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Targeting 'highly vulnerable' households during strict lockdowns

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In this brief article, we attempt to quantify the number of households in the country which are 'highly vulnerable' to hunger and poverty due to sudden and highly restrictive lockdowns, such as the enhanced community quarantine, and other social distancing measures, as well as estimate the budget that will be needed to address their vulnerability. 'Highly vulnerable' households are defined in this study as those unlikely to have incomes during strict lockdown periods because of the employment characteristics of their employed members and which likely have little or no savings to tide them over. Using nationally-representative household data, we define a job loss index to identify the employment characteristics that are most sensitive to the lockdown measures, and given these employment characteristics, identify the 'highly vulnerable' households. Depending on the pre-lockdown income threshold eligibility used, we estimate the number of 'highly vulnerable' households in the country at anywhere from 7.4 million to 11.3 million. At ₱5,000 per 'highly vulnerable' household, the estimated costs amount to ₱36.9 billion to ₱56.5 billion, again depending on the income threshold used. We also propose a way for the government to operationalize the process of identifying and helping 'highly vulnerable' households.

JEL classification: I32, I38; H53
Keywords: social protection, vulnerable households, poverty, targeting, COVID-19, lockdown

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1. Introduction

Most countries in the world have implemented some form of strict movement restrictions or hard lockdowns as a means to control the spread of COVID-19. In the Philippines, the strictest form of movement restriction has been termed the enhanced community quarantine or ECQ.[1] The ECQ was imposed in Metro Manila, initially on March 16, 2020, but this was soon expanded to the whole of Luzon from March 17 to May 15, 2020. This was further extended in Metro Manila, CALABARZON, most of Central Luzon, and a few more high-risk provinces up to May 30, 2020.

Afterwards, ECQs were implemented selectively in parts of the country whenever the surge in cases threatened the viability of the healthcare system, including in Metro Manila and nearby provinces at the end of March 2021 up to mid-April. In between, laxer forms of lockdowns or community quarantines were put in place.

ECQs, although likely necessary to slow down the spread of COVID-19, have resulted in much hardship for those whose livelihoods were affected by the mobility restrictions (Meo et al. [2020]; UN [2020]). ECQs have underscored the grave vulnerability of individuals and households in highly affected economic sectors, especially those reliant on so-called non-standard forms of employment and with little or no access to social protection. According to the Social Weather Stations, for example, the incidence of hunger in the country nearly doubled from the pre-pandemic period (8.8 percent in December 2019) to the ECQ period (16.7 percent in May 2020). The increase in hunger incidence was especially high in Metro Manila (7.3 percent to 19.4 percent), where movement restrictions were most strictly implemented [SWS 2020].

As a stop-gap response to provide quick relief to households adversely affected by the harsh lockdown measures, the government, through the Social Amelioration Program (SAP) of the Department of Social Welfare and Development (DSWD) in the Bayanihan to Heal as One Act of 2020 (Republic Act No. 11469), allotted around ₱200 billion for 18 million households (75 percent of the total number of households).[2] Each household was allocated ₱5,000 to ₱8,000 per month for two months, depending on the prevailing minimum wage in the locality. While SAP was supposed to be implemented in April and May 2020, there were significant delays, as well as some duplications and other issues, in the delivery of cash transfers to households that were not in the DSWD's conditional cash transfer program due to the lack of comprehensive household registry [Cho et al. 2020]. Given the government's limited budget constraint, a mechanism for targeting the most vulnerable households – who tend

[1] See https://www.officialgazette.gov.ph/downloads/2021/03mar/20210328-OMNIBUS-Guidelines-RRD.pdf for a typology of the various kinds of lockdowns imposed in the Philippines.

[2] See https://www.dbm.gov.ph/index.php/secretary-s-corner/press-releases/list-of-press-releases/1647-dbm-releases-p199-975-billion-for-dswd-social-amelioration-program.

to be the more disproportionately adversely affected by lockdown measures – is thus needed for any future similar eventualities.

This article is an attempt to do the following: first, to quantify the number of 'highly vulnerable' households due to the pandemic and lockdown, and who are likely to need financial assistance, whether from the government (national or local), the private sector, or civic organizations; second, to estimate the amount of money that will be needed to address this vulnerability; and third, to propose a methodology for operationalizing the targeting of 'highly vulnerable' households.[3]

2. Data

For the analysis, we use the various nationally-representative household surveys of the Philippine Statistics Authority (PSA), especially the Labor Force Surveys (LFS), both pre-pandemic and during the pandemic. The LFS, which is considered to be representative up to the regional level, is conducted quarterly in the Philippines in the months of January, April, July, and October, and is the official source of official employment statistics in the country.[4]

The timing of the conduct of the LFS, which was continued through the various community quarantines, means that employment data was collected during the period of strict lockdown in April 2020. By comparing employment data before the pandemic (January 2020 and prior) and during the ECQ and even post-ECQ, it is possible to identify types of 'vulnerable' employment or those that were more likely to be lost due to the ECQ and the pandemic in general.

For the subsequent analysis, we use mainly the April 2019, July 2019, January 2020, April 2020, and July 2020 LFS. In Table 1, we present some summary information on these various LFS.

As supplementary source of information, we also use the merged LFS and Family Income and Expenditure Survey (FIES) of 2015-2016 to obtain information that is used to categorize households and workers by income group.

[3] We acknowledge that the observed effects on employment are a result of a combination of the lockdown measures, the rather voluntary social distancing measures undertaken by individual members of households and the mitigating effects of other government responses, such as wage subsidies and other support to businesses. However, as will be apparent later on, the lockdown measures at their height took a predominant role in explaining the adverse effects on employment.

[4] Beginning February 2021, in order to monitor the impact of the pandemic on employment, the PSA is also conducting a monthly LFS in the months when there is no quarterly LFS. The sample size is smaller, however, and is mainly to generate national-level estimates. See https://psa.gov.ph/content/psa-approves-conduct-2021-updating-list-establishments-ule-0

TABLE 1. Sample statistics

	Apr-19	Jul-19	Jan-20	Apr-20	Jul-20
Total no. of households	40,310	39,371	41,351	41,558	41,839
Total no. of individuals	172,284	175,438	178,140	176,469	176,355
Total no. of employed individuals	68,274	69,545	71,073	56,830	68,853
Total no. individuals in paid employment*	63,672	64,724	66,243	52,553	62,938
Average no. in paid employment per household	1.6	1.6	1.6	1.3	1.5

*Paid employment excludes unpaid family workers.
Sources of data: Authors' notes.

