Moron	6,022	5.8	27,820	88.1	43.2	7.7
Pestel	9,997	9.6	39,416	88.6	30.8	9.1
Roseaux	6,958	6.7	28,507	92.1	32.7	6.8
Total	104,241	100.00	441,562	76.5	32.3	100.0

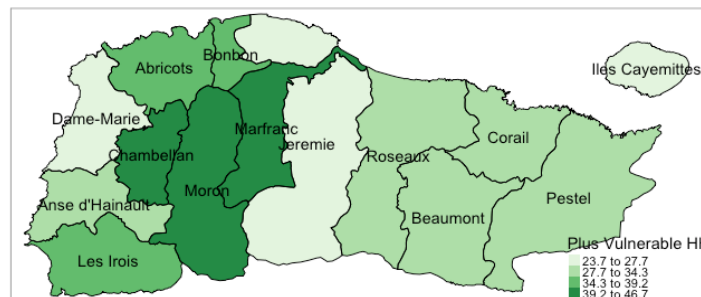
Source: SIMAST 2022.

The analysis of SIMAST survey data indicates that close to one third of the population of the Grande Anse (33,705 households) is classified as most-vulnerable according the HDVI PMT. In the municipalities of Chambellan, Marfranc, and Moron, more than 40 percent of the households are most-vulnerable (Table 3.2, column 5). Due to its relatively large urban population and its *chef-lieu* being the economic hub of the Department, the municipality of Jeremie has the lowest share of highly vulnerable population. In absolute values it has the largest number of most-vulnerable households, however (Table 3.2, column 6). The share of most-vulnerable households in the population tends to

⁹ Survey coordinators and field supervisors decide whether an enumeration area is rural or urban. The criteria considered for identifying urban areas are the following: demographic density relatively high, better access to infrastructure and basic services, dense buildings and construction (MAST 2022).

be higher in municipalities in the Western part of the Department (Figure 3.2). The remainder of the HDVI categories' distribution is as follows: 22 percent of households are classified as mid-vulnerable, 19 percent of households fall into the less-vulnerable category, and 27 percent of households have an HDVI Index low enough to place them in the non-vulnerable group. About 40 percent of households in the Department are female headed and slightly more than 2 percent of individuals report living with disabilities¹⁰.

Figure 3.2: Households in Grande Anse Department classified as most-vulnerable



IV. Impact of the earthquake on households

I. Type of shock reported

More than two-thirds of the households from the Grande Anse Department reported having been affected by the August 2021 earthquake. In the SIMAST shock module, households can report more than one shock. About 71,000 households representing 68 percent of the population were affected in one way or another by the August 2021 earthquake (Table 4.1). The second most prevalent type of reported shock is hurricanes, which impacted 3,000 households and most likely reflected Tropical Storm Grace which occurred only two days after the earthquake. Landslides are the third most common shock. Floods and droughts affected less than 0.3 percent of households in the 12 months prior to the SIMAST interviews. Interestingly, very few households stated that the insecurity and health crises had affected them over the past year, the reference period for the shock reports, despite the ongoing COVID-19 pandemic and rising insecurity levels. Several households were affected by multiple shocks in the twelve months preceding the interview. More than 69,000 households

¹⁰ Disability is defined as having a lot of difficulty or a complete inability to function in at least one of four domains: vision, hearing, speaking, practicing self-care.

identified the August 2021 earthquake as the shock with the largest impact they experienced over the reference period.

Table 4.1: Types of shocks affecting households in the past 12 months

	Households reporting to be affected (Number)	Households reporting to be affected (Percentage of total*)	Households reporting shock as the one with highest impact (Number)
Earthquake	71,083	68.4	69,235
Landslides	2,762	2.6	1,092
Hurricane	3,011	2.9	1,220
Floods	171	0.2	88
Droughts	345	0.3	79
Insecurity	208	0.2	34
Health crisis	313	0.3	43
No shock	32,254	30.9	..

Source: SIMAST (2022). * Total number of households is 104,241.

