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Getting the Price Tag of the COVID Crisis: Measuring Health Expenditures in a Pandemic Based on the System of Health Accounts Framework

DLSU-AKI Working Paper Series 2021-05-064

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May 2021

Abstract

The COVID-19 pandemic forced many (if not all) countries to resort to extreme interventions to manage the spread of the Corona virus. However, most of these spending are not explicitly considered as health expenditures in typical National Health Accounts (NHA) estimates. As such, estimating health spending by employing the conventional expenditure items recorded in NHAs may not reflect the overall financial impact of the COVID-19 pandemic on the healthcare system. We argue that an expanded measure of health spending might be needed to capture the overall impact of the pandemic on the health expenditures. We find at least nine COVID-related expenditure groups that are consistent with the accounting principles of the System of Health Accounts framework and should be considered by statistical agencies and health ministries when compiling their respective NHAs.

JEL-Classification: E01, H51, I10, I19, P44.

Keywords: System of Health Accounts, National Health Accounts, health expenditures, COVID-19, pandemic.

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The COVID-19 pandemic forced many (if not all) countries to resort to extreme interventions in order to manage the spread of the virus. These interventions include national and local lockdowns, travel restrictions, and expanded police presence, among others. Moreover, businesses such as malls, public transport, and restaurants have had to incur additional costs to meet social distancing guidelines imposed by their governments. However, most of these spending are not explicitly considered as health expenditures in typical National Health Accounts (NHA) estimates. As such, estimating health spending by employing the conventional expenditure items recorded in NHAs may not reflect the overall financial impact the COVID-19 pandemic incurred on healthcare systems.

Similar to the System of National Accounts, the System of Health Accounts 2011 (SHA 2011) also adheres to the willingness-to-pay principle when recording expenditure items. The goal of NHA estimates based on the SHA is to inform policymakers and health professionals about society’s aggregate willingness to pay for a certain level of health status. Typically, expenditures of the state’s healthcare system (such as insurance providers, various government health agencies, and households) are sufficient enough to reflect this. Because of the COVID-19 pandemic, however, other agents—those that are not typically involved in healthcare—were forced to finance certain interventions to mitigate the spread of the virus. If NHA compilers disregard the expenditures from these agents, the set of Health Accounts they compile would be insufficient to meet the goal of capturing the aggregate willingness to pay for the containment of COVID-19.

In this paper, we discuss why certain expenditure items should be included in an expanded set of NHAs in light of the pandemic. We do not deviate entirely from the SHA 2011. We based our assessment on the expenditure boundaries of the said framework, particularly the four criteria for determining whether these activities should be considered as part of the core expenditure accounts of NHAs. We employ a more relaxed assessment, by considering expenditure items that meet at least two of these criteria for inclusion in the expanded NHA. We also show that these expenditure items could be categorized based on the classification systems provided by the SHA 2011 framework.

We identify at least nine COVID-related expenditure items that firmly meet at least two of the SHA 2011 criteria, namely: (a) police and law enforcement expenditures; (b) other lockdown expenditures; (c) test and trace systems; (d) quarantine and isolation facilities; (e) expenditures on pandemic-related advocacy; (f) business expense for social distancing and hand hygiene; (g) expenditures of non-government organizations; (h) donations, and; (i) masks and personal hygiene expenditures by households. We consider expenditures on welfare assistance during lockdowns, such as the Furlough scheme and other similar policies, as part borderline cases, and their treatment would depend on the mode these schemes were delivered.

This paper aims to provide a guide for NHA compilers to develop a set of accounts that captures the complete financial burden caused by the spread of the illness. Following the initial year of the COVID-19 pandemic, statistical agencies and health ministries would be faced with the monumental task of compiling NHAs for their respective countries.

Academics and policymakers would look back at 2020 to determine how interventions and resource allocations affected health outcomes in the macro level. NHAs can be a powerful tool for these types of analysis, but only if resource allocation and expenditures are recorded thoroughly.

This paper is organized as follows: section 2 briefly discuss the SHA 2011 framework, particularly, its general accounting principles and the rationale why some expenditure items are recorded in the core NHA and not others; section 3 discuss how economic agents spent in response to the pandemic, providing a sense of magnitude of the financial burden caused by the spread of the disease; in section 4, we provide an assessment on which expenditures items we think should be included in an expanded NHA, based on the criteria we laid out; and lastly, we end with some concluding remarks.

Expenditure Boundaries of SHA 2011

The SHA 2011 Framework

The SHA 2011 was developed by the Organisation for Economic Cooperation and Development (OECD), European Statistical Office (Eurostat) and the World Health Organization (WHO) to provide the foundational framework for the health care system of each country around the globe from an expenditure perspective (World Health Organization, 2017). Prior to the SHA 2011, the OECD published the SHA 1.0 framework to present a standardized approach with detailed classifications in compiling data on health expenditures to describe the health system of each country (Nakhimovsky et al., 2014). However, the framework was deemed inadequate to address the constant changes in the health-care systems around the world, such as changes in demographics and disease patterns, rapid technological advances, and more complex health financing and delivery mechanisms. Hence, the SHA 1.0 was expanded and published as the SHA 2011 to become more adaptable to the rapidly evolving health systems, as well as to meet the current data needs on more detailed health expenditure information for policy making.

The core accounting framework of the SHA 2011 is built around a tri-axial system of health expenditures recording, namely consumption, provision and financing (World Health Organization, 2017). These three core axes address the following three basic questions:

- What kinds of health care goods and services are consumed?
- Which health care providers deliver these goods and services?
- Which health care financing schemes pay for these goods and services?

