No. 50   September 2, 2021

The Role of Existing Social Protection Programs in Alleviating Poverty Caused by Large-Scale Negative Shocks

Tobias Pfutze

The deep global recession induced by Covid-19 is putting at risk the gains in poverty reduction made over the past three decades. The ability of existing social protection programs to prevent a permanent increase in poverty is thus of obvious importance. Yet, research on their performance during and after large aggregate shocks is largely missing. This Brief provides evidence by examining the performance of cash transfer programs in Indonesia and the Philippines following two recent natural disasters. One of them, Typhoon Yolanda, is an extreme weather event of the kind expected to become more common as global climate change intensifies. The results presented also contribute to the broader discussion on adaption to climate change and the need to provide adequate protection mechanisms to affected populations.

Probing a Largely Unexplored Topic

One of the biggest promises of social protection programs is to help beneficiary households cope better with adverse life events. Cash transfer programs, by providing an income floor, are at least partially designed to prevent a negative transitory shock from throwing a household into permanent destitution. Such poverty traps would ensue if, for example, a household was forced to sell off productive assets or assume debt in order to meet immediate financial needs. The poverty trap could extend to the next generation if the household also had to drastically reduce food consumption or withdraw children from school to cut costs or add income earners.

Negative shocks to income and wealth can be specific to a single household or affect a large number of households simultaneously. The existing literature focuses mostly on the ability of cash transfer programs to mitigate household-level shocks. An early study (de Janvry et al. 2006) employs data from the randomized pilot of Mexico's flagship conditional cash transfer (CCT) program Progresa that also contains information on a variety of self-reported shocks at the household and village levels. It finds that the program mostly protected beneficiary households from the adverse effects of a family member's unemployment or illness on a child's school attendance. A related and more recent study (Adhvaryu et al. 2018) looks specifically at the longer-term consequences of income shocks. Using the same data source, the authors interact the randomized beneficiary status with the prevalence of a negative rainfall shock at birth. They show that while such shocks have a long-term negative effect on children's school attendance, each year under Progresa mitigated this effect by 0.1 years of schooling. Rainfall shocks, as measured by absolute negative deviations of rainfall from the mean, have also been used in a recent study on Zambia's Child Grant unconditional cash transfer program (Asfaw et al. 2017). This study finds that every millimeter in average negative monthly deviation in rainfall reduces household expenditures on food and non-food items by around 4 percent and calorie consumption by nearly 5 percent. The cash transfer offsets these effects by 70 percent to 80 percent.

Not all the empirical literature shows such unmitigated positive effects, however. One article (Gitter, Manley, and Barham 2011) studies the interaction of a drop in coffee prices for households living in coffee-producing localities and the randomized receipt of a cash transfer program and finds rather mixed effects. Concerned with early child development, it analyzes the effects of conditional cash transfer programs in Mexico, Honduras, and Nicaragua on height-for-age z-scores. The CCT is found to mitigate the coffee price shock only for Mexico. No significant effect is found for Honduras, while for Nicaragua, the CCT program actually worsens the shock's negative effect.

This Brief focuses on the performance of existing social protection policies in the context of an aggregate shock, which is a largely underexplored topic. The Brief does not consider *expansions* of existing programs in response to large-scale shocks, either vertically (by increasing benefits to beneficiaries) or horizontally (by including previously ineligible households). (While the program in the Philippines was expanded during the period under study, this was not related to the typhoon.) While this topic also needs more scholarly attention, some studies have considered it. The first such study comes from Argentina. In response to its severe economic crisis in 2002, the country's government implemented a cash transfer/workfare program aimed at families with dependents whose breadwinner had become unemployed because of the crisis. The only evaluation of the program (Galasso and Ravallion 2004) shows somewhat mixed results: While the program failed to properly target the intended beneficiaries, reaching only about one-quarter of eligible families, it succeeded in lowering the unemployment rate by 2.5 percentage points. A second study focuses on Fiji after the country was hit by Hurricane Winston in February 2016. The vertical expansion consisted of a top-up to three existing social assistance programs, worth around three months of the programs' regular payments. An impact evaluation of this intervention (Ivaschenko et al. 2020) finds that beneficiary households were 26 percent more likely to have replaced a lost dwelling, and 13 percent more likely to have repaired damaged walls at the time of the survey.

In the discussion that follows, this Brief will examine the performance of social protection programs in the context of natural disasters in two different countries: Typhoon Yolanda (known outside the Philippines as Haiyan) in the Philippines in 2013; and a 2018 earthquake and tsunami in the central part of the island of Sulawesi in Indonesia. The results fill a gap in the existing literature by providing the first estimates on the actual protection provided by social protection programs in the context of aggregate shocks.