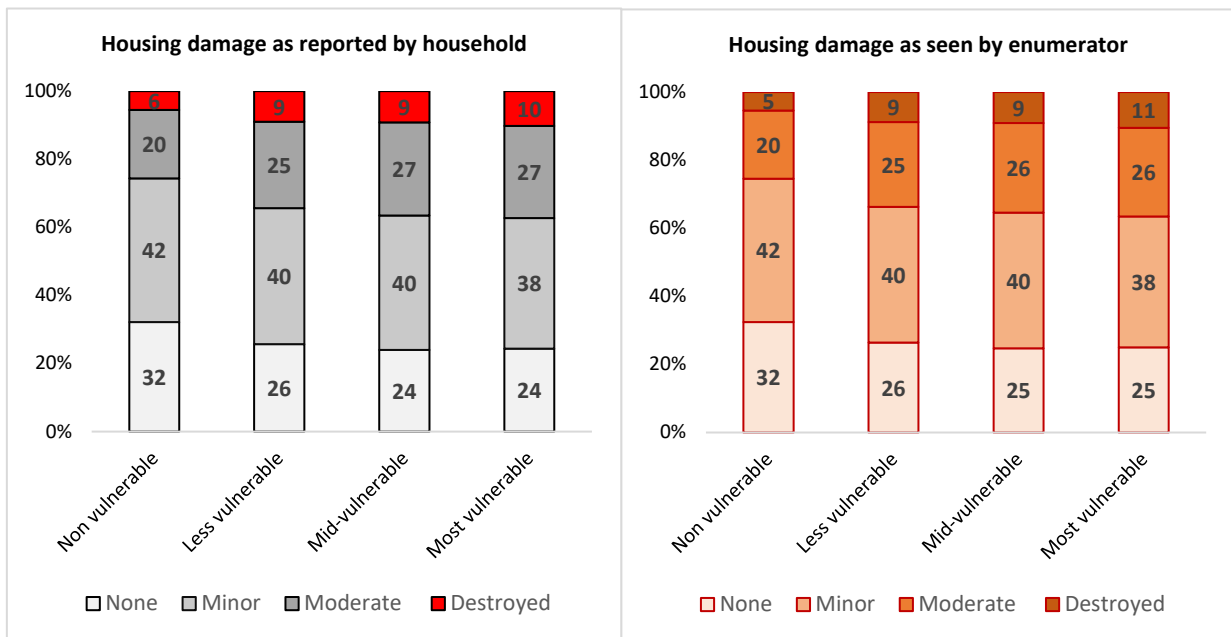
The proportion of households reporting to have been affected by the earthquake is high and similar across all HDVI vulnerability groups. Between 67 and 70 percent of the households in each vulnerability category reported being affected by the natural disaster. About 67 percent of the non-vulnerable households were affected by the earthquake. Slightly less than 70 percent of households from the mid-vulnerable category reported being impacted. The shock module asks households to refer to the last most important shock they faced when answering the shock related questions. In order to understand the effects the earthquake had on households and the coping mechanisms they adopted, in what follows the analysis is restricted to the 69,235 households who identified the earthquake as the most important shock they faced in the past 12 months.

II. Housing

Around 8.5 percent of earthquake affected households reported losing their home as a result of the disaster, with housing damage disproportionately affecting the most vulnerable. In total, the houses of close to 5,900 households were destroyed during the earthquake. This figure is inferior to the 8,648 reported by the GoH in the PDNA (GoH 2021) based on a rapid evaluation. However, the housing sector report of the PDNA had a category of “Severely damaged or destroyed” and initially identified 5,736 houses in this category in Grande Anse. When the whole summary report was compiled, this number was increased to 8,648. Therefore, the SIMAST survey data tracks very well the original

estimate prepared by the PDNA housing team. The impact was the largest for the HDVI most-vulnerable category with more than 10 percent of households losing their accommodation (Figure 4.1). At the other end of the vulnerability distribution, less than 6 percent of HDVI non-vulnerable households lost their home. About a fourth of the total affected population suffered moderate housing damage. Overall, the affected households in the HDVI non-vulnerable category experienced the least housing damage, which is explained by the fact that their homes tend to be made of better construction materials. The other three categories were rather similarly exposed.

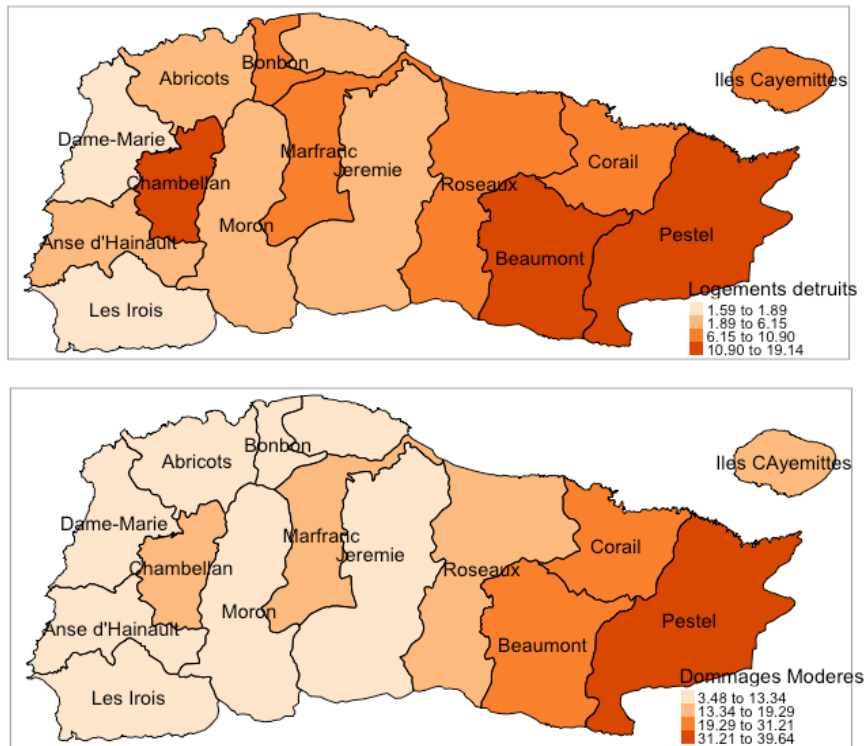
Figure 4.1: Housing damage among earthquake affected households



Note: In an effort to reduce reporting bias and ensure comparability in the assessment of housing, the damage was rated by both the interviewee and the interviewer separately.

The impact of the earthquake on housing conditions was more severe in municipalities located in the Eastern part of the Department which is closer to the earthquake epicenter. The five municipalities of Pestel, Cayemites, Corail, Beaumont, and Roseaux were the most affected. Farther to the West of the Department, the municipalities of Chambellan and Marfranc experienced relatively high levels of housing damage. On the whole, a clear spatial pattern was observed with higher distance to the earthquake being correlated with lower housing destruction and damage.

