Strengthening Procurement in the Time of a Pandemic: Evidence from the Philippines

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The coronavirus pandemic has tested the resilience of procurement systems around the world, as governments try to deliver critical public goods while mitigating the risks of relaxing procurement rules to cope with the demands of this emergency. What lessons might we learn from the experience of the Philippines? We construct and open for public use a novel dataset on coronavirus-related government contracts worth P20 billion (USD 400 million), representing nearly 60% of the total value of publicly available contracts as of August 2020. Using this item-level dataset, we find that: (i) medical and social amelioration goods comprise 99% of the value of our sampled contracts, (ii) the typical (median) procurement from award date to reported delivery took 9 days, (iii) around 71% of items were procured at high prices and which warrant a second look from authorities, (iv) more than 60% of items by value had data quality issues, and (v) more than 66% of items by value did not have sufficient descriptions or specifications to warrant price comparisons. Learning from the literature on social accountability movements, we propose ways for civil society, government, journalists, business, and the academe to collaborate to systematically verify and improve the quality of procurement data, so procuring entities can buy better and be more responsive to people's needs in the next rounds of coronavirus purchases and in future emergencies.

Disclaimer: Our research findings cannot and should not be used to conclude fraud or corruption, because our research only covers limited publicly available documents: purchase orders, notices of award, and annual procurement plans. Our study intends to inform the government and civil society on how we might mitigate potential risks in the system for new rounds of coronavirus-related purchases and future emergencies.

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Executive Summary

Key Empirical Findings

We study P20 billion worth of coronavirus-related procurement from a risk-based sample of 581 contracts (120 variables) with 2,832 items (11 variables), representing 58 percent of total value and 5 percent of the total number of contracts as of 3 August 2020. We find:

1. **Completeness**: 76 transactions worth around P1 billion have broken weblinks, or lack at least an annual procurement plan, a purchase order, or a notice of award. We show samples of good documentation from the Central Bank and Department of Agriculture. As of 3 August 2020, only 205 procuring entities have uploaded documents, compared to around 2,000 national agencies, cities, municipalities, and provinces.

2. **Quality**: More than 66 percent of goods representing P13.3 billion do not have sufficient descriptions or specifications to enable price comparisons. Almost all transactions have at least one missing field or inconsistent amounts across their documents. We quantify these other data quality issues using 15 risk indicators.

3. **Value**: Medical and social amelioration goods and services accounted for 99 percent of the value of our sample. Of 205 procuring entities, the top 10 were associated with 89 percent of value. Of the 435 suppliers, the top 10 were associated with two-thirds of the total value procured. Three (3) suspended suppliers were able to bid on coronavirus-related contracts, though these issues are being resolved by government agencies. Three (3) suppliers with foreign addresses have high-value transactions each worth at least P300 million.

4. **Duration**: The typical (median) procurement under the Bayanihan Act took 9 days from award to delivery but we cannot confirm the actual physical delivery of the goods. More than 10 percent of the contracts had dates of awards that were inconsistent with their other supporting documents.

5. **Price**: Of the total P20 billion in contracts in our sub-sample for prices, we were able to analyze only P5.4 billion worth of goods that had comparable external prices. From this smaller subset, we find that taxpayers could save P319 million to P550 million if these were procured using the median externally researched price of those goods. Out of 1,359 total items, 596 had comparable prices with external sources. 421 out of these 596 comparable items (71%) were procured at higher than the median external price. While quality, import costs, or other factors may account for some of the differences that we document in our external price analysis, we believe that identifying these items will help concerned authorities confirm these prices. These results warrant a second look to ensure that the procurement of such items was judicious.

Key Policy Recommendations

The key empirical findings inform these policy recommendations, as summarized below:

1. **Systematically Improving Procurement Data Quality**: We recommend that the Government Procurement Policy Board (GPPB) and the Philippine Government Electronic Procurement System (PhilGEPS) team collaborate with civil society organizations to include in their process a layer of data quality protocols to ensure the completeness and quality of procurement data uploaded by procuring entities. This mitigates the risk indicators we identified. The cleaning protocols can be based on the methodology we employed in the formation of the 15 risk indicator codes, as discussed in Section E2. To improve tracking from budgeting to delivery, we recommend that procuring entities be required to upload delivery receipts, and that the system use linking variables to complete the data chain from finance, budget, procurement, delivery, and audit.

2. **Making Open Contracting More Inclusive**: We recommend that procuring entities assess the strength of their procurement systems by scrutinizing and adapting to the local context the emergency procurement rubric developed by Development Gateway and the Global Digital Marketplace, which documents good practices in different countries in aggregating demand, providing template specifications and contracts, and mitigating price gouging. This is one way to prepare for the next pandemic or emergency scenarios. We should also expand the list of existing accredited suppliers for critical emergency goods. We note that this type of systems research cannot replace the deeper monitoring and engagement work done by civil society monitors as watchers in Bids and Awards Committees, but the methods in this paper may help citizen-monitors in their decision-making on which areas to prioritize their limited time and resources. We recommend that we learn from and build on the experiences of grassroots community organizers in the social accountability movements featured in our literature review, and the critical literature about open data movements, so we can make open contracting initiatives truly inclusive.

3. **Strengthening the Civic Movement to Verify and Check Procurement Data**: This research proposes nine key areas where civil society, journalists, government, and the academe can collaborate to systematically verify procurement data, buy better, and be more responsive to people's needs in future emergency response programs.

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A. Problem Motivation

1. **Globally, governments buy around USD 13 trillion worth of goods and services through public procurement, but only 2.8 percent of this amount is publicly available** (Hunt, 2020)**.** Only 2 percent of total contract value passes global open contracting data standards, a global reporting standard that aims to free up data so that civil society organizations, journalists, businesses, and governments can monitor and assess the quality and performance of public procurement and analyze whether taxpayers are getting value for money. From January to July 2020, the global coronavirus-related procurement market is estimated to be around USD 100 billion.

2. **The COVID-19 pandemic sparked widespread panic buying even among governments leading to threats in efficient government spending** (Cheney, 2020)**.** The COVID-19 crisis made apparent that many societies were not prepared to face a global pandemic. Also made apparent by the crisis is how important government procurement is during an emergency. The pandemic made vital supplies increasingly difficult to get, as seen with the extreme measures taken in order to obtain personal protective equipment. In order to effectively combat such scenarios, government procurement must ensure the ability to procure emergency supplies fast, ensure quality supplies and services, and ensure service delivery and sustain the economy. (Davis, Kilroy, and Fung, 2020)

3. **In the Philippines, as of July 2020, Congress budgeted around P390 billion (USD 8 billion) for coronavirus-related emergency programs**, mostly on cash transfers (Citizens' Budget Tracker, 2020)[1]. **At least P40 billion (USD 800 million) or a tenth of this total value** will undergo some form of negotiated procurement under a state of calamity. **Around P36 billion (USD 700 million) worth of coronavirus-related purchase orders and notices of award has been made publicly available** in a Philippine government online repository specific to the coronavirus-related negotiated procurement for emergency cases as of August 3 ('GPPB Resolution No. 06-2020', 2020).

4. **Two situations highlight the need for deeper study of the procurement system by taxpayers, government, and civil society movements:** First, the Philippines's state of calamity has been extended by one more year, until September 2021, which means a sizable portion of the 2021 national budget may also be subject to more relaxed rules and risks of negotiated procurement. Second, an additional P140 billion (USD 3 billion) in coronavirus-related spending has been signed into law under Bayanihan to Recover As One Act (Republic Act No. 11494), whose validity has been extended to June 2021.

5. **Publicly available procurement data in the Philippines are aggregated at the contract-level, not at the item level, which limits their comparability and use.** These data sets do not yet fully follow the open contracting data standard. Philippine laws require only uploading some pre-tender and tender information to ease

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[1] As of May 2021, the Citizens' Budget Tracker's estimate of the government budget for coronavirus response and recovery is around P600 billion ($12 billion) or just 3.3% of GDP from Bayanihan 1 and 2.

compliance and prioritize social service delivery. There are no known available data on post-tender, delivery, and audit of these coronavirus-related transactions. Suppliers' qualification documents, like business permits and tax returns, though required under law, are not yet available in the government's coronavirus procurement portal. These data sets are also fragmented. They lack variables that link data sets together; as such there is a need to integrate and strengthen the procurement data chain by linking the data chain of financing, budget, procurement, delivery, and audit.

6. **Philippine procurement regulations hold that all bidding must by default be competitive and should strive to have more than one participating bidder.** One of the alternative procurement modes exemptions under this rule is negotiated procurement under a state of emergency (*Government Procurement Reform Act*, 2003), where the state allows the heads of procuring entities to negotiate with one supplier. (Note 1. Regular and Alternative Modes of Procurement in the Philippines)

7. **However, under the Bayanihan to Heal as One Act or Republic Act No. 11469, goods and services procured to deal with COVID-19 are regarded as exemptions from competitive bidding**. There is an existing law, RA 9184, that stipulates provisions for negotiated procurement, but the government allowed for more relaxed standards for coronavirus-related purchases, limited to specific categories: medical goods, personal protective equipment, goods like food packs for emergency relief and social amelioration, property leases for medical facilities and services, construction of quarantine and medical facilities, utilities and telecommunications, and other critical services related to the provision of medicine (*Bayanihan to Heal as One Act*, 2020)[2].

8. **Unlike the negotiated procurement under the Government Procurement Reform Act (GPRA), the following procurement rules are relaxed under the Bayanihan to Heal As One Act (Bayanihan)**. Bid securities and performance securities, which are payments intended to deter bidders from withdrawing their bids, are required under GPRA but are not required under Bayanihan. Under Bayanihan, procuring entities can purchase from more than one supplier if the emergency supplies are unavailable, and these would not be considered splitting of contracts, unlike GPRA. Procuring entities can do special repeat orders from the same supplier as long as they do not exceed 100% of the amount of the previous contract, a relaxation of the GPRA rule of 25%. To speed up bidding, the Bayanihan Act does not require suppliers to register under the Philippine Government Electronic Procurement System (PhilGEPS), the country's official online portal for procurement.

9. **While this allows for more flexible negotiations with single suppliers, negotiated procurement during emergency cases presents some risks**. The flexibility that is allowed also runs the risk that funds may be improperly used or be

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[2] RA No. 11469, Item 2.2. Of the Circular: a. Goods, which may include personal protective equipment such as gloves, gowns, masks, goggles, face shields; surgical equipment and supplies; laboratory equipment and its reagents; medical equipment and devices; support and maintenance for laboratory and medical equipment, surgical equipment and supplies; medical supplies, tools, and consumables such as alcohol, sanitizers, tissue, thermometers, hand soap, detergent, sodium hydrochloride, cleaning materials, povidone iodine, common medicines; testing kits; and such other supplies or equipment as may be determined by the DOH and other relevant government agencies; b. Goods and services for social amelioration measures in favor of affected communities; c. Lease of real property or venue for use to house health workers or serve as quarantine centers, medical relief and aid distribution locations or temporary medical facilities; d. Establishment, construction, and operation of temporary medical facilities; e. Utilities, telecommunications, and other critical services in relation to operation of quarantine centers, medical relief and aid distribution enters and temporary medical facilities; and f. Ancillary services related to the foregoing.

unaccounted for. For example, there has already been a Senate inquiry into alleged overpriced items for personal protective equipment (*Manila Bulletin*, 2020, *Senate of the Philippines*, 2020). There have also been allegations of suspended suppliers that have been allowed to participate in the emergency bids (de Vera, 2020).

B. Review of Related Literature

This section situates our study in the growing literature of civil society participation, social accountability, and open contracting movements and its critiques.

10. **Globally, only 6 of 259 Open Government Partnership (OGP) procurement commitments include an engagement with civil society or public participation.** "The bulk of procurement commitments are instead focused on internal systems changes, e.g. development of an e-procurement portal. This suggests a need for greater emphasis on and advocacy for the inclusion of citizen engagement and participation within the design of open contracting reforms to ensure the intended benefits flow back to citizens." (Caccia *et al.*, 2020)

11. **The researchers found the following risks in emergency procurement systems during covid, in Hivos-funded action research study of 12 countries' published as of October 2020**[3]: there are more uncertain prices for key emergency items; there is not enough data on emergency purchases is available; data quality is generally poor; being listed in a supplier registry increased a company's chances of getting a contract; cumbersome or tokenistic feedback mechanisms deterred participation; open contracting data helped enable data-driven tools and methodologies. They recommend that governments publish complete data about emergency contracts in open and structured formats; publish information about suppliers; promote coordination and centralized purchasing to spot and prevent price disparities; establish standard tender documents; modify procurement guidelines that can be detrimental to transparency; create strategies for capacity building; create spaces for meaningful participation and citizen feedback.

12. **In the Philippines, there are open contracting initiatives both on the national and local government levels. Most of these studies are focused on regular procurement and increasing bidder participation, competition, and transparency.** There was a recently released study of coronavirus procurement by Barajas (2020). He found that the shift to negotiated procurement for emergency cases increased the awarding rate of COVID-19 related tenders from 17% to about 47%, though he concludes that this utilization rate is still low. The analysis used both GPPB and PhilGEPS, though the methodology focuses on contract-level data, and does not validate and consider item-level data.[4] He further finds that "LGUs with low COVID-19 procuring capacity are best paired with COVID-19 suppliers that are capable to supply outside their home regions."