Regional Case Studies: Philippines and Indonesia

The paucity of research on this question most probably stems from the high demands on the data necessary to produce a state-of-the-art study. One would ideally want to be able to observe the same household over time and have quasi-random assignment to the social protection program and the shock under study. While this perfect data may not exist, several second-best options are available to address this question in a convincing manner. This Brief will look at two natural disasters that occurred in two different countries in the 2010s. The first event is Typhoon Yolanda, which swept the Visayas in the Philippines and also affected some areas in Luzon and Mindanao in 2013. The second is an earthquake in Central Sulawesi in Indonesia in 2018. While the typhoon affected a large area of the country, the earthquake was a much more localized event.

In both cases the only available data are pooled cross-sections (that is, in each time period a different random sample of households can be observed). Surveys were completed shortly before and a few months or a few years after the event. To assess whether existing social protection programs helped limit the damage suffered from these events, results are presented for a triple- differenced specification. That is, the analysis compares the change in the outcome between the period before and after the natural disaster for beneficiary households in affected areas to those in all the other groups. Moreover, the analysis also accounts for average changes in outcomes in each municipality or district that are unrelated to beneficiary status or the disaster. This allows the causal effect of the program to be isolated.

Typhoon Yolanda in the Philippines, 2013

Typhoon Yolanda made land fall in Eastern Samar in the early morning of November 8, 2013. Over the course of the day it moved westward, making landfall five more times on different islands of the archipelago. According to the National Disaster Risk Reduction and Management Council (NDRRMC 2014), it affected a population of more than 16,000,000, killing 7,362 people (including 1,062 missing), and injuring a further 28,688. It destroyed 489,613 houses, and damaged a further 595,149, leading to total losses of more than US$1.8 billion.

Of interest is the role that the Philippines' flagship social protection program, Pantawid Pamilyang Pilipino Program (4Ps), played in the aftermath of the storm. The program pays households ₱500 (around US$10.40) per month as a health

benefit, plus ₱300 monthly for ten months each year for each of up to three children attending school. Beneficiaries, in turn, must comply with health and educational conditionalities to receive the benefit (for example, children must attend 85 percent of classes every month).
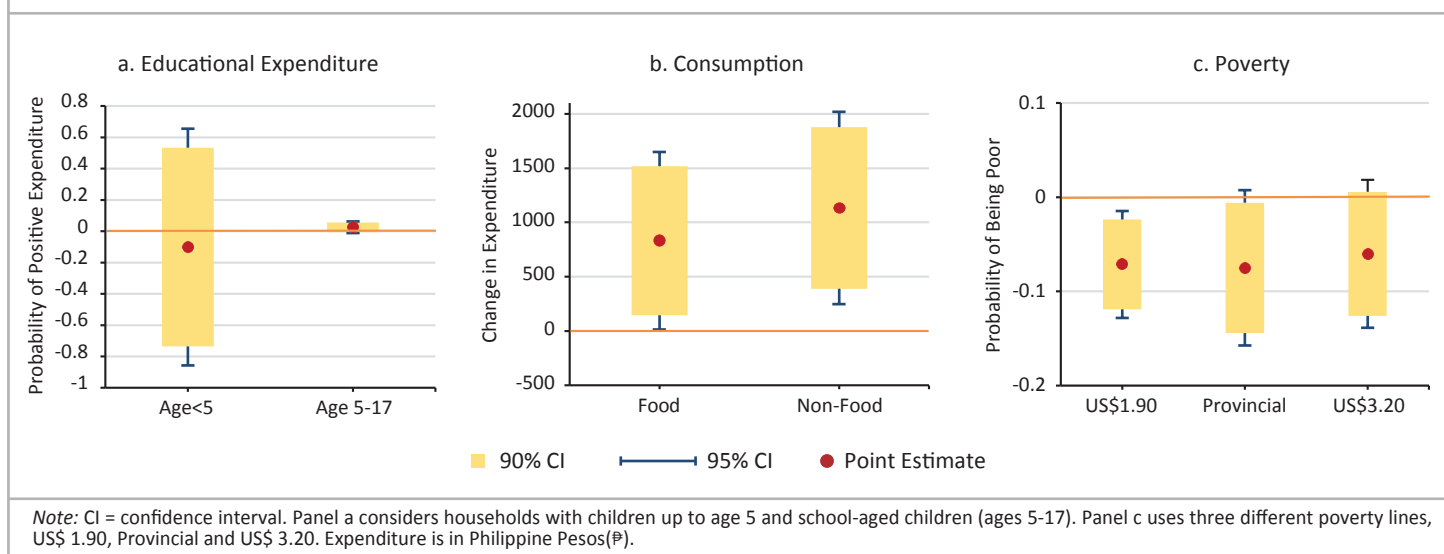
The data come from the 2012 and 2015 rounds of the Family Income and Expenditure Survey (FIES). The effects of the typhoon are thus evaluated roughly two years after the event. The data contain self-reported beneficiary status in the 4Ps. The program was expanded over the time period under study, but the data show no relation between expansion and proximity of the typhoon path. One possible minor confounding factor are top-up payments paid by the World Food Program (WFP) and UNICEF to 4Ps beneficiary households living in impacted areas in the immediate aftermath of the typhoon. WPF made two top-up payments of ₱1,300. UNICEF restricted its activity to 4Ps households in the five worst affected provinces of Eastern Samar (Bowen 2015).