Figure 4.2: Earthquake impact on housing



Wall material's solidity and housing destruction were negatively correlated. On the one hand only 3 percent and 6 percent of houses made of cement and bricks/rocks were destroyed during or after the earthquake, respectively.¹¹ On the other hand, walls in sheet metal, straw, cardboard and plastic appear to be the most earthquake-vulnerable types. Houses with walls in splint and daub are the most common in the Department and were fairly resilient to the earthquake (7 percent were destroyed) according to the SIMAST data (Table 4.3). Traditional wood and wood/stone houses can often be recomposed using the same materials, and thus are rarely completely destroyed. Surveys were conducted door to door and enumerators were asked to check the status of houses before recording the information, thus reducing the risk that households responded in ways that they thought would make them eligible for assistance.

¹¹ Note that these results are somewhat surprising in the Haitian context in which masonry houses (blocs/cement) tend to be very fragile, much more so than wood or composite materials, and usually do very poorly in earthquakes.

Table 4.3: House wall materials and earthquake damage among earthquake affected households

Housing damage	None	Minor	Moderate	Destroyed	Total	
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Number of houses</u>	<u>Percent</u>
<i>Wall material:</i>						
Straw	15.2	25.0	26.2	33.5	164	100.0
Sheet metal	34.4	24.5	21.4	19.8	5,910	100.0
Other	18.0	26.4	36.6	19.0	4,222	100.0
Cardboard/plastic	21.8	26.8	33.3	18.1	4,450	100.0
Wood/planks	30.8	30.0	24.6	14.6	1,159	100.0
Splint daub	31.3	40.9	20.6	7.2	20,205	100.0
Bricks/Rocks	11.6	44.2	38.2	6.0	11,084	100.0
Earth	25.5	45.8	23.6	5.0	2,297	100.0
Cement/Blocks	30.8	47.0	19.0	3.2	19,744	100.0

Source: SIMAST 2022.

As many as 22,040 earthquake affected households or 32 percent had to leave their houses after the shock. Interestingly, households in the non-vulnerable and less vulnerable categories were more likely than most and mid-vulnerable households to leave their houses, despite the fact that the latter categories were much more likely to have suffered moderate damage or complete destruction to their homes (Table 4.4). This higher propensity to relocate seen in less deprived households likely reflects their available resources, while more vulnerable households face resource constraints as well as difficulties in safely securing their house and belongings in their absence. Half of the households who left their houses had suffered moderate damages to their homes or destruction indicating that house damage was an important factor driving location decisions. The share of households with a moderately damaged or destroyed house among those who left their homes was above 50 percent for the mid-vulnerable and most vulnerable, and much lower at 35 percent for the non-vulnerable. This implies that housing conditions were the primary reasons vulnerable households left their homes after the earthquake.

Table 4.4: Households that left their houses according to HDVI category

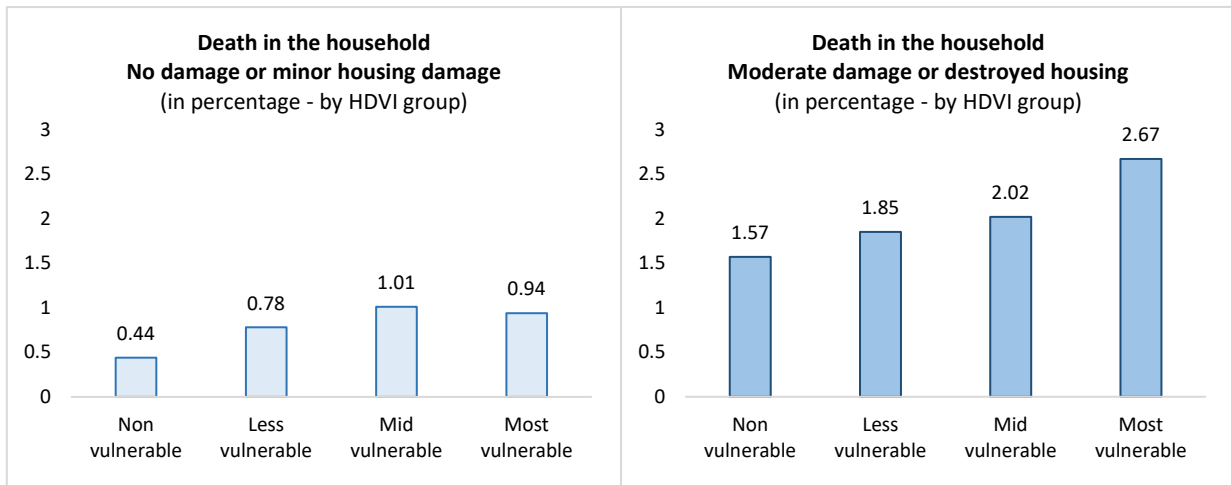
	Affected by earthquake	House with moderate damage or destroyed		Left house after earthquake		House with moderate damage or destroyed and left house	
	Total number of households	Number of households	In % of total	Number of households	In % of total	Number of households	In % of those who left
Total population	69,235	23,166	33.5	22,040	31.8	11,014	50.0
HDVI most vulnerable	22,058	8,217	37.2	6,606	29.9	3,734	56.5
HDVI mid vulnerable	15,358	5,609	36.5	4,620	30.1	2,559	55.4
HDVI less vulnerable	13,428	4,618	34.4	4,496	33.5	2,278	50.7
HDVI non vulnerable	18,391	4,722	25.7	6,318	34.4	2,243	35.5

Source: SIMAST (2022).