3. Defining 'highly vulnerable' households

The vulnerability we are considering is the vulnerability of certain households to hunger and poverty, stemming from their inability to earn income due to restrictions on activity from the ECQ (and stemming from the pandemic more broadly) and the characteristics of their members' jobs.

Although all households share in the difficulties that come with strict lockdowns, some households are much more vulnerable than others. Here we define a 'highly vulnerable' household in a very specific way. A 'highly vulnerable' household is one which (1) belongs to a low-income group, where low-income is defined in terms of a household total or per capita income threshold, and (2) does not have or is not likely to have (in the case of a forward-looking identification) at least one member in paid employment during a strict lockdown. A household member is in paid employment if he or she is in any of the following types of employment: paid job in government or the private sector (including private households and family-owned business); self-employment either as an employer or an own-account worker; and overseas employment.

The reason for considering households instead of individuals in the giving of assistance is that a household can have multiple employed members. Although the loss of job by any one member increases the hardship of a household, having at least one other member with a paid job provides some insulation from distress. The reason for considering only low-income households in terms of per capita income is two-fold: first these households are likely to have little if any savings to tide them over during a lockdown; and second, the combination of limited fiscal space, especially with reduced tax intake during the pandemic, and uncertainty about the length of the lockdown and the economic malaise that accompanies a lockdown, suggests household targeting is necessary.

Figures 1a and 1b show the estimated number and the estimated share of households with no member in paid employment from April 2019 to July 2020, as

calculated from the various LFS in the period. The first thing to note is that even in regular times, or before the pandemic, a subset of households numbering about two million nationally or about nine percent of all households, already reported not having any member in paid employment, as can be seen from the black bar up to January 2020. Most of these are households reliant on pensions, domestic or foreign transfers from non-household members, as well as investment dividends.

But during the ECQ, this number jumped to five million households or 21 percent of all households, or an increase of about three million households (or 150 percent). By July 2020, when the lockdowns were eased, the number of households with no member in paid employment declined to 2.6 million, which was still 22 percent higher compared to the pre-pandemic level of 2.1 million (January 2020). This does not even take into account the decline in the quality of employment post pandemic, as evidenced, for instance, by the rise in underemployment rate from 14.8 percent in January 2020 to 18.9 percent in April 2020, and at 17.3 percent in July 2020.

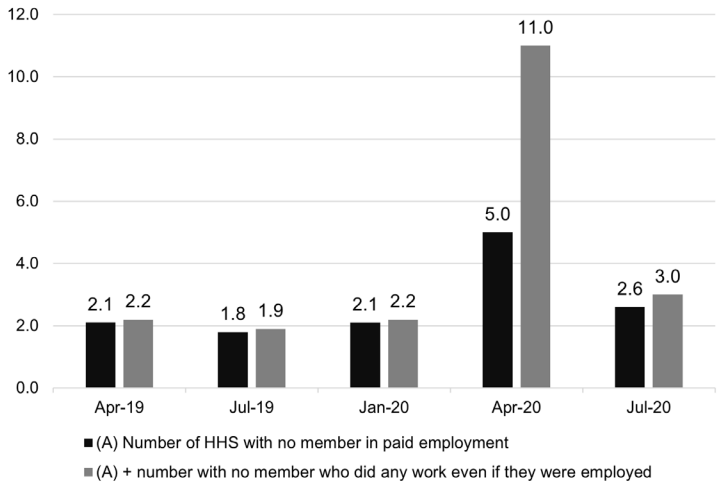
Moreover, if one also considers among those with no paid employment, those who reported not being able to do any work during the ECQ even if they reported having a job, the number of households with no member in paid employment shoots up to 11 million (450 percent higher than pre-pandemic level).[5] Of course, some of these workers, especially those in regular and white collar jobs, might have received salaries even if they did not do any work during the period, and so the 11 million is likely an overestimate of households with no paid employment.

Figures 1a and 1b identify 'highly vulnerable' households after the fact, or after the ECQ has been imposed and workers have already lost their jobs. In practice, this poses difficulties as this requires conducting data collection via household enumeration during an ECQ, when data collection is difficult to do because of social distancing and limits on transportation. This will likely mean a delay in the identification of the 'highly vulnerable' households and a delay in the distribution of much-needed aid.

An alternative is to have a forward-looking system of identifying 'highly vulnerable' households by tagging those households whose employed members are in paying jobs with a high chance of being lost during a hard lockdown. We show how this could be done in the next section.

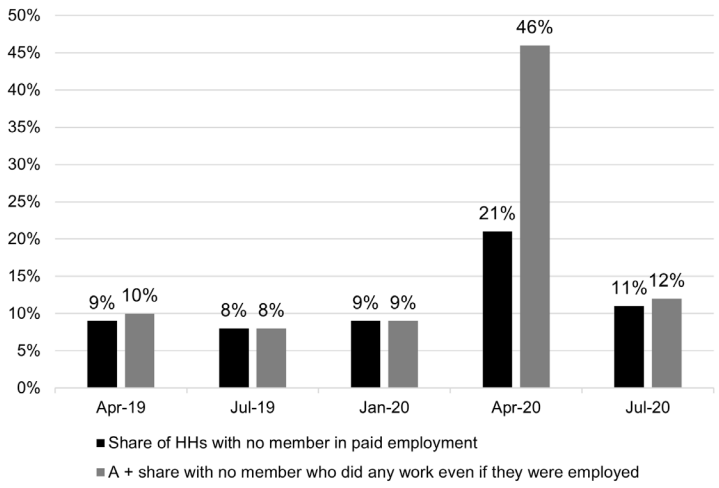
[5] This is the grey bar in Figure 1.

FIGURE 1a. Number of households with no member in paid employment (in millions)



Source: Authors' computations based on LFS.