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[3] Lessons from the COVID-19 pandemic: Findings and recommendations for better emergency procurement from 12 countries, funded by Hivos Open Contracting Partnership. (October 2020).
<https://www.open-contracting.org/wp-content/uploads/2020/10/OCP2020-Action-Research-COVID19.pdf>
[4] Barajas, John Raymond (2020). "Contextualizing procurement capacity of Philippine local government units (LGU) in response to the COVID-19 pandemic: A multi-criterion decision analysis perspective"
<https://drive.google.com/file/d/1OitWnFHgb3l5LHSMtONqoBiCsdVgxY2Z/view> [Accessed: 15 December 2020]

Table B. Review of Open Contracting Studies in the Philippines

Level	Regular Procurement	Negotiated Procurement under Emergency Situations
National Government	- Civil Society Manual on Drug Procurement Monitoring and Evaluation (Parafina, 2012)[5] - Expenditure Monitoring in the Philippines: A Rapid Scan of the Experience (Aceron, 2015)[6] - Hivos Article 19 Review of PhilGEPS Open Contracting Data Standard (Hivos, 2016) - Open contracting scoping and baseline study based on PhilGEPS public data sets (Helton, Canjura, Canares, 2016) - Textbook procurement watching with the Department of Education (Textbook 1-2-3) by G-Watch and Procurement Watch Inc. (Aceron, 2015) (Center for Public Impact, 2016)[7] - Infrastructure procurement by the Department of Public Works and Highways (PCIJ; Ilagan, 2018) - Mining and extractive industries (Bantay Kita, 2019) - Procurement system review across various government agencies (Philippine Institute of Development Studies, Navarro and Tanghal, 2020)	- Barajas (2020), based on contract-level data sets from PhilGEPS and GPPB. *** This study: Coronavirus-related procurement, based on item-level data set from the GPPB.** (WeSolve, Citizens' Budget Tracker, Hivos Southeast Asia, 2020)
Local government	- Province of Abra Concerned Citizens of Abra for Good Governance (CCAG) (CCAGG, Oxford Insights, 2020) - Province of Albay (Layertech, 2019) - Province of South Cotabato (European Chamber of Commerce in the Philippines, 2020) - Local Hospital - Procurement Watch Differential Expenditure Efficiency Management tool (IBP, 2020)[8]	- Pasig City drug and medicine procurement monitoring, featured in "An Inclusive Response to the COVID-19 Pandemic in the Philippines: What is the role of open contracting?" (Canares, Paredes, Pepito, Van Schalkwyk, forthcoming)[9] - Local budget tracker with the Municipality of Gumaca, Quezon (Citizens' Budget Tracker, 2020) *** This study: Coronavirus-related procurement from GPPB, including procuring entities from LGUs.** (WeSolve, Citizens' Budget Tracker, Hivos Southeast Asia, 2020)

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[5] Parafina, Redempto (2012). "Civil Society Manual on Drug Procurement Monitoring and Evaluation." Published in the Office of the Ombudsman's website.
<https://www.ombudsman.gov.ph/UNDP4/wp-content/uploads/2012/12/3-Drugs-Procurement-Monitoring.pdf>
[6] Aceron, Joy. (2015). "Expenditure Monitoring in the Philippines: A Rapid Scan of the Experience (Draft)." G-Watch (Government Watch) Working Paper.
<https://www.g-watch.org/resources/political-democracy-and-reforms-poder-studies/expenditure-monitoring-philippines-experience>
[7] G-Watch (Government Watch). 13 April 2016. "Delivering educational textbooks to schools in the Philippines: Textbook Count 1-2-3". <https://www.g-watch.org/news-release/delivering-educational-textbooks-schools-philippines-textbook-count-1-2-3 >
"Textbook Count 1-2-3. School supplies in the Philippines." Centre for Public Impact. A BCG Foundation.
<https://www.centreforpublicimpact.org/case-study/ensuring-efficient-procurement-and-delivery-of-school-supplies-textbooks/>
[8] International Budget Partnership. 2008. "Procurement Watch Inc. Specializes in Monitoring Public Procurement in the Philippines". <https://www.internationalbudget.org/wp-content/uploads/Procurement-Watch-Inc.-Specializes-in-Monitoring-Public-Procurement-in-the-Philippines.pdf> This case was excerpted from Our Money, Our Responsibility: A Citizens' Guide to Monitoring Government Expenditure by Vivek Ramkumar (International Budget Partnership, 2008), available at www.internationalbudget.org.
[9] Canares, Paredes, Pepito, Van Schalkwyk. Forthcoming. "An Inclusive Response to the COVID-19 Pandemic in the Philippines: What is the role of open contracting?" Funded by Hivos Open Up Contracting Project.

13. **The most extensive reviews of regular expenditure and procurement monitoring have been done by Government Watch (G-Watch) (Aceron, 2015), the Hivos Open Contracting Project (Helton, Canjura, and Canares, 2016), and Navarro and Tanghal (2017) of the Philippine Institute of Development Studies.**

   a. Aceron (2015) traces the context and experience of Philippine civil society initiatives in government monitoring and accountability, stretching back from the 1980s experience of the Center for Concerned Citizens of Abra for Good Governance (CCAGG). Aceron draws out useful lessons from the experience of Government Watch (G-Watch), a social accountability program of the Ateneo School of Government, which pioneered textbook watching initiatives with the Department of Education (DepEd). "According to the official report of [the NGO, Government Watch] G-Watch, 'savings' from corruption amounted to USD1.84 million."

   b. Hivos Southeast Asia, through its five-year Open Up Contracting Project, has worked with journalists, civil society, business, and local governments to create actionable recommendations to improve the environment of open contracting and regular procurement (Helton, Canjura, Canares, 2016).[10] In the same report, they noted the difficulty that citizens face in engaging in procurement processes, specifically the high level of investment in skills required to understand these processes and the time required to participate in bid committees. They recommended a strong collaboration among transparency advocates to serve as a wider network for open contracting. They also discussed needed improvements in data quality: the Open Contracting Data Standard (OCDS) recommends the publication of 55 data points, but while PhilGEPS tracks 98 data points, only half of the data are aligned with the standard. They also shared the critical role of passing an enabling freedom of information law, which has not yet been passed.

   c. Navarro and Tanghal (2017) of the Philippine Institute of Development Studies have done an extensive review of the procurement experiences of different government agencies and found that due to poor planning, government agencies experience delay and underspending, and must therefore invest in planning activities prior to procurement.

   d. There are sectoral studies of infrastructure contracts (Philippine Center for Investigative Journalism, 2018) and on mining and extractive industries (Bantay Kita). PCIJ performed a case study of infrastructure projects by the Department of Public Works and Highways (PCIJ, 2018). Bantay Kita has organized around transparency in mining and extractive industries, and was considered by van Schalkwyk and Canares (2020) to be among one of the open data cases that meet the conditions for social inclusion.

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[10] Justin Helton, Jose Canjura, Michael Canares (2016). Open Contracting in the Philippines. Scoping Study. Transparency, Accountability, and Participation: Open Contracting Data, program funded by Hivos and Web Foundation.

e. The seven conditions for social inclusion that Bantay Kita were able to meet were: (1) disruption of data flows (publication of mining data), (2) opportune niche (mining act, Philippine Extractive Industries Transparency Initiative), (3) infomediaries (Bantay Kita and Palawan State University), (4) value creation (problem-focused training and capacity building), (5) switchers (Bantay Kita brings multiple stakeholders like business and government), (6) value activation (questioning how mining company royalties are computed), and (7) outcome re inclusion (no material benefits for marginalized community but improvement in social benefits from a more inclusive process). This framework, along with Aceron (2015) and Fox and Aceron's (2016) scholarship on social accountability are essential reads for those who want to engage in truly inclusive citizen-led movements.

14. **Efforts at the local government level center on increasing bidder participation and competition under regular procurement, with some new studies on drug and medicine procurement during COVID-19.**

a. Layertech and OCDex wrote a report on the procurement trends in the Province of Albay to increase bidder participation and competition in regular procurement (Layertech, 2019). The European Chamber of Commerce of the Philippines is working with the Province of South Cotabato to also increase bidder participation (On the Road to a Better Procurement System in South Cotabato, 2019). Oxford Insights has studied a citizen-led local project and infrastructure monitoring effort in Abra: the Concerned Citizens of Abra for Good Government. (*CCAGG - Civic Action and Accountability in Open Contracting*, 2020).

b. Canares, Paredes, Pepito, and Van Schalkwyk (2021) highlighted that difficulty in monitoring drug and medicine procurement, in the City of Pasig, citing findings from the Commission on Audit on high variations in prices and low utilization in 2018 and 2019, and upcoming results on drug price comparisons during the COVID-19 period. Researchers concluded that, "At its best, there was the intention to be transparent, and there are some efforts to do that, including what was mentioned as the livestreaming of procurement activities on the city's official Facebook account. But this is only one aspect of the whole contracting process. Like all other local government units in the country, the contracting and implementation processes are shielded from public view."

c. The Citizens' Budget Tracker (2020) has tracked the coronavirus response and recovery budget at the national level and also helped design the local coronavirus budget tracking system with the Municipality of Gumaca, Quezon Province: called Gumaca COVID-19 Aid Reporting and Expenditure Summary (CARES), accessible via https://gumaca.gov.ph/cares/. The movement shared this local reporting model to the Bureau of Local Government Finance, to institute better reporting standards on coronavirus spending.[11]

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[11] Citizens' Budget Tracker. A Review of Philippine Government Spending for Coronavirus Response and Recovery in 2020. 10 November 2020. 58th Philippine Economic Society Annual Meeting and Conference (bit.ly/cbt_pes2020).

15. **Transparency in procurement may lead to favorable outcomes including cost savings, faster procurement, and more unique winning bidders per contract.**

    a. In a study done in Mie Prefecture, Japan, improvement in transparency on the procurement process, through the introduction of a transparent, rules-based bidder qualifying process succeeding the previous discretion-based process, decreased both the average level of bids and the level of winning bids, leading to annual cost savings of 8%. Transparency also proved collusion existed in the bidding process and was reduced as a result of greater transparency. (Ohashi, 2009) After the launch of the Ukrainian e-procurement portal, ProZorro, in 2015, cost savings from corruption and increases in bids have been reported. As of 2017, UAH 22.4 billion (EUR 770 million) is said to be saved from corruption and needless expenses, 25,600 procuring entities are using the platform leading to 754,700 tenders worth UAH 549.5 billion (EUR 19.0 billion) (Offerman, 2017).

    b. A study done on ProZorro also shows that since the introduction of the system, there has been greater participation for suppliers with more unique bidders winning contracts. Procurement time is also shown to be quicker, with ProZorro procurement 5-6 days quicker than pre-ProZorro procurement (Kovalchuk, Kenny and Snyder, 2019).

16. **But open contracting and the larger open data movements have come with critiques. Open contracting may widen inequality if the data does not empower citizens to engage in the power structures that determine the delivery of public services.** (Leonelli, 2018; van Schalkwyk and Canares, 2020).

    a. Data is power, van Schalkwyk and Canares argue, and opening up data sets is a way to redistribute power. But since data requires specialized skills to analyze, it may further widen inequality between those who have the skills and resources to analyze and interpret data, and marginalized groups who cannot. In five international cases reviewed by Canares, only one led to inclusive outcomes. If open contracting aims to improve public outcomes and to promote the inclusion of marginalized groups, then this theory of change is not automatic.

    b. In a wider study of 28 countries in the Global South, van Schalkwyk and Canares (2020)[12] define inclusion as political participation. Canares and Van Schwalyk define inclusion as political participation: "... whether individuals or groups of people enjoy equitable opportunities in shaping how they are governed and achieve and benefit from desired governance outcomes" (Habermas 1996; Yuval- Davis 2011). Our approach to inclusion is political because it is inseparable from power, as highlighted by Gurstein (2010, 2011) and others [see, e.g., Arnstein's citizen control (1969), Pretty's

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[12] Francois van Schalkwyk and Canares. 2020. "Open Government Data for Inclusive Development". In book: Making Open Development Inclusive: Lessons from IDRC ResearchPublisher: MIT Press
<https://www.researchgate.net/publication/343879908_Open_Government_Data_for_Inclusive_Development>

self- mobilization (1995), and Hurlbert and Gupta's adaptive governance (2015)]. Access and broad forms of participation are important stepping stones to inclusiveness but do not necessarily confer agency on or empower those being included; access and participation may simply result in a "voice without agency ... [and] presence without politics" (Singh and Gurumurthy 2013, 186) for previously excluded communities." They add, "One of the central challenges of open data, then, is to actualize the core value of inclusion."

c. Infomediaries like journalists, researchers, community organizers, and civic movements hold a crucial role in partnering with marginalized communities in interrogating and reshaping the local power and governance structures that decide on the provision and distribution of public goods and services.

d. Indeed, in the social accountability literature, through Fox and Aceron's (2016)[13] study of the Textbook Case Count, a coalition which monitored the whole supply chain of textbook delivery in the Philippines, the authors pointed to a critical limit of procurement watching: "the constructive engagement approach worked very well for Textbook Count – for as long as the initiative could count on both senior policymaker allies and the resources needed to coordinate a nation-wide independent monitoring effort." Because of this identified "sustainability" challenge, they advocate for a more gradual build-up of efforts at the local government level. They argue that "vertically integrated, multi-level coalitions between CSOs, broad-based social organizations and public sector allies (where available) can combine bottom-up independent policy monitoring with the civic muscle needed to use evidence effectively for reducing corruption and improving public sector performance." They also advocated for longer time horizons in implementation, especially in coordinating with donors and supporters of social accountability programs.

17. **This Paper's Contribution.**

a. While most local procurement literature has been focused on regular procurement, emergency negotiated procurement is relatively understudied in the Philippines. The paper helps fill this gap by focusing on emergency procurement in the Philippines, a lower-middle income country rated by the Centers for Disease Control and Prevention to have a "very high level of COVID-19"[14] and one of the countries with the greatest need for more effective procurement of coronavirus-related transactions.

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[13] Jonathan Fox and Joy Aceron. 2016. "Doing accountability differently A proposal for the vertical integration of civil society monitoring and advocacy". Anti-Corruption Research Center. U4 Anti-Corruption Resource Centre Chr. Michelsen Institute (CMI).
<https://accountabilityresearch.org/publication/doing-accountability-differently-a-proposal-for-the-vertical-integration-of-civil-society-monitoring-and-advocacy/>
[14] Centers for Disease Control and Prevention Guidance as of 11 May 2021.
<https://wwwnc.cdc.gov/travel/notices/covid-4/coronavirus-philippines>

b. This study also quantifies the system-level data quality improvements in a public procurement system: and focuses on item-level data and risk management of publicly available online documents during a pandemic.

c. While civil society organizations are given a seat to observe bids under the law, this has proved to be difficult because of limited time and resources by civil society organizations and the lack of face-to-face interactions during the pandemic. While limited in depth, the wider system-level analysis that this paper provides could provide a useful risk framework in focusing limited staff time and resources of civil society organizations, journalists, procurement watchers, and institutions advocating for social accountability.

C. Research Design

C1. Objectives

The goal of the paper is to identify, quantify, and mitigate risks to emergency procurement in the Philippines and recommend solutions to balance timeliness and control more effectively for future emergency response programs.

C2. Questions

To achieve these objectives, this paper divides research questions into five empirical questions on the value, duration, price, process, and document quality of publicly available contracts on coronavirus-related government purchases. These empirical findings inform two normative policy questions related to mitigating procurement risk and improving the resiliency of the procurement system.

These five (5) **Empirical Questions** are discussed in **Chapter E**.

1. **Completeness**: Are procuring entities uploading complete documents?

2. **Quality**: Are procuring entities submitting consistent documents?

3. **Value**: How much has the Philippines procured under the first Bayanihan Act, by major category of goods? By supplier? By procuring entity? By contract size?

4. **Duration**: How long does the typical emergency procurement take?

5. **Price**: What is the price distribution of comparable goods?

These two (2) **Policy Questions** are discussed in **Chapter F**:

1. **Improving Data Quality:** How might we systematically improve data quality in succeeding coronavirus-related procurement submissions and other emergency-related procurements in the future?

2. **Mitigating Risk**: How might we mitigate the 15 identified procurement risks we identified? How do we make the Philippine government procurement system more effectively balance control and timeliness during emergency situations?

The answers to these questions inform our conclusion in Chapter G, where we build a case for collaboration between government, business, journalists, academe, and civil society movements to systematically verify procurement data and become more responsive to people's needs in future emergency response programs.

C3. Scope and Limitations

1. Because our research only covers publicly available purchase orders, notices of award, and annual procurement plans, our research findings cannot and should not be used to conclude fraud or corruption. Any conclusions to this effect made solely on the basis of this report are erroneous. Our study intends to inform government, civil society, and interested citizens in how we might mitigate potential risks in the system for new rounds of coronavirus-related purchases and future emergencies.

2. We rely on and are limited by publicly available coronavirus-related procurement documents on the GPPB portal: annual procurement plans, purchase orders, notices of award, and some publicly available price data. Philippine laws require only uploading some pre-tender and tender information to ease compliance and prioritize social service delivery. Suppliers' qualification documents, like business permits and tax returns, though required under law, are not yet available in the GPPB portal, which means we cannot cross-check the consistency of supplier information.

3. While PhilGEPS has published half of the variables recommended by the Open Contracting Data Standard, the Philippine coronavirus procurement data sets uploaded in the GPPB website are fragmented, which limits their comparability and use across different data sets. They lack variables that link datasets together. As such it is difficult to get the full picture of the procurement data chain; this shows the need to integrate these data sets by linking financing, budget, procurement, delivery, and audit data sets.

