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ABSTRACT

The Effects of the 2010 Haiti Earthquake on Children's Nutrition and Education*

We assess the impact of the 2010 Haiti earthquake on children's nutrition and education. We combine geo-coded shaking intensity data with four waves of the Haiti Demographic Health Survey, two administered before and two after the earthquake. We find lasting negative impacts of the earthquake on children's stunting and wasting as well as on school enrolment and attendance. A one standard deviation increase in shaking intensity raises infant stunting by 0.08 standard deviations and wasting by 0.04 standard deviations. Our estimates account for the millions in aid funds allocated by the World Bank to overcome the earthquake's aftermath. This aid mitigated but could not fully prevent the adverse effects on children's health and education. The results are robust to alternative specifications and different measures of exposure to the earthquake. Our results highlight the need for aid in poor areas affected by natural disasters to prevent infant malnutrition and poor education. Reduced children's health and education will have lasting private and social costs, which could easily exceed the necessary costs to counter these effects.

JEL Classification: I15, I25, Q54, O10

Keywords: natural disasters, earthquake, nutrition, education, school attendance, Haiti

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Introduction

Global economic losses from natural disasters in 2020 were valued at USD 210 billion (Munich Re, 2021). Among these, earthquakes are by far one of the most destructive type of disasters. When earthquakes strike, thousands of people can die in a matter of seconds and many more can be severely injured. Moreover, public infrastructure, private residences and business capital can be damaged or fully destroyed over large areas. Beyond their immediate destruction and large death toll, the consequences of earthquakes can potentially last over many years. This paper focuses on such mid- and long-term detrimental effects of earthquakes by assessing the changes in children's nutrition and education following the 7.0-degree earthquake that occurred in January of 2010 in Haiti. This earthquake was the second largest one in terms of fatalities during the last 40 years.[1] The estimated death toll ranged between 222,000 (United Nations, 2011) and 300,000 (Government of the Republic of Haiti, 2010a). The lower-bound estimate of monetary damages was USD 8.1 billion (Cavallo et al., 2010). The 2010 Haiti earthquake also illustrates an example of one of the biggest mobilizations of humanitarian assistance ever recorded.

The group most vulnerable to the consequences of natural disasters are children. Shocks experienced in early childhood can be carried on throughout the adult life, affecting cognitive development and skills, labour productivity, and lifetime income, which in turn produce grave repercussions for the economic well-being of a country's future population (Ho et al., 2017; Frankenberg and Thomas, 2019). Based on the fetal origins hypothesis, Epidemiologists also emphasize that chronic and degenerative conditions of adult health are triggered by circumstances of the individual's early life, including in-utero nutrition (Barker, 1990).

In this paper we quantitatively assess the effects of the 2010 Haiti earthquake on human capital accumulation among children exposed to the earthquake. We contribute to the literature by identifying local exposure to the earthquake with both objective (shaking intensity) and subjective (reported damage) data and we also provide a novel contribution to this literature by accounting for the two billion USD World Bank aid that was distributed after the earthquake. Moreover, we also explore the medium and longer-term effects of the earthquake by examining the persistence of the estimated negative effects on children's nutrition and education six to seven years after the earthquake.

To measure the effects on children's nutrition, we focus on three anthropometric measures: height-for-age, height-for-weight and weight-for-age z-scores. We focus especially on stunting, which reflects short height-for-age and is a consequence of inadequate nutrition intake over a longer period of time. Therefore, stunting is expected to be increasing even in the mid- or long-term after the earthquake and

[1] Between 1970 and 2008 the largest earthquake registered occurred in 1976 in China with a death toll of 242,000 casualties (Spence et al. 2011).

it can be a good predictor of future adult health status. To measure the effects on children's education, we focus on primary and secondary school enrolment, years of education, and school attendance.

We use data from four sources: (i) geo-coded survey data on over 15,000 children from four different waves of the Haiti Demographic and Health Survey (DHS) for the period 2000 to 2017; (ii) the United States Geological Survey (USGS) for measures of ground motion produced by the earthquake known as Peak Ground Acceleration (PGA); (iii) DesInventar data on damages and destruction after the Haiti earthquake; and (iv) the World Bank (WB) database of geo-located aid projects implemented in 2011 to overcome the consequences of the natural disaster. We assign every household and child an objective measure of shaking intensity based on the distance from each survey cluster to the stations providing ground motion measures. The World Bank data was used to control for differences in aid across space. It also helped to gain a better understanding of how humanitarian assistance could have mitigated the negative effects of the earthquake on health and human capital accumulation.

We measure exposure to the earthquake using the geographical coordinates of the DHS clusters in several ways. First, we construct a continuous treatment intensity measure based on the weighted peak ground acceleration (PGA) indices reported by geological stations spread throughout the country. While computing the weighted averages, we account for the distances between the stations providing the PGA measures and the DHS clusters. Second, we use the USGS ShakeMaps to define treatment groups based on shaking intensity radiuses, which indicate the earthquake depth and ground motion. We use Difference-in-Difference estimations to capture causal effects of the earthquake on children's nutrition and education. To account for potential shifts in the effects due to humanitarian assistance, we control for the amount of aid distributed to different areas of Haiti by the World Bank in 2011. The geo-locations of WB aid projects allow to calculate a weighted measure of humanitarian assistance for every DHS cluster. Finally, to demonstrate the robustness of our results, we alternatively measure the earthquake's impact through data on the physical damage at the district level.

Our findings provide evidence of lasting effects of the 2010 Haiti earthquake on children's nutrition and education. Using different identification methods, we consistently show that two and six to seven years after the earthquake, children living in areas of highest shaking intensity still suffered from lower height-for-age z-scores and significantly higher stunting. We do not find any significant differences by gender, but younger children at the time of the earthquake suffered a higher degree of stunting than older children. The strong negative impacts of the earthquake are also evident for school attendance and attainment. Boys demonstrate even lower school attendance and attainment in comparison to girls. The adverse effects are more pronounced for children in primary school. We also confirm the "delay hypothesis" that young adults were enrolled in school even after the age of 19, the official age limit for school attendance.[2] Our estimates show, not accounting for World Bank aid would lead to an

[2] 19 years old is not a strict graduation rule and many children enter secondary school later. As a result, many children graduate at the age of 20-25 years old.

underestimation of the effects of the earthquake on children's nutrition and education. Our results remain also significant after controlling for selective child mortality and displacement patterns and several additional robustness checks.

The negative effects of different natural hazards on human capital development in resource-poor settings have been previously investigated in the literature (Baez et al., 2010; Caruso, 2017; Nguyen and Minh Pham, 2018; Thamarapani, 2021 for many disasters; Tiwari et al., 2017 for monsoons; Gaire et al., 2006 for floods and epidemics; Datar et al., 2013 for droughts and floods; Frankenberg and Thomas, 2009 for tsunamis; Spencer et al., 2016 and Hugo de Oliveira et al., 2023 for hurricanes for hurricanes; Jensen, 2000 and Maccini and Yang, 2009 for weather shocks). We contribute to this literature by also providing evidence on the prevalence of these effects in the long-term which is critical in the context of children's nutrition and education. In addition, unlike most of the cited studies, we employ high resolution data to measure exposure of households and children to disasters at the local level. We use the geo-coded data from four DHS waves covering the period from 2000 to 2017 and USGS data on shaking intensity to identify potential damages at the moment of the earthquake at the community level.

So far only a few studies have focused on the effects of *earthquakes* on children's nutrition and education, notable exceptions are Bustelo et al. (2012) and Andrabi et al. (2021).[3] In contrast to Bustelo et al. (2012), we measure earthquake exposure at the local community level, and use both objective (shaking intensity) and subjective (reported damage) measures. Andrabi et al. (2021) use one wave of survey data and measure exposure to the earthquake by the distance to the fault line where the earthquake was generated. In contrast to them, we employ repeated cross-sectional data for a period of 17 years and are able to compare closely located clusters before and after the earthquake throughout the country.

We also add to the literature on the impacts of the 2010 Haiti earthquake. Other scholars have previously presented evidence of its influence on child labour as a coping strategy (Novella and Zanuso, 2018) and on household economic well-being and labour market participation (Saint-Macary and Zanuso, 2016). However, the impact of the 2010 Haiti earthquake on children's nutrition and education has not yet been studied. Given that Haiti has been hit by another severe earthquake in August 2021 with at least 2,200 fatalities, the topic has not lost its relevance.

The remainder of the paper proceeds as follows. Section 2 describes the Haitian context and the earthquake. Section 3 presents the data. Section 4 outlines the empirical strategies to exploit the natural experiment setting provided by the earthquake. Section 5 discusses the main results, including a heterogeneity analysis. Section 6 presents robustness checks. The final section concludes.

[3] Other studies have explored the macro-economic impacts of earthquakes (see e.g. Noy, 2009, Felbermayr and Groschl, 2014; Felbermayr et al., 2018; Fabian et al., 2019), or the effects of earthquakes on household welfare (see e.g. Gignoux and Menéndez, 2016), or labour market outcomes and firm performance (see e.g. Kirchberger, 2017; Cole et al. 2019).

2 Haitian Context and the 2010 Earthquake

With a Gross Domestic Product (GDP) per capita of about USD 2,925 in 2020, Haiti remains one of the poorest countries in the world, and the poorest one in Latin America and the Caribbean. On January 12th of 2010, a magnitude 7.0 earthquake on the Richter scale struck near the town of Léogâne, at an estimated depth of 13 kilometers (Eberhard et al., 2010). The epicenter was located 25 kilometers away from Haiti's capital, Port-au-Prince. It was the first earthquake to strike the nation after 240 years of seismic calm (Bakun et al., 2012). Prior to this event, the last time an earthquake of a similar magnitude struck Haiti was in the 18th century, therefore it is unlikely that households would make residential decisions based on their proximity to the fault line.

Community infrastructure was largely affected by the earthquake. For example, 1,300 schools and more than 50 hospitals and health centers collapsed or were ruled unusable (Government of the Republic of Haiti, 2010b). The overall damage and losses were estimated at about USD 8 billion, the equivalent of more than 120% of Haiti's GDP (Cavallo et al., 2010; United Nations, 2011). More than 2.3 million people were homeless after the quake (United Nations, 2011). In the weeks following the shock, 1.2 million people were living in 460 camps (Government of the Republic of Haiti, 2010b). Approximately 130,000 houses were destroyed and over 915,000 were damaged (Herrera et al., 2014).

The earthquake severely affected the food security of the Haitian population via the loss of goods, employment, forced migration and an increase in food prices which eroded the livelihoods of households (United Nations, 2011). According to the World Food Programme, about 1.3 million people living in the affected areas did not have enough to eat. An additional 600,000 people who had lost their homes were also struggling to meet their basic food needs (WFP, 2015). The whole country, not only heavily affected areas, suffered from a food deficit because of the strong integration of imported rice markets in Haiti. The most vulnerable groups in terms of food insecurity included households who were among the poorest before the earthquake, households who lost their dwellings and those with handicapped members and with only one bread winner for many inhabitants (Coordination Nationale de la Sécurité Alimentaire, 2010).

After the earthquake, Haiti saw one of the biggest mobilizations of humanitarian assistance ever recorded. As of 2013, the international community had pledged USD 13.5 billion for humanitarian relief and recovery efforts (U.S. Congress, 2014). The World Bank partnered with the United Nations, the European Union, the Inter-American Development Bank and multiple non-profit organizations for the post-disaster assessment of needs and disbursement of funds (World Bank, 2019). The emergency disaster response included the creation of temporary learning spaces by UNICEF, additional support for previously established School Feeding Programmes, general food distributions, food and cash-for-work programs, among others (United Nations, 2011; WFP, 2011).

3 Data Sources and Sample Composition

This study combines several data sets to empirically test the impact of the 2010 earthquake on children's nutrition and education. In the following sections, we describe the data sources and variables used in the analysis.

3.1 Children's Nutrition and Education

The data on children's nutrition and education was extracted from four waves of the Demographic Health Survey (DHS) conducted in Haiti in the period from 2000 to 2017. Specifically, the surveys were implemented in the years 2000, 2005/6, 2012, and 2016/17, thus providing two waves before and two waves after the 2010 earthquake as reflected in Figure 1. This repeated cross-sectional dataset includes information on a variety of topics such as child health, education, household and respondent characteristics, infant and child mortality, maternal health, wealth, child feeding practices, vitamin supplementation, anthropometry and anemia. The richness of the data permitted the introduction of a vast set of control variables to isolate the effects of the earthquake on nutrition and education. Geographical covariates and GPS coordinates are also available for all clusters covered by the survey.

Figure 1. Sample composition based on timing of the DHS roll-out.

Children's growth and nutritional status are assessed on the basis of height and weight measures via a standardised age- and sex- specific growth reference. We use a height-for-age z-score (HAZ), a weight-for-age z-score (WAZ) and a weight-for-height z-score (WHZ), all of which express values in units of standard deviations above or below the reference with an expected mean of 0 and a standard deviation (SD) of 1 for normalised indices (World Health Organization, 2007).

Children with HAZ, WHZ, and WAZ scores of 2 SD or more below average are classified as displaying stunting, wasting and underweight respectively (World Health Organization, 1995). HAZ reflects achieved linear growth. Low HAZ scores in a pathological context, refer to stunting and indicate a process of failure to reach linear growth potential as a result of suboptimal health and/or nutritional conditions (World Health Organization, 1995). WHZ scores reflect body weight relative to height and indicate the deficit in tissue and fat mass. Wasting refers to significant weight loss because of acute starvation, severe disease or chronic dietary deficiencies. WAZ scores reflect body mass in relation to age. Their interpretation is more complex since they are influenced by both child height and weight. For robustness checks, we also create dummies for *severe* stunting, wasting and underweight, when the corresponding HAZ, WHZ and WAZ scores fall 3 SD or more below average.

Further, to study the effects of the earthquake on educational outcomes we focus on four outcomes: primary and secondary school enrolment, total years spent in school, and current school attendance. Primary and secondary school enrolment are computed for children of the corresponding age groups, 6-14 and 15-18. The other two outcomes are taken for the entire range of school age (6 to 18 years old).

Table 1. Descriptive Statistics of Full Sample using Weights – Outcome Variables for Nutrition and Education

	(Year 2000)		(Year 2005/6)		(Year 2012)		(Year 2016/17)	
	Mean	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
				Nutrition				
HAZ	-1.155	1.461	-1.255	1.427	-0.954	1.418	-0.897	1.438
Stunting	0.277	0.448	0.285	0.451	0.213	0.409	0.204	0.403
Severe stunting	0.091	0.288	0.096	0.300	0.078	0.269	0.068	0.252
WHZ	-0.098	1.161	-0.228	1.365	-0.140	1.210	-0.020	1.122
Wasting	0.131	0.337	0.177	0.382	0.119	0.324	0.087	0.282
Severe wasting	0.036	0.186	0.063	0.243	0.034	0.180	0.018	0.134
WAZ	-0.722	1.209	-0.874	1.289	-0.647	1.197	-0.530	1.133
Underweight	0.056	0.230	0.103	0.304	0.053	0.225	0.039	0.194
Severe underweight	0.014	0.118	0.032	0.176	0.014	0.118	0.009	0.094
N	5,409		2,434		3,384		3,725	
				Education				
Primary school enrolment (Age 6-14)	0.510	0.500	0.636	0.481	0.774	0.418	0.791	0.406
N	11,486		11,196		12,076		12,915	
Secondary school enrolment (Age 15-18)	0.244	0.430	0.357	0.479	0.450	0.498	0.594	0.491
N	3,977		4,473		5,218		5,557	
Years spent in school (Age 6-18)	2.130	2.513	2.660	2.694	2.958	2.768	3.538	2.966
Current attendance (Age 6-18)	0.665	0.472	0.828	0.378	0.909	0.288	0.904	0.295
N	15,463		15,669		17,294		18,472	

As reflected in Table 1, children's nutrition and education have improved on average over time throughout the country despite the earthquake. In the first two waves, around a third of the surveyed sample suffered from stunting and two years after the disaster stunting was prevalent on 21% of the surveyed children. Starvation also significantly declined from 18% in 2005/2006 to around 9% in 2016. Across all four survey waves, we observe some deterioration of all nutrition indicators in the second wave 2005/2006 followed by a steady recovery in the next two waves. These trends are probably caused by higher political and economic instability in the 2000s because of a series of guerrilla attacks and revolts. The data also reflects constant improvements in the portion of children with primary and secondary school enrolment from 51% to almost 80% and from 24% to 60%, respectively. Moreover, the average total years spent in school increased on average over time from 2.1 to 3.5 years. We also observe improvements across waves in the proportion of students attending school going from 66% in 2000 to 90% in 2016/17. In the areas most affected by the earthquake, the picture looks very different. In these areas, pre-earthquake outcomes in terms of health and education were clearly better than post-earthquake outcomes. This is illustrated in Figure 2. This figure shows the difference in stunting and in primary school enrolment between the before- and after-earthquake periods by ground shaking intensity. For the considered outcomes, we first calculate the means for the 2000 and 2005/6 DHS waves as well as for the 2012 and 2016/17 DHS waves. Then, we find the difference between the means of the before- and after-earthquake time periods on the DHS cluster level. We plot these differences against ground shaking intensity measured with PGA g% and present their local polynomial smooth with a 95% confidence interval. We observe a strong increase in stunting and a strong decrease in primary school enrolment when shaking intensity is high. In particular, these devastating trends become visible when shaking intensity crosses the threshold of 0.2 PGA g% implying strong shaking. This calls for a more detailed analysis of the impact of the earthquake.[4]