Exposure to Typhoon Yolanda is coded as a binary variable equal to one if the municipality lies with a 100 km band on either side of the typhoon's path. The control group consists of households living in a band 100 km to 200 km from the path. The sample is limited to households with at least one member under the age of 18 (one eligibility criterium) and less than an estimated ₱50,000 in per capita income. While beneficiary households should be poor, targeting was far from perfect, as Acosta, Avalos, and Zapanta (2019) show.

The data do not contain direct information on school attendance. As a substitute, a binary variable equal to one if the household reports any educational expenditures was created. The rationale behind this variable is that every household with children who attend school must have at least some such minimal expenditure. Results are presented for households with children under the age of 5 and with school-aged children (5- to 17-year-olds). The other sets of dependent variables are per capita food and non-food expenditures, and poverty status. For the latter, results are presented for the internal poverty line applicable to the households (each province has its respective rural and urban poverty line), and the international daily purchasing power parity lines at US$1.90 and US$3.20 per capita.

Figure 1 shows the point estimates of the impact of the program, plus the confidence intervals (CI) within which the effect is estimated to fall with 90 percent and 95 percent probability. If an interval does not cross the zero-effect horizontal line, the probability that the true effect is equal to zero is less than 10 percent or 5 percent, respectively. That is, one can conclude that the estimated effect is real and not random. Panel a shows the results on school attendance: that is, for the binary outcome that a household reports any educational expenditures. The sample is divided into households with only pre-school aged children, and those with children of school age. The latter are expected to have educational expenses, whereas the former do not. For households with only pre-school aged children, the estimated

Figure 1. While the impact of the program on educational expenditure for households affected by the typhoon is unclear, it increased food and non-food consumption and reduced overall poverty

Note: CI = confidence interval. Panel a considers households with children up to age 5 and school-aged children (ages 5-17). Panel c uses three different poverty lines, US$ 1.90, Provincial and US$ 3.20. Expenditure is in Philippine Pesos(₱).

effect is slightly negative, but no assessment can be made given the large range of possible values. Households with school-aged children are more likely to have positive expenditures, but there still is probability of more than 10 percent that the true effect is equal to zero.

For changes in consumption expenditures, depicted in panel b, both point estimates are positive and there is a less than 5 percent probability that the true effect is zero. Food consumption is increased by an estimated ₱831 and non-food consumption by ₱1,134 as a result of the 4Ps program for households affected by the typhoon.

This leads to the question of how the increased consumption affects poverty status. All the provincial urban/rural poverty lines lie between the US$1.90 and US$3.20 ones. As panel c shows, the impact on poverty is negative throughout (that is, the program reduces poverty), but the effect is more pronounced for the poorest households (those at the lower poverty lines). At the US$1.90 line, the probability of being poor is estimated 7.14 percentage points lower for affected households who benefit from the program and the probability of the true effect being equal to zero is much less than 5 percent. This effect is not much different at the provincial line and the US$3.20 poverty line: 7.5 percentage points and 6.02 percentage points, respectively. However, these estimates are much less precise. For the provincial poverty line, the probability that the true effect is zero is more than 5 percent. For the US$3.20 line, it is more than 10 percent.