III. Health and mortality

Slightly more than 1 percent (844 households) of the earthquake affected population experienced the death of a household member after the disaster, with most vulnerable households more likely to experience a loss. This figure is a lot higher than the number of deceased (227) reported in the PDNA (GoH 2021). The likelihood of having lost a household member is more than twice as high for the most vulnerable households (1.6 percent) than for the least vulnerable ones (0.7 percent). Figure 4.3 shows that the more vulnerable the household, the higher the probability it experienced the death of a member after the August 2021 disaster. Further, it shows that across all HDVI categories the probability a member experienced death was higher for households with damaged or destroyed houses. Households in the most vulnerable household category and who suffered important damages to their homes registered the highest death rates.

Figure 4.3: Prevalence of death in households after the earthquake



More than 4 percent of the population affected by the earthquake suffered some form of injury, disease or disability. In total, 3,025 households reported that one of their members had suffered an injury, disease or disability after the disaster (Table 4.5). This figure is almost twice as high as the 1,696 reported in the PDNA by the GoH (2021) and could be explained by the different definitions used by the two sources. Around 77 percent of those injured needed medical attention and almost all of them did manage to get access to treatment (85 percent). After the disaster, 612 households reported that a member was left with a permanent injury or disability. This corresponds to 7 percent of the total population of persons with disabilities in Grande Anse.

Table 4.5: Injury and disabilities after the earthquake

	<u>Number</u>	<u>Percentage of earthquake</u>	<u>Percentage of population</u>
		<u>affected population*</u>	<u>with disability**</u>
Injury or disability after the shock	3,025	4.4	33.0
of which: Injury needed medical attention	2,326	3.4	25.4
of which: Went out to get medical attention	1,975	2.9	21.6
Permanent injury or disability due to shock	612	0.9	6.7

Source: SIMAST 2022. * n=69,235. **n=9,153. Population with disability defined as individuals reporting a lot of difficulty functioning or total incapacity to function at all in at least one of four domains used to assess disability (vision, hearing, speaking, self-care).

IV. Livelihoods and consumption

More than 41 percent of households impacted by the earthquake saw their capacity to work and generate income hindered. Among affected households, the most prevalent impediment to economic activity was the loss of productive capital and inputs with 18 percent (12,472) of the households concerned (Table 4.6). Inability to get to work and the closure of markets were the next most common difficulties households faced (10 percent and 11 percent respectively). Less than 0.5 percent of households interviewed and impacted by the earthquake declared that their employers shut down after the disaster indirectly revealing the predominance of self-employment in the Department rather than private sector resilience. Disaggregating according to household main economic activity, those primarily engaging in agriculture were the most affected in their capacity to generate income.

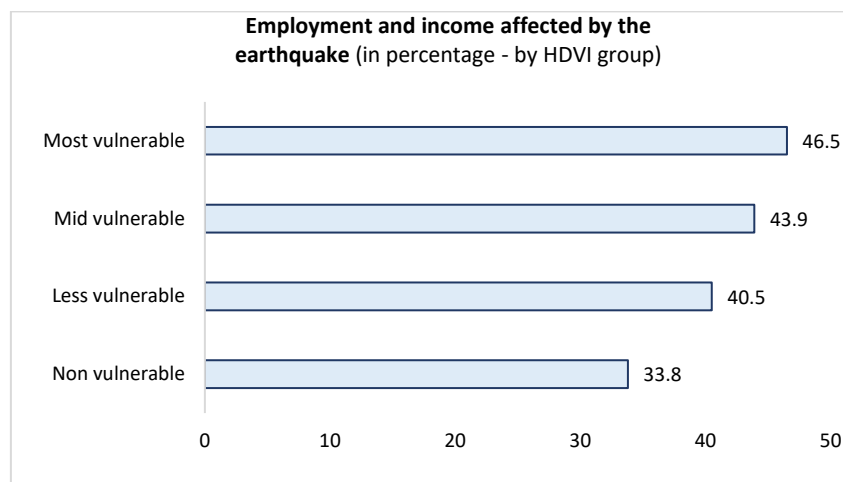
Table 4.6: Effects of the earthquake on employment and income

Main household economic activity	All	Agriculture*	Services	Retail trade	Other
Access to employment and income: Not affected	58.6	53.5	66.9	63.1	68.8
Access to employment and income: Affected	41.4	46.5	33.1	36.9	31.2
Affected: unable to get to work	9.9	10.6	11.3	8.4	8.5
Affected: markets and sales locations closed	10.9	11.5	9.3	11.4	8.5
Affected: loss of capital and inputs	18.0	21.8	9.4	14.9	11.4
Affected: firm/employer closed	0.4	0.2	2.0	0.1	0.7
Affected: Other	2.3	2.5	1.0	2.0	2.2
Total	100.0	100.0	100.0	100.0	100.0
Number of observations	69,235	40,107	4,237	14,486	10,405

Source: SIMAST 2022. * Agriculture, animal husbandry, and fishing.

The negative impact of the earthquake on employment and income was larger for more vulnerable households. Among the HDVI most vulnerable population, 47 percent of households reported that the disaster had affected their capacity to work and generate income, while only 34 percent of the non-vulnerable category reported a similar impact. Figure 4.4 shows that as vulnerability increased, so did the share of households experiencing difficulties to being economically active and generating income.