The primary goal of the tri-axial system of health expenditure accounting is to evaluate four essential components of health systems: governance, resource generation (human, physical, and knowledge), financing, and service delivery (Ilarina et al., 2019). To properly assess these components, the three axes of consumption, provision, and financing comprise 12 classifications to which all health expenditures are to be categorized. Four of these classifications provide information on the beneficiary characteristics of health expenditures, namely, age and sex, disease, region, and income.

Uses of the SHA 2011

The SHA 2011 is mainly designed to produce accurate and up-to-date health expenditures estimates for policy making and research. The health data from the NHA not just explain the growth of health expenditures over time, but they may also identify the potential determinants of health expenditures changes. The standardized framework and method put forward by SHA 2011 also pave the way to the production of cross-country comparable health estimates. These information may provide valuable inputs to targeted policies or programs that can be used by countries when allocating their budgets.

The additional provision of beneficiary disaggregation (i.e., age and sex, disease, income, region) may be used to assess the impact of these beneficiary characteristics to health expenditures, and vice-versa. Moreover, expenditure differences in health spending by age and socio-economic groups can also be analyzed from NHAs compiled through the SHA 2011 framework. Research centered on these aspects of health spending may have implications on the overall efficiency of health policies and programs implemented by various countries. These studies may also be used to evaluate the health policy objectives and the health care system of a country, and to identify areas for improvement or innovation.

Boundaries of the SHA 2011 Framework

The SHA 2011 defines health care expenditures as “all activities with the primary purpose of improving, maintaining and preventing the deterioration of the health status of persons and mitigating the consequences of ill-health through the application of qualified health knowledge” (World Health Organization, 2017). Four main criteria in determining the inclusion of activities/services within the core expenditure account of the SHA are embedded in this definition. The first criterion is the primary intent or purpose, which requires health activities/services to be included as long as they are chiefly intended to improve, maintain and prevent the deterioration of health status and mitigate the consequences of ill health. Second is the qualified health knowledge is necessary to carry out the health activity or service. Next is that consumption must be for the final use of health care goods and services of the resident population. Lastly there should be an existence of a transaction for the health goods and services. We will later use these criteria to assess whether COVID-related expenditures should be included in the NHA framework.

However, it is important to note that the recording of country-specific health care goods and services may not necessarily be encouraged to promote comparability in international data collection. The inclusion or exclusion of health care goods and services may also be dependent on data availability. Moreover, the SHA 2011 does not account for health care goods and services provided as intermediate outputs to other providers to avoid double counting, and it focuses on the consumption of health care goods and services by the resident population irrespective of where the transaction takes place (World Health Organization, 2017).

There are also borderline cases about the appropriate accounting of health care goods and services. These borderline cases are specific goods and services placed in the boundaries of health care and health-care related or non-healthcare products (World Health Organization, 2017). First of these cases are the multi-sectoral issues (i.e., road safety, car safety protocols). The main criterion for the inclusion or exclusion of these activities in the SHA is their primary intent or purpose and the application of a qualified medical knowledge and technology. Furthermore, these borderline cases also include well-being services (i.e., spa and wellness centers). The current health care expenditure accounts do not endeavor to measure the impact on welfare and the effectiveness of health care goods and services. However, if the well-being services (e.g., fitness training or specific diets) are medically recommended, then they shall be included in the health accounting.

The SHA 2011 also takes into account healthcare related functions, or memorandum items, which cover some areas of the health domain but go beyond the health care boundary (World Health Organization, 2017). These are enumerated below:

1. Capital formation of health care provider institutions;
2. Education and training of health personnel;
3. Research and development in health;
4. Food, hygiene and drinking water control;
5. Environmental health;
6. Administration and provision of social services in kind; and
7. Administration and provision of health-related cash-benefits.

How Economic Agents are Spending in the Pandemic

It is an understatement to say that the COVID-19 pandemic had a monumental impact on the economy and society. Once-busy cities were forced into lockdown, with all

but essential services closed indefinitely. Borders were shut, and for many places, there were stringent restrictions to domestic travel. In this section, we list down the various ways economic actors responded to the COVID-19 pandemic. It goes without saying that the expenditure items we discuss in the section are the candidates for inclusion in the expanded NHA. This is probably not the complete list of COVID-related expenditures, but we feel that we have covered most of the relevant expenditures related to the pandemic.

Government Response to the Health Crisis

Police and Other Law Enforcement

Perhaps the most notable response to the COVID-19 by governments around the world were lockdowns and border controls. The goal of these policies was to halt the spread of the virus by drastically limiting the contact of individuals from different households. Considering how fast the virus spread, many governments opted to implement these interventions to manage the spread of the virus. China was the first to implement a lockdown, shutting down most of the activities in their Hubei province. The first European country to issue a stay-at-home order was Italy. Other countries followed suit. Even the World Health Organization endorsed the implementation of these measures saying:

Large scale physical distancing measures and movement restrictions, often referred to as ‘lockdowns’, can slow COVID-19 transmission by limiting contact between people... WHO recognizes that at certain points, some countries have had no choice but to issue stay-at-home orders and other measures, to buy time. (World Health Organization, 2020)

By March 2020, about a quarter of the world was under some form of lockdown (Davidson, 2020). The stringency in which these measures were implemented vary per country. One common characteristic of these lockdowns is that they were often enforced by the police. In many countries, the presence of police and other security forces was instrumental in making sure that lockdown rules were followed. They were dispatched to implement checkpoints, enforce fines, and (in some instances) detain curfew violators. In countries such as the Philippines and Sri Lanka, police presence is so expansive that the UN has called the attention of their governments for having a “heavy-handed” approach to the pandemic (UN News, 2020).