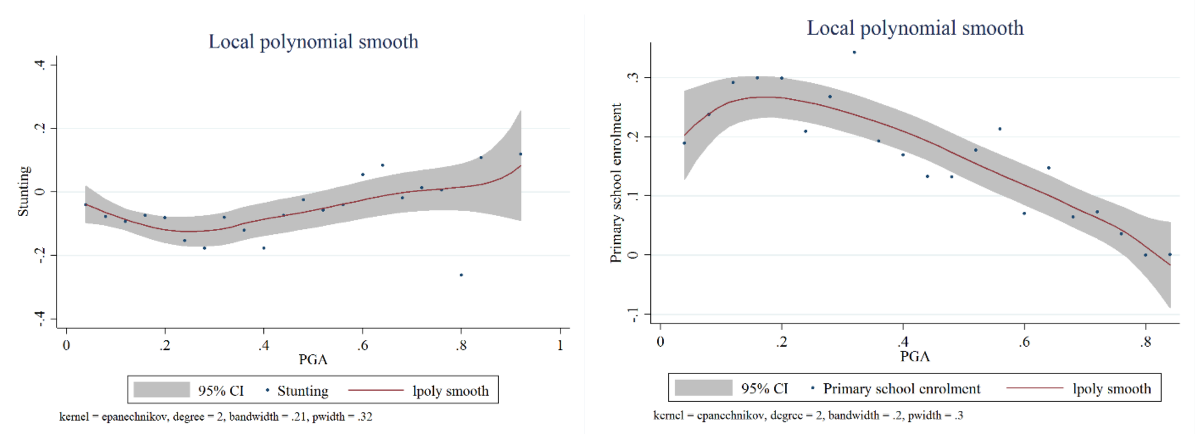

Figure 2. Difference in stunting (left) and in primary school enrolment (right) between the before- and after-earthquake periods by shaking intensity

We also delve into the effects of the earthquake on child labour and focus on three main variables: a) whether the child has worked outside the household including paid and non-paid work; b) whether the child has performed domestic household work, and c) whether the child has performed work for a family member. These variables are available in two of the four waves, in one wave before and in another wave after the earthquake. Child labour is widespread in Haiti. In the period 2005/6, over 33% and 20% of the children taking part in the survey were working outside of the household or for a family member, respectively. By 2012 the share of children working outside had been reduced to 23% and the share of children working for a family member had remained at 20%.[5]

3.2 Shaking Intensity and Damage Measures

The treatment variables are constructed on the basis of the 2010 seismic data from the U.S. Geological Survey (USGS). The treatment status is defined as shaking intensity based on the USGS ShakeMaps

[4] The graphs for other outcomes are presented in Appendix Figures A3 and A4.
[5] Online Appendix 1 reports in detail the descriptive statistics of all outcomes (S1.1) and control variables (S1.2, S1.3).

data. As observed in Figure A1, the impact of the earthquake across Haiti was measured in terms of several indicators such as peak ground acceleration (PGA), peak ground velocity (PGV), and instrumental intensity from the Modified Mercalli Intensity Scale (MI), from which categories of potential damage and perceived shaking were derived. Despite the availability of these different measures, both theory and evidence indicate that for the case of Haiti, PGA proves to be an optimal choice. PGA is a geological measure of the maximum acceleration experienced by a particle on the ground and is independent on building characteristics but considered a good index-to-hazard for low buildings up to seven stories, and most buildings in Haiti consist of only one story. PGV is a good index-to-hazard for taller buildings (USGS, 2018). Several recent studies (Santos and Baez, 2008; Saint-Macary and Zanuso, 2016), use PGA values as a proxy for earthquake intensity. Figure A1 also presents categorised earthquake impacts based on PGA values, where all values higher than 12g% imply strong perceived shaking and severe destructions.

The DHS data is merged at the cluster level with the USGS parameters of ground motion produced by the earthquake such as the Peak Ground Acceleration (PGA) to assign every cluster an objective measure of perceived shaking intensity. The map in Figure 3 shows the distribution of DHS clusters across every wave, against the background of the USGS ShakeMap. It also shows that the DHS clusters are dispersed over the entire country in all four waves.

We compute treatment intensity in two ways. First, we extract the information from a total of 175 stations, which report the earthquake intensity in terms of PGA.[6] We use these PGA values to construct a weighted index that identifies the level of ground motion and perceived shaking intensity for every DHS cluster on the map. More specifically, the weighted PGA index for DHS cluster c can be written as follows:

$WPGA_c = \frac{\sum_{\vartheta=1}^{\aleph} W_{c\vartheta} \cdot PGA_{\vartheta}}{\sum_{\vartheta=1}^{\aleph} W_{c\vartheta}}$, where PGA_{ϑ} is a PGA value reported by station ϑ, and $W_{c\vartheta} = \frac{1}{(distance_{c\vartheta}+\delta)^2}$ is a weight based on a specific function defined by the distance between DHS cluster c and station ϑ with buffer zone δ. For the main specification we assume that $\delta = 1$ implying that the PGA values from the stations within one kilometre radius are taken with a much higher weight than the PGA values from remote stations. This functional form of the weight outperforms the standard inverse distance function without any buffer zone as it takes the PGA values from very close stations into account as very large but not infinite. We also check the robustness of the results by considering $\delta = 5$ or 10.[7] The computed $WPGA_c$ index represents a continuous treatment variable for DHS cluster c that we use in our empirical

[6] 34 stations which did not report PGAs are ignored in the analysis.
[7] The consideration the standard weighting function based on inverse distance between every station and every cluster gives very similar results. However, this approach underperforms our approach as the PGAs from very close stations are taken into account with infinite weights and this does not allow to exclude any measurement errors and to provide a smooth distribution of intensity shaking.

analysis.[8] As Figure 4 shows, the surveyed clusters have a similar distribution of shaking intensity in all waves.

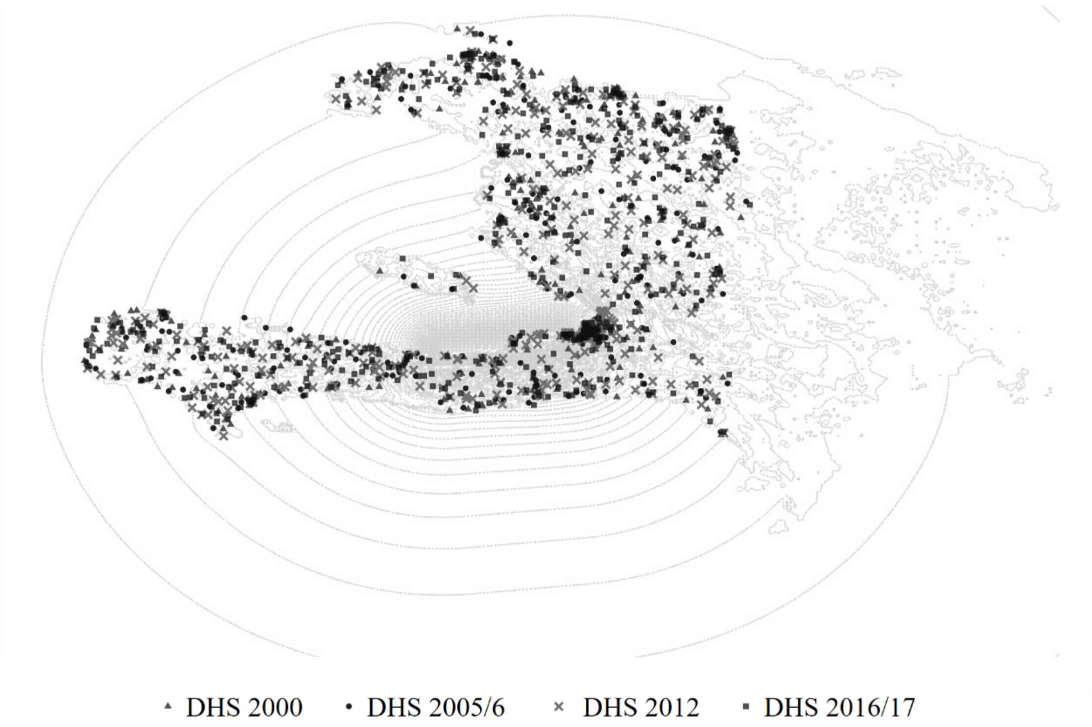

Figure 3. USGS ShakeMap Haiti together with DHS clusters

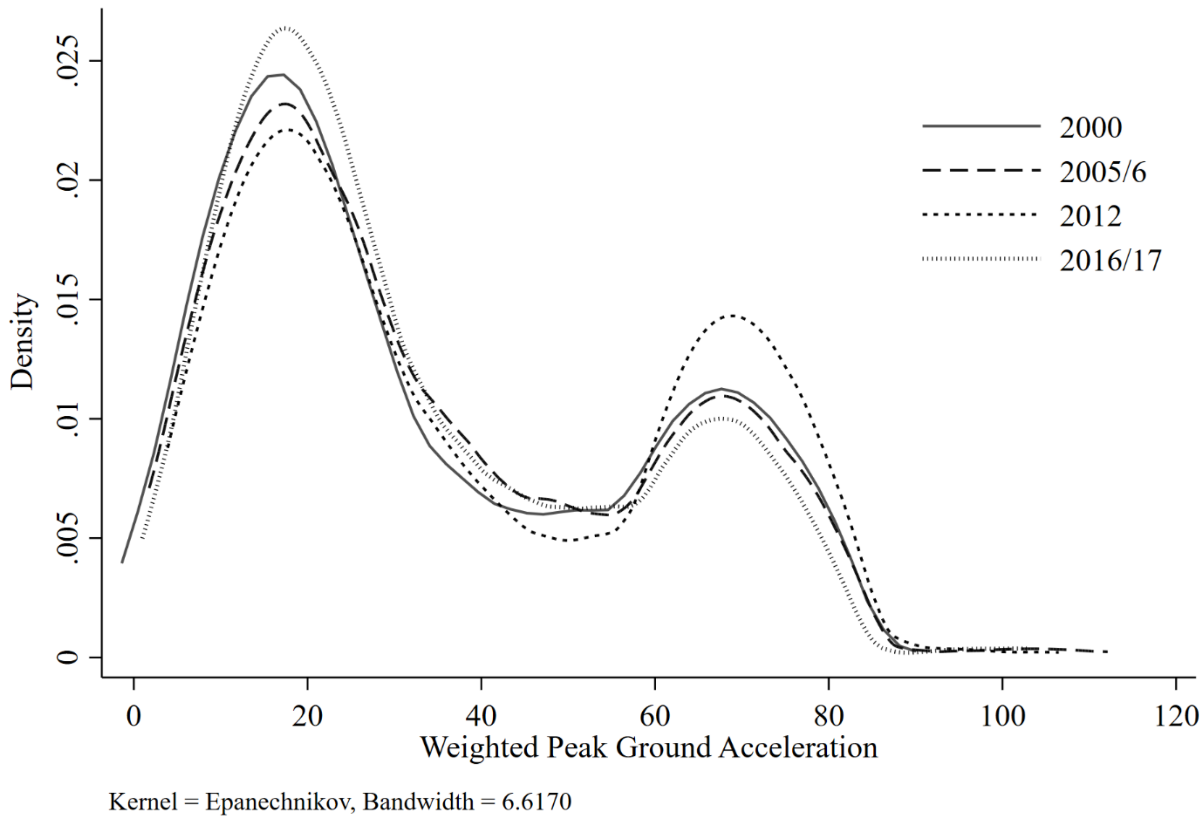

Figure 4. DHS clusters and shaking intensity by waves

[8] Figure A2 shows the distribution of the continuous WPGA index for all DHS clusters.

Second, we assign each DHS cluster a PGA value corresponding to a particular radius of perceived shaking intensity on the USGS ShakeMap (see Figure 3). Then, we create four treatment groups based on categories of the PGA values in Figure A1. We choose the following intervals based on the official PGA scale:

- <12%g – low treatment or no treatment
- [12%g, 20g%) – moderate treatment
- [20%g, 50g%) – strong treatment
- ≥50%g – severe treatment

For example, the severe treatment group comprises all DHS clusters that experienced PGA values greater than 50%g, i.e. they were exposed to severe, violent or extreme shaking per the Modified Mercalli Intensity Scale.

3.3 Aid Allocation

To account for disaster relief given to Haiti, we control for the two billion USD World Bank aid that was distributed after the earthquake in 2010. The map in Figure 5 shows that the World Bank's relief aid was targeted to areas with a higher concentration of crisis reports after the earthquake.

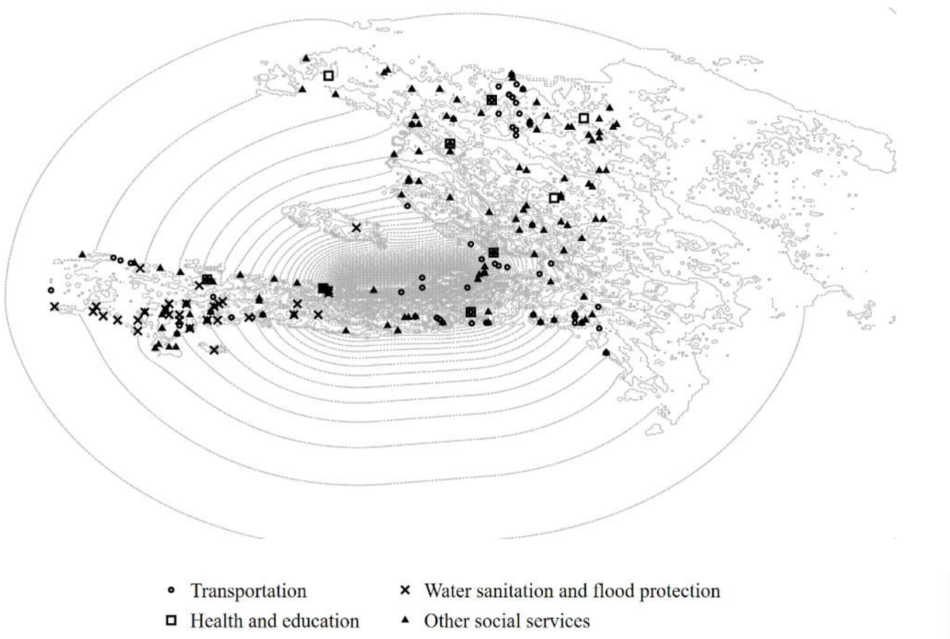

Figure 5. World Bank Aid Projects

To merge this information with the DHS data, we use the geo-localised data on aid projects established by the World Bank in 2011 (Strandow et al., 2011).[9] For Haiti, the data set covers 58 projects in 338 locations in sectors including agriculture, fishing and forestry; education, energy and mining; finance; health and other social services; industry and trade; information and communications; public administration, law and justice; transportation; water as well as sanitation and flood protection. The projects with highest budget were implemented in agriculture, water and transportation including infrastructure recovery. The emergency relief, as discussed above, was provided by NGOs and other international donors, while the World Bank focused on potentially long-term projects. Some of the World Bank projects had been already established before 2011 and post-disaster relief in this case implied a considerable increase of disbursements. We partially overcome a potential bias due to underreported aid by constructing a continuous weighted measure of aid similar to a continuous treatment variable of shaking intensity. We take all aid projects implemented in Haiti by the World Bank into account and build an aid index as follows:

$WAid_c = \frac{\sum_{\theta=1}^{\gimel} W_{c\theta} \cdot BUDGET_\theta}{\sum_{\theta=1}^{\gimel} W_{c\theta}}$, where $BUDGET_\theta$ is total budget committed for project θ,[10] and $W_{c\theta} = \frac{1}{(distance_{c\theta}+\delta)^2}$ is a weight based on a specific function defined by the distance between DHS cluster c and project θ with buffer zone δ. In the main specification, we assume that aid projects within a buffer zone of one kilometre are most important ($\delta = 1$). The value of buffer zones is chosen consistently with the continuous treatment measure and for robustness checks we also provide the results for $\delta = 5$ and $\delta = 10$.

4 Empirical Strategy

In order to capture the effects of the earthquake on children's nutrition and education, we use a Difference-in-Difference (DID) estimation approach. The repeated cross-sectional structure of the DHS data set in combination with the known geo-locations of the DHS clusters offers the opportunity to construct treatment and control groups. For every cluster in every survey wave 2000, 2005/6, 2012 and 2016/17, we compute and assign either a continuous weighted index or a discrete measure of shaking intensity. Hence, we use two alternative approaches to capture the local impact of the earthquake. In the main sample, we exclude children living in camps and then test further potential displacement patterns in the robustness checks section.

[9] For more information see https://www.aiddata.org/data/all-world-bank-ibrdida.

[10] In the main specifications, we use the World Bank aid data on commitments because the disbursements are only available for a much smaller number of projects. Nevertheless, for robustness checks we estimate the benchmark specification with the World Bank aid index computed based on the disbursement data.

Our identification strategy relies on the exogenous nature of the earthquake, and therefore, on exogenous degrees of ground shaking. The benchmark econometric model used to estimate the effects of the earthquake on children's nutrition and education in case of a continuous treatment is as follows:

$$Y_{ijcrt} = \alpha + \theta WPGA_{cr} + \rho(P_t \cdot WPGA_{cr}) + \gamma WAid_{crt}$$
$$+\lambda_r + \delta_t + X'_{ijcrt}\kappa + Z'_{ijcrt}\eta + H'_{jcrt}\mu + \varepsilon_{ijcrt}\ , \quad (1)$$

where Y_{ijcrt} denotes the outcome variable (nutritional status or education outcome) for child i in household j in cluster c in region r, in period t; $WPGA_{cr}$ is a continuous treatment variable that denotes a weighted PGA index based on a special weight function taking into account the inverse distance between DHS clusters and PGA stations. It is a cluster fixed effect that captures all effects that are specific to clusters that have experienced the same shaking intensity during the earthquake. We also include wave fixed effects δ_t to account for time trends. The third and fourth survey waves (2012 and 2016/17) are combined in a post-earthquake time dummy P_t. Pooling the information from two surveys allows to increase power. The parameter of interest ρ measures the impact of the 2010 earthquake on children's nutrition and schooling via the interaction between the time dummy, P_t, and the continuous treatment measure $WPGA_{cr}$. It reflects average effects over the six to seven years that followed the earthquake. The geo-locations of DHS clusters allow to compare the affected households in 2012 and 2016/17 with closely located households from 2000 and 2005/6. $WAid_{crt}$ is a weighted index of the World Bank aid for cluster c in region r and period t. It equals 0 in 2000 and 2005/6. Finally, this specification separates the impact of the earthquake from any region-specific effects in outcomes by including regional fixed effects λ_r.