The Sulawesi Earthquake and Tsunami, 2018

On September 28, 2018, a 7.5 earthquake struck Indonesia with an epicenter 80 km north of the city of Palu, followed by a tsunami and earth liquefaction, caused major damage in three districts: the city of Palu, Donggala, and Sigi. According to some estimates, the event has caused a total of 4,340 deaths (plus 667 missing persons), 10,679 injuries, and US$1.5 billion in damages, including the destruction of 3,673 houses and damage to a further 39,191.
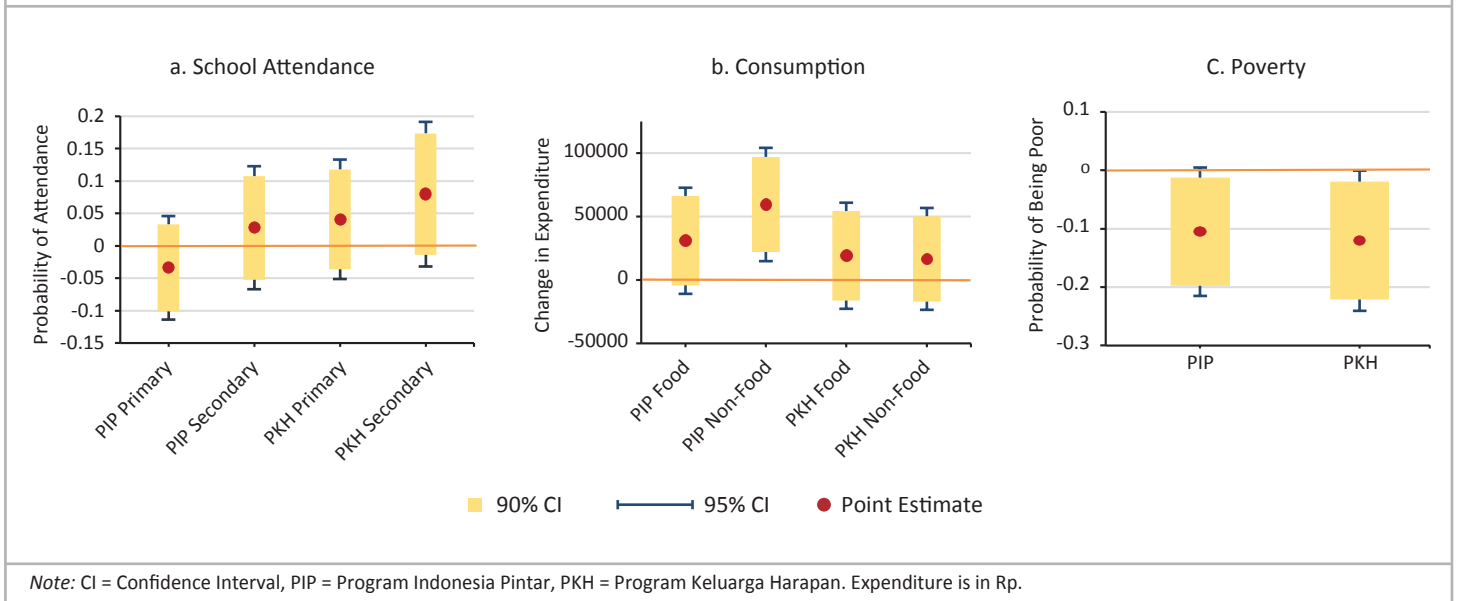
The data employed in the analysis below come from the 2018 and 2019 rounds of Indonesia's National Socio-Economic Survey (SUSENAS). They were collected in March of each year, roughly six months before and after the earthquake, and constitute independently drawn cross-sections. The triple-differences compare changes in the geographical dimension between districts that were severely and only mildly affected, and a comparison group comprising the three neighboring districts of Poso, Toli-Toli, and Parigi Moutong.

Two cash transfer programs are of interest: The first is Program Indonesia Pintar (PIP) which provides direct monetary transfers to poor students to lower their net costs of access to education. The second, Program Keluarga Harapan (PKH), pays benefits for up to nine years to households with minor children if certain educational and health conditionalities are met. Given the nature of the two programs, the sample is naturally restricted to households with at least one child under the age of 18. High-income households are excluded by restricting the sample to those with total per capita expenditures of less than Rp1.5m (around US$106.50). The three outcomes studied align with the previous analysis. School attendance here is directly observed. The change in average beneficiary status between the two areas is very similar for PKH, but slightly different for PIP. This may make the PIP-related estimates somewhat less reliable.

The results for the Sulawesi earthquake are qualitatively similar to those for Typhoon Yolanda, but slightly less precise. This is likely a consequence of the smaller sample size and the lower proportion of program beneficiary households. Starting with school attendance in figure 2, no statistically significant results can be found, implying that the damage suffered in the earthquake did not force children out of school to work.