Keeping People Inside

As mentioned earlier, national and local lockdowns were some of the major strategies of governments to prevent the spread of the virus within their borders. Only essential shops were open in some areas where lockdowns were imposed. Several businesses were forced

to halt operation, leaving workers who rely on those businesses without a means to earn a living.

As a response to this, many governments issued benefits to aid individuals who lost their livelihoods following the restrictions. Some governments provided relief through unemployment insurance, whereas others resort to direct transfers in cash and in kind. The U.K. and Australian governments are notable cases because they introduce schemes wherein the government provide, cash grants to businesses, allowing them to pay their staff at a portion of their regular salary while their establishment is closed during the lockdown.

These benefits would often have two goals: (a) to provide welfare assistance to individuals who are unable to make ends meet as a result of the restrictions, and (b) to motivate individuals to stay at home and abide by the lockdown rules. One can argue that lockdowns would not be effective without these benefits because workers who lost their jobs might find it necessary to find another means to earn outside without the government providing these benefits.

Border Controls

One of the initial response of governments to the pandemic is the restriction of access to their borders. Even countries within the European Union, an organization that espouses the idea of freedom of movement, were forced to implement restriction in terms of access to their respective jurisdictions (Stavis-Gridneff, 2020). Schwartz, 2021 released a list of the various travel restriction put in place by different states as of April 2021. These include mandatory reverse transcription polymerase chain reaction (RT-PCR) tests for travellers coming in to the country and strict quarantine upon arrival.

The cost burden of these requirements varies per country. For most countries, testing is shouldered by the state. The cost of quarantine facilities, however, are often shouldered by individuals. Countries like the Taiwan and Singapore require travelers to shoulder the cost of quarantine hotels, where travelers are required to stay for 14 days before they are allowed to integrate with the public. A handful of countries such as Ecuador, Guam, and earlier in the pandemic, Australia, shouldered the cost of these facilities (Schwartz, 2021).

Test, Trace and Isolate

Perhaps the most ubiquitous response to the pandemic following lockdowns and border controls was the test and trace efforts. Governments invested in substantial portions of their 2020 budget on expanding their testing capacity. Countries like South Korea, Taiwan and Vietnam started testing their populations early. According to the data compiled by Ritchie et al. (2021), by the end of February 2020, South Korea has tested 96,000 individuals, Taiwan has tested 11,000 individuals, and Vietnam was able to test 2,000 individuals. At this time, the U.S., Germany, and the U.K. were setting up their testing

capacity. By the middle of March, these countries would be testing 100,000 individuals each. These countries would ramp up their testing regimes hereafter. As of January 2021, the U.S. has conducted 250 million tests, whereas the U.K. and Germany have conducted 77 million and 40 million tests, respectively.

The increase in testing did not come without cost. Massive investments had to be rolled out by government to ramp up testing capacities. The U.K., for instance, spent GBP 15 billion on their test and trace system as of November 2020, according to National Audit Office, UK (2020). The U.S. Congress, meanwhile, allocated USD 25 billion for testing (Whoriskey et al., 2020).

As of the writing of this manuscript, it is difficult to find aggregate data on what percentage of the total testing are being carried out by governments and what percent are being carried by individuals. Testing communities has been the main strategy of governments for containing local outbreaks, allowing them to isolate COVID cases and prevent the further spread of the virus. In some developing countries like the Philippines, the bulk of the testing are being undertaken by non-government organizations such as the Red Cross (Ramos, 2020). Meanwhile, private individuals are able to access testing, sometimes through their own expense, as part of their travel requirements.

Awareness and Advocacy

Governments worldwide are aware that in order to manage the spread of the virus, the public must be aware of the level of risk the disease brings to society. The public also needed to be informed on what actions they could take to contain the outbreak in their respective jurisdictions. Massive information and campaign efforts were undertaken to inform the public on infection levels, death rates, and the rules being implemented to limit the spread of the disease. Regular press briefings (in some countries, daily) were held by health ministries, heads of governments, and other authorities to keep the public updated on the “COVID situation”. Some governments even resort to campaign strategies such as posters, jingles, internet and TV commercials, instructing the public to wash their hands regularly and avoid going outside.

Private Sector Response

Keeping Employees Safe

Business owners have had to take steps to keep their employees safe during the pandemic. In the Philippines, where public transportation was suspended during the lockdown, some essential businesses were forced to offer shuttle services to their workers. Establishments such as call centers were forced to house some of their employees in hotels, which served as temporary dormitories while public transport services are not available. Additional compensation in the form of advances in work salary as well as hazard pay

were also offered to employees of an essential business (Willis Towers Watson, 2020).

Even with the easing of restrictions, businesses hoping to have their employees return to the workplace sought to impose testings to ensure that the virus does not spread to their respective offices. Much of the testing were undertaken by private companies were shouldered by the companies themselves.

Adhering to Social Distancing Guidelines

At the start of autumn in 2020, many countries opted to ease restrictions as they see infection rates fall. This allowed businesses such as bars, salons, and restaurants to re-open. As these establishments open their doors to the public, certain measures had to be imposed in order to to mitigate the risk of further spreading the disease. In many countries, restaurants and bars had to open at limited capacity to ensure that social distancing guidelines were followed. Protective barriers were installed to prevent the droplets from reaching establishment staffs and other customers. Stickers were laid out on the ground to ensure that customers walk along pathways in one direction.