All regressions include a series of additional controls. In particular, vector X_{ijcrt} captures children's characteristics, vector Z_{ijcrt} denotes parental traits, and vector H_{jcrt} controls for household characteristics. ε_{ijcrt} is an idiosyncratic shock term. In all estimations we account for the sample design features of our data set, and hence use the provided sample weights, primary sampling units and strata (the interaction of survey wave, region, and type of region). This allows us to compensate for stratum-level over-sampling and under-sampling, to adjust for non-response, and to produce robust standard errors clustered on the primary sampling unit. The weight adjustments can alter the estimated coefficients, while the cluster and strata adjustments only alter the standard errors.

We also consider the specifications, in which we interact aid with shaking intensity. In particular, we pursue two strategies. In the first one, we simply add an interaction term between aid and shaking intensity in equation (2). In the second one, we generate the weighted aid index for all clusters before and after the earthquake and interact aid flows with shaking intensity for all clusters. Both strategies produce negligible effects for such interaction terms, hence we do not include the interaction terms in the benchmark specification.

In the second strategy, we distinguish between different treatment groups based on shaking intensity radii provided by the ShakeMaps considering the earthquake depth and ground motion. In particular, we construct four treatment groups as described above: low, moderate, strong and severe shaking groups. Thus, the second empirical strategy is based on four treatment groups:

$$Y_{ijcrt} = \alpha + \sum_{k=1}^{3} \theta_k D_{kcr} + \sum_{k=1}^{3} \rho_k (P_t * D_{kcr}) + \gamma WAid_{crt} +$$

$$\lambda_r + \delta_t + X'_{ijcrt}\kappa + Z'_{ijcrt}\eta + H'_{jcrt}\mu + \varepsilon_{ijcrt} \ . \qquad (2)$$

The parameter of interest ρ_k measures the impact of the 2010 earthquake on children's nutrition and schooling via the interactions between the after-earthquake dummy P_t and treatment dummies D_{kcr}. As above, the treatment effect must be interpreted as an average effect over the entire post-earthquake observation window.

In equations (1) and (2), the household, parental and children's characteristics are different depending on which outcome we consider, nutrition status or educational level or attendance. The details on these control variables are presented in Tables S1.2 and S1.3. The main concerns regarding the validity of these strategies such as the potential existence of unobserved trends that may change differently in the treated and control groups are addressed in the robustness checks section.

5 Results

This section presents all benchmark results, first for nutrition, and second, for education outcomes. We also consider heterogeneous effects by gender and age cohort.

5.1 Children's Nutrition

Table 2 reports the effects of the earthquake on children's nutrition. We focus on six outcomes, including three z-scores and three dummies of malnutrition. Panel A summarizes the results for a continuous treatment using the weighted PGA index with a buffer zone of one kilometre ($\delta = 1$). Panel B summarizes the results for four treatment groups based on PGA radii extracted from the USGS ShakeMaps. The light shaking intensity group is the reference group. The odd columns present the specifications not controlling for the distributed World Bank aid and the even columns present the specifications including the World Bank aid index. All regressions include a full set of control variables, among which are socio-economic characteristics of children and their parents.

The results suggest that after the earthquake, children who experienced a one standard deviation (SD) higher shaking intensity have a HAZ score which is lower by 0.06 SDs (in col. 1: -0.0042*sd($WPGA$)/sd(HAZ)=-0,0042*21,25/1.45). The effect on the stunting dummy is comparable and shows an increase of 0.07 SDs. This corresponds to a deterioration of stunting of 3 percentage points which is equivalent to 12% of the stunting mean. After controlling for the World Bank aid, the negative impact of the earthquake on HAZ scores and stunting becomes even a bit larger (0.08 SDs or 14% of the mean), suggesting that aid – as expected – was allocated to those areas that were most severely affected.

These findings are confirmed by an analysis where we consider four treatment groups based on PGA values. The effects' sizes are very similar. More specifically, the fourth treatment group comprising areas with severe shaking intensity shows a 0.09 SD decrease in HAZ scores and a 0.08 SD increase in stunting. In other words, children living in areas struck with a PGA higher than 50g% suffer from a 33-percentage point decrease in HAZ scores that translates into a 10-percentage point increase in stunting in comparison to areas with a PGA lower than 12g% (light shaking).

Wasting has also been aggravated in struck areas after the earthquake, though the change in WHZ scores is not significant. A one SD increase in shaking intensity is associated with 0.04 SD increase or a 2.5 percentage point increase in wasting, which is equivalent to 20% of the wasting mean. In specifications with four treatment groups, the highly struck areas imply an almost 7 percentage point increase in wasting. In terms of SD, these effects are very comparable. The inclusion of World Bank aid as a control only slightly changes this effect. Underweight has not significantly increased after the disaster but WAZ scores decrease by 0.04 SD even after accounting for World Bank aid.

In both panels A and B, the World Bank aid effect is significant and has the expected sign: it increases the z-scores and decreases stunting, wasting and underweight by about 0.09 SD on average. However, the World Bank aid effect does not offset the negative impact of the earthquake on children's nutrition. The effects on stunting and wasting persist in affected areas even 6 years after the earthquake.

We also study the changes in indicators of *severe* stunting, wasting and underweight (< -3 SD). Controlling for World Bank aid, the effects on severe stunting and wasting are sizeable in heavily affected areas (see Table S2.1). These effects remain robust in both specifications with continuous and group treatments. A one SD increase in shaking intensity leads to a 0.08 SD increase in severe stunting and to a 0.04 SD increase in severe wasting, which corresponds to 26% and 18% of the corresponding means. In areas struck with a PGA higher than 50g%, severe stunting on average rises by 7.5 percentage points and severe wasting rises by 2 percentage points.

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Table 2. Effects of the Earthquake on Nutrition – Benchmark

	(1) HAZ	(2) HAZ	(3) Stunting	(4) Stunting	(5) WHZ	(6) WHZ	(7) Wasting	(8) Wasting	(9) WAZ	(10) WAZ	(11) Underweight	(12) Underweight
PANEL A												
Intensity*post	-0.0042***	-0.0051***	0.0014***	0.0017***	0.0004	-0.0004	0.0012***	0.0014***	-0.0023*	-0.0034***	0.0002	0.0003
	(0.0014)	(0.0014)	(0.0004)	(0.0004)	(0.0013)	(0.0013)	(0.0003)	(0.0003)	(0.0012)	(0.0013)	(0.0003)	(0.0003)
WB aid		0.0122**		-0.0038***		0.0109***		-0.0027***		0.0158***		-0.0018**
		(0.0050)		(0.0012)		(0.0040)		(0.0009)		(0.0040)		(0.0007)
Observations	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.1981	0.1988	0.1360	0.1368	0.0793	0.0802	0.0757	0.0764	0.1663	0.1680	0.0371	0.0376
Mean outcome	-1.1066	-1.1066	0.2537	0.2537	-0.1057	-0.1057	0.1297	0.1297	-0.7067	-0.7067	0.0566	0.0566
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
PANEL B												
Moderate*post	-0.0778	-0.0676	-0.0036	-0.0065	0.1250	0.1357	-0.0384	-0.0407	0.0419	0.0561	-0.0368*	-0.0384**
	(0.1069)	(0.1080)	(0.0308)	(0.0308)	(0.0942)	(0.0931)	(0.0262)	(0.0260)	(0.0862)	(0.0860)	(0.0192)	(0.0192)
Strong*post	-0.1074	-0.1179	0.0109	0.0139	-0.0126	-0.0236	0.0238	0.0261	-0.0707	-0.0853	0.0071	0.0086
	(0.0789)	(0.0794)	(0.0234)	(0.0237)	(0.0751)	(0.0746)	(0.0206)	(0.0206)	(0.0681)	(0.0681)	(0.0164)	(0.0163)
Severe*post	-0.3338***	-0.3732***	0.0902***	0.1015***	0.0560	0.0148	0.0652***	0.0741***	-0.1594**	-0.2140***	0.0030	0.0088
	(0.0855)	(0.0855)	(0.0251)	(0.0255)	(0.0814)	(0.0807)	(0.0211)	(0.0211)	(0.0803)	(0.0802)	(0.0167)	(0.0166)
WB aid		0.0116**		-0.0033***		0.0121***		-0.0026***		0.0161***		-0.0017**
		(0.0049)		(0.0012)		(0.0041)		(0.0009)		(0.0040)		(0.0008)
Observations	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.1991	0.1998	0.1363	0.1369	0.0795	0.0806	0.0766	0.0773	0.1667	0.1686	0.0377	0.0383
Mean outcome	-1.1066	-1.1066	0.2537	0.2537	-0.1057	-0.1057	0.1297	0.1297	-0.7067	-0.7067	0.0566	0.0566
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: Panel A shows the results of continuous treatment specifications with buffer zone $\delta = 1$ km. Panel B shows the results of specifications with four intensity groups. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms between shaking intensity and the after-earthquake dummy are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

We also study the heterogeneity of these effects by gender, age cohort, in utero status, and trimester of gestation. The analysis for gender does not show any statistically significant difference between boys and girls for any of the six nutritional outcomes. In terms of age cohort, some of the indicators we consider suggest that one-year old children at the time of the earthquake were more severely hit by the earthquake than older children. Finally, our results do not confirm that children who were in utero in highly affected areas at the time of the earthquake subsequently suffered more from malnutrition than the already born children. See Appendix B1 for further details

5.2 Education

Table 3 shows the impact of the earthquake on educational outcomes. We focus on current school attendance and years in school. Panels A and B show the results for continuous and group treatments, respectively. We also present all results with and without World Bank aid, but always include a full set of control variables as well as region and wave fixed effects. The results are robust among all educational outcomes illustrating the decrease of both school enrolment and school attendance.

Table 3. Effects of the Earthquake on Education – Benchmark

	(1) Primary	(2) Primary	(3) Secondary	(4) Secondary	(5) Years	(6) Years	(7) Attendance	(8) Attendance
PANEL A								
Intensity*post	-0.0025***	-0.0028***	-0.0008*	-0.0010**	-0.0034**	-0.0039**	-0.0016***	-0.0018***
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0016)	(0.0016)	(0.0002)	(0.0002)
WB aid		0.0039***		0.0039*		0.0080		0.0027***
		(0.0010)		(0.0023)		(0.0056)		(0.0006)
Observations	47,673	47,673	19,225	19,225	66,898	66,898	66,898	66,898
R-squared	0.1493	0.1500	0.2585	0.2592	0.6036	0.6037	0.1395	0.1401
Mean outcome	0.6814	0.6814	0.4067	0.4067	2.7483	2.7483	0.8283	0.8283
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Age	6-14	6-14	15-18	15-18	6-18	6-18	6-18	6-18
PANEL B								
Moderate*post	0.0404	0.0412	0.0150	0.0182	0.2566**	0.2597**	0.0530*	0.0538*
	(0.0330)	(0.0330)	(0.0380)	(0.0378)	(0.1199)	(0.1195)	(0.0292)	(0.0293)
Strong*post	-0.0097	-0.0150	0.0188	0.0127	0.0740	0.0606	-0.0033	-0.0066
	(0.0199)	(0.0200)	(0.0249)	(0.0250)	(0.0785)	(0.0788)	(0.0176)	(0.0176)
Severe*post	-0.1526***	-0.1616***	-0.0496*	-0.0577**	-0.1537	-0.1747*	-0.0947***	-0.0999***
	(0.0195)	(0.0195)	(0.0288)	(0.0287)	(0.1016)	(0.1037)	(0.0157)	(0.0157)
WB aid		0.0031***		0.0038*		0.0079		0.0020***
		(0.0009)		(0.0022)		(0.0052)		(0.0006)
Observations	47,673	47,673	19,225	19,225	66,898	66,898	66,898	66,898
R-squared	0.1507	0.1512	0.2593	0.2600	0.6039	0.6040	0.1405	0.1408
Mean outcome	0.6814	0.6814	0.4067	0.4067	2.7483	2.7483	0.8283	0.8283
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Age	6-14	6-14	15-18	15-18	6-18	6-18	6-18	6-18

Notes: Panel A shows the results of continuous treatment specifications with buffer zone $\delta = 1$ km. Panel B shows the results of four intensity groups specifications. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms between shaking intensity and the after-earthquake dummy are reported.

Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Panel A of Table 3 suggests that a one SD increase in shaking intensity decreases primary school enrolment by almost 0.12 SD (-0.0025*21.25/0.44) or 5 percentage points which corresponds to 8% of the mean. Secondary school enrolment is much less affected and decreases by only 0.04 SD, which translates into a change equal to 4.5% of the mean. When looking at the non-parametric treatment groups (Panel B), the effects for primary and secondary school enrolment come to a 15-percentage point decrease and a 5-percentage point decrease, respectively, for the most severely struck areas in comparison to areas with light shaking. Controlling for World Bank aid makes the effects larger by only 0.01 SD. The years of education decrease by only 0.03 SD in areas with a one SD higher shaking intensity. The negative effect on school attendance is much higher and comes to 0.09 SD for an increase in shaking intensity by one SD. This translates into a decrease in current attendance equivalent to 4% of the mean.

The effect associated with World Bank aid is positive, sizeable and significant in all regressions. The estimated effects suggest that World Bank aid increased primary and secondary school enrolment by 0.08 SD and school attendance by 0.07 SD. These improvements correspond to changes equal to 6% and 10% of the corresponding means for school enrolment and equal to 3% of the mean for school attendance. These effects might be explained by the investments in school infrastructure and transport recovery in the aftermath of the earthquake. Despite the fact that aid mitigates the negative effects of the earthquake on school outcomes, it does not fully overcome them. Accounting for WB aid increases the effects associated with shaking intensity. The resulting effect sizes correspond to 9%, 6% and 5% of the corresponding means, respectively.

Panel B shows comparable effects for the specification with four treatment groups. In the most struck areas, all four educational outcomes decreased after the earthquake. Controlling for World Bank aid, primary school enrolment and secondary school enrolment are lower by 16 percentage points and 6 percentage points respectively, in severely affected areas with a PGA above 50g% (group 4) compared to areas with a PGA below 12g%. Interestingly, years of education and attendance increased for the moderately affected areas (group 2 comprises areas with PGA between 12g% and 20g%). We do not have any well-founded explanation for these effects, but they might be due to very effective reconstruction efforts and humanitarian assistance, which is not captured by World Bank aid. The improvements in education for group 2 come up to 26 percentage points in years of education and 5 percentage points in attendance.

We also explored the heterogeneity of the education effects by gender, birth time and education cohort. We find that the negative effects of the earthquake on secondary school enrolment and years of education are not significantly different for boys and girls. However, gender matters in differentiating the impact of the earthquake on primary school enrolment and attendance. Further, our findings show that being in utero during the earthquake only affects total years of education but no other educational outcome. Finally, the results by education cohort suggest that in severely struck areas more than in less affected areas children tried to catch up with education levels that correspond to their age. See Appendix B2 for further details.

Next, we explore whether the lower enrolment and attendance rates described before might be the consequence of increased child labour. We distinguish between child labour outside the household (paid and non-paid), child labour for a family member, and child housework. Table S2.2 shows that the earthquake had a positive and significant impact on the probability that children between 6- and 18-years old worked either outside their household for pay, or unpaid for a family member. A one SD increase in shaking intensity leads to a 0.08 SD increase in paid work outside their household. This is a sizeable effect which is equivalent to 55% of the corresponding mean. In contrast, hours spent on work outside the household did not significantly increase in the affected areas after the earthquake. We also find that the effect of the earthquake on non-paid work outside the household is negative and insignificant. A one SD increase in shaking intensity causes a 0.07 SD increase in child work for a family member which is equal to 13% of the respective mean. In terms of hours, a one SD increase in shaking intensity leads to a 33-percentage point increase in hours of child work for the family. This is equivalent to 22% of the mean and corresponds to an increase of child work for a family member by about 20 minutes per week.

Our second specification using four treatment groups leads to very similar results. Panel B of Table S2.2 confirms the increase in paid child labour outside the household and in work for a family member in highly struck areas. Paid child labour outside the household increases by only 3 percentage points in areas with a PGA higher than 50g% in comparison with areas with only light shaking intensity. Child labour for a family member in these areas increases by 5 percentage points. This might be explained by a higher involvement of children in the recovery and reconstruction of their family's houses. Increased child work is also confirmed when looking at hours spent by a child on work for a family member. This increase in severely struck areas in comparison to lightly struck areas corresponds to 68 percentage points or to about 40 minutes per week. The increased child labour, especially work for a family member and paid work outside the household, might explain the decrease in school enrolment and attendance in highly affected areas after the earthquake.

6 Robustness Checks

To further check the robustness of our results we test whether these hold for alternative specifications of the weight functions. In our benchmark results we construct ground shaking intensity and aid allocation using weighted indices based on a buffer zone $\delta = 1$ implying that all data within 1 kilometre is of higher importance. Alternative buffer zones $\delta = 5$ and $\delta = 10$ do not change the main results (see Tables S4.1 and S4.2). We also perform placebo tests for both nutritional and educational outcomes where we restrict the sample to only the years 2000 and 2005, hypothetically assuming that the earthquake had already happened in the year 2004. Our results remain consistent for both nutritional (Table S4.3) and educational outcomes (Table S4.4), for both we do not find any significant effects. A second placebo test for education using a sample of people older than 35 in the year of earthquake also confirms the robustness of our findings (Table S4.5).