4. A system study such as this cannot replace the deeper monitoring and engagement work done by civil society monitors as watchers in Bids and Awards Committees, but the methods in this paper may help citizen monitors in their decision-making on which areas to prioritize their limited time and resources.

D. Data

D1. Source

Our raw data come from the online portal Government Procurement Policy Board (GPPB): https://gppbgovph.com/awardedcontracts.ph. The GPPB is the highest policy making body on public procurement in the Philippines. All procuring entities are required under the Bayanihan to Heal As One Act to upload their coronavirus-related procurement contracts to an online portal. The full list of data sources is in the References section.

D2. Population

Procuring entities have uploaded a total of 11,697 purchase orders and notices of award worth P35,955,162,449.00 (around USD 700 million) publicly available as of 3 August 2020, our cut-off date for inclusion in this analysis. These population values will increase as procuring entities submit their documents to catch the deadlines required by law. The data, however, is available only at the contract-level, not the item-level; as such the number of items is not known.

D3. Sampling

We use a risk-based sampling method using six sampling criteria shown below, with a representative mix of high-value and small-value contracts. The final sample consisted of 581 contracts worth P20,813,817,890. Our team encoded a total of 2,832 line items from these contracts.

Because we had limited staff time and resources to analyze all 11,697 transactions, we decided to ensure material representation of the population to 58 percent of the total contract value (see Note 2). There was a pilot batch for the period as of June 24 to test run our analysis, and a second batch to scale up analysis from June 25 to August 3; this meant there were two materiality thresholds for high-value transactions.

These six criteria were designed to maximize the number of identifiable procurement risks:
  1. High-value transactions beyond a threshold of materiality (see Note 2)
  2. Amount awarded is greater than approved budgeted amount
  3. Large difference between awarded amount and budgeted amount
  4. Date of award falls on a weekend
  5. Dates are out of order or beyond the declared coronavirus procurement period
  6. Random sampling of small-value transactions

Sampling criteria 1, 2, 3, and 6 are based on the amount awarded as specified in the raw GPPB tables. Criteria 4 and 5 are samples based on dates that are out of order. Criteria 6 is especially important since in theory, small value transactions are subject to less controls.

The sampling is biased towards high value transactions and unbiased towards small value transactions. This sampling methodology was designed by two professional auditors in our

research team, with the advice of a former commissioner of the Philippine supreme audit institution. Our sampling initially assumed that the amounts in the contract-level data in the raw GPPB tables available in the online portal were correct. But we did consistency checks which revealed some inconsistencies in the data. The sampling results are shown below:

Table D3.1. Sampling Table as of 3 August 2020

As of 3 August 2020	Total value (PHP)	Number of contracts	Number of items
Population	P 35,955,162,449	11,697	Unknown
Sample	P 20,813,817,890	581	2,832
Sub-sample of top 5 major categories for price analysis	P 19,974,227,798	420	1,359
Sample as percent of population	58%	5%	Unknown

Table D3.2. Sampling Table by Criteria as of 3 August 2020

Sampling Criteria	Amount (PHP)	No. of contracts	% of sample value
Population: Awarded value of all uploaded contracts in the GPPB Awarded Contracts Page as of 3 August 2020	**35,959,984,741.67**	**11,697**	**-**
Final Sample for Risk Analysis	**20,813,802,890.93**	**581**	**100.0%**
o/w Sampling Criteria 1a: All high-value transactions above a materiality threshold as of June 24	724,030,200.00	4	3.5%
o/w Sampling Criteria 1b: All high-value transactions above a materiality threshold from June 25 to August 3	10,010,800,000.00	5	48.1%
o/w Sampling Criteria 2: Amount awarded is greater than approved budgeted amount	60,013,512.20	15	0.3%
o/w Sampling Criteria 3: Date of award falls on a weekend	261,921,935.81	109	1.3%
o/w Sampling Criteria 4: Dates are out of order or beyond the declared coronavirus procurement period (March 25 to August 3 2020)	21,003,737.25	32	0.1%
o/w Sampling Criteria 5: A large difference between awarded amount and budgeted amount	418,168,225.00	12	2.0%
o/w Sampling Criteria 6: Random sampling of small-value transactions	9,317,865,280.67	404	44.8%

D4. Data Collection and Cleaning

From the raw data set with only 14 contract-level variables in open format, we collected a final data set with 120 contract-level variables and 11 item-level variables.

1. **Data collection**: The data collection was performed by 24 research team members. A pilot data collection exercise was done for the first phase given publicly available data as of 24 June 2020; and a scale-up second phase of data collection from June 25 to August 3, with publicly available data as of 3 August 2020. Each contract was assigned to an encoder. The original 14 variables are from the GPPB website (raw). The primary data sources are the uploaded purchase orders, notice of awards, and annual procurement plans. The rest are variables for data quality and risk. The identification (ID) variables indicate the contract or item-level observation and the codes of the researchers accountable for encoding the observation.

2. **Data cleaning and verification**: After performing the sampling of the raw data, the team performed a cleaning and verification protocol to check the consistency of the publicly available contract data with the data actually encoded in the uploaded contracts. All observations were checked four times for consistency: by a research assistant, by an auditor, by one of the authors who performed a check of the system as whole, and by a team of authors who did a final check on the item-level dataset.

The documentation and descriptive statistics of these final collected variables are presented in **Note 6**.

Table D4. Variables, by source (category)

Variables, by source (category)	Contract-level	Item-level
Final clean data	**120**	**11**
From GPPB website - raw variables (gppb)	14	0
From Purchase Order (po)	30	9
From Notice of Award (noa)	11	1
From Annual Procurement Plan (app)	3	0
From Risk Analysis: tally of 15 risk indicators (risk)	30	0
From Audit and Sampling Procedure (audit)	17	0
ID: Unique identification number (uid)	1	1
ID: Encoder / researcher assigned (encoder)	4	0
Duration	10	0

E. Empirical Findings

E1. Availability. Are procurement documents available and complete?

Method: We define complete documentation as a transaction having all three required supporting documents: an Annual Procurement Plan (APP), a Notice of Award (NOA), and a Purchase Order (PO). We summarize these issues of completeness and availability in Table E1. We also show three model cases of documentation in Box E1.

Key Findings:

1. 76 transactions worth around P1 billion have either broken weblinks to documents or are lacking at least an annual procurement plan, a purchase order, or a notice of award. This represents 13% of the number of transactions and 5% of the value of our sample.

2. The most common issue is the lack of an available notice of award (60 contracts worth P244 million). The most significant issue is the number of documents with broken weblinks (8 contracts worth P770 million).

3. Model documents exist in the current data set: we show good models of an Annual Procurement Plan and Purchase Order from the Bangko Sentral ng Pilipinas, and a model Notice of Award from the Department of Agriculture Field Office VII. We summarize the characteristics of good procurement documentation in Box E1.

Table E1. Issues on Completeness and Availability

Issues on Completeness and Availability	Count	Amount
Missing Annual Procurement Plan	3	Not Indicated
Missing Purchase Order	2	Not Indicated
Missing Notice of Award	60	244,054,458.42
Link broken (URL Error: file not found)	8	769,914,000.00
weblinks to PO and NOA interchanged	1	16,500,000.00
Link to PO the same as link to NOA	2	2,557,000.00
Number with missing document or broken link	**76**	**1,033,025,458.42**
Samples	**581**	**20,813,817,890.93**
% of Samples	**13%**	**5%**

Box E1. Model Annual Procurement Plan, Purchase Order, and Notice of Award

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The following are the best uploaded documents we saw online in the GPPB data set:

1. Annual Procurement Plan (APP) from the Bangko Sentral ng Pilipinas
   The APP defines the procuring entity's buying program for the year.

2. Notice of Award (NOA) from the Department of Agriculture Field Office VII
   The NOA is a document from the procuring entity notifying the supplier that the bid for a specific type and quantity of item has been accepted

3. Purchase Order (PO) from the Bangko Sentral ng Pilipinas
   The PO is a document sent by a buyer to purchase specific quantities and types of items from a supplier.

These three documents are model documents because they have complete information, consistent data across documents, and a correct sequence of approvals. Here are these characteristics of these model documents in greater detail:

❏ Complete signature

❏ Complete information, including information on the document type, supplier, payment, delivery

❏ Complete attachments and assessment of eligibility documents: with Purchase Request (PR) and Notice to Proceed (NTP)

❏ Adequate item or material description or specification

❏ Proper sequence of approval

❏ No issues on the integrity of approvals (e.g. no manual alterations)

❏ With breakdown of purchases

❏ Consistent data across documents (APP vs. PO vs. NOA)

❏ Free from material typographical and mathematical errors

❏ Document available and uploaded online

❏ With budget tracking number

❏ With certification of preparer

E2. **Document Quality**. Are uploaded documents consistent?

Method:

1. Using 15 risk indicators discussed below, we quantify document quality and consistency issues in the GPPB data set. We show how inconsistencies in these documents may affect the procurement process.

2. We chose these from an original list of 68 procurement risk indicators: the original list of procurement risk indicators from the UN Convention Against Corruption, the Government Procurement Reform Act, the Bayanihan Act, the Disaster Risk Reduction Manual, and generally accepted accounting and auditing principles.

3. We use these findings to inform policymakers how to mitigate these procurement risks.

Key Findings:

1. **Specifications or descriptions:** The most significant procurement risk is the lack of specifications or goods descriptions: a quarter of items studied representing P13.3 billion lacked sufficient material descriptions to make price comparisons (risk 14, detailed in the Price Analysis). This is significant because determining the price, timing, and quality of procurement rely on the right level of specifications of goods, services, or infrastructure.

2. **Document quality:** Almost all contracts lacked at least one basic information or field (risk 2). Around a third of the contracts worth around P6 billion have some form of inconsistency in amounts (risk 4). Some transactions had significant typographical or mathematical errors (risk 11) and material differences in amounts (risk 15).

3. **Inconsistent dates**: Almost all transactions had dates that were inconsistent across the internal documents of the transaction we reviewed (risk 6). These risks are discussed in detail in the section on Duration.

4. **Supplier risks**: There were transactions with three suspended suppliers worth around P700 million (risk 12), but these are already being resolved by government agencies (Box E2). More than P700 million worth of transactions have inconsistent supplier information across documents (risk 13).

5. **15 risk indicators**: Table E2 summarizes the key issues on document quality, and their frequency, by number of transactions, and by amount.

Table E2. Summary of Risk Indicators and Document Quality Issues

Risk	Description	n	Amount	% of n	% of amount
R1	Unclear data or signatures in documents	89	1,086,406,605	15%	5%
R2	Missing basic information	564	20,572,137,251	97%	99%
R3	Lacking description or specification (see Section E5)	334	13,280,893,805	25%	66%
R4	Inconsistent amounts among documents	151	6,196,341,922	26%	30%
R5	Missing document or broken weblinks	88	299,745,283	15%	1%
R6	Inconsistent dates or times	571	20,616,964,160	98%	99%
R7	Purchase inconsistent with purpose	26	466,659,335	4%	2%
R8	Large time lapsed between order and award (see Section E4)	175	7,138,479,325	30%	34%
R9	Transaction entered twice	9	98,264,850	2%	<1%
R10	Many same orders to the same supplier	51	568,172,761	9%	3%
R11	Significant typographical and mathematical errors	24	61,422,523	4%	<1%
R12	Transactions with suspended suppliers	2	727,694,000	<1%	4%
R13	Inconsistent supplier information	230	728,005,870	40%	4%
R14	Price is risky	See E5			
R15	Material differences in amounts	94	1,142,136,423	16%	5%
Note	Sample	581	20,813,817,891	100%	100%

The following section explains the significance of each identified risk indicator.

Risk indicators 1 to 4 indicate how strict or lax internal controls are among procuring entities. Considering that the resources involved are taxpayer money, the government must show stewardship and accountability on the resources entrusted to them. During times of national emergencies such as the current pandemic, uncertainty and volatility increases the risk of hurried and poor implementation of internal controls.

Risk Indicator 1. Unclear data or signatures in documents

There is a risk that the documents may have validity issues, because of the following factors that make data or signatures unclear:

- Superimpositions, handwritten, erasures with no countersignatures
- Alterations after scanning and before uploading to website
- Partially cut documents when scanned for upload
- Unreadable details, blurry documents
- Issues on signatures like signatures are not identical or no signatures at all
- Document uploaded is a soft copy and in an editable version

Risk Indicator 2. Missing basic information

There is a risk that the basic information on the documents are not present such as:

- document information (PO number, Obligation Request / Budget Utilization and Request Status (OBR / BURS) number, other attachments)
- product information (price, quantity, amount, description, breakdown)
- supplier information (name of supplier, supplier address, name of conforme)
- payment and delivery information (payment term, delivery term, date of delivery, place of delivery)
- notarial information (notarial references, signature of notary public, date, notarial seal)

Risk Indicator 3. Lacking goods description or specifications

There is a risk that the description is inadequately described, ambiguous, incomplete, or misleading because the specifications and other information pertaining to the goods or services are not indicated.

Risk Indicator 4. Inconsistent amounts among documents

There is a risk that some information in a document is not consistent with the information in other documents due to the following:

- amount is different between words and numbers
- amount stated in PO is different in NOA
- stated purpose of purchase is different across the PO, NOA, and the GPPB website
- other information not consistent among the documents

Risk Indicator 5. Missing documents or broken weblinks

There is a risk that the transactions do not exist due to following reasons:

- document is not uploaded for either PO, NOA, or APP
- document uploaded does not pertain to the transaction described
- a document is uploaded as an alternative but the alternative document uploaded is not valid
- issues in the URL because the document links to another document, file is not found, or the link to two different documents are the same

This fifth risk indicator measures the completeness of documents: this checks if the relevant procedures and controls were properly performed and observed. Incomplete documents and attachments indicate the strength or weakness in the implementation of process and controls.

Risk Indicator 6. Inconsistent dates or times

Documents in the wrong chronological order signal that controls and processes may have been overlooked. To illustrate, the correct order is such that the notice of award must be issued before the purchase order. Within the documents, the dates of approval must also be in order. (See Box E1)

These documents and approvals must also be linked to specific budget utilization codes, which indicate the budget and fund sources, as indicated by the Obligation Request Status (OR / OBR / ORS), Budget Utilization and Request Status (BURS) numbers. If there is disorder in the dates of documents, it means that some controls and processes may have been overlooked. Here are sample cases.

For example:
- Purchase Order is dated before Notice of Award
- PO is dated before Signed by Bidder date in the Notice of Award
- PO is dated before ORS/BURS/OBR
- NOA is dated before ORS/BURS/OBR
- Signed by Bidder date (NOA) is dated before NOA
- Signed by Bidder date (NOA) is dated before ORS/BURS/OBR

Risk Indicator 7. Purchase inconsistent with purpose

There is a risk that the purpose of the purchase is inconsistent across certain documents:

- Inconsistent stated purpose of purchase among documents
- Inconsistent project name and materials purchased
- Inconsistent timing of purchase for the project
- Inconsistent number of items purchased

Risk Indicator 8. Large time lapsed between order and award

There is a risk that procurement-related documents (PO and NOA) are not processed and reviewed in a timely manner because of the time difference in the dates of the documents. A large time lag between the preparation and approval of procurement-related goods may indicate poor performance efficiency of the procuring entities. And if the data awarded is too fast, there may have been processes skipped.