Household Spending

Working and Studying From Home

As mentioned earlier, lockdowns forced individuals to stay at home if they can. Businesses were forced to enforce alternative work arrangements for their employees, such as working from home. As such, workers have had to absorb some of the expenditures that business would have had to shoulder had it not been for the lockdown. These expenses include: electricity, water, internet connection, among others.

In the same light, school children and university students were also told to continue with their education through online learning. Household had to incur additional utility and other expenses as children and university students stayed home for their schooling.

Masks and Hand Washing

If long ques were the symbol of the Great Depression, perhaps masks would be the symbol for the COVID-19 pandemic. The WHO has repeatedly stressed its guidance on mask-wearing, stating how they are instrumental in preventing the spread of the disease. Many national and local governments mandated the use of masks in public transport and enclosed spaces. In some countries, masks were required to be worn at all times outside of the residence. In addition to mask-wearing, hand-washing was considered to be an effective way to preventing the transmission of the virus. Governments echoed the advice of health professionals that people should wash their hands regularly.

How to Expand the Expenditure Boundaries of SHA 2011

Should Pandemic Expense be Included in the NHA?

In the SNA framework, estimates final consumption expenditure reflects the society's willingness to pay to achieve a certain level of utility. Deflation allows GDP estimates to indicate how much utility has improved from the increase in nominal GDP. In the context of the NHA, it can be argued that expenditures from this set of accounts reflect the society's willingness to pay to achieve a certain level of health outcomes. As such, if statistical agencies and health ministries strictly follow the expenditure items in previous versions of the NHA that they have compiled, these agencies will not be able to capture the extent to which governments, businesses, and private individuals are willing to pay to manage the pandemic.

In this section, we discuss whether or not some expenditure items incurred during the pandemic should be included in the NHA. We identified 12 expenditure items associated with the management of the spread of the virus and evaluate them using four criteria that are based on the general accounting principles of SHA 2011.

In section 2, we discussed the expenditure boundaries of SHA 2011. The framework provided general criteria for the inclusion of health spending to the NHA. These criteria are:

1. Primary intent or purpose, which requires health activities/services to be included as long as they are chiefly intended to improve, maintain and prevent the deterioration of health status and mitigate the consequences of ill health.
2. There is qualified health knowledge necessitated to carry out the health activity or service
3. Consumption must be for the final use of health care goods and services of the resident population
4. There should be an existence of a transaction for the health goods and services

We will use these criteria to evaluate whether the identified COVID-related expenditure items are good candidates for the inclusion of an expanded NHA. Adhering to these criteria would ensure that estimates would be internally consistent with other expenditure items in the accounts.

We do not expect that these expenditure items would be fully consistent with all of the criteria, nor do we expect the assessment to be a straight forward process. For this paper, we say an expenditure item *should* be considered part of the expanded NHA when it meets

at least two of the four criteria of the SHA. This is a more relaxed approach than the identification of expenditure items for the typical NHA compilation. However, we argue that this is necessary to capture the full financial burden caused by the pandemic. In our examination, we also find that some of the expenditure items fall within the gray area of some of the criteria, depending on the context of the spending. Table 1 presents the summary of our assessment.

Table 1: COVID Expenditures vis-à-vis SHA 2011 Criteria

	Criteria 1	Criteria 2	Criteria 3	Criteria 4
Welfare assistance	Maybe	No	Maybe	Maybe
Police and other law enforcement	Yes	No	Yes	Yes
Other lockdown expenses	Yes	No	Yes	Yes
Test and trace systems	Yes	Yes	Yes	Yes
Quarantine centers and isolation facilities	Yes	Yes	Yes	Yes
Advocacy	Yes	Yes	Yes	Yes
Business expenses for social distancing	Yes	Yes	Maybe	Yes
Employer spending on transportation, housing, food for workers	No	No	Maybe	No
Work-from-home and online learning expenditures	No	No	No	No
Non-government organization	Yes	Yes	Yes	Yes
Donations in kind and in cash	Yes	Yes	Yes	No
Mask and Personal hygiene	Yes	Maybe	Yes	Yes
Home deliveries	Maybe	No	Maybe	Maybe

Note: Table shows whether or not select COVID-related expenditure items meet the four SHA expenditure criteria. Yes means that have met the criteria and No means otherwise. Maybe means that the expenditure item is a borderline case.

Government Expenditures

Welfare Assistance. As mentioned in section , lockdowns are probably one of the most defining interventions in the COVID-19 pandemic. In order to incentivize individuals to stay at home and close their businesses, governments were forced to provide welfare assistance to those whose livelihoods are effected. The question is whether these welfare packages should be considered part of healthcare expenditures of an expanded NHA.

It is without a doubt that many governments consider lockdowns as essential in controlling the spread of the virus that causes the pandemic. One can argue that it would be impossible for states and local authorities to enforce stay-at-home orders without the provision of welfare benefits. However, the main purpose of these packages is to meet the basic needs of individuals as they stay home for the duration of the lockdown, and not necessarily to provide a form of *health service*. This makes it difficult to classify this expenditure item in the context of Category 1. For this reason, we consider welfare packages as a borderline case when considering their purpose. Although the main purpose of welfare assistance is not towards and improvement and maintenance of health outcomes, the reason for their implementation is to complement lockdown policies, whose main objective

is to slow the spread of the virus. We argue that welfare assistance programs should not be considered as a standalone policy, rather as part of a greater lockdown and community containment policy.