FIGURE 1b. Share of households with no member in paid employment



Source: Authors' computations based on LFS.

4. Identifying vulnerable employment

While the job losses during the ECQ cut across different classes of workers, economic sectors, and occupations, some groups were more heavily affected than others. Here, we identify the characteristics of paid employment that were more likely to be lost during the ECQ.[6]

4.1. Class of worker

We first look at the levels of paid employment by class of worker for the periods April 2019, January 2020, and April 2020. The January 2020 LFS is the last one before the pandemic and the lockdown. The April 2019 LFS figures are included to allow for year-on-year comparison.

Table 2a shows the largest decline in paid employment from January 2020 to April 2020 was among employers (-39 percent) and *employees in private establishments* (-26 percent).[7] Among the self-employed, it is notable that the decline varies widely between the *self-employed in the agriculture sector* (basically unchanged) and the *self-employed in the non-agriculture sector* (-21 percent).

In terms of the contribution to total loss in paid employment, by far the biggest shares are by *employees in private establishments* (69 percent of total loss) and the *self-employed in the non-agriculture sector* (17 percent).

Because a subgroup may have a big contribution to total job loss simply because it is a big subgroup, we also compute what we labeled the job loss index (JLI). The JLI is simply the ratio of the *contribution to total decline in paid employment during the lockdown to the share to total paid employment pre-lockdown*. A JLI greater than one for a subgroup means the subgroup experienced a disproportionately large loss in paid employment during the lockdown. A JLI less than one means the subgroup experienced a disproportionately small loss in paid employment during the lockdown. And a JLI equal to one means the subgroup experienced a loss in paid employment that is proportional to its size. The two subgroups with the highest JLIs are *employers* (1.9) and *employees in private establishments* (1.3).

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[6] Some of the changes from quarter to quarter could of course be expected to be frictional, as some workers shift jobs even without a pandemic or lockdown. The study is not able to distinguish these frictional changes from the changes due to the pandemic or lockdown. But based on historical data, this could be expected to be a small fraction of the changes that occurred in the pre- to post-lockdown period.

[7] A year-on-year comparison can take into account possible seasonality in the pattern of paid employment. There are two disadvantages, however, (1) it is not able to take into account possible structural changes that may have occurred between April 2019 and April 2020, and (2) the weights in the April 2019 LFS were based on population projections from the 2010 Population Census, whereas the weights in the April 2020 LFS were based on the 2015 Population Census, which complicates direct comparisons of the magnitudes between the two surveys. Note, however, that the results will be almost identical if comparisons were made between the April 2019 and April 2020 LFS as shown in Annex Tables 2a to 2d. The main differences are that in the year-on-year comparisons, *financial and insurance activities and real estate activities* do not anymore fall among the highly vulnerable employment sectors, and *clerical support workers*, *service and sales workers*, and *elementary occupations*, would not be classified among the highly vulnerable occupations, which are replaced by *technicians and associates*.

We identify subgroups with JLI greater than one, regardless of the contribution to total decline in paid employment as among those in vulnerable employment. But we also include subgroups with only a proportional share in paid job loss (JLI equal to 1) but which contribute substantially to total paid job loss (arbitrarily set to be at least ten percent). Using these criteria, the subgroups based on class of worker that can be considered vulnerable employment are these three subgroups: employees in private establishments; the self-employed in non-agriculture; and employers.

TABLE 2a. Paid jobs and paid jobs lost during the ECQ by class of worker (in millions)

Class of worker	Apr-19	Jan-20	Apr-20	% change from January 2020 to April 2020	(A) Contribution to total decline in paid employment (January 2020 to April 2020)	(B) Share in total employ-ment in January 2020	Job loss index: (A)/(B)
Employee in private household	1.8	1.9	1.6	-16%	4%	5%	0.8
Employee in private establishment	21.0	21.9	16.2	-26%	69%	55%	1.3
Employee in government/ government corporation	3.9	3.9	3.5	-10%	5%	10%	0.5
Self-employed in non-agriculture sector	7.2	6.7	5.2	-21%	17%	17%	1.0
Self-employed in agriculture sector	4.5	4.5	4.5	0%	0%	11%	0.0
Employer	1.1	1.0	0.6	-39%	5%	3%	1.9
With pay worker in family-owned business	0.11	0.12	0.10	-16%	0.2%	0.3%	0.8
Total	39.56	39.89	31.70	-21%	100%	100%	

Sources of data: Authors' computations using the PSA's various labor force surveys.

4.2. Sector of employment

Meanwhile, by sector of employment, large employment declines were observed in *Arts* (-50 percent), *Accommodation and food service* (-37 percent), *Electricity, gas, steam, and air conditioning supply* (-36 percent), *Construction* (-30 percent), *Financial and insurance activities* (-30 percent), *Information and communication* (-27 percent), *Manufacturing* (-25 percent), *Transportation and storage* (-24 percent), *Wholesale and retail trade* (-24 percent), and *Real estate activities* (-22 percent), as shown in Table 2b. Note that most of these sectors entail work that either are difficult to do from home, such as *Transportation*, *Construction*, *Retail trade*, *Manufacturing*, and *Arts*, or are highly sensitive to the general level of economic activity, which is also highly affected by a lockdown, such as *Electricity*, *Financial activities*, and *Real Estate*.

In terms of the contribution to total loss in paid employment, the biggest shares are by *Wholesale and retail trade* (22 percent of total loss), *Construction* (15 percent), *Manufacturing* (11 percent), and *Transportation* (10 percent), and even *Agriculture* (10 percent).

The sectors that have JLI greater than one, ordered in terms of decreasing contribution to total paid job loss are the following: *Wholesale and retail trade*, *Construction*; *Manufacturing*; *Transportation and storage*; *Accommodation and food services*; *Financial activities*; *Arts*; *Electricity*; *Information*; and *Real estate*. In the absence of any other sector that has a contribution to paid job loss which is at least 10 percent and a JLI equal to one, these are the same subgroups that are considered vulnerable sectors of employment.