Risk Indicator 9. Transaction entered twice

Duplication of entries may be a risk because the value has been entered in the accounting records without actual activity or delivery of public services. On the other hand, this may also just be an error in the online portal or listing.

Risk Indicator 10. Many same orders to the same supplier

There is a risk that large contracts are split into smaller contracts, resulting into multiple contracts awarded to the same supplier. While the government is not prohibited from awarding similar contracts to the same supplier as there may be legitimate reasons for doing so, it could also indicate intentions to split contracts to circumvent the additional internal controls for larger amounts.

Risk Indicator 11. Significant typographical and mathematical errors

There is a risk that information indicated in the documents are typographically and mathematically incorrect, which may lead to misstatements of the transaction.

Risk Indicator 12. Continued transaction with blacklisted suppliers

There is a risk that procuring entities are still transacting with blacklisted suppliers, despite being banned from participating in procurement-related activities with the government, during the period in which the entity is blacklisted.

Risk Indicator 13. Inconsistent supplier information

Because of the pandemic situation, suppliers were not required to register with PhilGEPS. The lack of preverification makes consistency in supplier information across uploaded documents all the more important to ensure that the government is dealing with legitimate entities. These are samples of inconsistencies in supplier information:

- Supplier name or address is not available, not indicated, unreadable, or blurry
- Supplier has an unrelated business (e.g. printing services selling face masks)

Risk Indicator 14. Price may be risky

There is a risk that the price is unreasonably high or low compared to different sources of prices such as: internal and external prices data. These risks are explained in the section on price.

Risk Indicator 15. Material differences in amounts

There is a risk that the different relevant amounts are not reconciled:
- amount stated in PO is not equal to the amount awarded per GPPB website
- amount awarded is greater than the approved budget
- amount stated in PO is greater than the amount in NOA

Box E2. The Case of Three Suspended Suppliers (Risk Indicator 12)

Some procuring entities also entered into contracts with suspended suppliers. Government was exposed to P700+ million of these contracts, though these contracts are already in the process of cancellation.

According to the GPPB "consolidated blacklisting report"[15], accessed September 2020:

1. Company A "did not fulfill delivery of suppliers for drugs and medicines" with a city and had been sanctioned with a 2-year blacklisting. But it was able to initiate a P700+ million contract that has since been in the process of cancelation by the Department of Budget and Management.

2. Company B was sanctioned with a 1-year suspension for failing to complete more than three-fifths of the contract with a national government agency. But it was able to enter into a P1 million coronavirus-related contract.

3. Company C was sanctioned with a 1-year suspension because a previous contact was terminated when it "defaulted" on a P100+ million contract with a national government agency. But it was able to enter into a small contract less than P1 million.

As of December 18, 2020, these three companies have served their full period of suspension. While Company A's covid-related contract has since been in the process of cancelation and companies B and C are a small proportion of the total value, these three cases point to risk of exposure of government to future suspended suppliers, if the supplier information is not integrated into the emergency procurement system.

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[15] Source: Government Procurement Policy Board Website, accessed 1 September 2020
https://gppb.gov.ph/ConsolidatedBlacklistingReport.php

E3. Value. What did the government buy under the first Bayanihan Act?

Method: The tables below present the distribution by major type of goods and services according to the Bayanihan to Heal As One Act. We coded the contracts by more specific classifications. We summarize the concentration of the sample by procuring entity, by supplier (with domestic and foreign addresses), and by contract size.

Key Findings:

1. **By major type**: Of the P20.8 billion in contracts we studied in our sample, 99 percent were from medical goods and services (78 percent) and amelioration goods and services (21 percent). The rest of the one percent was from construction (0.6 percent), ancillary services (0.1 percent), utilities (0.1 percent), and property leases (<0.1 percent). We were unable to classify around P2 million (<0.1 percent) worth of contracts because of the lack of data.

2. **By subtype**: The top five largest categories are the following: Personal Protective Equipment (P10.0 billion), Testing kits (P5.2 billion), Rice (P3.1 billion), Laboratory, Medical, and Surgical Devices, Equipment, Tools and Supplies (P2.3 billion), Food (P0.9 billion). These top five subtypes account for 96 percent of sampled value, 70 percent of the total number of contracts, and 48 percent of the number of items.

3. **By supplier:** There are a total of 434 suppliers in our sample. The top 10 suppliers accounted for 67 percent of value. The only 3 suppliers with foreign addresses we found in our sample accounted for 12 percent of value. These suppliers had high value transactions worth more than P300 million each.

4. **By procuring entity**: There are a total of 205 procuring entities in our sample. The top 10 procuring entities accounted for 89 percent of value. The major procuring entity is the Department of Budget and Management Procurement Service (DBM - PS), accounting for 67 percent of sampled contract value. This is followed by the City Government of Taguig, representing 6 percent of value.

5. **By size of contract**: More than a third of the sampled contracts were below P500,000 and more than quarter of them were above P10 million, as designed in the sample. Figure E3.6 shows that these sizes vary, depending on the document source, which could be the purchase order, notice of award, or the amount awarded or approved budget of contract indicated in the GPPB website.

Table E3.1. Value of goods and services under the Bayanihan to Heal As One Act, by major type of good or service (covering transactions in our sample)

By major type of good	Number of purchase orders	Number of items	Amount (PHP)	% of total amount
Medical Goods and Services	210	1286	16,276,637,238.75	78.2%
Amelioration Goods and Services	289	935	4,379,282,994.56	21.0%
Construction	28	423	115,307,327.78	0.6%
Ancillary Services	31	149	21,196,220.85	0.1%
Utilities	10	25	17,446,512.65	0.1%
Property Lease	1	1	5,880,000.00	<1%
Cannot be classified	13	14	2,141,288.00	<1%
Total Sample	**581**	**2832**	**20,813,766,582.59**	**100%**
Population of 3 Aug 2020	11,697		35,955,162,449.00	

Table E3.2. Value of goods and services under the Bayanihan to Heal As One Act, by sub-type of good or service (covering transactions in our sample)

	Number of POs	Number of Line Items	Amount Spent	% of total
Amelioration Goods and Services	**288**	**934**	**₱4,379,282,994.56**	**21.02%**
Food	**94**	**440**	**₱911,903,617.611**	**4.38%**
Livelihood Programs	4	4	₱73,085,000.00	0.35%
Meals	25	102	₱93,949,714.00	0.45%
Medical and Health Services	1	1	₱22,000.00	0.00%
Personal Care	1	13	₱85,277,317.00	0.41%
Poverty Alleviation Programs	1	1	₱6,759,932.40	0.03%
Rice	**141**	**176**	**₱3,000,839,659.50**	**14.42%**
Social Services	1	1	₱30,250,000.00	0.15%
Household, Cleaning, Paper and Other Non-food Grocery Items	20	196	₱173,070,754.05	0.83%
Ancillary Services	**31**	**149**	**₱21,196,220.85**	**0.10%**
General Merchandise	13	95	₱6,350,976.55	0.03%
Provisions for Healthcare Providers, Allied Professionals, and Volunteers	11	42	₱9,710,045.00	0.05%
Transportation Services	7	12	₱5,135,199.30	0.02%
Construction	**28**	**423**	**₱115,307,327.785**	**0.55%**
Aid Distribution Centers	0	0	₱0.00	0.00%
Housing	2	72	₱39,969,491.55	0.19%
Quarantine Site	11	131	₱19,164,001.66	0.09%
Repurposed Spaces and Facilities	2	29	₱50,939,004.17	0.24%
Sanitation	10	47	₱1,009,220.71	<0.01%
Testing Site	1	1	₱3,731,780.26	0.02%
Not_Specified	2	143	₱493,286.60	0.00%
Medical Goods and Services	**210**	**1286**	**₱16,276,637,238.75**	78.20%
Laboratory, Medical, and Surgical Devices, Equipment, Tools and Supplies	**91**	**508**	**₱1,444,768,496.22**	**6.94%**
Medicines	28	495	₱195,539,574.53	0.94%
Personal Protective Equipment	**68**	**217**	**₱9,748,400,309.00**	**46.84%**
Support and Maintenance of Laboratory, Medical, and Surgical Devices, Equipment, and Tools	10	48	₱19,613,143.00	0.09%
Testing Kits	**13**	**18**	**₱4,868,315,716.00**	**23.39%**
Property Lease	**1**	**1**	**₱5,880,000.00**	**0.03%**
Hotel Rooms	0	0	₱0.00	0.00%
Large Public Venues	0	0	₱0.00	0.00%
Lots and Open Spaces	0	0	₱0.00	0.00%
Warehouses	1	1	₱5,880,000.00	0.03%
Utilities	**10**	**25**	**₱17,446,512.65**	**0.08%**
Maintenance, Repair, and Support	3	14	₱448,405.00	<0.01%
Management and Consultancy	0	0	₱0.00	0.00%
Security	0	0	₱0.00	0.00%
Water, Electricity, and Telecommunications	4	8	₱325,947.15	<0.01%
Other Services	3	3	₱16,672,160.50	0.08%
Not Specified	**4**	**5**	**₱1,243,843.00**	**0.01%**
Indeterminate_Info	**1**	**1**	**₱897,995.00**	**<0.01%**
Not Indicated	**8**	**8**	**₱0.00**	**0.00%**

	Number of POs	Number of Line Items	Amount Spent	% of total
Top 5 subtypes	**407**	**1359**	**₱19,974,227,798.33**	**96%**
Total sample	**581**	**2832**	**₱20,813,766,582.59**	**100%**

Table E3.3. Top 10 suppliers, by value (covered in our sample)

Supplier	Number of POs	Number of Line Items	Amount Spent	% of total
Pharmally Pharmaceutical Corporation	6	7	7,905,146,016.00	38.75%
Xuzhou Construction Machinery Group Imp. and Exp. Co., Ltd.	1	1	1,898,000,000.00	9.30%
Ferjan Healthlink Philippines Inc.	1	2	727,500,000.00	3.57%
BV Three Two Four Printing and Trading	9	85	555,959,568.00	2.73%
Biosite Medical Instruments	5	6	546,143,250.00	2.68%
5MJ Marketing	3	13	510,997,120.00	2.50%
JV of Sunwest Construction and Development Corporation and DCKAR Trading	1	1	435,000,000.00	2.13%
Medical Test Systems, Inc.	1	5	416,567,804.00	2.04%
Nikki Trading	1	1	403,880,000.00	1.98%
Hafid N' Erasmus Corporation	1	1	398,750,000.00	1.95%
Top 10 suppliers	**29**	**122**	**13,797,943,758.00**	**66.29%**
Rest of the suppliers	**552**	**2,710**	**7,015,822,824.59**	**33.71%**

Table E3.4. Top suppliers with foreign address, by value (covered in our sample)

Supplier	Number of POs	Number of Line Items	Amount Spent	% of total
Xuzhou Construction Machinery Group Imp. and Exp. Co., Ltd.	1	1	1,898,000,000.00	8.64%
Shanghai Puheng Medical Equipment, Co., Ltd	1	1	343,392,000.00	1.56%
Element Trade Limited	1	1	327,600,000.00	1.49%
Total - Suppliers with foreign addresses	3	3	2,568,992,000.00	11.69%

Table E3.5. Top 10 procuring entities, by value

Procuring Entity	Number of POs	Number of Line Items	Amount Spent	% of total
Procurement Service *	17	21	9,458,033,040.00	45.89%
Procurement Service - DBM *	7	11	4,725,697,320.00	22.93%
City Government of Taguig	32	398	1,361,774,892.47	6.61%
Department of Health	10	13	895,947,500.00	4.35%
Local Government Unit-City of Zamboanga	3	10	474,691,120.00	2.30%
Department of Agriculture Western Visayas	5	11	363,970,000.00	1.77%
Department of Agriculture Regional Office III	4	4	322,683,920.00	1.57%
City Government of Puerto Princesa	2	2	223,100,000.00	1.08%
Department of Agriculture - Regional FIeld Office 7	4	20	212,540,000.00	1.03%
Office of Civil Defense	1	1	170,000,000.00	0.82%
Provincial Government of Batangas	11	58	169,297,964.23	0.82%
Top 10 procuring entities	**96**	**549**	**18,377,735,756.70**	**88.30%**
Rest of the Procuring Entities	481	2283	2,436,030,825.89	11.70%

* As confirmed with GPPB and PhilGEPS, "PROCUREMENT SERVICE" and "Procurement Service - DBM" are the same procuring entity.

Table E3.6. Distribution of amounts of purchase orders (histogram and frequency table)
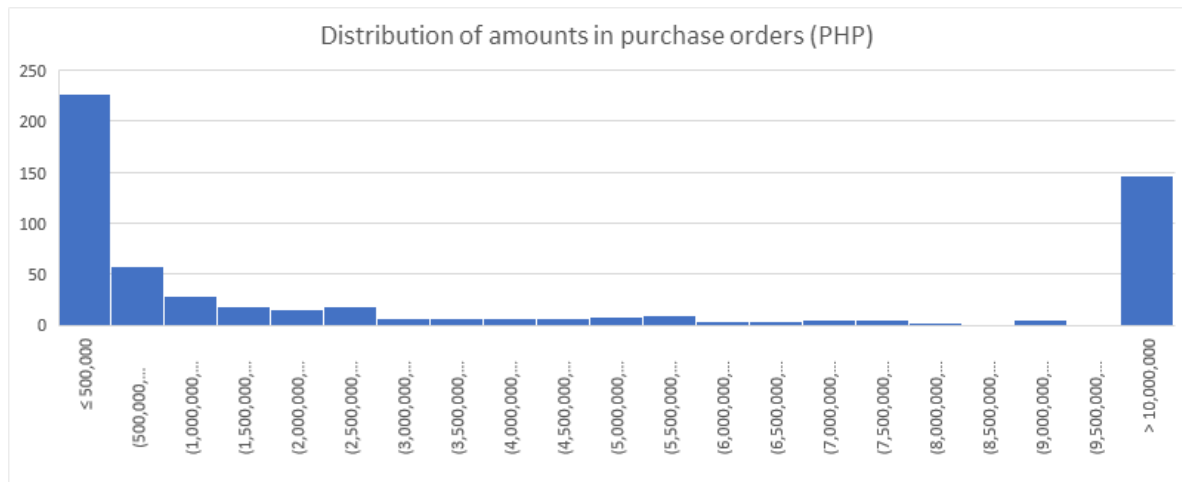
from	to	purchase order	notice of award	gppb website	approved budget of contract
0	**500,000**	**214**	**173**	**214**	**216**
500,000	1,000,000	53	48	50	52
1,000,000	1,500,000	32	30	33	22
1,500,000	2,000,000	18	20	22	23
2,000,000	2,500,000	17	15	16	17
2,500,000	3,000,000	18	16	19	16
3,000,000	3,500,000	7	5	9	8
3,500,000	4,000,000	7	7	7	5
4,000,000	4,500,000	7	6	6	10
4,500,000	5,000,000	5	5	5	3
5,000,000	5,500,000	9	7	9	9
5,500,000	6,000,000	9	9	8	11
6,000,000	6,500,000	4	1	5	6
6,500,000	7,000,000	4	4	4	7
7,000,000	7,500,000	4	3	4	4
7,500,000	8,000,000	6	5	5	3
8,000,000	8,500,000	2	2	2	2
8,500,000	9,000,000	0	0	0	0
9,000,000	9,500,000	5	3	4	4
9,500,000	10,000,000	1	1	1	1
10,000,000	**and above**	**146**	**141**	**158**	**162**
	specified amounts	568	501	581	581
	not indicated	13	78	0	0
	total	581	579	581	581

E4. Duration. How long did the typical coronavirus-related procurement take under the Bayanihan Act?