If a country relied on its existing welfare system, were in unemployment insurance shouldered the wages or living expenses of individuals who were subjected to unemployment following the lockdown, then it can be argued that such spending is not fully integrated into the pandemic response policy. Therefore, in such a case, we say that the purpose of the expenditure item is not for the rendering of healthcare services. This is in contrast to welfare assistance programs that were only implemented during the duration of a country's lockdown period.

It is easy to argue why most welfare assistance would not meet the second criteria because ministries of finance and state insurance agencies are often the ones providing these assistance packages. Meeting criteria 3 and 4 would again depend on how to perceive these assistance packages. If governments considering them as an integral part of lockdown policies, then it can be argued that they do meet both criteria. Otherwise, we argue that they do not.

Police, Other Law Enforcement, and Other Lockdown Expenditures. We argue that because law enforcement was critical in the enforcement of lockdown policies, expenses incurred by these agencies meet three of the four criteria for the inclusion of an expanded NHA. The argument is similar to that of welfare assistance. As lockdowns cannot be enforced without the police and other law enforcement, we consider them as an integral part of the policy.

The only difference with this expenditure item and welfare assistance is that existing welfare systems, such as unemployment insurance, could shoulder the living expenses of individuals in the event of joblessness regardless of whether there is a pandemic or not. In contrast, the police have been deployed to ensure the public's compliance to lockdown protocols and other restrictions, making it their primary purpose in this case.

However, the challenge for compilers is to identify the proportion of resources by law enforcement allocated for the enforcement of lockdown rules. One can argue that only a fraction of their resources are appropriated to the enforcement of lockdown protocols, leaving the remainder for deterring crime and maintaining peace and order.

Test and Trace Systems, and Quarantine Facilities. Both test and trace systems and quarantine facilities clearly meet all four criteria. The purpose of the test and trace systems is to identify infected persons and quarantine facilities are in place to prevent those individuals from spreading the disease to others. Expenditures on test and trace systems and quarantine facilities are likely already considered by compilers as part of their respective NHAs. Testing and contact tracing are health services provided by qualified health professionals and consumed by the resident population.

Advocacy. Similar to expenditures on test and trace systems, and quarantine facilities, spending on advocacy by national and local governments meets all of the four criteria for the inclusion of the NHA. Advocacy drives such as infomercials provide preventative care services to the general public (or locality). Facts presented in these advocacy campaigns are often provided by healthcare professionals and public health experts and consumed by the public.

Business Expenditures

Business Expenses for Social Distancing. As establishments open up, necessary precautions were put in place to prevent the further spread of the virus. In terms of purpose, it can be argued that the primary purpose of these expenditure items is to provide preventative care services by managing the spread of the disease. An important question when tackling this expenditure item is whether qualified health knowledge is needed to deliver these services. To this, we argue that business often adheres to guidelines put forward by health ministries and other health authorities installing the equipment that would ensure social distancing in their establishment.

Employer Spending on Transportation, Housing, Food for Workers, and Work-From-Home Expenditures. During the lockdown, many establishments chose to spend on transportation, accommodation, and food for their workers. This is especially true for countries like the Philippines, where public transportation was suspended throughout the lockdown. Deciding whether these expenditure items should be part of an expanded NHA depends on whether health services are rendered from the said spending. Although there are benefits to having workers stay at hotel/dormitories (i.e., they do not contract/spread the virus from the community), the primary purpose of these expenditures is to keep business operations running rather than to provide healthcare. Employers were only forced into the situation of providing for accommodation and food because of the absence of public transportation. We argue against the inclusion of such expenditure items in expanded NHA for this reason.

The same logic can be applied for expenditures relating to work-from-home setups. Although they provide incentives for individuals to adhere to stay-at-home orders, the primary intention for these expenses is to sustain business operations and not necessarily to complement lockdown policies.

Household Spending

Masks and Personal Hygiene. The WHO and many experts in the medical field emphasized that mask-wearing and hand washing are important in preventing the spread

of the virus. This is followed by an unprecedented rise in the sale of masks and hand sanitizers. We argue that household expenditures on these items would satisfy all four of the criteria for the inclusion in the expanded NHA. When individuals purchase these items, they do so with the conscious intention of protecting themselves and those around them from the virus.

Similar to the case of law enforcement, the challenge for NHA compilers is to identify the proportion of spending by households that were consciously acquired to prevent the spread of the disease. Frequent hand washing with soap and water is the main guidance by health expert to preventing the spread of the COVID. However, soap is also a common household item that has multiple uses. Including such expenditures may require compilers to consider identifying the portion of soap sales that is in excess of daily household use.

Home Deliveries. Similar to welfare assistance, home delivery service is another way households were incentivized to stay at their respective residences and prevent exposure. The rapid growth of delivery sales from companies such as Amazon, Uber, and Grab during 2020 is a clear manifestation that the consumption of these services was made because of the pandemic. On the one hand, households would opt for home delivery services to avoid being exposed to the virus. In that sense, the presence of these services offered some level of individual protection. On the other hand, one can argue that lockdowns could have been implemented even without these services, considering that essential shops are often open during the period of the lockdown. Therefore, we argue that home deliveries should likely not be a part of the extended NHA. At best, they should be considered borderline cases.