Figure 4.4: Impact of the earthquake on income across vulnerability category



Around 45 percent of earthquake impacted households reported lower access to food, and again the most vulnerable households suffered the largest impact. Increases in food prices was the primary reason provided (12 percent) followed by reduced access to markets due to damaged infrastructure, absence of vendors, lack of transportation means (8 percent). Approximately 7 percent of households lost agriculture output or stocks, which hindered their ability to put food on the table (Table 4.7). The HDVI most vulnerable households were more affected than any other category. Loss of agriculture inputs or production was mentioned relatively more frequently by households in that category indicating the importance of self-subsistence for this population group. Food insecurity risks increased among households affected by the earthquake as a direct consequence.

Table 4.7: Household access to food

HDVI category:	Non vulnerable	Less vulnerable	Mid-vulnerable	Most vulnerable	Total/All
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Non affected access	62.9	55.7	52.6	50.1	55.2
Affected access	37.1	44.3	47.5	49.9	44.9
Reduced access to markets	6.5	7.6	8.6	9.7	8.2
Price increases	12.3	12.8	12.3	12.0	12.3
Loss of agricultural production/stocks	4.4	6.8	7.8	9.2	7.2
Others	13.8	17.1	18.8	19.0	17.2

Source: SIMAST 2022.

V. Assistance received and unmet needs

I. Assistance from Government, NGOs, and international agencies

Only 6 percent of all earthquake-affected households report having obtained assistance from the central or local government and NGOs. Beyond insufficient assistance the distribution across HDVI categories indicates significant leakage to less vulnerable households. Overall, 1,237 households (or 5.6 percent) from the HDVI most vulnerable category obtained some type of assistance. While in absolute terms this number is larger than in any other category, a higher proportion of households from the HDVI less vulnerable and mid-vulnerable categories received external assistance (Table 5.1). Close to 11 percent of households who lost their houses after the disaster did get some type of support. It is to be noted, however, that the different survey roll-out periods may have resulted in some discrepancies in the information that was collected. As the first surveys were completed three months after the earthquake, these figures reflect assistance that was delivered shortly after the shock, which corresponds to the disaster immediate response phase. Any assistance that did reach households in these communes more than three months after the shock was not captured in the data, for instance early recovery social protection cash transfers. Conversely, answers from households in the last surveyed communes might suffer from recall bias. Besides, some of the assistance received might have been shared between households from the same affected communities, hereby biasing answers further. Finally, one cannot exclude the possibility that some households responded in ways that they thought would make them eligible for assistance. These findings must therefore be interpreted with caution.

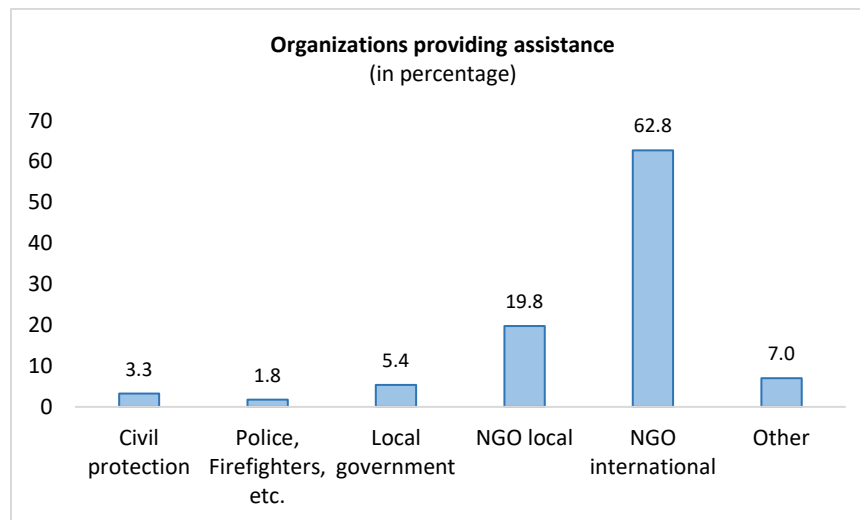
Table 5.1: Assistance received from government, NGOs, and international agencies

Received assistance:	Yes		No		Total	
	Number	Percent	Number	Percent	Number	Percent
All households	4,149	6.0	65,086	94.0	69,235	100.0
Households with destroyed houses	626	10.7	5,244	89.3	5,870	100.0
HDVI non vulnerable	1,003	5.5	17,388	94.6	18,391	100.0
HDVI less vulnerable	931	6.9	12,497	93.1	13,428	100.0
HDVI mid vulnerable	978	6.4	14,380	93.6	15,358	100.0
HDVI most vulnerable	1,237	5.6	20,821	94.4	22,058	100.0

Source: SIMAST (2022).

Local and international non-governmental organizations (NGOs) and UN agencies were the main reported providers of assistance to households after the earthquake. Among the 4,149 households supported by external actors, 20 percent and 63 percent received assistance from a local NGO or an international NGO, respectively. Local municipality governments and the Civil protection public agency respectively reached 5 percent and 3 percent of earthquake-affected households. These figures highlight the limited capacity of (local) government authorities to support disaster-struck populations. However, it is also highly likely that households only had limited information as to which organizations were providing relief assistance. Numerous NGOs operate for the UN agencies as field implementers. Furthermore, the Civil Protection Agency played a prominent role in coordinating upstream the assistance with external partners across the devastated region.