One potential threat to identification is selective migration across clusters and regions. To address this, we re-estimate our benchmark regressions with a sample of children who were living in the same house after the earthquake. However, these results are produced only for the first three DHS waves as the question about living in the same house is not available in the last wave (2016/17). Tables S4.6 and S4.7 show that our results do not change if we re-estimate our regressions with this sub-sample. Next, we re-estimate our benchmark specifications now capturing displacement patterns and internal migration using data on all post-earthquake camps in Haiti from the Displacement Tracking Matrix (DTM) provided by the International Organization for Migration (IOM). Tables S4.8 and S4.9 report the results that consider the location and the capacity of the camps, assuming that this could be a potentially omitted variable that is correlated with both the intensity of the earthquake and the outcomes of interest. According to the OCHA (2021), the bulk of humanitarian aid was allocated through the camps, so negative effects of the earthquake could have been attenuated by more intensive assistance in these areas. However, the coefficient associated with the interaction between earthquake intensity and post-earthquake dummy does not change in most cases or if it changes, decreases only slightly. Hence, accounting for migration to the camps does not significantly change the results.

Another potential threat to identification is infant mortality caused by the earthquake. If the most severely affected children died our results would constitute lower bounds of the true effects. In Table S4.10, we show that highly struck areas are characterised by higher infant mortality following the earthquake. We use these results to predict child mortality associated with the earthquake and then re-estimate the benchmark nutrition models using mortality weights. The results in Table S4.11 confirm our main findings, and show that if anything, infant mortality leads us to slightly underestimate the true effects.

Next, we test the robustness of our findings to alternative measures of exposure. We explore how actual earthquake damages relate to children's nutrition and education using data on the destruction of infrastructure and on human casualties from the United Nations Disaster Information Management System (DesInventar). We consider measures of damage such as death toll, number of victims, houses destroyed and houses affected at the district level. Following the procedure in the previous sub-sections, we calculate the weighted index of damages for each DHS cluster based on the information on the distance between clusters' and districts' centroids. However, damages are potentially endogenous to earthquake exposure because they are correlated with unobserved determinants of children's nutrition and education, for example through the quality of the infrastructure and people's residences or household preferences. Therefore, we apply an instrumental variable approach, in which we instrument observed damage with ground shaking intensity based on the PGA measure. All types of damage are highly correlated with shaking intensity. The F-test from the first stage is higher than 700, see Tables S4.13 and S4.14 in the Online Appendix. The exclusion restriction requires that the earthquake affects children's nutrition and education exclusively through the damages reported in DesInventar. However, psychological shocks that come with an earthquake may also have a direct influence on children's nutrition and education. In this case, the exclusions restriction would not hold. As such, we prefer to use the main Difference-in-Difference specification as the benchmark and consider this instrumental variable approach - although previously applied in the literature (see, e.g., Kirchberger, 2019) - as a robustness check.

Appendix Tables C1 and C2 summarize the instrumented second stage results for children's nutrition and education, respectively. The results confirm that the earthquake causes stunting and wasting as well as a lower WAZ score. The estimated coefficients are now much larger. A one SD increase in the log of deaths, which corresponds to about 54 deaths, leads to a 0.2 SD increase in stunting and wasting. Likewise, a one SD increase in the log of homes destroyed, which corresponds to about 7 houses destroyed, causes a 0.1 SD increase in both stunting and wasting. The effects on education also become significantly larger in areas with more reported deaths and destruction. About 54 deaths (one SD) lead to a 0.3 SD decrease in primary school enrolment and a 0.1 SD decrease in secondary school enrolment. These changes correspond to 20% and 12% of the enrolment means, respectively. The same effects are caused by a 2 SD increase in homes destroyed that corresponds to about 14 homes destroyed. The decrease in attendance is equal to 0.24 SD as a result of the earthquake damages of 54 deaths or 14 homes destroyed. See Appendix C for more details on all robustness checks described above.

Finally, we conduct multiple hypothesis testing using Bonferroni-adjusted *p*-values. The results are reported in Tables S4.15 and S4.16. While previous estimates that were marginally significant (10% level) have lost statistical significance in some instances, our main conclusions remain.

7 Conclusion

Using data from four waves of the Haiti Demographic Health Survey (DHS) and shaking intensity measures from the United States Geological Survey (USGS), this study analyses the effects of the second deadliest recorded earthquake in history, which occurred in Haiti on January 12th, 2010 on children's nutrition and educational outcomes. We assess the mid-term consequences on two important indicators of children's human capital to get a better understanding of the earthquake's impact on the population.

This study provides strong evidence that children living in households heavily affected by the earthquake, experienced severe malnutrition and showed lower school enrolment and attendance compared to children from less or unaffected areas. These effects persist even after controlling for individual, household, and regional characteristics. We also show that the effects were mitigated by World Bank aid, but this was not enough to undo the adverse effects on health and education. In particular, we find higher probabilities of moderate and severe stunting as well as moderate wasting. We also find strong and robust evidence of lower primary and secondary school enrolment, of an overall reduction in number of years spent in the education system and lower school attendance. These results are also robust to the inclusion of internal migration, selective mortality and to alternative measures of exposure to the earthquake.

While the earthquake's impact was sizeable for both girls and boys, we do not find any evidence for substantial gender differences in the nutritional status. However, boys were significantly more discouraged from school enrolment than girls. We also show that younger children in heavily affected areas suffered more than older children and we find interesting patterns with respect to child labour. Paid child work outside the home and child work for the family increased for children living in highly affected areas. This may also, at least partly, explain the deteriorated educational outcomes in highly affected areas. Higher attendance and fewer years of education of students at older ages suggest that children seem to have postponed their education to later ages.

Interestingly, we find slightly positive changes in the years of education and school attendance in moderately affected areas. Our results suggest that this might be due to the impact of massive humanitarian aid allocated to these areas. Indeed, the findings of this study and those of the studies by Herrera et al., (2014), Novella and Zanuso (2018) and Saint-Macary and Zanuso (2016) all show the importance of the presence of international donors and other government institutions as well as targeted nutritional and educational interventions in the aftermath of a natural disaster.

Yet, our study suggests that overall the effects on human capital accumulation are enormous, the longer-term costs of the implied loss in human capital may have tremendous private and social costs, maybe much higher than the immediate loss implied by the destruction of physical capital and infrastructure.

Future research could try to uncover the ways in which children from affected households could recover from such shocks and to shed light on the potential mechanisms behind such a recovery. Numerous studies (Martorell et al., 1994; Prentice et al., 2013; Crookston et al., 2010) show that catch-up growth can be triggered by interventions outside the 9 to 24-month period of a child's life, and that adolescence is an additional window during which nutritional interventions and reliable food consumption patterns might still yield effects. The children studied in this paper are soon to reach their adolescence, and in their case, it might not be too late to revert the negative effects of the earthquake on children's human capital.

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Appendix A. Maps and graphs

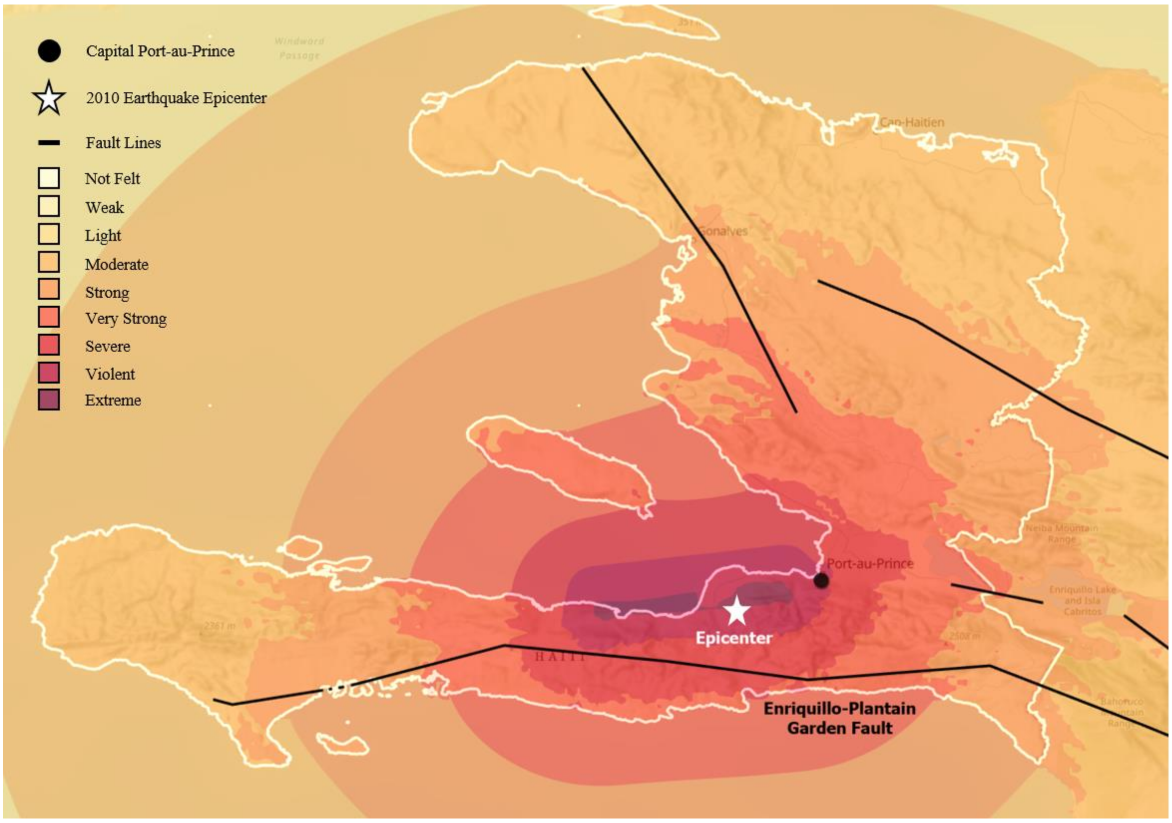


Figure A1. USGS ShakeMap of the 2010 Haiti Earthquake

Source: U.S. Geological Survey, Department of the Interior/USGS.

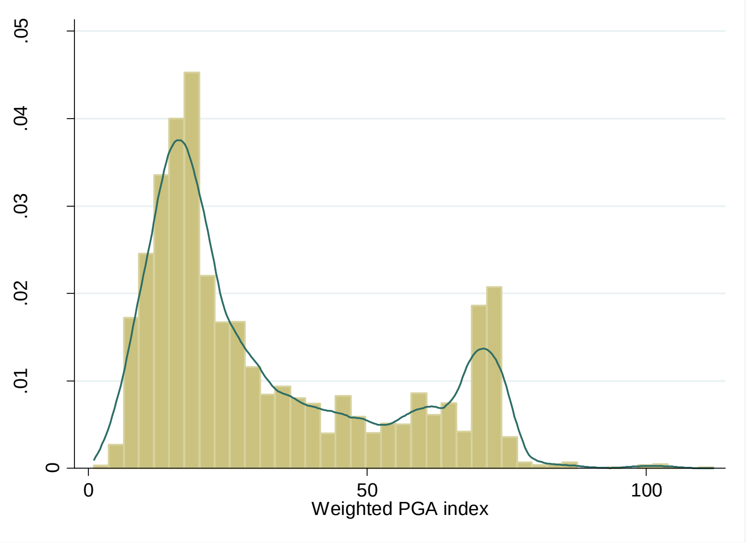
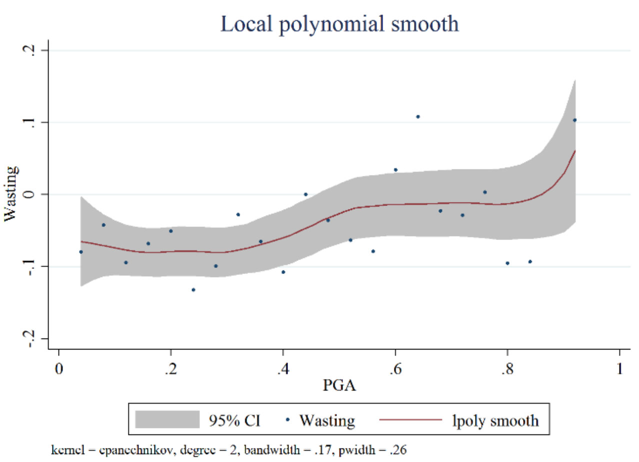


Figure A2. The Weighted PGA index distribution, $\delta = 1$.



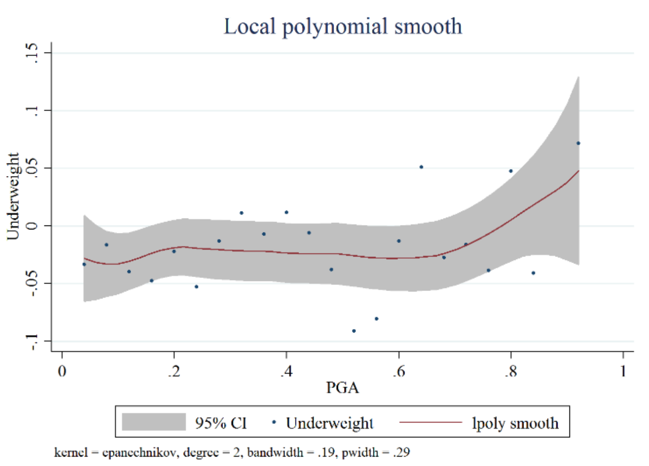
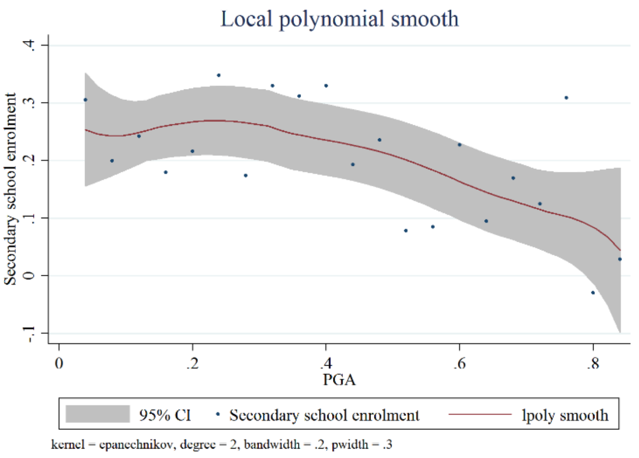
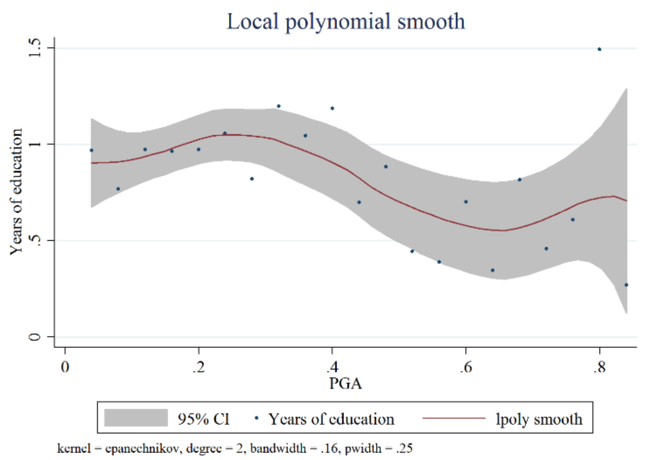


Figure A3. Difference in wasting (left) and underweight (right) between the before- and after-earthquake periods by shaking intensity





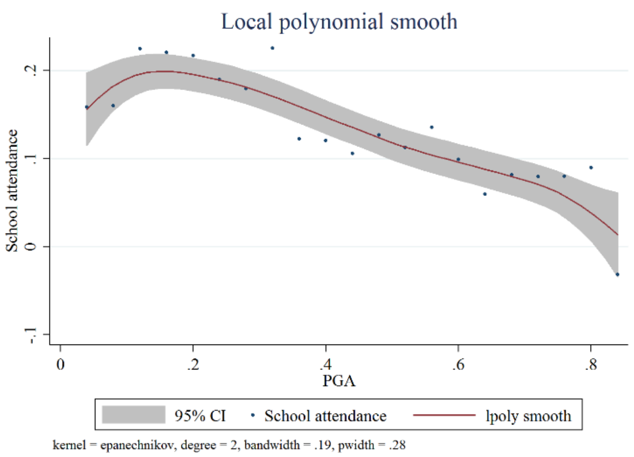


Figure A4. Difference in secondary school enrolment (top left), years of education (top right), and school attendance (bottom left) between the before- and after-earthquake periods by shaking intensity

Appendix B. Effect Heterogeneity

B1. Heterogeneous Effects in Children's Nutrition

In this section, we discuss the heterogeneity of the earthquake's effects on children's nutrition with respect to gender, age cohort and birth time. All specifications include a full set of control variables, time dummies, the interaction of the post-earthquake dummy and shaking intensity and the WB aid distributed to affected areas. Figures B1-B2 summarise these heterogenous effects on children's nutrition.[11]

After accounting for a gender dummy, as in the benchmark results, the interaction between the post-earthquake dummy and shaking intensity is statistically significant for HAZ scores, WAZ scores, stunting and wasting showing the persistence of children's malnutrition after the earthquake. The inclusion of World Bank aid is also significant and the results show that it helped to attenuate the detrimental effects of the earthquake, although not completely. However, the triple difference analysis for gender does not show any statistically significant difference between boys and girls for any of the six nutritional outcomes.