Method:

1. To clean date values, we extract all date variables in our constructed data set:

   g_startdate   g_enddate   g_awarddate g_acceptdate
   po_date   po_bidsign   po_orsdate   noa_date   noa_bidsign

2. To convert specific strings into date values, we replace the following month values: /03/ with " March ", /04/ with " April ", /05/ with " May ", /06/ with " June ", /07/ with " July ", /08/ with " August ".

3. Since the data set only covers coronavirus-related purchases in 2020, we replace: "/2019" with 2020, "/2018" with 2020, "/1930" with 2020, "/1920" with 2020

4. We fix month-date switching errors, which the GPPB dataset has a lot of. The GPPB data set confuses "mm/dd" with "dd/mm". Because our data set is limited to coronavirus purchases until August 3, 12/04 should reflect as April 12, not December 4. To systematically fix these errors, we replace:

12/1/2020 with 1/12/2020	11/1/2020 with 1/11/2020	10/1/2020 with 1/10/2020	9/1/2020 with 1/9/2020
12/2/2020 with 2/12/2020	11/2/2020 with 2/11/2020	10/2/2020 with 2/10/2020	9/2/2020 with 2/9/2020
12/3/2020 with 3/12/2020	11/3/2020 with 3/11/2020	10/3/2020 with 3/10/2020	9/3/2020 with 3/9/2020
12/4/2020 with 4/12/2020	11/4/2020 with 4/11/2020	10/4/2020 with 4/10/2020	9/4/2020 with 4/9/2020
12/5/2020 with 5/12/2020	11/5/2020 with 5/11/2020	10/5/2020 with 5/10/2020	9/5/2020 with 5/9/2020
12/6/2020 with 6/12/2020	11/6/2020 with 6/11/2020	10/6/2020 with 6/10/2020	9/6/2020 with 6/9/2020
12/7/2020 with 7/12/2020	11/7/2020 with 7/11/2020	10/7/2020 with 7/10/2020	9/7/2020 with 7/9/2020

5. We constructed several duration variables from these clean data (variables d0 to d9). To ensure these adjustments are not prone to outliers, we present median, 25th percentile, 75th percentile duration, along with the mean duration.

Key Findings:

1. **The typical (median) duration of coronavirus-related procurement contracts was 9 days from award to delivery (end).** This is based on the award date encoded by the research team to the end (delivery) date recorded by the GPPB. Since our data set does not have documents supporting proof of delivery, we were unable to confirm whether these were indeed the dates when the goods and services were delivered, or if they were in fact delivered.

2. **More than 10% of analyzed contracts (49 out of 488), had inconsistent dates of award.** These were the contracts where the award date specified in the GPPB online table did not tally with what was written in the attached notice of award. **There should be a cleaning and verification step to clean outliers**, especially since the measures of duration range from -169 days to 227 days.

**Table E4.1. Distribution of duration from notice of award to the registered end-date
(number of days)**
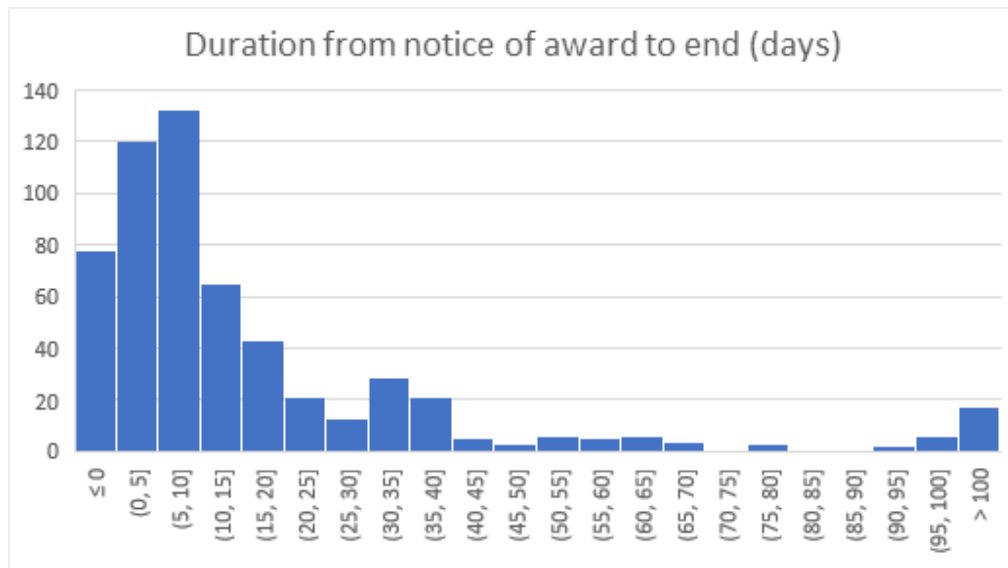
**Table E4.2. Duration of coronavirus-related procurement under the Bayanihan Act
(number of days)**

var	duration	p25	p50	p75	min	max	mean	sd	n
d0	**award to end**	**2**	**9**	**20**	-169	227	17.1	36.7	**581**
d1	award to purchase	0	**0**	1	-89	92	0.6	12.7	521
d2	purchase to start	0	**0**	1	-112	59	1.6	11.7	521
d3	start to end	3	**8**	15	-176	226	15.2	33.3	581

Table E4.3. Consistency checks across other duration variables

var	duration	p25	p50	p75	min	max	mean	sd	n
d4	noa (cbt) to noa (gppb)	0	**0**	0	-89	88	0.3	10.3	487
d5	noa to bidsign	0	**0**	0	-10	45	1.1	4.2	279
d6	bidsign to po	-2	**0**	0	-64	49	-2.2	8.1	280
d7	award to start	0	**1**	3	-112	60	2.7	11.9	487
d8	start to accept	-1	**0**	3	-58	226	3.3	22.3	581
d9	accept to end	0	**5**	15	-169	216	11.8	31.1	581

3. **We also show the time progression of the five biggest contracts by amount indicated in the purchase order**: all procured by the Department of Budget and Management Procurement Service, worth around P7 billion. The duration from award to end of these transactions (award to end-delivery) ranged from 16 to 100 days.

uid	noa to po (days)	po to start (days)	start to end (days)	po_amount	category	supplier	procuring entity
20200423-000002144	1	1	98	688,000,000	Testing Kits	PHARMALLY PHARMACEUTICAL CORPORATION	Procurement Service - DBM
20200608-000002145	1	0	15	2,877,300,000	Testing Kits	PHARMALLY PHARMACEUTICAL CORPORATION	Procurement Service - DBM
20200619-000002146	4	6	45	727,500,000	Personal Protective Equipment	Ferjan Healthlink Philippines Inc.	PROCUREMENT SERVICE
20200506-000002147	2	0	30	3,820,000,000	Personal Protective Equipment	PHARMALLY PHARMACEUTICAL CORPORATION	PROCUREMENT SERVICE
20200507-000002148	1	0	30	1,898,000,000	Personal Protective Equipment	XUZHOU CONSTRUCTION MACHINERY GROUP IMP. AND EXP. CO., LTD.	PROCUREMENT SERVICE

E5. Price. Is the government getting a reasonable price for what is bought?

Method and Limitations

1. In performing price analytics, we use two bases for price comparisons:

   a. the "internal prices", which are obtained from the GPPB procurement data;
   b. the "external prices", which are obtained from various online sources. In our external price dataset, we provide, for transparency, the source and the date we obtained such data.

2. The study is limited to the market price indicated on the month we obtained the price data (September 2020), and does not take into consideration shifts in price, which is possible due to volatility during emergency situations. For example, prices for masks are lower in September 2020 than in March 2020, which may lead to overestimating price differences between certain goods. To address this, we consider various methods, as detailed in our methods section below, for comparing prices and show how results differ using more conservative approaches. Because of these limitations, we remind our readers to exercise caution in interpreting our results.

Further Sampling

3. For this section, we limit our price comparisons to items that fall under the top five subcategories by value identified: (i) Personal Protective Equipment (P9.75 billion), (ii) Testing kits (P4.87 billion), (iii) Rice (P3.00 billion), (iv) Laboratory, Medical, and Surgical Devices, Equipment, Tools and Supplies (P1.44 billion), and (v) Food (P0.91 billion).

4. There are 420 contracts under these five sub-categories, and 1,359 transactions or items in these contracts. Transactions or items here pertain to a type of good (e.g. rice, mask, canned sardines, etc.). What we mean by "N items" is that there are N (non-unique) *types* of goods, not N *pieces or units* of a particular type of good.

5. We also note that because we limit our sample to these above-mentioned categories, any findings from this section remain valid only to these goods and cannot be extrapolated to other products.[16] In addition, given that we have not evaluated the complete set of procurement documents (only the ones available in the GPPB website), our empirical results can only speak to the data available to us.

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[16] Although medicines and non-food items are also commonly evaluated for price differentials, we do not consider them here given the reasons stated above.

Method for Internal Price Analytics

6. For internal price comparisons, we use prices within the dataset as bases for product prices. To do this, we assign product IDs to classify similar products together. As much as possible, we only assign unique product IDs to goods of the same quantity, volume / weight / mass, and function, disregarding differences in brand names. For example, canned sardines of the same weight will be given the same product ID, regardless of whether it's Brand A or Brand B. If products are fairly homogeneous such as rice or surgical masks (excluding cloth or N95 masks), we classify them as similar even if some descriptions, like the type of rice or the quality of mask, are not available.

7. For internal price analytics, we do not compare similar goods with different quantities or volume / weight / mass. For example, we do not compare the price of a case of 155g sardines (with 100 cans) and the price of a 155g can of sardines. The logic here is that procuring larger volumes of goods might result in lower prices per can (in the case) than the single can of sardines. However, this assumption may not hold in general if procuring entities normally purchase large quantities anyway (but report them as purchases of large quantities of a single can -- i.e. 10,000 cans of sardines, as opposed to 100 cases of sardines). Although we do not include the analysis here, to address this possibility, the reader may use the "conversion factors" provided in the dataset to compare similar products. For example, if one can of 155g sardines costs X, then 100 cans of 155g sardines cost 100X.

8. Of 1,359 items, 528 were not included in the analysis because of three reasons: (i) there was no price indicated (20), (ii) material description was not specific or informative enough to be matched with another product (314 items), or (iii) no other similar product was found in the dataset (194 items).

9. For the remaining items, we use two main item-level indicators to measure dispersion: (i) price deviation from median price, and (ii) amount deviation from median amount.

    a. Price deviation from median price is defined as the percentage deviation of the item's price from the median price. The median price minimizes the impact of outliers and considers the middle or 50th percentile of all prices in the category.

    $$PriceDeviation_i = \frac{Price_i - MedianPrice_j}{MedianPrice_j}$$

    where item i is part of item group j (e.g. item i is a sack of 50kg rice, and we compare it with prices of item group j, or all prices of a sack of 50kg rice available in the dataset). MedianPrice$_j$ is the median price for all goods in item group j.

b. Amount deviation from median amount is defined as the difference between an item's original amount and the same item's amount if it used the median price instead. This is calculated using the following formula:

$$AmountDeviation_i = OriginalAmount_i - MedianAmount_{ij}$$
$$AmountDeviation_i = Quantity_i \times (OriginalPrice_i - MedianPrice_j)$$

where variables are similarly defined as above.

Method for External Price Analytics

10. For external price comparisons, we use prices gathered from external sources as bases for product prices. Data sources used were: (i) GPPB / PhilGEPS market listings, (ii) Government price listings (from the Department of Health / Department of Trade and Industry / the Philippine Statistics Authority), (iii) Bureau of Customs import entries, and (iv) Online market survey from medical suppliers and other vendor websites. We also assign these external prices similar product IDs to be comparable with products from the procurement dataset. As before, we only match items that are fairly similar in terms of quantity, volume / weight / mass, and function, disregarding differences in brand names. But for those with information on brand names, we attempt to look for prices of products marketed under the same brand.

11. We follow the same approach as we did for internal price analytics, where we do not compare similar goods with different quantities or volume / weight / mass. However, we also provide conversion factors, so the interested reader may perform an analysis that takes conversion into consideration when comparing prices.

12. Of 1,359 items, only 596 were matched with at least one external price. A majority of items were not included in the analysis because of three reasons: (i) there was no price indicated (20), (ii) material description was not specific or informative enough to be matched with another product (312), or (iii) we were unable to find an external price for the item from reputable sources (431).

13. For the 596 items, we use two main item-level indicators to measure dispersion: (i) price deviation from external median price, and (ii) amount deviation from external median amount.

Key Finding: Two-thirds of the procurements in the sample studied lacked sufficient goods descriptions and specifications

14. **Lacking Material Description** - Around 24.6% of items (or 334 of 1359 transactions) are not included in the sample as it is impossible to perform accurate price comparisons because of the lack of material description. These items comprise 66% of the total procurement amount (or 13.3 out of 20.0 billion pesos) in our sample. These items involve large amounts: PPE sets without sufficient descriptions amount to more than 7.6 billion pesos while test kits with lacking descriptions total 4.5 billion pesos. Without proper descriptions, it is impossible to make accurate comparisons

and determine whether the procurement for such items was up to standard. Because of their materiality, we present these items below:

Table E5.1: PPEs With Lacking Descriptions (Top 7 Transactions)

Awarded Company	Procuring Entity	Quantity	Unit Price	Amount
Pharmally Pharmaceutical Corporation	PROCUREMENT SERVICE	2,000,000	1,910	3,820,000,000
XUZHOU CONSTRUCTION MACHINERY GROUP IMP. AND EXP. CO., LTD.	PROCUREMENT SERVICE	1,000,000	1,898	1,898,000,000
JV OF SUNWEST CONSTRUCTION AND DEVELOPMENT CORPORATION AND DKCAR TRADING	PROCUREMENT SERVICE	300,000	1,450	435,000,000
NIKKA TRADING	PROCUREMENT SERVICE	250,000	1,615.52	403,880,000
HAFID N/ ERASMUS CORPORATION	PROCUREMENT SERVICE	250,000	1,595	398,750,000
Shanghai Puheng Medical Equipment Co., Ltd.	PROCUREMENT SERVICE	200,000	1,716.96	343,392,000
BOWMAN TECHNOLOGIES, INC. (FORMERLY HULS TECHNOLOGIES PHILIPPINES, INC.)	PROCUREMENT SERVICE	150,000	1,455	218,250,000

Table E5.2: Test Kits With Lacking Descriptions (Top 5 Transactions)

Awarded Company	Procuring Entity	Quantity	Unit Price	Amount
Pharmally Pharmaceutical Corporation	Procurement Service - DBM	41,400	69,500	2,877,300,000
Pharmally Pharmaceutical Corporation	Procurement Service - DBM	2,000	344,000	688,000,000
Medical Test Systems, Inc.	Procurement Service - DBM	1,103	285,000	314,355,000
Pharmally Pharmaceutical Corporation	Procurement Service - DBM	312	787,938	245,846,016
Clearbridge Medical Philippines, Inc.	Office of Civil Defense	200,000	850	170,000,000

15. Internal Price Analytics

   a. To get a sense of the price distribution of different item groups, we first normalized prices by demeaning (i.e. subtracting the mean) and standardizing (i.e. dividing by the standard deviation) the price of each item in that group. Figure E5.1 shows the normalized price distribution for various product groups. Comparing prices of similar products across procuring entities, we found large variation in prices, sometimes as high as 6x that of other similar

products.[17] The figure shows that even restricting comparisons to prices found within the dataset yields large and significant differences in prices. In the ideal case of no price dispersion, only one price would emerge and the distribution would have only one value.

b. Given this price dispersion, we identified the median price for each item group and compared the price deviation for each item. We found that around 18 transactions have prices that are 2 to 52 times larger than the median price. We listed the top 10 transactions with the largest price deviations in Table E5.3. For example, there is a transaction for surgical masks which was procured at 1,400 pesos per piece. However, considering all other surgical mask prices in the dataset, we found a median price of 26 pesos. This implies that the procured mask at 1,400 pesos was 52 times larger than the median price of 26 pesos. The other items in the table were analyzed similarly.

c. Although price deviations are important indicators, we also considered which transactions have the largest amount deviations as these items may be the main source of discrepancies in the procurement sample by value. We compared the original amount and the median amount (i.e. the amount at which the items would have been bought if the items were bought at the median price). **If procured at median prices, procuring entities would have saved 190 million pesos.[18] To consider more conservative scenarios, if we use 10% higher than median prices, procuring entities would have saved 71 million pesos**. In both cases, the government would have saved a significant amount by reducing the observed price dispersion. Table E5.4 shows the top 10 transactions with the largest amount deviations.