TABLE 2b. Paid jobs and paid jobs lost during the ECQ by sector of employment (in millions)

Class of worker	Apr-19	Jan-20	Apr-20	% change from January 2020 to April 2020	(A) Contribution to total decline in paid employment (January 2020 to April 2020)	(B) Share in total employment in January 2020	Job loss index: (A)/(B)
Agriculture, forestry and fishing	7.9	8.2	7.4	-10%	10%	21%	0.5
Mining and quarrying	0.2	0.2	0.2	-17%	0.4%	0.5%	0.8
Manufacturing	3.4	3.5	2.6	-25%	11%	9%	1.2
Electricity, gas, steam and air conditioning supply	0.2	0.2	0.1	-36%	1%	0%	1.7
Construction	4.2	4.0	2.8	-30%	15%	10%	1.5
Wholesale and retail trade, repair of motor vehicles and motorcycles	7.6	7.7	5.8	-24%	22%	19%	1.2

TABLE 2b. Paid jobs and paid jobs lost during the ECQ by sector of employment (continued)

Transportation and storage	3.5	3.4	2.6	-24%	10%	9%	1.2
Accommodation and food service activities	1.8	1.9	1.2	-37%	8%	5%	1.8
Information and communication	0.4	0.4	0.3	-27%	1%	1%	1.3
Financial and insurance activities	0.5	0.6	0.4	-30%	2%	2%	1.4
Real estate activities	0.2	0.2	0.2	-22%	1%	1%	1.1
Professional, scientific and technical activities	0.3	0.3	0.2	-13%	0%	1%	0.6
Administrative and support service activities	1.7	1.7	1.5	-10%	2%	4%	0.5
Public administration and defense, compulsory social security	2.8	2.8	2.5	-11%	4%	7%	0.5
Education	1.2	1.3	1.1	-15%	3%	3%	0.7
Human, health, and social work activities	0.6	0.6	0.5	-18%	1%	1%	0.9
Arts, entertainment and recreation	0.4	0.4	0.2	-50%	2%	1%	2.4
Other activities	2.6	2.7	2.1	-20%	7%	7%	1.0
Total	39.56	39.89	31.70	-21%	100%	100%	

Sources of data: Authors' computations using the PSA's various labor force surveys.

4.3. Occupation

By broad occupational groups, substantial declines were recorded among *Crafts and related workers* (-34 percent), *Service and sales workers* (-25 percent), *Plant and machine operators* (-24 percent), and *Clerical support workers* (-24 percent), as shown in Table 2c.[8] The first three occupational subgroups contain jobs that for the most part are not suitable for work-from-home as they either require the use of equipment at the place of work or need access to the goods they are selling at their place of work. Clerical support workers might have been highly affected because many are employed in short-term contracts or work arrangements and could easily be laid-off if no work is needed or can be done.

[8] We exclude *Armed forces occupations* even if the calculated decline was high because of the very small sample size and the possibility that the observed change is simply due to sampling error. In fact, the estimate of those in *Armed forces occupations* has been volatile based on previous LFS. A priori, there is also no reason why *Armed forces occupations*, which would be mainly if not entirely a government job, would be greatly affected by lockdowns.

In terms of the contribution to total loss in paid employment, the biggest shares are by *Service and sales workers* (24 percent of total loss), *Elementary occupations* (24 percent), *Crafts and related workers* (13 percent), *Plant and machine operators* (10 percent), and *Managers* (10 percent).

The occupational groups that have JLI greater than one, ordered in terms of decreasing contribution to total paid job loss are the following: *Service and sales workers*; *Crafts and related workers*; *Plant and machine operators*; and *Clerical support workers*. Additionally, those in *Elementary Occupations* and *Managers* have contribution to paid job loss which is at least 10 percent and a JLI equal to one. Based on the criteria described above, these six subgroups are considered vulnerable occupation groups.

4.4. Basis of payment

By basis of payment (which applies only to workers who are employees), there was a large decline in paid employment among those *paid per day*, *per hour*, or *per piece* (-27 percent), as shown in Table 2d. The same subgroup also has a disproportionately large contribution to total loss in paid employment (56 percent), and is the only subgroup with JLI greater than one. This means that based on basis of payment, the subgroup paid *per day*, *per hour*, or *per piece* is considered vulnerable employment based on occupation.

To summarize, vulnerable employment is characterized by the following: by class of worker, those who are employees in private establishments, those who are employees in the non-agricultural sector, and those who are employers; by sector of employment, those who are in *Wholesale and retail trade*, *Construction*, *Manufacturing*; *Transportation and storage*, *Accommodation and food services*, *Financial activities*, *Arts*, *Electricity*, *Information*, and *Real estate*; by occupation, those who work as *Service and sales workers*, *Crafts and related workers*, *Plant and machine operators*, *Clerical support workers*, those in *Elementary Occupations*, or *Managers*; and by basis of payment for those who are employees, those who are *paid per day*, *per hour*, or *per piece*.[9]

Operationally, we employ the following definition for vulnerable employment:

- Those who are private sector employees, self-employed in non-agriculture, or employers, who are in one of the vulnerable sectors or in one of the vulnerable occupations identified using the JLI; and
- Those who are *paid per day*, *per hour*, or *per piece*, regardless of sector of employment or occupation.

[9] Though we analyzed the characteristics of paid employment only at the national level, the same methodology can also be applied at different levels of disaggregation, including at the regional level. It is possible that the characteristics of vulnerable employment will differ somewhat across regions. We do not show the regional differences here because the tables will be too numerous, but to illustrate this point, Annex Table 2d shows the sectors identified as having vulnerable employment, applying the same methodology used above, when the data is disaggregated by island groupings (with Luzon divided into 2): NCR; Other Luzon; Visayas; and Mindanao. Note that there are some differences in the identified sectors across island groups.