With regard to age cohorts, we study five different cohorts based on children's age measured in years. [12] One-year old children constitute the reference group (cohort 1). The main effects, irrespective of cohorts, remain unchanged. In addition, it becomes evident that older children of cohort 3 (25-36 months old at the time of the survey) and cohort 4 (37-48 months old at the time of the survey) demonstrate a faster recovery in their nutritional status measured by WHZ and WAZ scores than younger children of cohort 1 (0-12 months old at the time of the survey). A one SD increase in shaking intensity is, on average, associated with a 0.08 SD better WHZ score and a 0.07 SD better WAZ score for cohorts 3 and 4 in comparison to cohort 1. Underweight is also significantly lower for 4-year-old children and for one-year old children. Interestingly, there are no significant differences in stunting and wasting among various cohorts of children before and after the earthquake. Hence, only some of the indicators we consider suggest that children of cohort 1 are more vulnerable to natural disasters than older children.

Next, we test whether children who were in utero in January 2010 experienced subsequently more health problems because of their mother's food deficits during their pregnancy. For this purpose, we code a dummy that shows whether a child was in utero in the year of the earthquake. We thus drop children

[11] The coefficient plots are based on the regression results presented in the Tables S3.1 – S3.3. The results from the heterogeneity analysis in case of four treatment groups are available upon request.
[12] Cohort 1 was born in the years 1999, 2000, 2004, 2005, 2006, 2011, 2012, 2016 and 2017 and was under 0-12 months at the time of the survey. Cohort 2 was born in the years 1998, 1999, 2003, 2004, 2005, 2010, 2011, 2014, 2015, 2016 and was 13-24 months old at the time of the survey. Cohort 3 was born in the years 1997, 1998, 2002, 2003, 2004, 2009, 2010, 2014 and was 25-36 months old at the time of the survey. Cohort 4 was born in the years 1996, 1997, 2001, 2002, 2003, 2008, 2009, 2013 and was 37-48 months old at the time of the survey. Cohort 5 was born in the years 1995, 1996, 2001, 2007, 2008, 2012 and was 49-60 months old at the time of the survey.

from the DHS 2016/17 survey as they are too old to have been in utero in January 2010 and compare only children from the DHS 2000, 2005/6 and 2012 surveys. As shown in Figures B1 and B2, children who have been in utero and exposed to a higher shaking intensity have, in contrast to our expectations, a higher WHZ score than children who have not been in utero. However, the difference in wasting or stunting is not statistically significant. Interestingly, these children also demonstrate a slight improvement in the likelihood of being underweight. These findings might be explained by massive food distributions in highly struck areas after the earthquake. Looking at the results by trimesters, we find that these improvements are driven by women who, at the time of the earthquake, were in the first trimester of their pregnancy (see the results in Table S3.4). Pregnant women might have benefitted more from food distributions than other sections of the population. And probably the returns from additional food are the highest for women who are in the first trimester of their pregnancy. Generally, our results do not confirm that children who were in utero in highly affected areas at the time of the earthquake suffer more from malnutrition than the already born children.

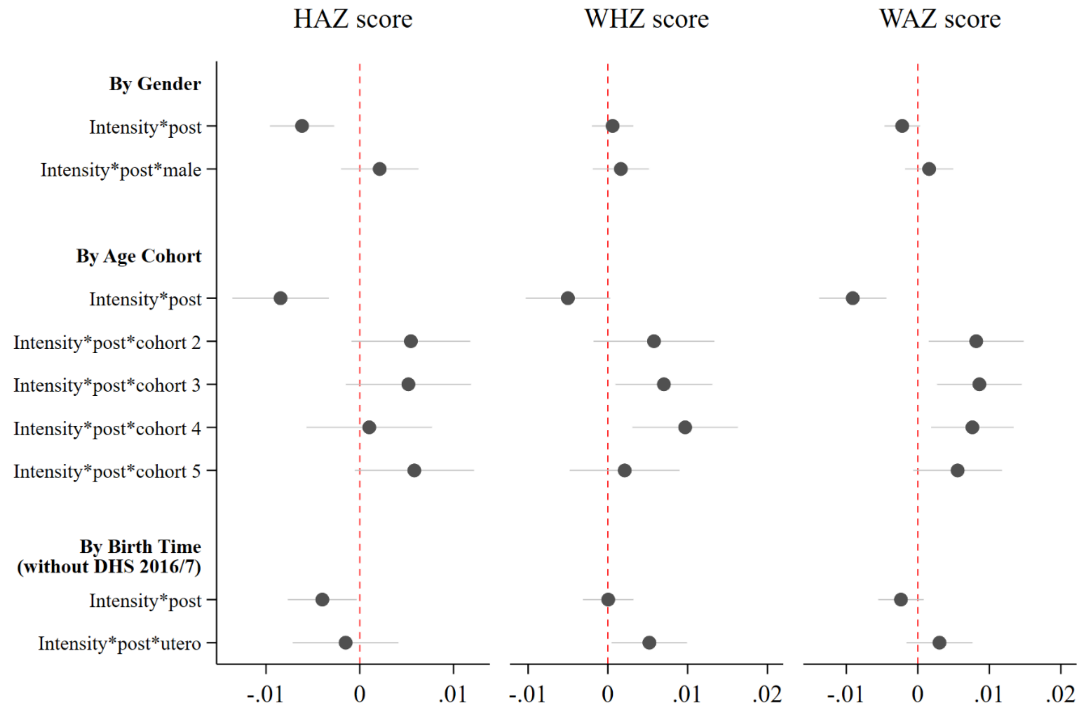


Figure B1. Effects of the Earthquake on Nutrition (z-scores) by Gender, Age Cohort and Birth Time

Notes: This figure visualizes the results of the regressions presented in Tables S3.1-S3.3. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables including the WB aid index. The regressions by age cohort use cohort 1 as the reference level. Cohort 1 was under 0-12 months at the time of the survey. Cohort 2 was 13-24 months old at the time of the survey. Cohort 3 was 25-36 months old at the time of the survey. Cohort 4 was 37-48 months old at the time of the survey. Cohort 5 was 49-60 months old at the time of the survey.

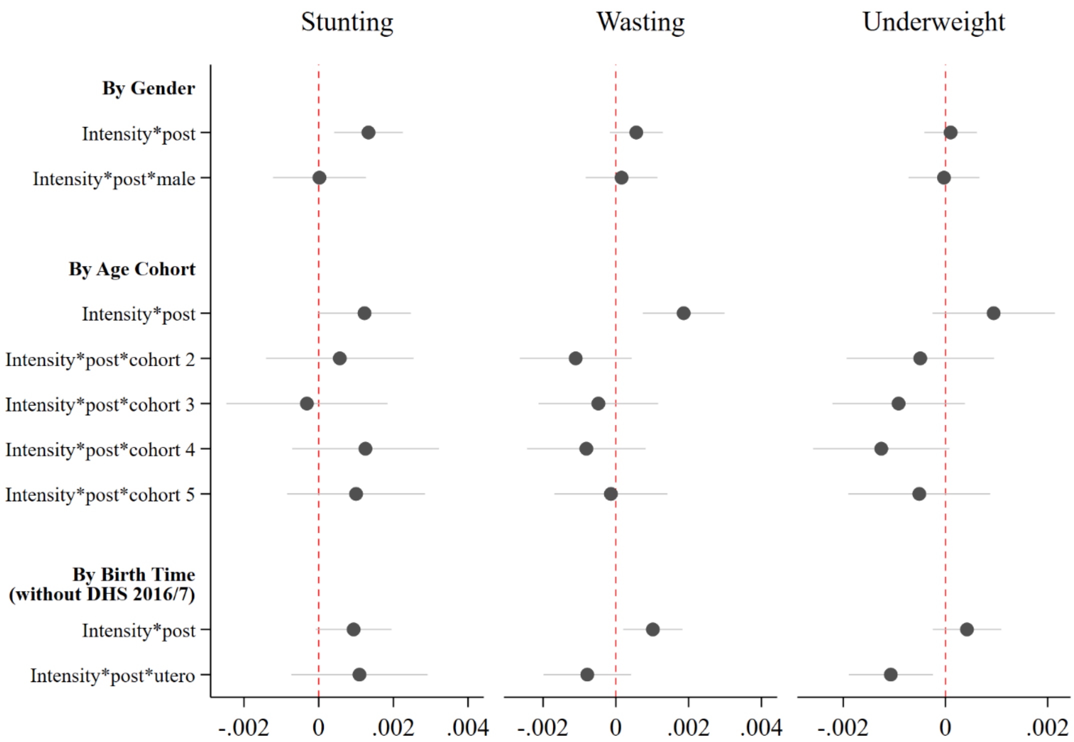


Figure B2. Effects of the Earthquake on Nutrition (Dummies) by Gender, Age Cohort and Birth Time

Notes: This figure visualizes the results of the regressions presented in Table S3.1-S3.3. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables including the WB aid index. The regressions by age cohort use cohort 1 as the reference level. Cohort 1 was under 0-12 months at the time of the survey. Cohort 2 was 13-24 months old at the time of the survey. Cohort 3 was 25-36 months old at the time of the survey. Cohort 4 was 37-48 months old at the time of the survey. Cohort 5 was 49-60 months old at the time of the survey.

B2. Heterogeneous Effects in Education

Figure B3 provides additional insights into how the impact of the earthquake differs with regard to gender and birth cohort.[13] The negative effects of the earthquake on secondary school enrolment and years of education are not significantly different for boys and girls. However, gender matters in differentiating the impact of the earthquake on primary school enrolment and attendance. A one SD increase in shaking intensity decreases both primary school enrolment and current attendance for boys by 0.025 SD or 1 percentage point more than for girls. These effects are not large in magnitude but statistically significant. Boys are more discouraged from attending school after the earthquake and from enrolling into primary school, although there is no change in secondary school enrolment or in years of education. This might be explained by a higher probability that families use their labour for reconstruction, i.e. recovering house ruins and repairs at home. We test this hypothesis in the next subsection when we focus on child labour.

We also explore the impact of the earthquake on children's education by birth cohort and also for those in-utero when the earthquake occurred. For example, it has been shown that children who were in utero

[13] The coefficient plots are based on the regression results presented in Tables S3.5-S3.6. The heterogeneity of the results in case of four treatment groups is available upon request.

during Ramadan have worse school performance than children who were not (Almond et al., 2015). However, as shown in Figure B3, primary school enrolment and attendance do not differ significantly for affected children who were in utero compared to affected children not in utero at the moment of the earthquake. Only years of education decrease significantly for such children. This effect might be explained by the fact that many children only started attending first grade at the age of 6 years in 2016/17, so for the majority of that group of children, years of education are equal to 0.[14] Hence, we do not find any robust evidence that children exposed to the shock while in utero suffered more in terms of their education.

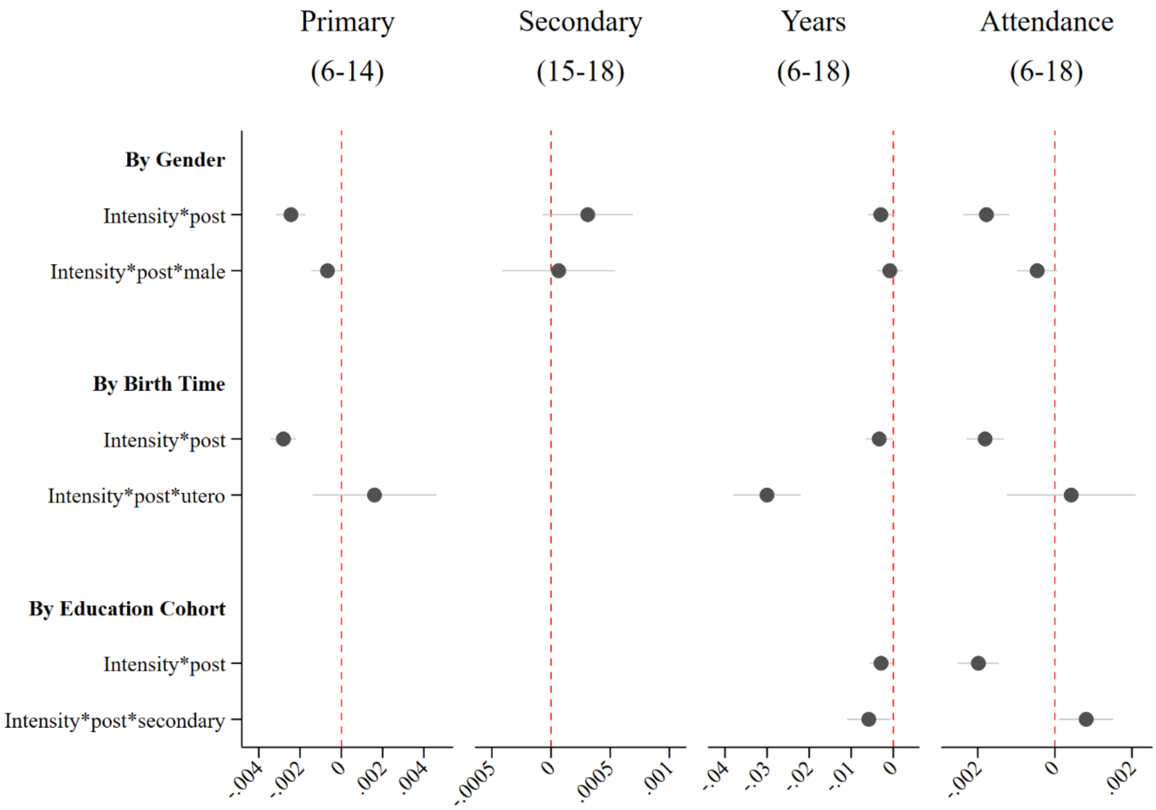


Figure B3. Effects of the Earthquake on Education by Gender, Birth Time, and Education Cohort

Notes: This figure visualizes the results of the regressions presented in Tables S3.5-S3.6. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables including the WB aid index. The heterogeneity by birth time reduces our sample as we focus on children who were in utero at the moment of the earthquake and thus secondary school enrolment is omitted. In the heterogeneity by education cohort, only school years and attendance are considered as only in these cases the sample comprises children of both age categories.

Next, we compare children of different cohorts, in particular, children aged 6 to 14 and 15 to 18. Only school years and attendance are considered in this heterogeneity check as the sample comprises children of both age categories. Interestingly, in highly struck areas, attendance in secondary school is higher than in primary school by 0.03 SD which corresponds to an increase equivalent to 9% of the attendance mean. However, the overall number of years of schooling drops by 0.03 SD in secondary school

[14] We do not consider secondary school enrolment as there are no children who were simultaneously in utero in January 2010 and turned 15 years old in later waves.

implying that more children dropped out in primary school and/or postponed their education. Hence, the two effects together may suggest that in severely struck areas more children tried to catch up with education levels that correspond to their age.

Appendix C. Robustness Checks

C.1. Alternative Specifications and Placebo Tests

First, we vary the specifications with regard to ground shaking intensity and aid allocation calculations. Our benchmark results are based on the buffer zone $\delta = 1$ i.e. all data within 1 kilometre has higher weights. Now, we consider alternative weight functions with buffer zones $\delta = 5$ and $\delta = 10$. These modifications do not change the main results, although the effect sizes become smaller because of the smoother distributions of the weighted indices. Tables S4.1 and S4.2 report these results for nutritional and educational outcomes, respectively.

In our placebo tests, we restrict our sample to the years 2000 and 2005, and assign 2004 as a 'fake' earthquake year, i.e. just before the second DHS wave was conducted. Table S4.3 shows that as expected, there is no significant change in HAZ scores or in stunting with this artificial treatment. WHZ and WAZ scores even show a slight increase, i.e. wasting and underweight declined in areas that later experienced a higher shaking intensity. These effects further support our main findings. The placebo test for educational outcomes is presented in Table S4.4. It shows that there are no changes in education, except for primary school enrolment, but this effect is much smaller than what we find for the period after the earthquake. Hence, this test also supports our main findings for education.

In the next test, we consider people older than 35 in the year of earthquake. At the time of the first DHS wave, they would have already finished school since that is when they turned 25 years old. For this reason, we do not expect any significant effects on education as all people considered have already finished their education by the time of the earthquake. Table S4.5 confirms our intuition except for secondary school attainment but the coefficient implies a decrease by 0.02 SD in highly struck areas after the earthquake. Although this effect is statistically significant, economically it is very small.

C.2. Displacement

Based on tracking data provided by the International Organization for Migration (IOM) and survey data reported in Herrera et al. (2014), Novella and Zanuso (2018) and Saint-Macary and Zanuso (2016), we know that most Haitians were residing in their original place of residence in 2011-2012. Yet, in order to address any potential concern regarding selective migration across clusters and regions we perform two additional checks. First, we re-estimate our main models and keep only children that after the earthquake remained in the same house as before the earthquake. Tables S4.6 and S4.7 show that our results are robust using this sub-sample.

Second, we measure potential displacement patterns through information on camp locations and their shelter capacity in 2010. We extract data on geographical coordinates and registered residents of all camps in Haiti for the period from September to December 2010.[15] We re-estimate our benchmark specifications, but include the weighted indices of camp locations to capture displacement patterns and internal migration. The weights are defined as $WCamp_c = \frac{\sum_{\theta=1}^{} W_{c\theta} \cdot POPULATION_\theta}{\sum_{\theta=1}^{} W_{c\theta}}$, where $POPULATION_\theta$ is the number of people living in camp θ in the time after the earthquake until the end of 2010, and $W_{c\theta} = \frac{1}{(distance_{c\theta}+\delta)^2}$ is a weight based on a specific function defined by the distance between DHS cluster c and camp θ with buffer zone δ. In the main specification, a buffer zone is 1 kilometre.