Figure E5.1: Price Distribution Across Different Item Groups

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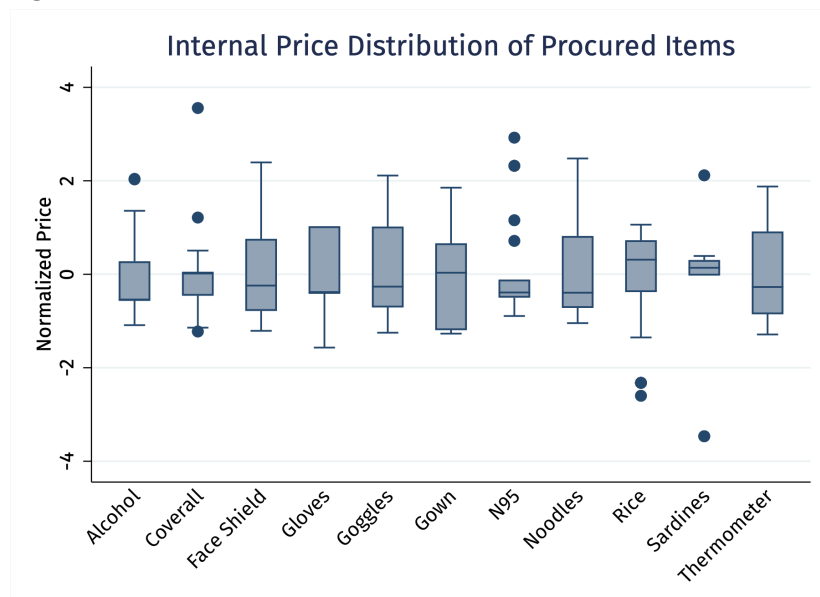
[17] We define price variation here as the ratio between the 90th and 10th percentile to remove the effect of outliers.
[18] To compute this figure, we only consider positive amount deviation and sum all items.

Table E5.3: Internal Price Deviation (Top 10 Items)

Material Description	Quantity	Measurement	Actual Price	Median Price	Price Deviation
Surgical Masks	100	pcs	1,400	26	52
Cooking Oil	10	liter	988	55	17
Mask w/ cap	24	pcs	180	26	6
Digital BP apparatus	5	sts	9,000	1,360	6
Disinfectant	126	gals	1,822.5	290	5
Deodorizer and Disinfectant	215	gals	1,650	290	5
Hospital Grade Disinfectant	22	gals	1,600	290	5
Respiratory Mask	500	pcs	750	150	4
Non-mercurial BP Apparatus	50	units	6,050	1,360	3
N95 Mask	150	pcs	641	150	3

Table E5.4: Internal Amount Deviation (Top 10 Items)

Material Description	Quantity	Measurement	Actual Amount	Median Amount	Amount Deviation
Commercial rice - Good quality (25 kilos/sack)	211,053	scks	263,816,250	232,158,300	31,657,950
Coverall suit, certified ASTM F1671/ISO/CE compliance	250,000	pcs	275,000,000	250,000,000	25,000,000
Rice, 25kg	83,558	scks	108,625,400	91,913,800	16,711,600
Rice Goods, Well Milled Rice (50 kgs/sack)	50,000	scks	123,500,000	111,000,000	13,500,000
Functional Mechanical Bed	100	sts	17,995,000	6,625,000	11,370,000
Rice grains, commercial	60,000	scks	138,000,000	132,000,000	6,000,000
KingFisherDeepwell 96 plate, V-bottom, polypropylene (1,103,000 reactions)	2,206	bxs	34,208,442	28,872,128	5,336,314
Rice 50kls/ sack	20,000	scks	49,000,000	44,000,000	5,000,000
MSMS Reagents - 960 tests	45	sts	6,561,900	1,582,650	4,979,250
Corned beef 150g (48 pcs/case)	12,834	cass	24,384,600	19,732,275	4,652,325

16. External Price Analytics

   a. **Of 1,359 items, only 596 had external prices available. Table E5.5 below shows the different sources of external prices.** More than a quarter were sourced from websites of online suppliers, and the team tried to obtain information from reputable sources (i.e. either from the actual company/brand or a reliable retailer/reseller). Other sources are government websites: the DOH is the largest government source of external prices.

b. **Around 71% of items (or 421 of 596 items) have higher than the median external prices.** We also found 80 items to be more than twice the median external price (compared to 18 for internal prices), which implies that external prices are generally lower than internal prices. Table E5.6 shows the top 10 items with the largest deviations from the external median price. For example, the plastic apron was procured at 340 pesos per piece, which is 22 times higher than a similar product found using external sources. While there may be differences in the actual product, the team tried looking for the best match for each item to ensure that comparisons are as accurate as possible.

c. Doing the same exercise as in the Internal Price Analytics, we noted that **if these items were procured at median (or median plus 10%) prices, procuring entities would have saved 550 million (or 319 million) pesos.** Table E5.7 presents the top 10 items with the largest deviation from the original amount. For example, the A Star Fortitude Kit was procured at 688 million, although we found an external source that sells the same brand of test kits at 572 million, yielding a discrepancy of 116 million. The remaining items in the table were computed similarly, and highlight which transactions in our dataset had the largest amount deviations.

17. **One limitation of our price analyses is that quality, import costs, or other factors may account for the difference that were documented in our external price analysis.** These results warrant a second look to ensure that the procurement of such items was judicious. The analyses in this section are not meant to be the final word on issues surrounding COVID-19 procurement in the Philippines, but are intended to serve as a first step at identifying potential opportunities for improvement in the procurement and data generation process.

Table E5.5: Source of External Prices

Source	Frequency
DOH (Department of Health)	209
Online Supplier	158
PSA (Philippine Statistics Authority)	77
PhilGEPS (Philippine Government Electronic Procurement System)	64
DA (Department of Agriculture)	45
DTI (Department of Trade and Industry)	25
BOC (Bureau of Customs)	18

Table E5.6: External Price Deviation (Top 10 Items)

Material Description	Quantity	Measurement	Actual Price	Median Price	Price Deviation
Surgical Masks	100	pcs	1,400	21	66
Plastic Apron with logo	2,500	pcs	340	15	22
Cooking Oil	10	l	988	50	19
Sodium hypochlorite 1L	500	btls	596	38	15
BRAND NEW Portable Point-of Care I-STAT Blood Analyzer	2	units	1,029,710	69,466	14
Anti-covid Disinfectant Solution	176	l	504	38	12
96-well Cold Blocks	2	units	56,238	4,841	11
96-well Cold Blocks	2	units	56,238	4,841	11
AVR 1KW - Panther	4	pcs	30,000	2,600	11
Apron Reusable long	500	pcs	150	15	9

Table E5.7: External Amount Deviation (Top 10 Items)

Material Description	Quantity	Measurement	Actual Amount	Median Amount	Amount Deviation
A Star Fortitude Kit 2.0 Covid 19 RT-PCR Test	2,000	kits	688,000,000	571,828,000	116,172,000
Gown	218,600	pcs	98,370,000	59,240,600	39,129,400
FLIR T620 Thermal Imaging Camera for Fever screening	50	units	90,000,000	51,101,070	38,898,930
Commercial rice - Good quality (25 kilos/sack)	211,053	scks	263,816,250	225,826,710	37,989,540
PERSONAL PROTECTIVE EQUIPMENT SET (PPE)	500,000	sts	727,500,000	693,035,000	34,465,000
40-Slice Computed Tomography (CT) Scan Machine with Complete Accessories	1	units	32,000,000	11,119,234	20,880,766
Rice, 25kg	83,558	scks	108,625,400	89,407,060	19,218,340
Rice Goods, Well Milled Rice (50 kgs/sack)	50,000	scks	123,500,000	107,000,000	16,500,000
Functional Mechanical Bed	100	sts	17,995,000	3,580,700	14,414,300
KingFisherDeepwell 96 plate, V-bottom, polypropylene (1,103,000 reactions)	2,206	bxs	34,208,442	22,289,225	11,919,217

F. Policy Recommendations

F1. Improving Data Quality

How might we improve data quality in the next round of coronavirus-related procurement and in future emergency scenarios?

1. **We find several issues that limit the use of the available procurement data for quantitative and linked analyses.** First, all transactions had data quality issues-- some have missing documents or broken weblinks. Uploaded documents have non-standardized formats and missing information. Second, item-level transactions and delivery receipts are currently not available in the GPPB portal. It took a team of 24 people, and hundreds of hours of work, to manually extract and check item-level data of 2,832 items from 581 public contracts worth P20 billion, which could have been done at the fraction of the time if these items had been encoded. Third, most items lacked goods descriptions and transactions are not tagged by more specific categories. This lack of information limits comparability of prices among items.

2. **To improve data quality, we recommend a more stringent submission protocol and publication policy for the GPPB portal and an improvement in the online submission forms.** We recommend that the data be published via the PhilGEPS portal so that all procurement data is consolidated, regardless of its being in the Bayanihan law or the regular procurement. Changes to the policy may include the prescription of standardized document formats, encoding of item-level entries with legal force, and submission of sworn declarations with digital signatures. These measures make procuring entities, who upload the files and information to the portal, more accountable for the data integrity, completeness, and veracity of documents.

3. **To maintain a high level of data quality, automated data quality checks on the information and documents uploaded to the portal should be introduced, including checks for date switching errors.** GPPB can work together with civil society movements to perform regular rounds of post-submission quality checks. The 15 risk codes we identified may be helpful for these assessments. Results of these assessments must be promptly fed back to the procuring entities to increase compliance to quality standards and give them due process and time to improve. In addition to checks and balances, the cooperation of civil society adds much needed human resources to support committed civil servants in the GPPB and PhilGEPS. Building such a civic movement is explored in further detail in Section G. This may also be useful input for the next round of PhilGEPS modernization.

4. **Finally, we recognize opportunities to strengthen the procurement data chain, linking budget, procurement, delivery, and audit data sets.** A major step in this direction can be made by empowering GPPB to require procuring entities to submit delivery receipts to the procurement portal, in addition to POs and notices of award. This will enable systematic and continuous monitoring of procuring entities and supplier transactions. The use of linking variables, such as the Unified Account Code Standards (UACS), budget and audit codes, should also be standardized to facilitate linking transactions across multiple datasets spanning multiple agencies.

F2. Mitigating Risks in the Procurement Process

1. **We recommend that the GPPB and PhilGEPS adapt to the local context the emergency procurement rubric developed by the UK Digital Service to assess the resilience of our procurement system in times of emergencies.** In this framework, a procurement system is resilient if it is able to: 1. buy smarter and faster in crisis, 2. ensure quality suppliers and services, and 3. maintain service delivery & sustain the economy.[19] The rubric has 11 major categories and 44 sub-indicators, with each score corresponding to a specific characteristic of the system. (See Box)

2. **While filling out this scorecard is out of the scope of our research, we believe it is a practical operational tool to prioritize areas for reform in our emergency procurement system.** The strength of this methodology is its ability to define priorities using a good set of international good practices in procurement. Any procurement officer from any procuring entity can assess the sub-indicators and define areas of improvement. But this assessment comes with a few important limits: The scores cannot and should not be used to compare across localities; the scores are best used for the assessment of the internal resiliency of the procurement system. Since there are so many indicators, the rubric should be further prioritized to fit one's local context. This prevents the assessment from becoming an impossible laundry list of reform. Localizing this scorecard is a priority area for future research and technical assistance.

3. **Given our limited study, we did find a few areas for prioritization:** In the next round of emergency procurement, we recommend that there be template contracts for commonly purchased medical goods and supplies at the right specification levels. There is a need to better monitor and allot resources to at-risk communities, pool demand, and expand the list of eligible suppliers during emergencies. Future assessments can answer questions like: How biased is the allocation of resources by region? Is there a bias towards certain suppliers? Is there a bias towards certain forms of goods and services? We also recommend greater controls for assessing and reporting price gouging by researching more secondary market price information, similar to the methodology we used for our price analysis.

4. With a combination of better data, the use of this framework to see weaknesses in the procurement system, and technical support from the national procurement policy bodies and civil society partners, procuring entities can improve their procurement and delivery systems for coronavirus and future emergencies.

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[19] Emergency Procurement Lessons Learned from Covid-19

Box. Rubric for Assessing Emergency Procurement Processes

The study Emergency Procurement Lessons Learned from Covid-19 recommends the use of the following rubric to assess the strength of emergency procurement processes. We recommend that the GPPB and the open contracting community localize this framework and assist procuring entities in strengthening public procurement and delivery systems.

This framework should not be used to identify an impossible laundry list of reforms; instead it should help procuring entities identify the most important binding constraints to procuring entities' delivery of critical public services. More details in the study linked above.

1. Understanding needs
1.1. Prioritising needs (3)
1.2. Identifying at-risk communities (3)
1.3. Monitoring needs of at-risk communities (3)
1.4 Allocating resources (2)

2. Aggregating demand
2.1. Pooling demand (3)
2.2. Spend control (3)
2.3. Centralising procurement (2)
2.4. Emergency procurement authority (3)

3. Quickly identifying and contracting reliable suppliers
3.1. Supplier verification (3)
3.2. Supplier database (3)
3.3. List of banned suppliers (3)
3.4. Framework agreements (3)
3.5. Expanding pool of eligible suppliers (3)
3.6. Supplier database fields (9)

4. Emergency procurement policies
4.1. Price standards (3)
4.2. Emergency contract mechanisms (3)
4.3. Bid and contract timelines (2)

5. e-Procurement
5.1. Telework capabilities (2)
5.2. Electronic tendering (2)
5.3. Electronic bid submission (2)
5.4. Electronic bond verification (2)
5.5. Electronic contract signature (2)
5.6. Electronic payment (3)

6. Simplifying contracting
6.1. Emergency contract templates (2)

7. Avoiding fraud and price gouging
7.1. Product standards (3)
7.2. Enforcement (3)
7.3. Supplier due diligence (3)
7.4. Price gouging (2)

8. Accountability and transparency
8.1. Emergency spending oversight (3)
8.2. Performance metrics and evaluations (3)
8.3. Open data for accountability (3)
8.4. Citizen feedback and CSO engagement (3)
8.5. Data standards (3)
8.6. Open data platforms (3)
8.7. Open contracting data fields (12)

9. Supply chain risk management
9.1. Risk assessment (3)
9.2. Prioritising public service delivery (2)

10. Support existing suppliers
10.1. Force majeure (3)
10.2. Extensions and renewals (2)
10.3. Timeliness and payment schedules (2)
10.4. Adjusting deliverables (3)

11. Digital tools for service delivery
11.1. Deploying digital services quickly (3)
11.2. User-centered design (3)
11.3. Accessibility (3)

Total (134)

G. Conclusion: Building a Civic Movement to Verify Data and Strengthen Procurement

Open and accountable public procurement systems are critical to saving lives, flattening the curve, and ensuring our economy and society recover from this pandemic and become more prepared in future emergencies. With the extension of the state of calamity until 2021 and the passage of the coronavirus recovery package (Bayanihan 2), billions will again be exposed to more relaxed procurement rules under negotiated procurement for emergency cases. Civil society, journalists, academics, and business groups are well-positioned to partner with policymakers not only to ensure the procurement systems remain resilient throughout this period but to provide much needed human resources and expertise, to carve out a clearer path for recovery.