For consumption, panel b paints a similar picture to the one found in the Philippines for PIP, but no results for PKH. While all point estimates are positive, the ones corresponding to PIP are larger in magnitude. For non-food consumption, the probability that the true effect is zero is much less than 5 percent. The

Figure 2. The programs had no significant impact on school attendance. One program helped families with food and particularly non-food consumption. Both programs helped reduce poverty.

Note: CI = Confidence Interval, PIP = Program Indonesia Pintar, PKH = Program Keluarga Harapan. Expenditure is in Rp.

average effect of PIP on non-food expenditures in affected areas is estimated at Rp59,538. That said, the results for the two programs are more similar when it comes to their effects on poverty, as can be seen in panel c. Despite PIP's strong effect on non-food consumption, there is a more than 10 percent probability that its true effect is equal to zero. For PKH, this probability is less than 5 percent. The point estimates are similar for both: In the absence of the social protection programs a significant proportion of beneficiary households (10.5 percent for PIP, and 12 percent for PKH) would have found themselves below the poverty in the aftermath of the earthquake.

Interpretation of Results and Conclusions

The two empirical case studies on Typhoon Yolanda in 2013 and the Sulawesi earthquake in 2018 provide several insights. Most importantly, both analyses show statistically and economically significant effects of cash transfers on poverty status. In the absence of the programs under study, 6 percent to 10 percent of beneficiary households affected by Typhoon Yolanda would have fallen underneath one of the three poverty lines studied. For households affected by the Sulawesi earthquake, 10 percent to 12 percent of PIP or PKH beneficiaries would have become poor.

Consumption and poverty are of course intrinsically linked, with the latter being an indicator of the former falling below a pre-established threshold. A second result that is consistent across both cases is the larger effect on non-food consumption relative to food consumption. This seems plausible, given that households faced with a negative shock will draw down non-food consumption much more than food consumption. That is, the demand for food can safely be assumed to be much more inelastic than for other goods. If social protection programs do their job and effectively protect against that shock, the effect would be expected to show up mostly on the non-food side. Taken together, these results strongly suggest that the cash transfer programs examined do provide some protection against aggregate shocks to income.

The evidence on school attendance is very weak. It must be kept in mind that the posited causal chain on school attendance arises from the need for children to work to support the household or the inability to support school fees or other related expenses. But no strong effect could be detected either for the Philippines, where no direct school fees exist, or for Indonesia, where attendance was directly observable and school fees do exist. This result is especially noteworthy for PIP, which is explicitly designed to help households with school fees. It underscores the need for careful design and evaluation of social protection programs.

References

Acosta, P., J. Avalos, and A. Zapanta. 2019. "Pantawid Pamilya 2017 Assessment: An Update of the Philippine Conditional Cash Transfer's Implementation Performance." World Bank Social Protection Policy Note No. 18. World Bank, Washington, DC.

Adhvaryu, A., A. Nystadham, T. Molina, and J. Tamayo. 2018. "Helping Children Catch Up: Early Life Shocks and the Progresa Experiment." NBER Working Paper 24848, National Bureau of Economic Research, Cambridge, MA.

Asfaw, S., A. Carraro, B. Davis, S. Handa, and D. Seidenfeld. 2017. "Cash Transfer Programmes, Weather Shocks and Household Welfare: Evidence from a Randomised Experiment in Zambia." Journal of Development Effectiveness 9 (4): 419–42.

Bowen, T. 2015. "Social Protection and Disaster Risk Management in the Philippines: The Case of Typhoon Yolanda (Haiyan)." World Bank.

De Janvry, A., F. Finan, E. Sadoulet, and R. Vakis. 2006. "Can Conditional Cash Transfer Programs Serve as Safety Nets in Keeping Children at School and from Working when Exposed to Shocks?" Journal of Development Economics 79 (2): 349–73.

Galasso, E., and M. Ravallion. 2004. "Social Protection in a Crisis: Argentina's Plan Jefes y Jefas." The World Bank Economic Review 18 (3): 367–99.

Gitter, S. R., J. Manley, and B. L. Barham. 2011. "The Coffee Crisis, Early Childhood Development, and Conditional Cash Transfers."

Ivaschenko, O., J. Doyle, J. Kim, J. Sibley, and Z. Majoka. 2020. "Does 'Manna from Heaven' Help? The Role of Cash Transfers in Disaster Recovery—Lessons from Fiji after Tropical Cyclone Winston." Disasters 44 (3): 455–76.

NDRRMC (National Disaster Risk Reduction and Management Council). 2014. "NDRRMC Update: Final Report re Effects of Typhoon 'Yolanda' (Haiyan)."