Tables S4.8 and S4.9 report the results that take into account the location and the capacity of the camps assuming that their omission could lead to a bias. The coefficients associated with the weighted index of camps are negative which suggest that indeed areas that are close to camps are those areas that were hit the most severely and hence where the negative effects are largest. This seems to be the case despite the humanitarian support that was channelled to these camps and the surroundings. If the camps are taken into account, the effect on stunting is lower by 0.01 SD than in the benchmark results and comes to an effect equivalent to 11% of the stunting mean. The effect on wasting remains at the same level of 0.08 SD which equals 21% of the wasting mean. Further, as in the benchmark results, while WHZ scores show a significant reduction, the effect of the earthquake on being underweight remains insignificant. The effects of the earthquake on education, controlling for the closeness of camps, remain robust for primary school enrolment and current attendance. The sizes of these effects are lower by only 0.02 SD; they amount to 0.11 SD and 0.09 SD, respectively. The effects on secondary school enrolment and years of education are not significant after controlling for the closeness of camps. This might be a signal that the results in these outcomes are driven by those areas which are close to the camps, where the infrastructure was heavily destroyed.

C.3. Selective Mortality

Another potential threat to identification is selective infant mortality. It could well be that the most severe effects of the shock on children's malnutrition are hidden behind the deceased infants and children. In this case, our main results would be downward biased.

To address the issue, we extract information on child mortality from the corresponding DHS question in all four waves. Following the same empirical strategy as in the benchmark estimations, we estimate the probability of a child having died conditional on shaking intensity. Table S4.10 shows the results, again for both shaking intensity specifications and with and without the control for World Bank aid. As expected, areas of intense shaking are characterised by higher infant mortality in the years following

[15] For more information visit https://dtm.iom.int/

the earthquake. In areas where the reported PGA was higher than 50g%, the number of perished children increased by about 3%.

C.4. Alternative Measure of Exposure

Table C1. Effects of the Earthquake on Nutrition, IV estimation (Second stage)

Instrumented variables	(1) HAZ	(2) Stunting	(3) WHZ	(4) Wasting	(5) WAZ	(6) Underweight
Log deaths	-0.0116	0.0049	0.0211	-0.0089	0.0109	-0.0012
	(0.0220)	(0.0071)	(0.0197)	(0.0058)	(0.0172)	(0.0041)
Log deaths*post	-0.0657***	0.0218***	-0.0040	0.0172***	-0.0433***	0.0044
	(0.0181)	(0.0053)	(0.0164)	(0.0042)	(0.0162)	(0.0033)
Log victims	-0.0095	0.0041	0.0207	-0.0092*	0.0118	-0.0013
	(0.0217)	(0.0070)	(0.0193)	(0.0057)	(0.0169)	(0.0040)
Log victims*post	-0.0706***	0.0234***	-0.0048	0.0187***	-0.0469***	0.0047
	(0.0195)	(0.0058)	(0.0178)	(0.0046)	(0.0175)	(0.0036)
Log homes destroyed	-0.0118	0.0049	0.0210	-0.0088	0.0106	-0.0012
	(0.0219)	(0.0071)	(0.0196)	(0.0058)	(0.0171)	(0.0041)
Log homes destroyed*post	-0.0656***	0.0218***	-0.0046	0.0175***	-0.0437***	0.0044
	(0.0182)	(0.0054)	(0.0166)	(0.0043)	(0.0163)	(0.0034)
Log homes affected	-0.0096	0.0042	0.0212	-0.0094*	0.0121	-0.0013
	(0.0221)	(0.0072)	(0.0197)	(0.0058)	(0.0173)	(0.0041)
Log homes affected*post	-0.0731***	0.0242***	-0.0051	0.0195***	-0.0487***	0.0049
	(0.0203)	(0.0060)	(0.0185)	(0.0048)	(0.0182)	(0.0037)
Observations	14,952	14,952	14,952	14,952	14,952	14,952
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Table continued.

Notes: The second stages of the IV specifications are presented where the instruments are the weighted index of the PGA measure of ground shaking intensity and its interaction with the after-earthquake dummy. Every two lines represent the results of different regressions depending on the type of damage including death tolls, number of victims, homes destroyed, homes affected. All damages are taken under logarithm. All models include regional and year fixed effects and a full set of control variables including the WB aid. Only the damages and their interactions with the after-earthquake dummy are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

We then use these results to predict the empirical probability of a child having perished after the earthquake and re-estimate the benchmark regressions on nutrition using mortality weights. These were constructed as the product of two weights: a DHS design sampling weight and a post-stratification weight computed as 1/predicted probability if a child is dead and 1/(1-predicted probability) if a child is alive (Desai & Franklin, 2019). Table S4.11 reports the results, again for both specifications (panel A and B). These results confirm the main findings above. A one SD increase in ground shaking intensity results in a 0.09 SD increase in stunting and in a 0.10 SD increase in wasting, which correspond to effects equal to 15% and 25% of the stunting and wasting means, respectively. These effects are higher by about 0.01 SD than the effects in the benchmark specification implying that the latter's coefficients represent lower bounds of the true effects. Alternatively, in severely affected areas with a PGA higher than 50g%, stunting and wasting are significantly higher by 11 percentage points and 9 percentage points than in less affected areas with a PGA lower than 12g%. These effects are larger by one and two percentage points in comparison to the benchmark results. In addition, severe stunting and wasting are also confirmed after considering selective mortality (see Table S4.12). Hence, our benchmark results including the effects of World Bank aid remain robust to controlling for selective mortality, but accounting for selective mortality implies even larger negative effects on children's health.

Table C2. Effects of the Earthquake on Education, IV estimation (Second stage)

	(1)	(2)	(3)	(4)
Instrumented variables	Primary	Secondary	Years	Attendance
Log deaths	0.0139*	0.0086	0.0599*	-0.0033
	(0.0085)	(0.0099)	(0.0338)	(0.0075)
Log deaths*post	-0.0350***	-0.0125**	-0.0496**	-0.0218***
	(0.0039)	(0.0055)	(0.0206)	(0.0031)
Log victims	0.0154*	0.0093	0.0634*	-0.0028
	(0.0089)	(0.0105)	(0.0352)	(0.0079)
Log victims*post	-0.0373***	-0.0134**	-0.0519**	-0.0236***
	(0.0042)	(0.0059)	(0.0219)	(0.0033)
Log homes destroyed	0.0146*	0.0091	0.0634*	-0.0039
	(0.0091)	(0.0108)	(0.0365)	(0.0082)
Log homes destroyed*post	-0.0351***	-0.0126**	-0.0499**	-0.0218***
	(0.0040)	(0.0056)	(0.0208)	(0.0032)
Log homes affected	0.0158*	0.0096	0.0654*	-0.0031
	(0.0092)	(0.0109)	(0.0364)	(0.0082)
Log homes affected*post	-0.0385***	-0.0139**	-0.0536**	-0.0244***
	(0.0044)	(0.0061)	(0.0226)	(0.0034)
Observations	47,673	19,225	66,898	66,898
Controls	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Age	6-14	15-18	6-18	6-18

Notes: The second stages of the IV specifications are presented where the instruments are the weighted index of the PGA measure of ground shaking intensity and its interaction with the after-earthquake dummy. Every two lines represent the results of different regressions depending on the type of damage including death tolls, number of victims, homes destroyed, homes affected. All damages are taken under logarithm. All models include regional and year fixed effects and a full set of control variables including the WB aid. Only the damages and their interactions with the after-earthquake dummy are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

The Effects of the 2010 Haiti Earthquake on Children's Nutrition and Education

Supplementary Online Appendix

Table of Content

Supplementary Online Appendix S1: Descriptive Statistics

Table S2.1. Descriptive Statistics of Nutrition, Education and Labour Outcomes

	2000		2005/6		2012		2016/17	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Health Outcomes (Age 0-5)								
HAZ	-1.15	1.46	-1.26	1.43	-0.95	1.42	-0.90	1.44
Stunting	0.28	0.45	0.29	0.45	0.21	0.41	0.20	0.40
Severe stunting	0.09	0.29	0.10	0.30	0.08	0.27	0.07	0.25
WHZ	-0.10	1.16	-0.23	1.37	-0.14	1.21	-0.02	1.12
Wasting	0.13	0.34	0.18	0.38	0.12	0.32	0.09	0.28
Severe wasting	0.04	0.19	0.06	0.24	0.03	0.18	0.02	0.13
WAZ	-0.72	1.21	-0.87	1.29	-0.65	1.20	-0.53	1.13
Underweight	0.06	0.23	0.10	0.30	0.05	0.23	0.04	0.19
Severe underweight	0.01	0.12	0.03	0.18	0.01	0.12	0.01	0.09
Observations	5,409		2,434		3,384		3,725	
Education Outcomes								
Primary school enrolment (Age 6-14)	0.51	0.50	0.64	0.48	0.77	0.42	0.80	0.41
Observations	11,486		11,196		12,076		12,951	
Secondary school enrolment (Age 15-18)	0.24	0.43	0.36	0.48	0.45	0.50	0.59	0.49
Observations	3,977		4,473		5,218		5,557	
Years of education (Age 6-18)	2.02	2.43	2.58	2.63	2.82	2.69	3.43	2.88
Currently attending school (Age 6-18)	0.66	0.48	0.82	0.38	0.91	0.28	0.90	0.30
Observations	15,463		15,669		17,294		18,472	
Labour Outcomes (Age 6-18)								
Child worked outside	-	-	0.35	0.48	0.25	0.43	-	-
Hours of work outside	-	-	1.13	3.54	0.93	2.64	-	-
Child did domestic work	-	-	0.91	0.28	0.89	0.31	-	-
Hours of domestic work	-	-	8.91	7.88	4.98	4.49	-	-
Child worked for a family member	-	-	0.21	0.41	0.22	0.41	-	-
Hours of work for a family member	-	-	1.66	4.62	1.25	3.39	-	-
Observations	-	-	14,304		11,988		-	-

Notes: Mean statistics and standard deviations are reported.

Table S1.2. Descriptive Statistics of Full Nutrition Sample (Age 0-5)

	Mean	Std. Dev.
Child's age in months	28.23	17.35
Gender of child: Male	0.50	0.50
Birth order number	3.53	2.52
Size at birth		
Very large	0.12	0.33
Larger than average	0.15	0.35
Average	0.43	0.50
Smaller than average	0.14	0.35
Very small	0.16	0.37
Child's relation to household head		
Son/daughter	0.69	0.46
Grandchild	0.21	0.41
Uncle/aunt/other relative	0.05	0.22
Adopted/foster child/stepchild	0.02	0.12
Not related	0.02	0.14
Niece/nephew by blood	0.02	0.14
Place where child was delivered		
Respondent's home	0.69	0.46
Other home	0.05	0.21
Government hospital	0.14	0.35
Government health centre	0.03	0.18
Nurse	0.01	0.07
Private hospital/clinic	0.04	0.19
Private health centre	0.01	0.11
Semi-private hospital	0.01	0.11
Other	0.01	0.10
Age of household head	42.27	14.05
Gender of household head: Male	0.61	0.49
Education of the child's mother		
No education	0.32	0.47
Primary	0.43	0.50
Secondary	0.23	0.42
Superior	0.02	0.13
Literacy of the child's mother		
Cannot read at all	0.47	0.50
Able to read only parts of sentence	0.12	0.33
Able to read whole sentence	0.41	0.49
Marital status of the child's mother		
Never married	0.03	0.18
Married	0.80	0.40
Living together	0.10	0.29
Widowed	0.01	0.11
Not living together	0.06	0.23
Occupation of the child's mother		
Not working	0.38	0.49
Prof., tech., management	0.03	0.16
Sales	0.30	0.46
Agric-self employed	0.06	0.23
Agric-employee	0.03	0.17
Household & domestic	0.02	0.14
Services	0.01	0.07
Skilled manual	0.02	0.14

Table continues next page.

Table S1.2 continued.

Unskilled manual	0.16	0.36
Body mass index of the child's mother	2284.69	413.95
Child's mother smokes cigarettes	0.02	0.16
Number of household members	6.55	2.63
Number of children 5 and under	1.94	0.94
House located in urban area	0.29	0.45
Cluster altitude in meters	287.30	313.01
House's floor material		
Earth/sand	0.51	0.50
Dung	0.02	0.12
Cement/concrete	0.30	0.46
Mosaic/ceramic	0.16	0.37
Observations	14,952	

Notes: Mean statistics and standard deviations are reported.

Table S1.3. Descriptive Statistics of Full Education Sample (Age 6-18)

	Mean	Std. Dev.
Child's age in years	11.81	3.73
Gender of child: Male	0.51	0.50
Child's relation to household head		
Son/daughter	0.62	0.48
Grandchild	0.13	0.34
Brother/sister	0.02	0.15
Other relative	0.07	0.26
Adopted/foster child	0.05	0.21
Not related	0.04	0.21
Niece/nephew	0.05	0.22
Gender of household head: Male	0.58	0.49
Age of household head	47.52	13.43
Relationship structure		
One adult	0.07	0.26
Two adults, opp. sex	0.21	0.41
Two adults, same sex	0.05	0.22
Three+ related adult	0.55	0.50
Unrelated adults	0.12	0.33
Household has electricity	0.27	0.44
Household has bicycle	0.13	0.34
Number of household members	6.58	2.61
Number of children 5 and under	0.89	1.00
House located in urban area	0.34	0.47
Cluster altitude in meters	266.19	299.39
Department of residence		
Aire Metropolitaine/Rest-Ouest	0.20	0.40
South-East	0.08	0.28
North	0.10	0.30
North-East	0.09	0.28
Artibonite	0.10	0.30
Centre	0.09	0.29
South	0.09	0.29
Grand'Anse/Nippes	0.14	0.35
North-West	0.10	0.30
Observations	66,898	

Notes: Mean statistics and standard deviations are reported.

Supplementary Online Appendix S2: Additional Results

Table S2.1. Effects of Earthquake on Nutrition – Severe Indicators

	(1) Severe Stunting	(2) Severe Stunting	(3) Severe Wasting	(4) Severe Wasting	(5) Severe Underweight	(6) Severe Underweight
Intensity*post	0.0011***		0.0003*		0.0001	
	(0.0002)		(0.0002)		(0.0001)	
Moderate*post		0.0292		0.0026		-0.0033
		(0.0199)		(0.0157)		(0.0119)
Strong*post		0.0258*		0.0097		0.0093
		(0.0155)		(0.0117)		(0.0076)
Severe*post		0.0748***		0.0207*		0.0082
		(0.0153)		(0.0112)		(0.0078)
WB aid	-0.0022***	-0.0019***	-0.0012***	-0.0013***	-0.0008***	-0.0008***
	(0.0007)	(0.0006)	(0.0004)	(0.0004)	(0.0002)	(0.0002)
Observations	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.0704	0.0709	0.0378	0.0381	0.0131	0.0133
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms between shaking intensity and the after-earthquake dummy and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S2.2. Effects of the Earthquake on Child Labour– Benchmark ($\delta = 1$)

	(1) Paid work outside	(2) Nonpaid work outside	(3) Hours of work outside	(4) Housework	(5) Hours of housework	(6) Work for family	(7) Hours of work for family
PANEL A							
Intensity*post	0.0005***	-0.0002	0.0021	-0.0015***	-0.0046	0.0013**	0.0149***
	(0.0001)	(0.0007)	(0.0033)	(0.0004)	(0.0085)	(0.0005)	(0.0038)
WB aid	0.0009	0.0032*	0.0197**	0.0057***	0.0881***	-0.0006	-0.0019
	(0.0012)	(0.0019)	(0.0099)	(0.0013)	(0.0240)	(0.0017)	(0.0130)
Observations	26,292	26,292	26,292	26,287	29,636	26,228	26,228
R-squared	0.0136	0.0432	0.0299	0.1091	0.1599	0.1331	0.1082
Mean outcome	0.0202	0.2866	1.0422	0.9025	6.8728	0.2172	1.4704
Controls	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES
PANEL B							
Moderate*post	-0.0056	-0.0403	-0.6443*	0.0450*	-0.4596	-0.0644	-0.7065*
	(0.0089)	(0.0480)	(0.3836)	(0.0266)	(0.9393)	(0.0436)	(0.4303)
Strong*post	0.0053	-0.0480	0.1069	0.0584***	1.0942**	-0.0386	-0.0337
	(0.0086)	(0.0380)	(0.2409)	(0.0186)	(0.5249)	(0.0326)	(0.2776)
Severe*post	0.0282***	-0.0180	0.0809	-0.0744***	-0.2536	0.0546*	0.6767***
	(0.0086)	(0.0384)	(0.1809)	(0.0234)	(0.5525)	(0.0325)	(0.2528)
WB aid	0.0009	0.0024	0.0108	0.0048***	0.0569**	-0.0004	-0.0038
	(0.0011)	(0.0019)	(0.0092)	(0.0013)	(0.0244)	(0.0016)	(0.0123)
Observations	26,292	26,292	26,292	26,287	29,636	26,228	26,228
R-squared	0.0144	0.0435	0.0301	0.1124	0.1580	0.1342	0.1089
Mean outcome	0.0202	0.2866	1.0422	0.9025	6.8728	0.2172	1.4704
Controls	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES

Notes: Panel A shows the results of continuous treatment specifications with buffer zone $\delta = 1$ km. Panel B shows the results of four intensity groups specifications. All models include regional and year fixed effects, shaking intensity specific variables, and the full set of control variables. Only the interaction terms between shaking intensity and the after-earthquake dummy are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Supplementary Online Appendix S3: Effect Heterogeneity