Figure 5.1: Types of organizations providing assistance to households



The most common type of assistance provided to households was in kind. More than 40 percent of households who received assistance did get food, water, and/or hygiene kits (Table 5.2). Shelter, tents, and blankets was the second most common type of assistance provided (31 percent). Only 5 percent (220 households) received cash transfers. The type of aid provided does not appear to accurately reflect household needs. For instance, the most vulnerable households or those who lost their houses due to ground motion were only slightly more likely to receive shelter, tents and blankets than households categorized as better off or without damage. A lower proportion of these households received cash transfers than households with no or minor house damages.

Table 5.2: Type of assistance received [by those who considered that they received assistance?]

	All households	Most vulnerable	Mid/Less/Non vulnerable	House destroyed or damaged	None of minor house damage
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Food, water, hygiene kits	43.3	42.1	43.8	41.2	45.9
Shelter, tent, blanket	31.2	32.4	30.7	34.0	27.6
Cash transfers	5.3	5.1	5.4	4.3	6.6
Other	20.3	20.4	20.2	20.5	19.9
Total	100.0	100.0	100.0	100.0	100.0
Number of observations	4,149	1,237	2,912	2,320	1,829

Source: SIMAST (2022).

5.2 Most pressing needs

Access to food and water as well as building materials were the most pressing needs facing affected households when interviewed. The most pressing needs identified by households did not vary extensively across HDVI vulnerability status. On average 86 percent and 79 percent of earthquake-hit households respectively mentioned that access to food and water and building materials were among their most pressing needs. Comparing households according to their vulnerability status, the mid- and most-vulnerable ones put more emphasis on building materials, school fees, and livelihood support. On the other hand, non- and less-vulnerable households mentioned hygiene products, medicine and medical care more frequently. Around 90 percent of the households who suffered significant housing damages mentioned a pressing need for building materials (Table 5.3).

Table 5.3: Most pressing needs of earthquake affected households

	HDVI Non vulnerable	HDVI Less vulnerable	HDVI Mid vulnerable	HDVI Most vulnerable	Destroyed or moderately damaged house
Food and water	88.3	89.0	85.7	83.5	83.1
Tents, blankets, sheets	4.3	4.3	4.0	4.2	5.0
Hygiene products	5.9	4.2	4.3	3.9	3.2
Clothing	2.3	2.8	2.5	2.2	1.9
Medicines and medical care	19.1	16.2	13.1	10.6	11.3
Building materials	67.7	78.9	82.9	85.4	89.9
School materials and school fees	23.5	22.2	23.4	26.8	21.4
Recapitalization (livelihoods)	54.1	53.9	55.8	57.1	56.6
Number of observations	18,391	13,428	15,358	22,058	23,166

Source: SIMAST (2022). Note: several answers could be chosen as the most pressing need.

VI. Conclusions and policy recommendations

This paper analyzes recently collected data from the new shock module of Haiti’s social registry. In the few weeks following the August 2021 earthquake, a series of questions focusing on the exposure, impact and consequences to exogenous shocks was added to social registry questionnaire. The shock module questionnaire was rolled out in the Grande Anse Department through five field deployments that occurred between November 2021 and August 2022. A total of 104,241 households and 441,562 individuals were interviewed corresponding to more than 94 percent of the latest population census projection estimates for the Department.

Overall and consistently across dimensions, the impact of the earthquake was more severe for the more socioeconomically disadvantaged households. The empirical analysis shows about two-thirds of the households from the Grande Anse Department were affected by the August 2021 earthquake. Socioeconomically more disadvantaged households were more exposed to the multifaceted impacts of the earthquake on housing, health, (self-)employment, and food security.

The earthquake response, which was predominantly provided by NGOs and in-kind, reached a limited number of affected households. Among those affected there doesn’t seem to have been any prioritization as all vulnerability categories had the same chance to receive assistance. Moreover, the targeting of the assistance could have better considered the needs of the population.

The following public policy recommendations can be drawn from the empirical analysis.

First, investments to improve housing are critical to strengthen poorer households' resilience to earthquakes. The analysis showed that houses made of more solid materials were less likely to suffer damages from the earthquake, and were associated with fewer deaths and injury, and less overall disruption in the livelihood of households.

Second, the capacity of government agencies (central and local) and donors to rapidly identify populations in needs of assistance needs to be strengthened ex-ante, particularly in a context of rapid onset disaster requiring immediate assistance. Outdated social registry data in the region did not allow for its immediate use to target households. Ensuring accurate household information and geolocation is of utmost importance to provide rapid assistance and could have allowed for efforts to focus on the most vulnerable households. Moreso, designing shock modules and preparing field work in advance (for instance training enumerators, ensuring the questionnaires are programmed and tested) could have significantly improved the targeting by accelerating the field work and ultimately the rapid targeting of households having lost their homes. Post-disaster contexts are highly chaotic, and challenges related to data collection efforts in these contexts difficult to predict. However, scenarios can be drafted, and teams prepared in advance to inform these efforts.

Third, the type of assistance provided needs to be carefully assessed in terms of its timing and the needs of households. Beyond the immediate needs for water, food, and shelter, households clearly expressed the need for items supporting their recovery in the medium term, including to rebuild their homes and livelihoods. Such recovery is best supported through cash transfers: to the extent local markets are functioning (which was rapidly the case in the region),¹² cash transfers allow households to determine which items to purchase and are generally cheaper to implement than in-kind transfers.¹³ Here again, more accurate and quickly gathered data is crucial to inform the type of assistance to be provided. There is also a need to ensure care services are available for persons with disabilities as more than 4 percent of the population affected by the earthquake suffered some form of injury, disease, or disability (1 percent of the affected population with permanent injury or disability) putting additional stress on the limited resources available.