TABLE 2c. Paid jobs and paid jobs lost during the ECQ by occupation

Class of worker	Apr-19	Jan-20	Apr-20	% change from January 2020 to April 2020	(A) Contribution to total decline in paid employment (January 2020 to April 2020)	(B) Share in total employment in January 2020	Job loss index: (A)/(B)
Managers	4.6	4.0	3.1	-21%	10%	10%	1.0
Professionals	2.3	2.5	2.0	-20%	6%	6%	1.0
Technicians and associate professionals	1.8	1.6	1.3	-18%	3%	4%	0.9
Clerical support workers	2.5	2.8	2.2	-24%	8%	7%	1.1
Service and sales workers	7.3	7.8	5.9	-25%	24%	20%	1.2
Skilled agricultural, forestry and fishery workers	5.0	4.9	4.8	-2%	1%	12%	0.1
Craft and related trades workers	3.4	3.2	2.1	-34%	13%	8%	1.6
Plant and machine operators and assemblers	3.4	3.4	2.6	-24%	10%	9%	1.2
Elementary occupations	9.2	9.6	7.6	-20%	24%	24%	1.0
Armed forces occupations	0.09	0.102	0.073	-28%	0.4%	0.3%	1.4
Total	39.56	39.89	31.70	-21%	100%	100%	

Sources of data: Authors' computations using the PSA's various labor force surveys.

TABLE 2d. Paid jobs and paid jobs lost during the ECQ by basis of payment

Basis of employment	Apr-19	Jan-20	Apr-20	% change from January 2020 to April 2020	(A) Contribution to total decline in paid employment (January 2020 to April 2020)	(B) Share in total employment in January 2020	Job loss index: (A)/(B)
Monthly	10.5	10.7	8.6	-20%	33%	39%	0.9
Per day, per hour, per piece	12.3	13.0	9.5	-27%	56%	47%	1.2
Other (in kind, commission, other)	3.9	4.0	3.3	-18%	11%	14%	0.8
Total	26.75	27.76	21.37	-23%	100%	100%	

Sources of data: Authors' computations using the PSA's various labor force surveys.

For purposes of succeeding discussions, we define 'vulnerable households' as households where all the paid employed members are in vulnerable employment due to the pandemic and lockdown measures, as characterized above. The 'highly vulnerable' households, meanwhile, are low-income 'vulnerable households'. In the next section we estimate the number of vulnerable households and 'highly vulnerable' households and estimate how much it will cost per month of ECQ to support them.

There have been other attempts in the past to define 'highly vulnerable' households. Our definition differs from these previous definitions in its specific focus on the impact of the pandemic and lockdowns on their vulnerability. Albert and Vizmanos [2018], for example, defines a vulnerability to poverty index which is constructed using the merged 2015 LFS-FIES, taking into account household characteristics, particularly those that are relevant to identifying poor households, demographic and regional characteristics, exposure to severe price and weather (storm) shocks. Accordingly, their vulnerability index places workers in the agricultural and fishery sector, namely, fishermen and farmers as belonging to highly vulnerable sectors; while urban dwellers, whose nature of employment and thus livelihoods are less susceptible to the usual adverse supply shocks, are less vulnerable to falling into poverty than rural workers. In this pandemic, however, the reverse is true: the agriculture, forestry and fishery sector belong to what are regarded as low-risk sectors, which are sectors considered essential and not as sensitive to social distancing measures; while urban workers were more affected due to the stricter lockdown measures implemented in more densely populated areas [ILO 2020].

5. Estimate of 'highly vulnerable' households and budget needed to support them during ECQ

Applying the operational definition of vulnerable employment to the January 2020 LFS, we estimate the number of 'highly vulnerable' households based on different per capita income thresholds. The January 2020 LFS itself, however, does not contain household income information. To estimate the share of vulnerable households belonging to different income thresholds, we use instead the merged 2015-2016 LFS-FIES data and simply assume that the per capita income threshold shares of vulnerable households that were obtained for that dataset are still applicable to the January 2020 LFS.[10]

Table 3 contains the estimated number of 'highly vulnerable' households using different per capita income thresholds by region.[11] Based on a threshold equal to

[10] At the time of writing this report, the PSA's merged 2018-2019 FIES-LFS microdata was not yet available.

[11] The thresholds that were chosen were illustrative. Other possible per capita income thresholds that can be used are the regional or even provincial total (or food) poverty lines generated by the PSA. Based on the 2018 poverty statistics issued by the PSA, 12 percent of households in the country were poor. This would appear to be very low thresholds, however, as even many normally non-poor households, when subjected to sudden unemployment of members due to the ECQ, could very easily fall into poverty. Based on the 2018, for example, even a household in the sixth decile is only able to save (total income minus total expenditure) ₱37,000, on average, which is only about one-and-a-half times the annual national per capita poverty threshold, whereas the average family size at that decile is 4.3.

the 50th percentile of per capita income determined at the national level, 'highly vulnerable' households total about 7.4 million nationally, equivalent to about 38 percent of all households in the country, of which about half a million are in NCR, and 3.7 million are in Luzon. Based on a threshold equal to the 60th percentile of per capita income, 'highly vulnerable' households total about 8.9 million nationally, equivalent to about 45 percent of all households in the country, of which close to 800 thousand are in NCR, and 4.8 million are in Luzon. Finally, based on a threshold equal to the 75th percentile of per capita income, 'highly vulnerable' households total about 11.3 million nationally, equivalent to about 56 percent of all households in the country, of which 1.4 million are in NCR, and 6.6 million are in Luzon.

Using the estimated number of 'highly vulnerable' households in Table 3, we compute for the total budget needed to support 'highly vulnerable' households per month of ECQ. Assuming a budget of ₱5,000 per 'highly vulnerable' household per month, and using the 50th percentile threshold, the estimated budget needed is ₱36.7 billion for the entire country, ₱2.5 billion for Metro Manila alone, and ₱18.4 billion for the whole of Luzon. Using the 60th percentile threshold, the estimated budget needed is ₱44.7 billion for the entire country, ₱3.9 billion for Metro Manila alone, and ₱23.8 billion for the whole of Luzon. And using the 75th percentile threshold, the estimated budget needed is ₱56.5 billion for the entire country, ₱6.9 billion for Metro Manila alone, and ₱32.8 billion for the whole of Luzon. An increase in the amount of aid per household, say from ₱5,000 to ₱6,000 will simply increase the estimated costs proportionately.