Table S3.1. Effects of the Earthquake on Nutrition by Gender

	(1) HAZ	(2) Stunting	(3) WHZ	(4) Wasting	(5) WAZ	(6) Underweight
Intensity*post	-0.0062***	0.0017***	-0.0012	0.0012***	-0.0044***	0.0003
	(0.0017)	(0.0005)	(0.0016)	(0.0004)	(0.0016)	(0.0003)
Intensity*post*male	0.0021	-0.0000	0.0017	0.0004	0.0021	0.0000
	(0.0021)	(0.0007)	(0.0019)	(0.0005)	(0.0019)	(0.0005)
WB aid	0.0122**	-0.0038***	0.0109***	-0.0027***	0.0157***	-0.0018**
	(0.0050)	(0.0012)	(0.0040)	(0.0009)	(0.0039)	(0.0007)
Observations	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.1991	0.1369	0.0802	0.0765	0.1681	0.0377
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables including the WB aid. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S3.2. Effects of the Earthquake on Nutrition by Age Cohort

	(1) HAZ	(2) Stunting	(3) WHZ	(4) Wasting	(5) WAZ	(6) Underweight
Intensity*post	-0.0084***	0.0012*	-0.0050*	0.0019***	-0.0091***	0.0009
	(0.0026)	(0.0006)	(0.0027)	(0.0006)	(0.0024)	(0.0006)
Intensity*post*cohort 2	0.0055*	0.0006	0.0058	-0.0011	0.0082**	-0.0005
	(0.0032)	(0.0010)	(0.0039)	(0.0008)	(0.0034)	(0.0007)
Intensity*post*cohort 3	0.0052	-0.0003	0.0070**	-0.0005	0.0086***	-0.0009
	(0.0034)	(0.0011)	(0.0031)	(0.0008)	(0.0030)	(0.0007)
Intensity*post*cohort 4	0.0010	0.0013	0.0097***	-0.0008	0.0076***	-0.0013*
	(0.0034)	(0.0010)	(0.0034)	(0.0008)	(0.0029)	(0.0007)
Intensity*post*cohort 5	0.0058*	0.0010	0.0021	-0.0001	0.0056*	-0.0005
	(0.0032)	(0.0009)	(0.0035)	(0.0008)	(0.0032)	(0.0007)
WB aid	0.0124**	-0.0039***	0.0112***	-0.0027***	0.0160***	-0.0019***
	(0.0052)	(0.0013)	(0.0040)	(0.0010)	(0.0042)	(0.0007)
Observations	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.2015	0.1406	0.0835	0.0783	0.1732	0.0393
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables including the WB aid. Only the interaction terms and the WB aid index are reported. Cohort 1 was born in the years 1999, 2000, 2004, 2005, 2006, 2011, 2012, 2016 and 2017 and was under 0-12 months at time of survey. Cohort 2 was born in the years 1998, 1999, 2003, 2004, 2005, 2010, 2011, 2014, 2015, 2016 and was 13-24 months old at time of survey. Cohort 3 was born in the years 1997, 1998, 2002, 2003, 2004, 2009, 2010, 2014 and was 25-36 months old at time of survey. Cohort 4 was born in the years 1996, 1997, 2001, 2002, 2003, 2008, 2009, 2013 and was 37-48 months old at time of survey. Cohort 5 was born in the years 1995, 1996, 2001, 2007, 2008, 2012 and was 49-60 months old at time of survey. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S3.3. Effects of the Earthquake on Nutrition by Birth Time (2005-2012)

	(1) HAZ	(2) Stunting	(3) WHZ	(4) Wasting	(5) WAZ	(6) Underweight
Intensity*post	-0.0040**	0.0009*	0.0000	0.0010**	-0.0024	0.0004
	(0.0019)	(0.0005)	(0.0016)	(0.0004)	(0.0016)	(0.0003)
Intensity*post*utero	-0.0015	0.0011	0.0052**	-0.0008	0.0030	-0.0011**
	(0.0029)	(0.0009)	(0.0024)	(0.0006)	(0.0024)	(0.0004)
WB aid	0.0088	-0.0029*	0.0126**	-0.0013	0.0145**	-0.0017*
	(0.0072)	(0.0018)	(0.0054)	(0.0014)	(0.0061)	(0.0010)
Observations	11,227	11,227	11,227	11,227	11,227	11,227
R-squared	0.2140	0.1473	0.0900	0.0802	0.1778	0.0405
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables including the WB aid. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S3.4. Effects of the Earthquake on Nutrition for Children Being in Utero by Trimesters

	(1) HAZ	(2) Stunting	(3) WHZ	(4) Wasting	(5) WAZ	(6) Underweight
PANEL A						
Intensity*post	-0.0044**	0.0011**	0.0002	0.0011**	-0.0025	0.0003
	(0.0018)	(0.0005)	(0.0016)	(0.0004)	(0.0016)	(0.0003)
Intensity*post*first trimester	0.0036	-0.0007	0.0126***	- 0.0032***	0.0116***	-0.0013*
	(0.0053)	(0.0015)	(0.0041)	(0.0010)	(0.0040)	(0.0007)
WB aid	0.0086	-0.0028	0.0138***	-0.0016	0.0153**	-0.0018*
	(0.0073)	(0.0018)	(0.0053)	(0.0014)	(0.0060)	(0.0010)
Observations	11,227	11,227	11,227	11,227	11,227	11,227
R-squared	0.2135	0.1465	0.0900	0.0807	0.1783	0.0400
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
PANEL B						
Intensity*post	-0.0042**	0.0011**	0.0008	0.0009**	-0.0019	0.0002
	(0.0018)	(0.0005)	(0.0016)	(0.0004)	(0.0016)	(0.0003)
Intensity*post*second trimester	-0.0024	0.0003	0.0049	-0.0006	0.0021	-0.0003
	(0.0054)	(0.0018)	(0.0050)	(0.0011)	(0.0048)	(0.0005)
WB aid	0.0087	-0.0028#	0.0127**	-0.0013	0.0145**	-0.0017*
	(0.0072)	(0.0018)	(0.0052)	(0.0014)	(0.0061)	(0.0010)
Observations	11,227	11,227	11,227	11,227	11,227	11,227
R-squared	0.2133	0.1465	0.0896	0.0802	0.1778	0.0402
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
PANEL C						
Intensity*post	-0.0040**	0.0010*	0.0008	0.0009**	-0.0018	0.0003
	(0.0018)	(0.0005)	(0.0016)	(0.0004)	(0.0015)	(0.0003)
Intensity*post*third trimester	-0.0030	0.0020	0.0008	0.0003	-0.0013	-0.0013*
	(0.0042)	(0.0015)	(0.0036)	(0.0010)	(0.0039)	(0.0007)
WB aid	0.0092	-0.0031*	0.0128**	-0.0015	0.0149**	-0.0016
	(0.0073)	(0.0018)	(0.0054)	(0.0014)	(0.0060)	(0.0010)
Observations	11,227	11,227	11,227	11,227	11,227	11,227
R-squared	0.2138	0.1474	0.0891	0.0803	0.1778	0.0401
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: Panels A-C show the results of continuous treatment specifications with buffer zone $\delta = 1$ km for children being in 1-3 trimesters. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S3.5. Effects of the Earthquake on Education by Gender

	(1) Primary	(2) Secondary	(3) Years	(4) Attendance
Intensity*post	-0.0024***	-0.0013**	-0.0033*	-0.0016***
	(0.0004)	(0.0005)	(0.0019)	(0.0003)
Intensity*post*male	-0.0007*	0.0004	-0.0017	-0.0005**
	(0.0004)	(0.0007)	(0.0016)	(0.0002)
WB aid	0.0041***	0.0039*	0.0086	0.0028***
	(0.0010)	(0.0023)	(0.0056)	(0.0006)
Observations	47,673	19,225	66,898	66,898
R-squared	0.1505	0.2598	0.6042	0.1402
Controls	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Age	6-14	15-18	6-18	6-18

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables including the WB aid index. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S3.6. Effects of the Earthquake on Education by Birth Time

	(1) Primary	(2) Years	(3) Attendance	(4) Years	(5) Attendance
Intensity*post	-0.0028***	-0.0033**	-0.0018***	-0.0029**	-0.0020***
	(0.0003)	(0.0016)	(0.0002)	(0.0014)	(0.0003)
Intensity*post*utero	0.0016	-0.0300***	0.0004		
	(0.0015)	(0.0041)	(0.0009)		
Intensity*post*secondary				-0.0058**	0.0008**
				(0.0026)	(0.0004)
WB aid	0.0040***	0.0069	0.0027***	0.0095*	0.0027***
	(0.0010)	(0.0056)	(0.0007)	(0.0055)	(0.0006)
Observations	47,673	66,898	66,898	66,898	66,898
R-squared	0.1501	0.6044	0.1401	0.6105	0.1566
Controls	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES
Age	6-14	6-18	6-18	6-18	6-18

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables including the WB aid index. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Supplementary Online Appendix S4: Robustness Checks

Table S4.1. Effects of the Earthquake on Nutrition for Continuous Treatment ($\boldsymbol{\delta = 5km}$ and $\boldsymbol{\delta = 10km}$)

	(1) HAZ	(2) HAZ	(3) Stunting	(4) Stunting	(5) WHZ	(6) WHZ	(7) Wasting	(8) Wasting	(9) WAZ	(10) WAZ	(11) Underweight	(12) Underweight
Intensity (5 km)*post	-0.0056***		0.0018***		-0.0004		0.0015***		-0.0037***		0.0004	
	(0.0015)		(0.0004)		(0.0014)		(0.0004)		(0.0014)		(0.0003)	
Intensity (10 km)*post		-0.0061***		0.0019***		-0.0005		0.0016***		-0.0041***		0.0004
		(0.0016)		(0.0005)		(0.0015)		(0.0004)		(0.0015)		(0.0003)
WB aid	0.0113**	0.0105**	-0.0035***	-0.0032***	0.0114***	0.0117***	-0.0026***	-0.0025***	0.0156***	0.0152***	-0.0018**	-0.0018**
	(0.0049)	(0.0048)	(0.0012)	(0.0012)	(0.0040)	(0.0040)	(0.0009)	(0.0009)	(0.0039)	(0.0039)	(0.0007)	(0.0007)
Observations	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.1989	0.1989	0.1367	0.1366	0.0801	0.0800	0.0763	0.0763	0.1681	0.1681	0.0377	0.0377
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: All specifications are for continuous treatment with either buffer zone $\delta = 5km$ or buffer zone $\delta = 10km$. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.2. Effects of the Earthquake on Education for Continuous Treatment ($\boldsymbol{\delta = 5km}$ and $\boldsymbol{\delta = 10km}$)

	(1) Primary	(2) Primary	(3) Secondary	(4) Secondary	(5) Years	(6) Years	(7) Attendance	(8) Attendance
Intensity (5km)*post	-0.0030***		-0.0011**		-0.0041**		-0.0020***	
	(0.0003)		(0.0005)		(0.0017)		(0.0003)	
Intensity (10km) *post		-0.0032***		-0.0011**		-0.0045**		-0.0021***
		(0.0004)		(0.0005)		(0.0019)		(0.0003)
WB aid	0.0036***	0.0033***	0.0038*	0.0037*	0.0079	0.0077	0.0024***	0.0022***
	(0.0010)	(0.0010)	(0.0022)	(0.0022)	(0.0054)	(0.0053)	(0.0006)	(0.0006)
Observations	47,673	47,673	19,225	19,225	66,898	66,898	66,898	66,898
R-squared	0.1500	0.1501	0.2592	0.2591	0.6037	0.6037	0.1401	0.1402
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Age	6-14	6-14	15-18	15-18	6-18	6-18	6-18	6-18

Notes: All specifications are for continuous treatment with either buffer zone $\delta = 5km$ or buffer zone $\delta = 10km$. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.3. Effects of the Earthquake on Nutrition: Fake Treatment 2005

	(1) HAZ	(2) Stunting	(3) WHZ	(4) Wasting	(5) WAZ	(6) Underweight
Intensity*post 2005	0.0009	-0.0001	0.0045**	-0.0008	0.0038**	-0.0009**
	(0.0020)	(0.0006)	(0.0020)	(0.0005)	(0.0018)	(0.0005)
WB aid fake	-0.0154**	0.0035	0.0157*	-0.0035*	0.0029	-0.0027
	(0.0072)	(0.0032)	(0.0088)	(0.0020)	(0.0070)	(0.0020)
Observations	7,843	7,843	7,843	7,843	7,843	7,843
R-squared	0.2291	0.1609	0.1065	0.0902	0.1959	0.0553
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: All regressions are estimated as if the earthquake occurred in 2004 before the second DHS wave interviewed in 2015. The 2012 and 2016/17 DHS waves are excluded. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction term between ground shaking intensity and the 2005-year dummy and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.4. Effects of the Earthquake on Education: Fake Treatment 2005

	(1) Primary	(2) Secondary	(3) Years	(4) Attendance
Intensity*post 2005	-0.0013***	-0.0002	-0.0009	-0.0005
	(0.0005)	(0.0007)	(0.0025)	(0.0004)
WB aid fake	0.0008	0.0009	-0.0003	0.0021*
	(0.0013)	(0.0020)	(0.0077)	(0.0012)
Observations	22,682	8,450	31,132	31,132
R-squared	0.2450	0.2544	0.5602	0.1409
Controls	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Age	6-14	15-18	6-18	6-18

Notes: All regressions are estimated as if the earthquake occurred in 2004 before the second DHS wave interviewed in 2015. The 2012 and 2016/17 DHS waves are excluded. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction term between ground shaking intensity and the 2005-year dummy and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.5. Effects of the Earthquake on Education for People Older than 35

	(1) Primary	(2) Secondary	(3) Years
Intensity*post	0.0002	-0.0005**	-0.0050
	(0.0003)	(0.0003)	(0.0041)
WB aid	0.0012	0.0004	-0.0095
	(0.0011)	(0.0007)	(0.0091)
Observations	60,472	60,472	60,472
R-squared	0.0329	0.2129	0.3852
Controls	YES	YES	YES
Region FE	YES	YES	YES
Age	>=35 earthquake	>=35 earthquake	>=35 earthquake

Notes: All regressions are estimated for a reduced sample of people older than 35 at the year of the earthquake. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction term between shaking intensity and the after-earthquake dummy and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.6. Effects of the Earthquake on Nutrition for Respondents Living in the Same House

	(1) HAZ	(2) Stunting	(3) WHZ	(4) Wasting	(5) WAZ	(6) Underweight
PANEL A						
Intensity*post	-0.0037*	0.0011*	0.0007	0.0000	-0.0015	0.0007*
	(0.0020)	(0.0006)	(0.0018)	(0.0004)	(0.0016)	(0.0004)
WB aid	0.0001	0.0002	0.0093*	-0.0019**	0.0062	-0.0000
	(0.0096)	(0.0030)	(0.0051)	(0.0010)	(0.0066)	(0.0019)
Observations	10,270	10,270	10,270	10,270	10,270	10,270
R-squared	0.2226	0.1517	0.0958	0.0434	0.1883	0.0836
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
PANEL B						
Moderate*post	-0.1206	-0.0086	0.2656**	-0.0483**	0.1072	-0.0440
	(0.1238)	(0.0379)	(0.1346)	(0.0243)	(0.1229)	(0.0347)
Strong*post	-0.0735	-0.0062	-0.0000	0.0063	-0.0330	0.0207
	(0.0987)	(0.0318)	(0.0959)	(0.0206)	(0.0845)	(0.0261)
Severe*post	-0.2756**	0.0762*	0.1195	-0.0077	-0.0750	0.0284
	(0.1221)	(0.0391)	(0.1056)	(0.0222)	(0.1054)	(0.0276)
WB aid	-0.0013	0.0004	0.0114**	-0.0022**	0.0068	-0.0000
	(0.0100)	(0.0032)	(0.0053)	(0.0010)	(0.0068)	(0.0019)
Observations	10,270	10,270	10,270	10,270	10,270	10,270
R-squared	0.2229	0.1521	0.0970	0.0444	0.1888	0.0849
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: All regressions are estimated for a reduced sample for people living in 2012 in the same house as before the earthquake. The 2016 DHS wave is excluded. Panel A shows the results of continuous treatment specifications with buffer zone $\delta = 1$ km. Panel B shows the results of four intensity groups specifications. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms between shaking intensity and the after-earthquake dummy and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.7. Effects of the Earthquake on Education for Respondents Living in the same House

	(1) Primary Age 6-14	(2) Secondary Age 15-18	(3) Years Age 6-18	(4) Attendance Age 6-18
PANEL A				
Intensity*post	-0.0031***	-0.0006	-0.0037*	-0.0019***
	(0.0004)	(0.0006)	(0.0022)	(0.0003)
WB aid	0.0067***	0.0059**	0.0113	0.0022**
	(0.0017)	(0.0024)	(0.0076)	(0.0010)
Observations	32,289	12,663	44,952	44,952
R-squared	0.2042	0.2501	0.5723	0.1453
Controls	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
PANEL B				
Moderate*post	0.0155	0.0929**	0.3373**	0.0383
	(0.0409)	(0.0472)	(0.1443)	(0.0339)
Strong*post	-0.0341	0.0352	0.0412	-0.0197
	(0.0241)	(0.0306)	(0.0991)	(0.0197)
Severe*post	-0.1898***	-0.0194	-0.1468	-0.1157***
	(0.0265)	(0.0351)	(0.1430)	(0.0183)
WB aid	0.0055***	0.0049**	0.0096	0.0019*
	(0.0017)	(0.0024)	(0.0071)	(0.0011)
Observations	32,329	12,680	45,009	45,009
R-squared	0.2052	0.2521	0.5726	0.1465
Controls	YES	YES	YES	YES
Region FE	YES	YES	YES	YES