¹² See for instance https://www.impact-repository.org/document/reach/385d397c/REACH_HTI_Factsheet_ICSM-Grand-Sud_November-2021-Cycle2.pdf

¹³ <https://blogs.worldbank.org/developmenttalk/what-do-we-know-about-cash-and-kind-transfers-humanitarian-settings-not-enough-0>

Fourth, developing a shock response mechanism that has clear procedures on when and how to respond using safety nets is critical. This would require a normative framework that regulates how to activate a response through cash transfers, secure funding, rapidly identify and register the beneficiaries and distribute funds to people. This would improve coordination and prevent relying exclusively on NGOs and UN agencies who may not have a full view of relief efforts thus leading to duplication of efforts.

Fifth, strengthening the delivery chain for cash transfers will be key to achieve higher efficiency in future responses. Based on reports on the levels of aid provided through cash transfers in the region in comparison to the levels received reported in the survey there were significant delays in the distributions of cash transfers. This is a likely result of the reliance on physical cash delivery rather than mobile money in Haiti, which was further impeded by the rising insecurity, damaged infrastructure, and difficult access to rural, mountainous areas. Investing in developing the mobile money infrastructure is thus critical for improved disaster response.

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Annex 1: Shock module questionnaire

CH1. Votre ménage a-t-il été affecté par un choc durant les 12 derniers mois (nan 12 mwa ki sot pase yo, eske nou te travèse gwo gwo difikilite ki gen rapò ak yon seri de fenomèn natirel oswa sityasyon peyi a) 1= oui (wi) 0= non (non) Si oui passer à CH1, si non fin CH1.1 Si oui, lequel de ces chocs, [si plusieurs chocs, quel a été celui a fait le plus de dégâts (si se wi, ki yès nan chok sa yo (si gen pliyè, di nou ki yès ladan yo ki te fè plis dega a?)] 1 Tremblement de terre (tranblemandè) 2 Glissement de terrain/éboulement (glisman teren) 3 Ouragan (ouragan) 4 Inondations (inondasyon) 5 Crise sanitaire (maladi, epidemi...) 6 Sécheresse (sechrès) 7 Situation sécuritaire (pwoblèm sekirite) 8 Autres, préciser (lòt, di kisa) _____	CH8. Est-ce qu'il y a des membres du ménage qui sont décédés à la suite du [choc] (eske te gen moun nan kay la ki mouri akòz de chok la)? 1= oui (wi) 0= non (non)	CH13. Est-ce le choc a affecté les actifs du ménage (eske chok la te afekte byen moun nan kay la tankou) ? 1= oui (wi) 0= non (non) 99 = NA (si cela n'existait pas) (nou pat gen sa) a. Récolte (rekòt) b. Bétail (bèt) c. Intrants agricoles (plan) d. Outils agricoles ou de pêche (zouti pou jaden ak lapèch) e. Stocks commerciaux (chay) f. Boutique (boutik) g. Atelier de transformation (atelye) h. Autre, préciser (lòt di kisa) _____	CH17. Sous quelle forme avez-vous reçu cette aide (si se wi, ki èd ou te jwenn) ? 1. En nature (nourriture, eau, kit d'hygiène, tente...) (en natif (manje, ki twalèt, tant...)) 2. En espèce (Mon Cash, Natcash, transfert local, de l'étranger...) (kòb, (monkach, natkach, tranfè moun lòt zòn, moun nan peyi etranje) 3. Les deux formes (sou tou 2 fòm)			
CH2. Avez-vous changé de commune suite au choc (eske nou te kite komin nan apre chok sa) 1= oui (wi) 0= non (non)	CH9. Si oui, combien (si wi, konbyen moun)	CH14. Les emplois et sources de revenus du ménage ont-ils été affectés par le [choc] (eske chok la afekte aktivite nou te konn fè pou rentre kòb)? a. Non affectés (non yo pat gen anyen) b. Affectés, impossibilité de se rendre sur lieu de travail (routes détruites, véhicules endommagés, transports inexistant, etc.) (nou pat ka al travay (wout kraze, machin an pann, pat gen trafik...)) c. Affectés, marchés et points de vente fermés (mache ak tout lòt kote yo vann te fèmen) d. Affectés, perte de capital et intrants (pèdi tout byen ak bagay poum plante) e. Affectés, firme/employeur à l'arrêt (travay te fèmen) f. Autres, à préciser (lòt bagay di kisa) _____	CH18. Quels sont par ordre d'importance, les trois besoins les plus pressants pour votre ménage (kisa 3 bagay nan sa yo ki pi enpòtan pou nou ta jwenn kounyèa) a. Nourriture (manje) b. Eau de boisson (dlo pou bwè) c. Eau courante (dlo pou sèvi) d. Logement, abri, tente (kote pou n rete, abri, tant) e. Produits d'hygiène (kit twalèt) f. Vêtements, couvertures, draps (rad, dra) g. Médicaments (medikaman) h. Soins médicaux (la swenay) i. Matériau de construction (materio pou konstwi kay) j. Matériels scolaires et frais d'écolage (materyel ak kòb pou voye timoun lekòl) k. Recapitalisation (moyens d'existence) (repan n aktivite ekonomik) l. Autres <table border="1" style="width: 100%;"> <tr> <td style="width: 33%; height: 20px;"></td> <td style="width: 33%; height: 20px;"></td> <td style="width: 33%; height: 20px;"></td> </tr> </table>			