Other Expenditures

Non-Government Organization and Donations. Non-government organizations such as the Red Cross played a crucial role in the pandemic response. In some countries, these organizations shouldered a large share of the testing. It is critical that expenditures from these organizations be included in an expanded NHA. In the same light, donations from private individuals that were coursed through the provision of masks and PPEs—especially during the first wave of the pandemic—were integral in the initial pandemic response. The challenge for compilers of the NHAs is to find sources of information for such a fragmented set of expenditures.

Where Would They Fit in the NHA?

In this section, we demonstrate that pandemic-related expenditure items that were identified in the previous section can be categorized under the classification system laid out in the SHA 2011 framework. In particular, we provide the SHA classification codes under financing source (FS), institutional units of financing source (FSRI), financing agent

(FA), financing scheme (HF), healthcare function (HC), healthcare provider (HP), factors of provision (FP), and capital formation (HK) for each of the items. Table 2 summarizes the classification we adopted for each item. A description of each classification codes can be found in Appendix A.

Government Expenditures

When accounted for in the national health accounts, expenditures on test and trace, the establishment of quarantine centers and COVID-19 advocacy may be classified as government expenditures (FS.RI 1) in the form of transfers allocated for health purposes from government domestic revenue (FS 1), financed through government schemes or compulsory contributory health care financing schemes (HF 1.1). These are expenditures chiefly made by a country's ministry of health (FA 1.1.1), especially because they initiate and lead each country's efforts in containing the spread of the COVID-19. They may, however, also be accompanied by other relevant ministries and public units belonging to the central government (FA 1.1.2), as well as local government units (FA 1.2), in the implementation of the programs and policies. These expenditures are paid to hospitals (HP 1) and providers of ambulatory (HP 3) and preventive health care (HP 6), as these are the establishments expected to conduct contact tracing, quarantine procedures, and COVID-19 prevention advocacy. The production of these health care services entail the wages and salaries (FP 1) of those personnel employed to conduct them, and the health care goods needed (FP 3), such as health equipment and medicines, especially track and trace programs and quarantine centers. The expenditures on the establishment of quarantine centers may also be categorized under capital formation because they are composed of research and development in infrastructures (HK 1.1.1), respectively.

Other lockdown expenses such as police and military mobilization may also be categorized as government expenditures (FS.RI 1) formed as transfers allocated for health purposes from government domestic revenue (FS 1), also financed through government schemes or compulsory contributory health care financing schemes (HF 1.1). Yet, compared with the primary programs initiated by the government of each country, these initiatives are often led by other relevant ministries and public units belonging to the central government (FA 1.1.2) and local government units (FA 1.2), because they may be considered as miscellaneous activities which have purposes other than health. These expenditures are also not paid to any specific health care provider, and they entail the wages and salaries (FP 1) of the personnel employed to conduct the activities, and health care goods (FP 3).

Business Expenditures

With regard to business expenditures related to the prevention of the spread of COVID-19 such as barriers required for social distancing, and additional spending on employees'

Table 2: Categorizing COVID Expenditures using SHA 2011 Classifications

	FS	FSRI	FA	HF	HC	HP	FP	HK
Welfare assistance	1 or 2	1.1	1 or 3	1 or 2.3	6	6	3	NA
Police and other law enforcements	1	1.1	1.1.2 or 1.2	1.1	6	nec	1.1	NA
Other lockdown expenses	1	1.1	1.1.2 or 1.2	1.1	6	nec	3	NA
Test and trace systems	1	1	1	1.1	3 and 6	1, 3, and 6		NA
Quarantine centers and isolation facilities	1	1.1	1.1.2 or 1.2	1.1	1	3.nec	1.1, 3.2, 3.nec,	NA
Advocacy	1	1.1	1.1.2 or 1.2	1.1	6	6	1.1, 3.2, 3.nec,	NA
Business expenses for social distancing	6.2	1.2	3	2.3.1	6	nec	3.2	NA
Employer spending for transportation, housing, food of employees, and health	6.2	1.2	3.2	2.3.1	6	6, 3.nec or 7.3	nec	NA
Employer spending on transportation, housing, food for worker	6.2	1.2	1.1.2 or 3.2	2.3.1	6	nec	nec	NA
Non-government organization	6.1	1.3 or 1.5	5	3	1 or 6	7.9	1.1 or 3	NA
Donations in kind and in cash	6.1	1.3 or 1.5	5	3	5	1, 3 or 7.1	3	NA
Mask and personal hygiene	6.1	1.3	5	3	6	5.1	3	NA
Home deliveries	6.1	1.3	5	3	6	5.1	3	NA

Note: Table shows the expenditure items categorized using the classifications in the SHA framework. From left to right, the column header represents: financing source (FS), institutional units of financing source (FSRI), financing agent (FA), financing scheme (HF), healthcare function (HC), healthcare provider (HP), factors of provision (FP), capital formation (HK). Description of each classification codes can be found in appendix A.

allowances for transportation, housing, food and health given the mobility restrictions, these may be classified as corporation expenditures (FS.RI 1.2 and FA 3.2). These expenditures are in the form of other revenues from corporations (FS 6.2), financed through enterprise financing schemes (HF 2.3.1). Business expenses promoting social distancing are not paid to any specific health provider, but they may entail the usage of some health care materials (FP 3.nec). Conversely, business spending on employee’s allowances for transportation, housing, food, and health may be paid to providers of ambulatory health care (HP 3), preventive care (HP 6), and health care system administration and financing (HP 7), but may not necessarily entail the usage of any factor of health provision.