Notes: All regressions are estimated for a reduced sample for people living in 2012 in the same house as before the earthquake. The 2016 DHS wave is excluded. Panel A shows the results of continuous treatment specifications with buffer zone $\delta = 1$ km. Panel B shows the results of four intensity groups specifications. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms between shaking intensity and the after-earthquake dummy and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.8. Effects of the Earthquake on Nutrition Controlling for Camps

	(1) HAZ	(2) HAZ	(3) Stunting	(4) Stunting	(5) WHZ	(6) WHZ	(7) Wasting	(8) Wasting	(9) WAZ	(10) WAZ	(11) Underweight	(12) Underweight
Intensity*post	-0.00422***	-0.00411***	0.00142***	0.00135***	0.000441	5.11e-05	0.00117***	0.00126***	-0.00226*	-0.00252**	0.000212	0.000326
	(0.00140)	(0.00145)	(0.000409)	(0.000412)	(0.00128)	(0.00129)	(0.000326)	(0.000329)	(0.00125)	(0.00127)	(0.000258)	(0.000262)
WB aid		0.00500		-0.00138		0.00797*		-0.00190*		0.00941**		-0.00166**
		(0.00547)		(0.00134)		(0.00459)		(0.00112)		(0.00473)		(0.000807)
Camps		-0.000368***		0.000125***		-0.000152		4.01e-05		-0.000325**		6.62e-06
		(0.000136)		(3.65e-05)		(0.000116)		(3.46e-05)		(0.000138)		(2.24e-05)
Observations	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.198	0.200	0.136	0.138	0.079	0.080	0.076	0.077	0.166	0.169	0.037	0.038
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction term between the weighted index of ground shaking intensity and the after-earthquake dummy as well as the WB aid and the camps indices are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.9. Effects of the Earthquake on Education Controlling for Camps

	(1) Primary	(2) Primary	(3) Secondary	(4) Secondary	(5) Years	(6) Years	(7) Attendance	(8) Attendance
Intensity*post	-0.0025***	-0.0025***	-0.0008*	-0.0004	-0.0034**	-0.0018	-0.0016***	-0.0016***
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0016)	(0.0016)	(0.0002)	(0.0002)
WB aid		0.0022**		0.0003		-0.0061		0.0011
		(0.0011)		(0.0023)		(0.0061)		(0.0007)
Camps		-0.0001***		-0.0002***		-0.0008***		-0.0001***
		(0.0000)		(0.0000)		(0.0002)		(0.0000)
Observations	47,673	47,673	19,225	19,225	66,898	66,898	66,898	66,898
R-squared	0.1493	0.1507	0.2585	0.2622	0.6036	0.6049	0.1395	0.1410
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Age	6-14	6-14	15-18	15-18	6-18	6-18	6-18	6-18

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction term between the weighted index of ground shaking intensity and the after-earthquake dummy as well as the WB aid and the camps indices are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.10. Effects of the Earthquake on Infant Mortality

	(1) Child perished	(2) Child perished	(3) Child perished	(4) Child perished
Intensity*post	0.0004**	0.0005***		
	(0.0002)	(0.0002)		
Moderate*post			0.0104	0.0098
			(0.0147)	(0.0148)
Strong*post			0.0018	0.0036
			(0.0088)	(0.0088)
Severe*post			0.0273**	0.0309***
			(0.0111)	(0.0112)
WB aid		-0.0013**		-0.0013**
		(0.0006)		(0.0006)
Observations	25,297	25,297	25,596	25,297
R-squared	0.1102	0.1105	0.1103	0.1112
Controls	YES	YES	YES	YES
Region FE	YES	YES	YES	YES

Notes: All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.11. Effects of the Earthquake on Nutrition Controlling for Infant Mortality

	(1) HAZ	(2) Stunting	(3) WHZ	(4) Wasting	(5) WAZ	(6) Underweight
PANEL A						
Intensity*post	-0.0057***	0.0018***	-0.0004	0.0015***	-0.0038***	0.0005*
	(0.0015)	(0.0004)	(0.0013)	(0.0003)	(0.0013)	(0.0003)
WB aid	0.0134***	-0.0043***	0.0111***	-0.0031***	0.0168***	-0.0020***
	(0.0050)	(0.0012)	(0.0042)	(0.0010)	(0.0039)	(0.0007)
Observations	14,921	14,921	14,921	14,921	14,921	14,921
R-squared	0.2042	0.1407	0.0839	0.0815	0.1760	0.0445
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
PANEL B						
Moderate*post	-0.1597	0.0182	0.1006	-0.0180	-0.0192	-0.0188
	(0.1139)	(0.0304)	(0.0982)	(0.0281)	(0.0957)	(0.0239)
Strong*post	-0.1554*	0.0205	-0.0678	0.0414*	-0.1376*	0.0300
	(0.0871)	(0.0248)	(0.0809)	(0.0230)	(0.0782)	(0.0207)
Severe*post	-0.4170***	0.1101***	-0.0033	0.0874***	-0.2571***	0.0240
	(0.0905)	(0.0263)	(0.0862)	(0.0231)	(0.0854)	(0.0194)
WB aid	0.0128***	-0.0037***	0.0125***	-0.0031***	0.0172***	-0.0018**
	(0.0049)	(0.0012)	(0.0041)	(0.0009)	(0.0040)	(0.0007)
Observations	14,921	14,921	14,921	14,921	14,921	14,921
R-squared	0.2053	0.1410	0.0843	0.0822	0.1766	0.0452
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: Panel A shows the results of continuous treatment specifications with buffer zone $\delta = 1$ km. Panel B shows the results of four intensity groups specifications. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.12. Effects of Earthquake on Severe Nutrition with PSW

	(1) Severe Stunting	(2) Severe Stunting	(3) Severe Wasting	(4) Severe Wasting	(5) Severe Underweight	(6) Severe Underweight
Intensity*post	0.0012***		0.0004**		0.0002	
	(0.0003)		(0.0002)		(0.0001)	
Moderate*post		0.0495**		0.0249		0.0013
		(0.0221)		(0.0209)		(0.0122)
Strong*post		0.0320*		0.0292*		0.0128*
		(0.0184)		(0.0174)		(0.0079)
Severe*post		0.0861***		0.0353**		0.0119#
		(0.0173)		(0.0148)		(0.0083)
WB aid	-0.0024***	-0.0021***	-0.0013***	-0.0013***	-0.0008***	-0.0008***
	(0.0007)	(0.0007)	(0.0005)	(0.0004)	(0.0002)	(0.0002)
Observations	14,921	14,921	14,921	14,921	14,921	14,921
R-squared	0.0749	0.0758	0.0507	0.0516	0.0136	0.0139
Controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Notes: The specifications are weighted with respect to the probability of being perished. All models include regional and year fixed effects, shaking intensity specific variables, and a full set of control variables. Only the interaction terms and the WB aid index are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.13. Effects of the Earthquake on Nutrition, IV estimation (First stage)

	(1) Log deaths	(2) Log deaths*post	(3) Log victims	(4) Log victims* post	(5) Log homes destroyed	(6) Log homes destroyed* post	(7) Log homes affected	(8) Log homes affected* post
Intensity	0.0703***	0.0023	0.0721***	0.0040**	0.0708***	0.0020	0.0708***	0.0040**
	(0.0041)	(0.0021)	(0.0032)	(0.0018)	(0.0041)	(0.0019)	(0.0030)	(0.0017)
Intensity*post	-0.0025	0.0784***	-0.0010	0.0727***	-0.0006	0.0782***	-0.0004	0.0702***
	(0.0029)	(0.0018)	(0.0025)	(0.0016)	(0.0030)	(0.0016)	(0.0022)	(0.0014)
Year 2005	-0.2182**	0.0092	-0.0734	0.0594	-0.1856*	0.0175	-0.0498	0.0602*
	(0.1026)	(0.0490)	(0.0955)	(0.0399)	(0.1050)	(0.0454)	(0.0911)	(0.0373)
Year 2012	0.8798***	6.4063***	0.4155**	7.9880***	0.8947**	5.7808***	0.2895	5.9091***
	(0.2987)	(0.2417)	(0.2036)	(0.1423)	(0.3487)	(0.3067)	(0.1885)	(0.1284)
Year 2016	0.9024***	6.4117***	0.4650**	8.0198***	0.9400***	5.8115***	0.3380*	5.9402***
	(0.2930)	(0.2352)	(0.2011)	(0.1400)	(0.3467)	(0.3047)	(0.1866)	(0.1270)
WB aid	- 0.0518***	-0.0663***	-0.0249***	-0.0345***	-0.0545***	-0.0678***	-0.0181**	-0.0259***
	(0.0123)	(0.0117)	(0.0084)	(0.0071)	(0.0154)	(0.0152)	(0.0077)	(0.0064)
Observations	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.8231	0.9738	0.8314	0.9871	0.8292	0.9734	0.8355	0.9826
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES

Notes: The first stages of the IV specifications for the nutrition sample are presented where the instruments are the weighted index of the PGA measure of ground shaking intensity and its interaction with the after-earthquake dummy. Every two columns show the first stages depending on the type of damage including death tolls, number of victims, homes destroyed, homes affected. All damages are taken in logarithm. All models include regional and year fixed effects and a full set of control variables including the WB aid. Only the intensity index, its interaction with the after-earthquake dummy, the WB aid index and wave dummies are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.14. Effects of the Earthquake on Education, IV estimation (First stage)

	(1) Log deaths	(2) Log deaths*post	(3) Log victims	(4) Log victims*post	(5) Log homes destroyed	(6) Log homes destroyed*post	(7) Log homes affected	(8) Log homes affected*post
Intensity	0.0615***	-0.0087***	0.0595***	-0.0065***	0.0569***	-0.0095***	0.0576***	-0.0065***
	(0.0049)	(0.0022)	(0.0029)	(0.0019)	(0.0053)	(0.0020)	(0.0026)	(0.0018)
Intensity*post	0.0049*	0.0817***	0.0027	0.0760***	0.0050*	0.0816***	0.0024#	0.0735***
	(0.0029)	(0.0016)	(0.0022)	(0.0015)	(0.0030)	(0.0015)	(0.0019)	(0.0014)
Year 2005	-0.0615	0.0199	0.0044	0.0273	-0.0496	0.0256	0.0302	0.0312
	(0.0816)	(0.0395)	(0.0666)	(0.0329)	(0.0765)	(0.0367)	(0.0630)	(0.0319)
Year 2012	1.4140***	6.1870***	0.7731***	7.7647***	1.4269***	5.6698***	0.6137***	5.6738***
	(0.2086)	(0.2337)	(0.1313)	(0.1409)	(0.2667)	(0.2854)	(0.1203)	(0.1279)
Year 2016	1.3763***	6.1505***	0.7847***	7.7739***	1.4111***	5.6547***	0.6251***	5.6812***
	(0.2060)	(0.2272)	(0.1321)	(0.1399)	(0.2635)	(0.2767)	(0.1219)	(0.1282)
WB aid	-0.0808***	-0.0630***	-0.0426***	-0.0319***	-0.0815***	-0.0695***	-0.0325***	-0.0222***
	(0.0083)	(0.0117)	(0.0055)	(0.0073)	(0.0110)	(0.0141)	(0.0051)	(0.0066)
Observations	47,673	47,673	47,673	47,673	47,673	47,673	47,673	47,673
R-squared	0.8833	0.9727	0.8876	0.9856	0.8871	0.9716	0.8933	0.9805
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Age	6-18	6-18	6-18	6-18	6-18	6-18	6-18	6-18

Notes: The first stages of the IV specifications for the education sample are presented where the instruments are the weighted index of the PGA measure of ground shaking Intensity and its interaction with the after-earthquake dummy. Every two columns show the first stages depending on the type of damage including death tolls, number of victims, homes destroyed, homes affected. All damages are taken in logarithm. All models include regional and year fixed effects and a full set of control variables including the WB aid. Only the intensity index, its interaction with the after-earthquake dummy, the WB index aid and wave dummies are reported. Robust standard errors in parentheses are clustered at the regional level *p<0.1; **p<0.05; ***p<0.01.

Table S4.15. Effects of the Earthquake on Nutrition – Multiple Hypothesis Testing using Bonferroni adjusted p-values

	(1) HAZ	(2) HAZ	(3) Stunting	(4) Stunting	(5) WHZ	(6) WHZ	(7) Wasting	(8) Wasting	(9) WAZ	(10) WAZ	(11) Underweight	(12) Underweight
Panel A												
Intensity*post	-0.0042***	-0.0051***	0.0014***	0.0017***	0.0004	-0.0004	0.0012***	0.0014***	-0.0023*	-0.0034***	0.0002	0.0003
	(0.0014)	(0.0014)	(0.0004)	(0.0004)	(0.0013)	(0.0013)	(0.0003)	(0.0003)	(0.0012)	(0.0013)	(0.0003)	(0.0003)
bonf p-values	[0.0183]	[0.0032]	[0.0044]	[0.0006]	[1]	[1]	[0.0032]	[0.0005]	[0.3527]	[0.0440]	[1]	[0.7645]
WB aid		0.0122**		-0.0038***		0.0109***		-0.0027***		0.0158***		-0.0018**
		(0.0050)		(0.0012)		(0.0040)		(0.0009)		(0.0040)		(0.0007)
bonf p-values		[0.0260]		[0.0086]		[0.0206]		[0.0169]		[0.0004]		[0.0260]
Panel B												
Moderate*post	-0.0778	-0.0676	-0.0036	-0.0065	0.1250	0.1357	-0.0384	-0.0407	0.0419	0.0561	-0.0368*	-0.0384**
	(0.1069)	(0.1080)	(0.0308)	(0.0308)	(0.0942)	(0.0931)	(0.0262)	(0.0260)	(0.0862)	(0.0860)	(0.0192)	(0.0192)
bonf p-values	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[0.6103]	[0.5505]
Strong*post	-0.1074	-0.1179	0.0109	0.0139	-0.0126	-0.0236	0.0238	0.0261	-0.0707	-0.0853	0.0071	0.0086
	(0.0789)	(0.0794)	(0.0234)	(0.0237)	(0.0751)	(0.0746)	(0.0206)	(0.0206)	(0.0681)	(0.0681)	(0.0164)	(0.0163)
bonf p-values	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]
Severe*post	-0.3338***	-0.3732***	0.0902***	0.1015***	0.0560	0.0148	0.0652***	0.0741***	-0.1594**	-0.2140***	0.0030	0.0088
	(0.0855)	(0.0855)	(0.0251)	(0.0255)	(0.0814)	(0.0807)	(0.0211)	(0.0211)	(0.0803)	(0.0802)	(0.0167)	(0.0166)
bonf p-values	[0.0009]	[0.0002]	[0.0031]	[0.0008]	[1]	[1]	[0.0143]	[0.0037]	[0.2371]	[0.0461]	[1]	[1]
WB aid		0.0116**		-0.0033***		0.0121***		-0.0026***		0.0161***		-0.0017**
		(0.0049)		(0.0012)		(0.0041)		(0.0009)		(0.0040)		(0.0008)
bonf p-values		[0.0365]		[0.0188]		[0.0141]		[0.0174]		[0.0004]		[0.0365]
Observations	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952	14,952
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: Clustered robust standard errors in parentheses. *p<0.1; **p<0.05; ***p<0.01

Table S4.16. Effects of the Earthquake on Education – Multiple Hypothesis Testing using Bonferroni adjusted p-values

	(1) Primary	(2) Primary	(3) Secondary	(4) Secondary	(5) Years	(6) Years	(7) Attendance	(8) Attendance
Panel A								
Intensity*post	-0.0025***	-0.0028***	-0.0008*	-0.0010**	-0.0034**	-0.0039**	-0.0016***	-0.0018***
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0016)	(0.0016)	(0.0002)	(0.0002)
bonf p-values	[0.0000]	[0.0000]	[0.0695]	[0.0695]	[0.0695]	[0.0694]	[0.0000]	[0.0000]
WB aid		0.0039***		0.0039*		0.0080		0.0027***
		(0.0010)		(0.0023)		(0.0056)		(0.0006)
bonf p-values		[0.0001]		[0.1711]		[0.1710]		[0.0001]
Panel B								
Moderate*post	0.0404	0.0412	0.0150	0.0182	0.2566**	0.2597**	0.0530*	0.0538*
	(0.0330)	(0.0330)	(0.0380)	(0.0378)	(0.1199)	(0.1195)	(0.0292)	(0.0293)
bonf p-values	[0.8465]	[0.8465]	[1]	[1]	[0.2393]	[0.2392]	[0.3998]	[0.3998]
Strong*post	-0.0097	-0.0150	0.0188	0.0127	0.0740	0.0606	-0.0033	-0.0066
	(0.0199)	(0.0200)	(0.0249)	(0.0250)	(0.0785)	(0.0788)	(0.0176)	(0.0176)
bonf p-values	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]
Severe*post	-0.1526***	-0.1616***	-0.0496*	-0.0577**	-0.1537	-0.1747*	-0.0947***	-0.0999***
	(0.0195)	(0.0195)	(0.0288)	(0.0287)	(0.1016)	(0.1037)	(0.0157)	(0.0157)
bonf p-values	[0.0000]	[0.0000]	[0.2562]	[0.1781]	[0.2562]	[0.2562]	[0.0000]	[0.0000]
WB aid		0.0031***		0.0038*		0.0079		0.0020***
		(0.0009)		(0.0022)		(0.0052)		(0.0006)
bonf p-values		[0.0045]		[0.1595]		[0.1595]		[0.0045]
Observations	47,673	47,673	19,225	19,225	66,898	66,898	66,898	66,898
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Age	6-14	6-14	15-18	15-18	6-18	6-18	6-18	6-18

Notes: Clustered robust standard errors in parentheses. *p<0.1; **p<0.05; ***p<0.01