TABLE 3. Estimated number of 'highly vulnerable' households (in thousands)

Region		Estimated number of VHs belonging to poorest		
	Number of Vulnerable HHs (VHs)	50% of HHs in terms of per capita income	60% of HHs in terms of per capita income	75% of HHs in terms of per capita income
NCR	2,429	495	786	1,384
CAR	182	94	114	141
Region 1	628	358	437	541
Region 2	395	239	287	351
Region 3	1,932	789	1,058	1,465
CALABARZON	2,458	935	1,230	1,731
MIMAROPA	359	245	278	322
Region 5	662	514	567	615
Region 6	983	637	727	867
Region 7	958	597	687	804
Region 8	505	393	430	469
Region 9	395	304	333	369
Region 10	613	423	479	544

TABLE 3. Estimated number of 'highly vulnerable' households (continued)

Region 11	777	455	543	643
Region 12	618	467	519	578
ARMM	240	230	235	239
CARAGA	269	204	222	246
Philippines	14,403	7,379	8,932	11,308

Sources of data: Authors' computations using January 2020 LFS and applying shares based on income thresholds from merged 2015-2016 LFS-FIES.

TABLE 4. Estimated cost of providing ₱5,000 cash aid to 'highly vulnerable' households (in ₱ millions)

	VHs belonging to poorest		
Region	**50% of HHs in terms of per capita income**	**60% of HHs in terms of per capita income**	**75% of HHs in terms of per capita income**
NCR	2,476	3,930	6,920
CAR	470	569	707
Region 1	1,790	2,186	2,704
Region 2	1,196	1,437	1,755
Region 3	3,945	5,292	7,326
CALABARZON	4,677	6,149	8,656
MIMAROPA	1,227	1,391	1,609
Region 5	2,570	2,833	3,074
Region 6	3,183	3,637	4,333
Region 7	2,984	3,436	4,020
Region 8	1,964	2,148	2,343
Regionn 9	1,518	1,666	1,846
Region 10	2,113	2,395	2,718
Region 11	2,275	2,715	3,214
Region 12	2,337	2,595	2,889
ARMM	1,151	1,176	1,194
CARAGA	1,021	1,108	1,230
Philippines	36,895	44,662	56,539

Sources of data: Authors' computations using the PSA's various labor force surveys.

Some refinements are possible. For example, how much a household receives could be made dependent on the size of the household, either a fixed amount per household member, or, alternatively, a fixed amount plus an amount dependent on the size of the household. The amount that is provided to a household can also be set to be equal to the amount that is needed to move them out of either the food poverty line or the total poverty line. Because the food and total poverty lines vary across provinces and regions, which is meant to take into account differences

in standards of living across provinces and regions, this means that 'highly vulnerable' households in different places could receive different amounts even if they are of the same household size. For instance, Table 5 shows the estimated cost of providing cash aid equivalent to the monthly poverty threshold per individual in 'highly vulnerable' households.[12] The total costs are approximately double the estimated amounts needed to provide each 'highly vulnerable' household ₱5,000. Of course, under this set-up, households receive different amounts depending on their household size and the region where they live.

Note that the estimated budget needed to address the needs of the 'highly vulnerable' households can be expected to rise the longer the lockdown period is put in place, as more households become 'highly vulnerable' due to depleted savings or the loss of jobs from an extended economic downturn, both local and global, or even a spike in the cost of goods, which will raise the poverty line.

TABLE 5. Estimated cost of providing cash aid equivalent to monthly regional poverty threshold to each individual in 'highly vulnerable' households (in ₱ millions)

	VHs belonging to poorest		
Region	**50% of HHs in terms of per capita income**	**60% of HHs in terms of per capita income**	**75% of HHs in terms of per capita income**
NCR	5,349	8,488	14,945
CAR	720	871	1,083
Region 1	3,864	4,719	5,839
Region 2	2,138	2,569	3,137
Region 3	8,150	10,933	15,136
CALABARZON	10,363	13,625	19,182
MIMAROPA	2,141	2,427	2,807
Region 5	5,157	5,686	6,168
Region 6	5,890	6,731	8,018
Region 7	5,869	6,758	7,906
Region 8	3,817	4,175	4,553
Region 9	2,948	3,236	3,587
Region 10	3,835	4,347	4,934
Region 11	4,325	5,160	6,109
Region 12	4,263	4,734	5,270
ARMM	2,766	2,826	2,871
CARAGA	2,116	2,296	2,548
Philippines	73,709	89,581	114,094

Sources of data: Authors' computations using the PSA's various labor force surveys.

[12] See Annex Table 1 for the regional monthly poverty thresholds used. These were computed as the PSA's monthly poverty threshold in 2018 adjusted for the estimated inflation.

In Table 6, we compare the actual number of households given the first tranche of SAP and the total amount of the first-tranche aid that was disbursed to the total identified 'highly vulnerable households' in this paper and the estimated cash aid they will require per month, which were taken from Tables 4 and 5. This paper's 'highly vulnerable households' was equivalent to only 65 percent of the actual households that received cash aid from the SAP. The rate varies by region. In NCR, Region 3, and CALABARZON, where the lockdowns were longest, the estimated number of highly vulnerable households was equivalent to about 80 percent of those who actually received cash aid. In the other regions, the shares were between 50 percent and 60 percent. This suggests that the more prevalent targeting issue during the SAP distribution was likely leakage rather than under coverage, and that leakage was more extensive in regions where the lockdowns were less strict. The total estimated cost of providing each member of highly vulnerable households an amount equal to the regional poverty line was 116 percent of what was actually disbursed. In most regions, the share exceeded 100 percent. For these regions, what it implies, especially given the finding of possible leakage, is that households did not receive an amount sufficient to raise them above the poverty line assuming they had no other source of income during the lockdown period.[13]

6. Operationalization

The data we used in the previous sections are the FIES of the PSA, which are anonymized, apart from being just sample-based, and so cannot be used to identify which actual households are 'highly vulnerable'.

Instead, what can be used is the *Listahanan* 3 (or future *Listahanans*) of the DSWD's National Household Targeting System for Poverty Reduction (NHTS-PR), which collects information on 16.1 million households in the country on variables similar to those in the LFS and the FIES. *Listahanan* 3 has greater coverage and enables a more flexible definition of the poverty threshold than its earlier versions. The *Listahanans* 1 and 2, as well as the then still-yet-to-be completed *Listahanan* 3 were used by DSWD to identify 6.7 million households that were eligible to receive cash transfers under the *Bayanihan Law*.[14] But for the rest, the government had to rely on local government units (LGUs) for identification, which caused most of the delay as most LGUs undertook a new wave of data collection.