Aside from enterprises, schools have also been faced with additional expenditures due to the “new normal” brought by the COVID-19 pandemic. Pertaining particularly to the shift to online learning, schools have spent significantly on improvements for online systems and IT equipment, and have allocated additional expenses for the health of faculties and students. These expenditures may be categorized as corporation expenditures (FS.RI 1.2 and FA 3.2), or expenditures of other government ministries and public units for public schools (FA 1.1.2), in the form of revenues from corporations (FS 6.2), financed through enterprise financing schemes (HF 2.3.1). The additional expenditures on health are paid to providers of ambulatory health care (HP 3) and preventive care (HP 6), and entail wages and salaries (FP 1) and health care goods (FP 3). However, the expenditures on online systems and IT equipment are not paid to any specific health provider, nor entail the usage of any factor of health provision.

Household Spending

Other COVID-19 related expenditures chiefly spent by households such as donations in cash and kind, and health care materials primarily used for the prevention of the spread of COVID-19 (i.e., masks, disinfectants, and soap), may be classified as household expenditures (FS.RI 1.3 and FA 5) in the form of other revenues from households (FS 6.1), financed through household out-of-pocket payments. These expenditures are paid to retailers and other providers of medical goods (HP 5) and entail the usage of health care goods (FP 3).

Considering the expenditures made by non-profit organizations (i.e., Red Cross), these are not directly accounted for in the national health accounts. However, due to these organizations’ significant contributions to the COVID-19 pandemic global efforts, their expenditures should be appropriately included in the health expenditure accounting. These expenditures may be categorized as household (FS.RI 1.3 and FA 5), or rest of the world expenditures (FS.RI 1.5 and FA 5) for global non-profit organizations. These are formed as other revenues from households (FS 6), financed through household out-of-pocket payments, because their funds are made up chiefly of contributions from individual entities. These expenditures are paid to providers of health care system administration and financing, and entail the wages and salaries (FP 1) of the personnel hired by these organizations

and the health care goods and services (FP 3) acquired for the conduct of their COVID-19 related activities.

Other Expenditures

Other expenditures related to the COVID-19 pandemic are the distribution of welfare assistance, which may be classified as either government (FS.RI 1.1 and FA 1) or corporation expenditures (FS.RI 1.2 and FA 3), because the initiatives are not isolated to just the government but also extends to private entities. These are in the form of either transfers from government domestic revenue (FS 1.1), foreign origin (FS 2), or other revenues from corporations (FS 6.2). These expenditures are also financed either through government schemes and compulsory contributory health care financing schemes (HF 1) or enterprise financing schemes (HF 2.3.1). These are paid to providers of health care system administration and financing (HP 7), and may entail health care materials (FP 3), such as masks and medicines, for distribution to people as part of the welfare assistance packages.

Conclusions

In this paper, we find that nine expenditure items related to the COVID-19 pandemic explicitly adhere to at least two of the criteria for inclusion in NHAs and one borderline case. The nine expenditure items are (a) police and law enforcement expenditures; (b) other lockdown expenditures; (c) test and trace systems; (d) quarantine and isolation facilities; (e) expenditures on pandemic-related advocacy; (f) business expense for social distancing and hand hygiene; (g) expenditures of non-government organizations; (h) donations, and; (i) masks and personal hygiene expenditures by households. Meanwhile, the borderline case is the expenditures on welfare assistance. We urge statistical agencies and health ministries to consider these expenditure items when compiling the Health Accounts for their respective countries. Otherwise, their NHA estimates would not reflect the extent to which resources are stretched because of the pandemic. We argue that the inclusion of welfare assistance should also be considered when accounting for health expenditures because, in most cases, lockdown measures would be difficult to enforce had it not been for these packages. However, this is contingent on the mechanism on how these financial assistance schemes were implemented. Research employing data from an expanded NHA would be able to assess the total cost of containing global disease outbreaks and, perhaps, determine whether resources are better spent in pandemic preparation efforts or mitigation and containment.

We also show that these expenditure items can be categorized under the classification of the SHA 2011 framework. Compilers should not have a difficult time determining how to properly classify these expenditure items. It is entirely feasible to compile an expanded set of NHA in conjunction with the SHA framework.

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Appendix

A System of Health Accounts Classifications

The System of Health Accounts (SHA) 2011 provides a standard for classifying health expenditures according to consumption, provision and financing. National Health Accounts tables contain at least eight health expenditure classifications. They are as follows:

Table 3: SHA Classification by Financing Source

Code	Name
Code	Name
FS.1	Transfers from government domestic revenue (allocated to health purposes)
FS.2	Transfers distributed by government from foreign origin
FS.3	Social insurance contributions
FS.3.1	Social insurance contributions from employees
FS.3.2	Social insurance contributions from employers
FS.3.3	Social insurance contributions from self-employed
FS.3.4	Other social insurance contributions
FS.5	Voluntary prepayment
FS.5.1	Voluntary prepayment from individuals/households
FS.5.2	Voluntary prepayment from employers
FS.5.3	Other voluntary prepaid revenues
FS.6	Other domestic revenues n.e.c.
FS.6.1	Other revenues from households n.e.c.
FS.6.2	Other revenues from corporations n.e.c.
FS.6.3	Other revenues from NPISH n.e.c.

Table 4: SHA Classification by Institutional Unit of Revenue Source

Code	Name
FS.RI.1.1	Government
FS.RI.1.2	Corporations
FS.RI.1.3	Households
FS.RI.1.4	NPISH
FS.RI.1.5	Rest of the world
FS.RI.1.nec	Unspecified institutional units providing revenues to financing schemes (n.e.c.)