CH3. Si oui, dans quelle commune habitez-vous avant (si se wi, ki kote nou te abite avan)? _____	CH10. Est-ce qu'il y a des membres du ménage qui ont été frappés par une maladie, un handicap ou qui a été blessés gravement à la suite du [choc] (eske gen moun ki te tonbe malade oswa andikape ou byen te blese grav akòz chok la) ? 0. Non aucun (non pat gen sa) (Si non aller à la question CH12) 1. Oui, maladie chronique (wi, maladi kronik) 2. Oui, blessure grave (wi, gwo blese) 3. Oui, handicap physique/moteur (wi, andikape, paralyze) 4. Oui handicap mental (folie, démence) (wi, foli) 5. Oui autres (wi lòt bagay) _____	CH15. Est-ce que l'accès (physique) du ménage aux sources de nourriture a été affecté par le [choc] (eske li te difisil pou nou jwenn manje akòz de sa) 1. Non affecté (non li pat difisil) 2. Affecté, à cause d'un accès réduit aux marchés (destruction d'infrastructure, manque de transport, pas de vendeurs, etc.) (li te difisil paske pat gen mache, anpil bagay te kraze, pat gen transpò, pat gen machann...) 3. Affecté, à cause d'une augmentation des prix (li te difisil paske tout pri yo te moute) 4. Affecté, à cause d'une perte de propre production agricole ou stocks (li te difisil paske nou te pèdi tout jaden ak tout sa nou te genyen) 5. Affecté, Autres à préciser (lòt bagay di kisa)	CH19. Lieu de collecte (kote yo fè ankèt la) 1. Logement normal (nan kay moun nan) 2. Abri provisoire /tente (abri/tent) 3. Centre d'hébergement (sant otorite mete moun) 4. Hébergement provisoire chez un proche, voisin ou ami (kay fanmi, vwazinn, zanmi) 5. Autres : préciser (lòt) _____			
CH4. Avez-vous quitté votre logement immédiatement après le choc (eske nou te kite kay la tou swit apre chok la) ? 1= oui (wi) 0= non (non) CH5. Si oui, ou étiez-vous logé (si wi, ki kote nou te ale) 1. Dans un espace ouvert près de la maison (nan yon anplasman ouvè tou pre kay la) 2. Dans un abri collectif (nan yon kote yo te mete tout moun ki te viktim yo) 3. Chez des amis ou de la famille (kay zanmi/fanmi) 4. Louer/acheter/une autre maison (lwe/achte yon lòk kay) 5. Autres, préciser (lòt bagay, di kisa) _____	CH11. Ces malades ont-ils pu accéder à des soins (eske moun ki te viktim yo te rive yo te jwenn la swenay)? 1= Oui, suffisamment (wi, anpil swen) 2= Oui, pas assez (wi, yon ti swen tou piti) 0= Non (non)	CH16. Avez-vous reçu l'assistance des autorités étatiques, ou les représentants des ONG, des Nations Unies ou d'autres organisations depuis le [choc] (Eske gen otorite nan leta, ONG, lòt òganizasyon ki te pote èd pou nou) ? 1. Oui, d'un représentant de la protection civile au niveau départemental ou national (wi potekeyon sivil) 2. Oui d'un représentant de la police, des pompiers ou autres (wi la polis, ponpye). 3. Oui d'un représentant du gouvernement local ou de la mairie (wi la meri ak lòt otorite leta nan zòn nan) 4. Oui d'une ONG/association locale (ONG/asosyasyon istit) 5. Oui d'une ONG internationale (ONG etranje) 6. Autres, préciser (lòt) _____ 7. Non (nou pat jwenn èd)	CH20. Quel est le degré de dommages au logement observé par l'énumérateur : 1. Aucun dommage (pa gen domaj) 2. Dommages mineurs (ti kraze tou piti) 3. Dommages modérés (kraze ap anpil) 4. Dommages sévères (kraze anpil) 5. Logement détruit (kraze nèt)			
CH6. Est-ce qu'il y a des membres du ménage ont quitté définitivement le ménage suite au choc (eske gen moun nan kay la ki te kite net apre sa) ? 1= oui (wi) 0= non (non)	CH12. Est-ce que certaines de ces installations sont devenues dysfonctionnelles à la suite du [choc] (eske bagay sa mwen pral site la yo te gen pwoblèm apre chok la) ? 1= oui (wi) 0= non (non) 99 = NA (si cela n'existait pas) (nou pat gen sa) a. Canalisation d'eau (kannal dlo) b. Système d'assainissement c. Réseau électrique (kouran) d. Réseau d'eau potable/ puits artésiens/fontaine/sources (tiyo dlo, pi, fontèn, sous)					
CH7. Si oui, combien (si wi, konbyen moun)						

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ABSTRACT

We examine recently collected data from Haiti's social registry new shock module to measure the scale of the August 2021 earthquake's impact on households and assess the adequacy of the relief response. In the aftermath of the earthquake, a survey module was promptly developed for the national social registry to evaluate the impacts and consequences of wide-reaching exogenous shocks as well as the needs of affected households. Using this rich unique dataset covering the full population of the Grande Anse Department in Haiti, we find that more than two-thirds of households were affected in one way or another by the August 2021 earthquake. Overall and consistently across dimensions, the impact of the earthquake was more severe for the more socioeconomically disadvantaged households. Less than 10 percent of all earthquake-affected households reported obtaining assistance from a government body or a non-governmental organization. The findings from the data analysis provide important lessons on disaster relief to inform future emergency responses.

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