[13] At the moment there is no available data to test whether those that actually received cash aid from the SAP would also be the highly vulnerable households as identified by our methodology.

[14] The DSWD identified the following poor and vulnerable households and individuals: (i) 4.3 million households included in the 4Ps, using *Listahan* 1, 2, 3 (yet incomplete); (ii) 2.2 million poor households not included under the 4Ps, using *Listahanan* 1 and 2; (iii) 2.9 million indigent senior citizens, using information from local government unites and local DSWD offices; and (iv) 7.7 million informal workers and daily wage earners from DSWD estimates. See the Social Amelioration Program Guidelines as of April 13, 2020. Retrieved from: https://www.adb.org/sites/default/files/linked-documents/43407-017-sd-05.pdf

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TABLE 6. Comparison of actual SAP disbursement with estimated needed to target highly vulnerable HHs

	Actual from DSWD		Based on suggested methodology in this paper					
					Estimated cost (in ₱ millions)			
Region	Actual Number of HHs given SAP (in millions)	Actual SAP Disbursements (1st tranche) (in ₱ millions)	Number of Vulnerable HHs belonging to poorest 75% in terms of per capita income (in millions)	As % of actual HHs given SAP	₱5k per HH	As % of actual SAP disbursements	Total cash aid equivalent to monthly regional poverty threshold per HH member	As % of actual SAP disbursements
NCR	1.777	13,917	1.384	78%	6,920	50%	14,945	107%
CAR	0.249	1,288	0.141	57%	707	55%	1,083	84%
Region 1	0.982	5,071	0.541	55%	2,704	53%	5,839	115%
Region 2	0.676	3,570	0.351	52%	1,755	49%	3,137	88%
Region 3	1.795	11,269	1.465	82%	7,326	65%	15,136	134%
CALABARZON	2.236	14,112	1.731	77%	8,656	61%	19,182	136%
MIMAROPA	0.589	2,684	0.322	55%	1,609	60%	2,807	105%
Region 5	1.138	5,196	0.615	54%	3,074	59%	6,168	119%
Region 6	1.454	8,289	0.867	60%	4,333	52%	8,018	97%
Region 7	1.312	7,486	0.804	61%	4,020	54%	7,906	106%
Region 8	0.830	3,774	0.469	56%	2,343	62%	4,553	121%
Regionn 9	0.711	3,136	0.369	52%	1,846	59%	3,587	114%
Region 10	0.892	4,992	0.544	61%	2,718	54%	4,934	99%
Region 11	0.950	5,345	0.643	68%	3,214	60%	6,109	114%
Region 12	0.911	4,221	0.578	63%	2,889	68%	5,270	125%
ARMM	0.474	1,975	0.239	50%	1,194	60%	2,871	145%
CARAGA	0.479	2,142	0.246	51%	1,230	57%	2,548	119%
Philippines	17.457	98,465	11.308	65%	56,539	57%	114,094	116%

Sources of data : DSWD (https://public.tableau.com/views/SAPMonitoringDashboardforEmergencySubsidyunderAICS/Dashboard1?:display_count=no&:showVizHome=no)

The *Listahanan* 3 likely already includes most of the poor households in the country, owing to its wide coverage. This database should suffice, or if not, should be enhanced to identify the 'highly vulnerable' households as defined above or even using a modified or refined definition during lockdowns, not just in the current pandemic but in possible future ones. This would mean, among others, collecting the necessary employment information from the household members.

As was done to some extent, the DSWD should also first identify who among the current 4Ps beneficiaries, already known to be poor, are also part of the 'highly vulnerable' population as defined above and supplement their regular benefits with a top-off that is in accordance with the amount determined by government that these households should get.[15] Doing so will reduce the possibility of 'leakage' or 'inclusion error', or of identifying those not (or not yet) 'highly vulnerable' as among the 'highly vulnerable', which can happen if there is too much leeway in identifying the beneficiaries. This is in line with what the Indonesian government did when it increased the annual payout per beneficiary of the *Program Keluarga Harapan* (conditional cash transfer program) by 25 percent, and shifted from quarterly to monthly disbursements [Theis et al. 2020].

7. Concluding remarks

In this paper, we define ''highly vulnerable'' households as those unlikely to have income during strict lockdown periods because of the employment characteristics of their employed members and which likely have little or no savings to tide them over during the lockdown.

Using the merged 2015 FIES and 2016 LFS, we show that the employed members of these 'highly vulnerable' households are likely to be private sector employees, self-employed in non-agriculture, or employers, who are also in one of the vulnerable sectors or in one of the vulnerable occupations, which were identified using a job loss index (defined as the ratio of the contribution to total decline in paid employment during the lockdown to the share to total paid employment pre-lockdown) derived using the January-April 2020 LFS; plus, those who are *paid per day*, *per hour*, or *per piece*, regardless of sector of employment or occupation.

Depending on the pre-lockdown income threshold eligibility used, we estimate the number of 'highly vulnerable' households to be between 7.4 million and 11.3 million. At ₱5,000 per 'highly vulnerable' household, the estimated costs amount to ₱36.9 billion to ₱56.5 billion, again depending on the income threshold used. The estimated cost doubles or increases thereabouts if per capita aid equivalent to the poverty threshold in the region of residence of the 'highly vulnerable' household were instead to be given.

[15] We thank Dr. Joseph Capuno of the UP School of Economics for this suggestion.

Finally, the employment characteristics that were identified to determine ''highly vulnerable'' households are not meant to be exhaustive, but merely directive – to give policymakers a sense of the factors that should be considered in determining households with sources of livelihood which are highly sensitive to lockdown measures. Moreover, this does not mean that government aid should be given exclusively to these households given the pandemic's sweeping effects on the economy, but that identification and allocation of aid towards 'highly vulnerable' households should be prioritized given that these households are already disadvantaged to begin with and are disproportionately affected by the lockdown, and thus more susceptible to hunger.