Table 5: SHA Classification by Financing Agent

Code	Name
Code	Name
FA.1	General government
FA.1.1	Central government
FA.1.1.1	Department of Health
FA.1.1.2	Other ministries and public units (belonging to central government)
FA.1.1.nec	Unspecified central government agents (n.e.c.)
FA.1.2	State/Regional/Local government
FA.1.3	Social security agency
FA.1.3.1	Social Health Insurance Agency (PHIC)
FA.1.3.2	Other social security agency (GSIS, SSS)
FA.2	Insurance corporations
FA.2.1	Commercial insurance companies
FA.3	Corporations (Other than insurance corporations) (part of HF.RI.1.2)
FA.3.1	Health management and provider corporations
FA.3.2	Corporations (Other than providers of health services)
FA.4	Non-profit institutions serving households (NPISH)
FA.5	Households
FA.6	Rest of the world
FA.6.1	International organisations
FA.6.2	Foreign governments
FA.6.3	Other foreign entities
FA.nec	Unspecified financing agents (n.e.c.)

Table 6: SHA Classification by Financing Scheme

Code	Name
Code	Name
HF.1	Government schemes and compulsory contributory health care financing schemes
HF.1.1	Government schemes
HF.1.1.1	Central government schemes
HF.1.1.1.1	Domestic revenue-based central govt schemes
HF.1.1.1.2	Foreign assistance-based central govt schemes
HF.1.1.2	State/regional/local government schemes
HF.1.2	Compulsory contributory health insurance schemes
HF.1.2.1	Social health insurance schemes
HF.2	Voluntary health care payment schemes
HF.2.1	Voluntary health insurance schemes
HF.2.1.1	Primary/substitutory health insurance schemes
HF.2.1.1.2	Government-based voluntary insurance
HF.2.1.1.3	Other primary coverage schemes
HF.2.1.2	Complementary/supplementary insurance schemes
HF.2.1.2.1	Community-based insurance
HF.2.1.2.2	Other complementary/supplementary insurance
HF.2.1.2.2.1	Life and non-life insurance schemes
HF.2.1.2.2.2	Managed health care schemes (HMOs)
HF.2.3	Enterprise financing schemes
HF.2.3.1	Enterprises (except health care providers) financing schemes
HF.2.3.2	Health care providers financing schemes
HF.3	Household out-of-pocket payment

Table 7: SHA Classification by Healthcare Function

Code	Name
Code	Name
HC.1	Curative care
HC.1.1	Inpatient curative care
HC.1.3	Outpatient curative care
HC.1.nec	Unspecified curative care (n.e.c.)
HC.2	Rehabilitative care
HC.3	Long-term care (health)
HC.3.1	Inpatient long-term care (health)
HC.3.2	Day long-term care (health)
HC.3.3	Outpatient long-term care (health)
HC.3.4	Home-based long-term care (health)
HC.3.nec	Unspecified long-term care (n.e.c.)
HC.4	Ancillary services (non-specified by function)
HC.5	Medical goods (non-specified by function)
HC.6	Preventive care
HC.7	Governance, and health system and financing administration

Table 8: SHA Classification by Healthcare Provider

Code	Name
Code	Name
HP.1	Hospitals
HP.1.1	General hospitals
HP.1.1.1	Public general hospitals
HP.1.1.2	Private general hospitals
HP.1.1.nec	Other General hospitals
HP.1.2	Mental health hospitals
HP.1.3	Specialised hospitals (Other than mental health hospitals)
HP.1.nec	Unspecified hospitals (n.e.c.)
HP.2	Residential long-term care facilities
HP.2.1	Long-term nursing care facilities
HP.2.2	Mental health and substance abuse facilities
HP.2.9	Other residential long-term care facilities
HP.3	Providers of ambulatory health care
HP.4	Providers of ancillary services
HP.5	Retailers and Other providers of medical goods
HP.5.1	Pharmacies
HP.5.2	Retail sellers and Other suppliers of durable medical goods and medical appliances
HP.5.9	All Other miscellaneous sellers and Other suppliers of pharmaceuticals and medical goods
HP.6	Providers of preventive care
HP.7	Providers of health care system administration and financing
HP.7.1	Government health administration agencies
HP.7.2	Social health insurance agencies
HP.7.3	Private health insurance administration agencies
HP.7.9	Other administration agencies
HP.nec	Unspecified health care providers (n.e.c.)

Table 9: SHA Classification by Factors of Provision

Code	Name
Code	Name
FP.1	Compensation of employees
FP.3	Materials and services used
FP.3.1	Health care services
FP.3.2	Health care goods
FP.3.2.1	Pharmaceuticals
FP.3.3	Non-health care services
FP.3.3.1	Training
FP.3.3.2	Technical Assistance
FP.3.3.3	Operational research
FP.3.3.nec	Other non-health care services (n.e.c.)
FP.3.4	Non-health care goods
FP.3.nec	Other materials and services used (n.e.c.)
FP.4	Consumption of fixed capital
FP.5	Other items of spending on inputs
FP.5.1	Taxes
FP.5.2	Other items of spending
FP.nec	Unspecified factors of health care provision (n.e.c.)

Table 10: SHA Classification of Health Capital Formation

Code	Name
Code	Name
HK.1.1.1	Infrastructure
HK.1.1.2	Machinery and equipment
HK.1.1.3	Intellectual property products