We recommend the strengthening of existing civic movements and partnerships[20] where government, civil society, academe, business, and journalists can work together to verify and publish coronavirus-related procurement data at the national level to strengthen procurement and mitigate risks. This movement can:

1. Verify whether local and national government units have submitted coronavirus-related procurement contracts, in compliance with the Bayanihan Act. This can be done in a systematic fashion.
2. Provide another layer of consistency checks for data quality at the item-level
3. Publish this verified open data set regularly
4. Check supplier eligibility and information
5. Check if item-level prices may be unreasonable
6. Check if procured items have sufficient technical specifications
7. Update market prices from secondary sources, especially of top procured items like personal protective equipment, medical equipment, and goods
8. Complete the data chain from purchases to budgets to delivery at the local level
9. Provide real-time operational feedback to planners.

We invite supply chain experts and planners to look at our item-level data set to look at how critical commodities are planned for, budgeted, aggregated, bought, distributed, and delivered. Directions for future research and civic engagement include tracing how each type of item is planned, distributed, and used: from identifying community needs, the way demand is aggregated, and the way the supply chain is planned to reach people in need. We invite constitutionally mandated agencies and investigative journalists to examine, study, and critique this open data set, which we are releasing for public use. We emphasize that this type of system-level study cannot replace the deeper monitoring and engagement work done by civil society monitors as watchers in Bids and Awards Committees, but the methods in this paper may help citizen-monitors in their decision-making on which areas to prioritize their limited time and resources. We recommend that we learn from and build on the experiences of grassroots community organizers in the social accountability movements featured in our literature review, and the critical literature about open data movements, so we can make open contracting truly inclusive.

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[20] See D.J. Benito, K.I.I. Abante, F.P. Tan. 2021. "Data for Empowerment: Organizing Principles for an Inclusive Public Data Ecosystem in the Philippines". WeSolve Working Paper.

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Price data from government websites, online stores, and official product websites:
See each item link under "SourceofPriceData" variable.

Government Websites
Bureau of Customs
Department of Agriculture
Department of Trade and Industry
Department of Health DOH LCP, DOH NMMC, DOH PHC, DOH SRP
(Department Memorandum No. 2020-0250)
Food and Drug Administration
Philippine Government Electronic Procurement System
Philippine Statistics Authority

Online Stores and Official Product Websites:
SM Markets, Anlene Website, Coke Beverages, https://www.speedbiosystems.com/product/NFIH001/a-star-covid-19-real-time-rt-pcr-test-kit-ruo, Landers, Milo Website, Aaawholesalecompany.com, Alibaba.com, Alimed.com, bena1983.en.made-in-china.com, benchmarkscientific.com, cisnovo.com, Clorox Official Store Lazada, dotscientific.com, drlab.co, finddx.org, fishersci.co.uk, fishersci.com, hospeq.com, https://catalog.hardydiagnostics.com/cp_prod/product/253317h-hydraflock-flocked-swab-for-nasopharyngeal-and-urethral-cell-sampling-sterile-0140-tip-diameter-6-overall-swab-length-10-boxes-of-50-individually-wrapped-by-puritan-medical-swabs-and-applicato, https://kelidevices.com/product/camtech-rapid-test/, https://worldwide.promega.com/products/nucleic-acid-extraction/viral-rna-extraction-viral-dna-extraction/reliaprep-viral-tna-miniprep-system-custom/?catNum=AX4820, https://www.neuromics.com/VTM-Kit, https://www.spill911.com/tychem-br-level-b-suit-for-scba.html, Indoplas Official Shopee Store, inspectortools.com, Lenovo, Lysol Official Store Shopee, medicalsuppliesdepot.com, medicalsuppliesdepot.com.ph, medshop.com.ph, optiummedical.com, panther.ph, philmedicalsupplies.com, scriphessco.com, shanghaibasking.en.made-in-china.com, SM Supermarket Online Catalog, sonofax.com, steiriliu.com, thomassci.com, www.hce-uk.com/, zonemedical.com.au

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I. Notes

Note 1. Regular Procurement in the Philippines

**Technical Note 1. Procurement of Goods, Infrastructure, and Consulting Services
in the Philippines under the Government Procurement Reform Act (RA 9184)**

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1. Regular procurement in the Philippines is defined and regulated by the Government Procurement Reform Act (GPRA) under Republic Act No. 9184. This law defines procurement as "the acquisition of Goods, Consulting Services, and the contracting for Infrastructure Projects by the Procuring Entity. Procurement shall also include the lease of goods and real estate. With respect to real property, its procurement shall be governed by the provisions of Republic Act No. 8974 and other applicable laws, rules and regulations."

2. The main mode of procurement is through competitive bidding or open tender. Competitive bidding can be open to all companies regardless of location, in the case of international competitive bidding, or may be limited to companies located only in the Philippines, for domestic competitive bidding.

3. The competitive bidding process starts with a pre-procurement conference, which assesses the readiness of procurement in terms of funding and documents of the Bids and Awards Committee (BAC). The pre-procurement conference is required only for procurement with values above a certain level determined in the implementing rules and regulations.

4. An Invitation to Bid is then issued after the pre-procurement conference. At least one pre-bid conference must then be conducted within a reasonable time, not specified in RA 9184, before the deadline of receipt of bids. After the deadline of receipt of bids closes, the BAC then commences to the Preliminary Examination of Bids, where the BAC evaluates the technical component of bids and filters out all bids that do not meet the technical requirements of the goods or services being procured. The bids are then examined for their financial components, with the contract awarded to the bid with the Lowest Calculated Responsive Bid for goods and infrastructure or Highest Rated Responsive Bid for consulting services. Within fifteen days of determining the Lowest Calculated Responsive Bid or Highest Rated Responsive Bid, the head of the procuring entity must approve or disapprove the recommendation of award. A Notice of Award is then issued to the bidder immediately. Within ten days from receipt of the Notice of Award, the winning bidder and the procuring entity then must enter into contract. Within seven days after contracting, the procuring entity then issues a Notice to Proceed. (*Government Procurement Reform Act*, 2003)

5. In contrast to competitive bidding, RA 9184 lists the only other procurement method as "alternative methods", an umbrella category containing limited source bidding, direct contracting, repeat order, shopping, and negotiated procurement. In limited source bidding, only companies of a certain category and financial capability are invited for bidding. A potential issue with limited source bidding is the imposition of dubious requirements that can limit bidding only to those with connections within the government. There is also no minimum number of invitees for limited source bidding, which is another potential issue. (Jones, 2009)

Note 2. Sampling Computations: Auditors' Notes

Our sampling method was a mix of monetary unit sampling based on a materiality threshold and a random sample of small transactions. This section makes explicit the assumptions we used in this sampling method.

The consideration of materiality is a matter of professional judgment; as such we sought the advice of professional auditors and those with experience in our supreme audit institution. We deemed it appropriate to establish 3% of the total awarded contract amount as an appropriate materiality level for high value transactions. We computed the materiality threshold for each of the two periods: for the pilot period as of June 24, and the scale-up from June 25 to August 3, 2020. This materiality threshold is set to reduce the risk of undetected misstatements in the data.

We determined performance materiality by deducting from the materiality threshold the total amount of misstatements that we anticipate and which we believe will not be detected in the data. We do not anticipate additional errors in excess of 30% of materiality, based on anticipated errors in the current audit, as well as our risk assessment procedures.

When an exception is identified in our testing sample, we can consider two options:

- If we conclude that the identified exception is pervasive and there are likely more errors in the population, we may use our judgment to determine whether expanding the sample would be prudent. We may need to perform a qualitative evaluation of any unusual or unexpected findings to enable us to reassess our audit approach.

- If after the original sample we cannot yet conclude that a qualification is necessary, we are to use judgment to expand our sample until we have reached a 90-95 percent confidence level.

	Data as of June 24, 2020	Data from June 25, 2020 to August 3, 2020
Total Monetary Value of Population	6.085,814,567	29,874,170,174
Input factor (materiality level)	3%	3%
Materiality	182,574,430	896,225,100
Anticipated Uncorrected Misstatements (30%)	54,772,330	268,867,600
Performance Materiality (70%)	**127,802,100**	**627,357,500**

Consideration of Individually Significant Items

Before determining the sample size, we also considered how to address individually significant items. Such items may include items that we determine to be high risk by virtue of size (i.e., exceeding performance materiality) or risk of misstatement:

- Amount awarded is greater than budgeted amount
- The date of award falls on a weekend
- The dates are out of chronological order
- There is significant variance between awarded amount and budgeted amount

Identifying and considering individually significant items in the population is important in order to properly design our sampling procedures.

Applying these criteria to the population, we found that it is unusual for individual items in the population to exceed performance materiality. As such we select an appropriate sample size from the population containing items less than performance materiality: including a random sample of small value transactions.

Emphasis on Small-Value Transactions

Small value transactions also have a possible risk to be misstated. Lesser controls and review procedures are usually applied to small value transactions, as a result, less scrutiny is made on these items. Therefore, in our sample design, we increased the number of samples selected coming from these small value transactions.

Based on the sample size calculated below, as the researchers intended to have a scope of 58% monetary value of the population and 5% of the total number of items, the items still needed after determining the difference from the suggested minimum sample size and the desired scope will be coming from small value transactions.

Sampling Approach, Method, and Unit

When designing and executing an audit sample, we are required to determine a sample size sufficient to reduce sampling risk to an acceptably low level The researchers planned to use a statistical sampling approach to provide for the equal chances of items being selected, to avoid bias, and to provide the researchers with a reasonable basis to draw conclusions from the population.

With regard to using a statistical sampling approach, the researchers chose a sample for random sampling purposes using a systematic monetary unit sampling (MUS). MUS is a value-weighted selection designed to select a sample based on each item having a chance of selection proportion to their size, which means that items with higher monetary value have a higher chance of being selected but not all the time. With this method of sampling, the effort is directed towards covering larger value items.

As to the sampling unit, the researchers identified it to be each transaction (row) in the population list of awarded contracts. Each transaction contains orders for various goods, services, and infrastructure. Before we cleaned the data, we assumed that one Purchase Order, one Notice of Award and one Annual Procurement Plan in every transaction is presumed by the researchers.

Determining Sample Size

We use professional judgment in leveraging on the following statistically formulated table to determine the sample size. If the population size lies in between the listed multiples of materiality, we can interpolate to determine the appropriate sample size.

Population Size - Multiples of Performance Materiality	Sample Size	Population Size - Multiples of Performance Materiality	Sample Size
1x	4	9x	30
2x	6	10x	46
3x	10	15x	60
4x	12	20x	76
5x	16	30x	90
6x	18	40x	120
7x	22	50x	150
8x	24	100x	300

The sample sizes above represent suggested minimum samples sizes. In some circumstances, it is appropriate to increase the sample sizes above those in this table. Our sample size tables are grounded in statistical theory and simplifies many of the judgments necessary to determine a sample size. However, it is important to understand the factors incorporated in these sample sizes in order to achieve our desired assurance on the population and design an efficient sample plan.

The above sample size table incorporates the following concepts relevant to determining a statistical sample size for audit sampling:

● Confidence level: The confidence level relates to the level of substantive assurance we plan to obtain from a particular test of details. The greater our assessed level of risk, the higher our confidence level needs to be (which results in a higher sample size). Sampling risk helps in our determination of what is an acceptable risk of a material error going undetected and is generally expressed as a percentage. The sampling risk is the difference of one minus the confidence level.

● Tolerable misstatemen: Tolerable misstatement is the amount of misstatement we are willing to accept in a population that still allows us to obtain an appropriate level of assurance. Tolerable misstatement is generally set at performance materiality.

● Population size: The population size is needed in order to select the sample size and project the sample result. The population size is incorporated into the multiples of performance materiality calculation in the sample size tables.

The following procedures are necessary to determine the sample size. Performance materiality and total monetary value of population (population size) is needed.

1. Determine the multiples of materiality by dividing the total monetary value of population by the determined performance materiality

$$\frac{total\ monetary\ value\ of\ adjusted\ population}{performance\ materiality}$$

2. Use linear interpolation for the sample size because the calculated result lies in between the multiples of performance materiality

$$x = x1 + \left(y - y1 \times \frac{x2 - x1}{y2 - y1}\right)$$

x_1 = lower multiples of performance materiality
x_2 = higher multiple of performance materiality
y_1 = lower sample size
y_2 = lower sample size
y = multiples of materiality

3. The researchers used professional judgment in adding items to the sample size. They considered to achieve at least 60% scope in terms of monetary value of the population and 5% of the total number of transactions. Therefore, the researchers randomly selected items as sample size to include the additional 205 items.

4. Summarize the sample size calculation of small value transactions

	Data as of June 24, 2020	Data from June 25, 2020 to August 3, 2020
Multiples of materiality	$\frac{total\ monetary\ value\ of\ adjusted\ popula}{performance\ materiality}$ $\frac{5,175,102,767.42}{127,802,100} = 40.49$	$\frac{19,863,370,174.25}{627,357,500} = 31.66$
Interpolation of sample size	$x = x1 + \left(y - y1 \times \frac{x2 - x1}{y2 - y1}\right)$ $x = 120 + \left(40.49 - 40 \times \frac{150}{50}\right.$ $x = 121.47 \simeq 122$	$x = x1 + \left(y - y1 \times \frac{x2 - x1}{y2 - y1}\right)$ $x = 90 + \left(31.66 - 30 \times \frac{120}{40}\right.$ $x = 94.98 \simeq 95$
Suggested minimum sample size	122	95
Total suggested minimum sample size	217	
Add: Sample size using professional judgment	187	
Total determined sample size of small value transactions	404	

Note that we do not default to this mathematical modification without using our professional judgment to determine the appropriate sampling technique and the extent of the sample. Depending on the number of items in the population and the multiples of PM, the mathematical modification might result in a sample size that, based on our professional judgment, is not appropriate for the population being

tested. Based on professional judgement, a smaller sample size may be suitable considering the specific facts and circumstances of the engagement.

Sampling Method to Make Selections

Before designing the audit samples, we may gain efficiencies by considering whether there are individually important items that we can test prior to selecting a sample. Since the researchers opted to select all the items that fall under the five risk parameters, only the remaining items are subjected to random sampling. The monetary value of the items that fall under the five risk parameters are removed to arrive at the adjusted population as shown in Understanding and Defining the Population for Sample Selection section.