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Annex

ANNEX TABLE 1. Estimated monthly poverty threshold

Region	Estimated monthly poverty threshold, 2021
NCR	2,701
CAR	2,342
Region 1	2,540
Region 2	2,357
Region 3	2,522
CALABARZON	2,622
MIMAROPA	2,187
Region 5	2,298
Region 6	2,305
Region 7	2,419
Region 8	2,352
Region 9	2,410
Region 10	2,335
Region 11	2,440
Region 12	2,354
ARMM	2,595
CARAGA	2,386
Philippines	2,424

Author's computations based on PSA's 2018 regional poverty lines adjusted for estimated inflation.

ANNEX TABLE 2a. Paid jobs and paid jobs lost during the ECQ by class of worker (in millions)

Class of worker	Apr-19	Jan-20	Apr-20	% change from April 2019 to April 2020	(A) Contribution to total decline in paid employment (April 2019 to April 2020)	(B) Share in total employment in April 2019	Job loss index: (A)/(B)
Employee in private household	1.8	1.9	1.6	-14%	3%	5%	0.7
Employee in private establishment	21.0	21.9	16.2	-23%	61%	53%	1.1
Employee in government/ government corporation	3.9	3.9	3.5	-9%	5%	10%	0.5
Self employed in non-agriculture sector	7.2	6.7	5.2	-27%	25%	18%	1.4
Self employed in agriculture sector	4.5	4.5	4.5	0%	0%	11%	0.0
Employer	1.1	1.0	0.6	-46%	7%	3%	2.3
With pay worker in family-owned business	0.11	0.12	0.10	-6%	0.1%	0.3%	0.3
Total	39.56	39.89	31.70	-20%	100%	100%	

Sources of data: Authors' computations using the PSA's various labor force surveys.

ANNEX TABLE 2b. Paid jobs and paid jobs lost during the ECQ by sector of employment (in millions)

Class of worker	Apr-19	Jan-20	Apr-20	% change from April 2019 to April 2020	(A) Contribution to total decline in paid employment (April 2019 to April 2020)	(B) Share in total employment in April 2019	Job loss index: (A)/(B)
Agriculture, forestry and fishing	7.9	8.2	7.4	-7%	7%	20%	0.4
Mining and quarrying	0.2	0.2	0.2	-8%	0.2%	0.4%	0.4
Manufacturing	3.4	3.5	2.6	-23%	10%	9%	1.2
Electricity, gas, steam and air conditioning supply	0.2	0.2	0.1	-38%	1%	0%	2.0
Construction	4.2	4.0	2.8	-34%	18%	11%	1.8
Wholesale and retail trade, repair of motor vehicles and motorcycles	7.6	7.7	5.8	-23%	23%	19%	1.2
Transportation and storage	3.5	3.4	2.6	-27%	12%	9%	1.4
Accommodation and food service activities	1.8	1.9	1.2	-33%	8%	4%	1.6
Information and communication	0.4	0.4	0.3	-39%	2%	1%	2.4
Financial and insurance activities	0.5	0.6	0.4	-19%	1.3%	1.4%	0.9
Real estate activities	0.2	0.2	0.2	-12%	0.3%	0.5%	0.5
Professional, scientific and technical activities	0.3	0.3	0.2	-19%	1%	1%	1.0
Administrative and support service activities	1.7	1.7	1.5	-12%	3%	4%	0.6
Public administration and defense, compulsory social security	2.8	2.8	2.5	-12%	4%	7%	0.6
Education	1.2	1.3	1.1	-2%	0%	3%	0.1

ANNEX TABLE 2b. Paid jobs and paid jobs lost during the ECQ by sector of employment (in millions) (continued)

Human, health, and social work activities	0.6	0.6	0.5	-18%	1%	1%	0.9
Arts, entertainment and recreation	0.4	0.4	0.2	-54%	3%	1%	3.0
Other activities	2.6	2.7	2.1	-16%	5%	6%	0.8
Total	39.56	39.89	31.70	-20%	100%	100%	

Sources of data: Authors' computations using the PSA's various labor force surveys.

ANNEX TABLE 2c. Paid jobs and paid jobs lost during the ECQ by occupation (in millions)

Class of worker	Apr-19	Jan-20	Apr-20	% change from April 2019 to April 2020	(A) Contribution to total decline in paid employment (April 2019 to April 2020)	(B) Share in total employment in April 2019	Job loss index: (A)/(B)
Managers	4.6	4.0	3.1	-32%	19%	12%	1.9
Professionals	2.3	2.5	2.0	-13%	4%	6%	0.6
Technicians and associate professionals	1.8	1.6	1.3	-25%	6%	4%	1.4
Clerical support workers	2.5	2.8	2.2	-15%	5%	6%	0.7
Service and sales workers	7.3	7.8	5.9	-20%	18%	18%	0.9
Skilled agricultural, forestry and fishery workers	5.0	4.9	4.8	-5%	3%	13%	0.3
Craft and related trades workers	3.4	3.2	2.1	-36%	16%	9%	1.9
Plant and machine operators and assemblers	3.4	3.4	2.6	-23%	10%	9%	1.2
Elementary occupations	9.2	9.6	7.6	-17%	19%	23%	0.8
Armed forces occupations	0.09	0.102	0.073	-14%	0.1%	0.2%	0.6
Total	39.56	39.89	31.70	-20%	100%	100%	

Sources of data: Authors' computations using the PSA's various labor force surveys.

ANNEX TABLE 2d. Paid jobs and paid jobs lost during the ECQ by basis of payment (in millions)

Basis of payment	Apr-19	Jan-20	Apr-20	% change from April 2019 to April 2020	(A) Contribution to total decline in paid employment (April 2019 to April 2020)	(B) Share in total employment in April 2019	Job loss index: (A)/(B)
Monthly	10.5	10.7	8.6	-18%	36%	39%	0.9
Per day, per hour, per piece	12.3	13.0	9.5	-23%	52%	46%	1.1
Other (in kind, commission, other)	3.9	4.0	3.3	-16%	12%	15%	0.8
Total	26.75	27.76	21.37	-20%	100%	100%	

Sources of data: Authors' computations using the PSA's various labor force surveys.