In order to select the items using monetary unit sampling, the following procedures are performed:
1. Determine a random starting point. We used the random number generator of Excel to generate a starting point.
2. Next, we need to calculate the sampling interval. It is calculated by dividing the population by sample size or using the following formula:

$$k = \frac{total\ monetary\ value\ of\ adjusted\ population}{sample\ size}$$

3. Enter the random starting number as negative. This number will be needed to complete the MUS reconciliation after selecting the samples.
4. Each monetary value of the succeeding logical unit is added until the cumulative total equals or exceeds zero. The item is selected as a sample every time this happens.
5. From hereon, repeat the process but use the sampling interval instead of the random starting number. Enter the sampling interval as negative and add the monetary value of the succeeding logical unit until the cumulative total equals or exceeds zero. The item that makes the cumulative total equal or exceed zero is selected as a sample.
6. Repeat the steps until the determined sample size is reached.

The arrangement of the items is based on the arrangement of the extracted data from the GPPB website. In addition, if the recorded amount of a logical unit is larger than the sampling interval, the logical unit might be selected more than once. This means the actual number of logical units selected for the sample might be less than the computed sample size.

By performing the sampling procedures as described, we got the following tables:

Detailed Sampling Results

Final Sample for Risk Analysis	Approved Budget	Amount Awarded	No. of Transactions (Purchase Orders)
Population: All uploaded procurement contracts in the GPPB Awarded Contracts Page as of August 3, 2020	40,690,507,786.44	35,959,984,741.67	11,697
o/w Sampling Criteria 1a: (as of June 24, 2020) All high-value transactions above a materiality threshold	1,317,976,800.00	910,711,800.00	4
o/w Sampling Criteria 1b: (from June 25 to August 3, 2020) All high-value transactions above a materiality threshold	10,196,300,000.00	10,010,800,000.00	5
o/w Sampling Criteria 2: Amount awarded is greater than approved budgeted amount	38,073,947.00	355,962,037.08	15
o/w Sampling Criteria 3: Date of award and acceptance date falls on a weekend	276,106,813.08	261,757,684.57	109
o/w Sampling Criteria 4: Dates are out of order or beyond the declared coronavirus procurement period (March 25 to August 3 2020)	22,658,615.48	21,902,857.25	32
o/w Sampling Criteria 5: A large difference between awarded amount and budgeted amount	1,005,773,026.00	178,193,526.56	12
o/w Sampling Criteria 6: Random sampling of small-value transactions	10,103,031,881.36	9,589,122,613.65	404
TOTAL SAMPLE SIZE	22,959,921,082.92	21,332,590,519.11	581
PERCENTAGE OF SAMPLE	56.43%	59.32%	

Final Sample for Risk Analysis	Amount Spent	% Amount Spent Relative to Approved Budget	% Amount Spent Relative to Amount Awarded	% of Amount Spent
o/w Sampling Criteria 1a: (as of June 24, 2020) All high-value transactions above a materiality threshold	724,030,200.00	54.93%	79.50%	3.5%
o/w Sampling Criteria 1b: (from June 25 to August 3, 2020) All high-value transactions above a materiality threshold	10,010,800,000.00	98.18%	100.00%	48.1%
o/w Sampling Criteria 2: Amount awarded is greater than approved budgeted amount	60,013,512.20	157.62%	16.86%	0.3%
o/w Sampling Criteria 3: Date of award and acceptance date falls on a weekend	261,921,935.81	94.86%	100.06%	1.3%
o/w Sampling Criteria 4: Dates are out of order or beyond the declared coronavirus procurement period (March 25 to August 3 2020)	21,003,737.25	92.70%	95.89%	0.1%
o/w Sampling Criteria 5: A large difference between awarded and budgeted amount	418,168,225.00	41.58%	234.67%	2.0%
o/w Sampling Criteria 6: Random sampling of small-value transactions	9,317,865,280.67	92.23%	97.17%	44.8%
TOTAL SAMPLE SIZE	20,813,802,890.93	90.65%	97.59%	100.0%

Note 3. Data Collection and Verification Protocols

Below are markers that were used to standardize and codify information and flag possible and/or notable issues as well as errors in the encoding stage. Guidelines for the documentation of information and the procedural overview are provided on Appendix A.

Table 1

General markers	Applied when?
?	In the event that there is uncertainty in terms of how exactly to flag and/or what marker to place in a cell; this is a temporary indicator only and must be revisited by the QCR team then said team would conclude after careful deliberation on what marker should be indicated or what the final output should be; Cells flagged with this marker should be logged on the Issues Monitoring Log tab
Not Indicated	In the event when the information is missing or not given on the document or when no document is available
NA	This is not entered manually, but is system-generated based on a coded formula in a given cell; do not tamper or edit the formula found in some cells

Table 2

Specific markers on the "Remark(s)" column	Applied when?
Alternative document uploaded: Used (insert/specify name or document type here) instead	In the event that a different document (i.e. neither a PO, a NOA, or an APP) was uploaded and used as substitute
Error in URL: File not found	In the event that the link is broken and/or no file is available
Interchanged documents: URL to PO instead of to NOA (write "to NOA instead of to PO" if for NOA table)	In the event that the link directs to a PO instead of a NOA and vice versa, i.e. documents are interchanged, but both (PO and NOA) are still available; Note: Even if uploaded documents are interchanged, the available information should still be supplied in its corresponding cell
Not specified and itemized explicitly but may be under a broad category	In the event that the procurement activity or procured items are not broken down specifically on the APP document, i.e. items are not listed on the APP in the way they were listed on the PO, but there is a line item on the APP document to where the procurement activity may belong and whose description resembles the project title or the essence or purpose of the procurement activity itself
Proper PO (write "NOA" or "APP" if for NOA or "APP" table respectively) not uploaded	In the event that the appropriate copy of the PO or NOA or APP was not uploaded, i.e. document says it is a PO or NOA or an APP, or is similar to a PO or NOA or an APP but in a different template
Unavailable PO (write "NOA" or "APP" if for NOA or APP table respectively)	In the event that the link directs to a NOA instead of a PO and vice versa and the corresponding document is unavailable, i.e. only the PO was uploaded for both tables or only the NOA is uploaded for both tables; when the link directs to a PO or NOA and the APP is unavailable as well as not uploaded
Unreadable PO (write "NOA" or "APP" if for NOA or APP table respectively)	In the event that the PO, NOA, or APP is unreadable
Inconsistent MOP	In the event that an MOP is similar to any of the official MOPs listed on Table 6, but is not written in the exact way, e.g."Negotiated Purchase" instead of "Negotiated Procurement," "Emergency Purchase" instead of "Emergency Negotiated Procurement," and the like
Wrong MOP	In the event that the given information is different and an unclassified MOP, i.e. not enlisted on Table 6 below

Nothing further	In the event that all information and notable issues have been flagged accordingly, i.e. in its respective cell per column, and no other and added issues, problems, concerns, and/or anomalies have been made, observed, and detected; this is applicable only to the Remark(s) columns of the APP, PO, and NOA tables
With exceptions	In the event that all information and notable issues have been flagged accordingly, i.e. in its respective cell per column, and no other and added issues, problems, concerns, and/or anomalies have been made, observed, and detected; this is applicable only to the Remark(s) column of the Analysis table, after all encoded information and uploaded documents have been reviewed thoroughly
w/o/e	In the event that all information in all cells for every dataset is given, correct, without exception(s), not missing, and has no issues as well as no problems and concerns exist with the uploaded document; this should be utilized instead of leaving the cell for this column blank

Table 3

Specific markers on "Signed by Bidder?" column	Applied when?
Yes, no date	In the event when document was signed by authorized signatory and with name, but the date when it was signed is not given on the document
Yes, no name and date	In the event when document was signed by authorized signatory, but the date when it was signed and the name of the authorized signatory are not given on the document
Yes, unreadable date	In the event when document was signed by authorized signatory and with name, but the date when it was signed is illegible
(Insert actual date, i.e. MM/DD/YYYY, when document was signed)	In the event that the signature and date are available, with or without name, but indicate on the Remark(s) column, "No bidder name" if only signature and date are available

Table 4

Specific markers on "Comment(s) on Name" column	Applied when?
No issues noted	In the event when there are no issues, and/or concerns on/with signatory's name
Incomplete name	In the event when name is incomplete, i.e. either no last name or first name
Name not consistent with other documents	In the event when the name of the signatory in PO is not the same with the name of the signatory in NOA and vice versa
Other remarks - (Insert elaborate explanation of issues and/or concerns specifically on the name of the authorized signatory here)	In the event when none of the situations listed above are applicable; Specify the issues or concerns after the dash, and no need to reiterate on the Remark(s) column

Table 5

Specific markers for the GPPB classification	Applied when?
Not specified	In the event that good(s) procured and/or service(s) availed are generally stated or described but not specified and itemized
Indeterminate Info	In the event that the document and/or info is unreadable and/or incomplete

Go to Breakdown of POs with Various Items Tab	In the event that the PO has multiple items listed, this is specifically applied on the Main Sheet

Table 6

Points to consider for MOP as per RA 9184 and RA 11469
There are two major types of procurement methods: 1. Public or competitive bidding, and; 2. Alternative modes of procurement Under alternative modes are the following: 1. Negotiated procurement 1.1. Emergency negotiated procurement 2. Direct contracting 3. Shopping 4. Limited source bidding, and; 5. Repeat order.

Table 7

Points to consider for nature of procurement transaction as per RA 9184 and RA 11469	
Goods	These refer to "all items, supplies, materials and general support services, except consulting services and infrastructure projects, which may be needed in the transaction of the public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non - personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the procuring entity or such services. The term 'related' or 'analogous services' shall include, but is not limited to, lease of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity." Note regarding materials for construction: If materials are procured separately by the admin or via "Pakyaw," a job order used by local gov't for infra projects, the transaction is classified under this category and, generally but not always, labor is then provided by the LGU. But if a contractor is engaged, the goods along with other services related to the project for which said contractor is hired are provided by it. The transaction will then be categorized under infra unless specified otherwise and description of project falls into the definition of services.
Services	These refer to "services for Infrastructure Projects and other types of projects or activities of the Government requiring adequate external technical and professional experts that are beyond the capability and/or capacity of the government to undertake such as, but not limited to: 1. Advisory and review services 2. Pre-investment or feasibility studies 3. Design 4. Construction supervision 5. Management and related services, and; 6. Other technical services or special studies." Note that when it comes to this particular nature of procurement transaction, think of consultancy services as key takeaway.

Infrastructure	This includes "the construction, improvement, rehabilitation, demolition, repair, restoration and/or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings and other related construction projects of the government." Note that, in general, the project title is indicative of what the procurement transaction is/should be for.

Table 8

Points to consider for GPPB classification as per GPPB ADV 04-2020	
Amelioration Goods and Services	Are "goods and services for social amelioration measures in favor of affected communities"
Construction	Involves the "establishment, construction, and operation of temporary medical facilities and aid/medical distribution centers"
Medical Goods and Services	May include "personal protective equipment such as gloves, gowns, masks, goggles, face shields; surgical equipment and supplies; laboratory equipment and its reagents; medical equipment and devices; support and maintenance for laboratory and medical equipment, surgical equipment and supplies; medical supplies, tools, and consumables such as alcohol, sanitizers, tissue, thermometers, hand soap, detergent, sodium hydrochloride, cleaning materials, povidone iodine, common medicines (e.g. paracetamol tablet and suspension, mefenamic acid, vitamins tablet and suspension, hyoscine tables and suspension); testing kits; and such other supplies or equipment as may be determined by the Department of Health and other relevant government agencies"
Property Lease	Involves "lease of real property or venue for use to house health workers or serve as quarantine centers, medical relief and aid distribution locations or temporary medical facilities"
Utilities	Are "utilities, telecommunications, and other critical services in relation to operation of quarantine centers, medical relief and aid distribution centers and temporary medical facilities"
Ancillary Services	Are supplemental "services and support to the foregoing."

Note 4. Acronyms

Table 9

GENERAL	
Acronym/Initialism	**Definition**
ABC	Approved Budget Ceiling
APP	Annual Procurement Plan
BURS	Budget Utilization and Request Status
CA	Contract/Agreement/Contract Agreement
CAD	Cash Advance
CFA	Certificate of Fund Availability
COA	Commission on Audit
COD	Cash on Delivery
EP	Emergency Procurement
JO	Job Order
LGU	Local Government Unit
M	Million
MOOE	Maintenance and Other Operating Expenses
MOP	Mode of Procurement
No.	Number
NOA	Notice of Award
NTP	Notice to Proceed
OR/OBR	Obligation Request
ORS	Obligation Request Status
PHP	Philippine Peso
PO	Purchase Order
PR	Purchase Request
RES	Resolution
RFQ	Request for Quotation
TF	Trust Fund

Note 5. Units of Measure

Table 10

Unit of Measure	
Unit	**Definition**
UOM	Unit of Measurement
amp	ampule
bg	bag
btl	bottle
bx	box
bdl	bundle
cn	can
cap	capsule
cas	case
cvn	cavan
cont	container
d	day
doz	dozen
drm	drum
ea	each
gal	gallon
job	job
kg	kilogram
kit	kit
l	liter
lot	lot
meal	meal
m	meter
mo	month
NA	not applicable
neb	nebule
pck	pack
pail	pail
pr	pair
pax	person
pc	pieces
rm	ream
rol	roll
scht	sachet
sck	sack
st	set
sht	sheet
tab	tablet
tst	test

tr	tray
tub	tube
unit	unit
vi	vial

Note 6. Philippine Open Covid Contracts Dataset (phlcovidcontracts v1)

We have documented our dataset for replication, review, and critique by the larger research community. We are making available our results in the following files and folders, accessible via hosted folder: bit.ly/phlcovidcontracts.

Folder	File	Format	Description
metadata	metadata	xlsx	Description of variables and their metadata (also see: Notes 6.1 and 6.2)
clean	contract	xlsx	The clean, final contract-level dataset used for analysis
clean	item	xlsx	The clean, final item-level dataset used for analysis, matches items with their corresponding contracts
clean	summary	xlsx	Summary of tables in the paper
price	price	do	Stata code used to run the price analytics
price	price_raw	xlsx	Raw file on item-level price data and external market price data
price	price_external_analytics	dta	Stata data file used to run the external price analytics
price	price_internal_analytics	dta	Stata data file used to run the internal price analytics
price	procurement_info	dta	Stata data file used to run the internal price analytics
price	price_analytics_items	xlsx	Detailed spreadsheet outlining the key price analytics data
raw	contracts_raw	xlsx	The downloaded table of contract-level data from the Government Procurement Policy Board website as of 3 August 2020
raw	POs NOAs APPs	pdf, jpg, various image files	All publicly available purchase orders, notices of award, and annual procurement plans from the GPPB website as of 3 August 2020, renamed by transaction ID

Note 6.0. Mapping to the Open Contracting Data Standard

We mapped our variables with the open contracting data standard. Notes 6.1 and 6.2 summarize these variables and their descriptions.

	Contract-level (Note 6.1)	Item-level (Note 6.2)
Total number of variables	120	11
Mapped to open contracting data standard variables	41	9

Note 6.1. Contract Level-Variables

n	category	varname	var label	ocds section	ocds path	ocds title
1	id	uid	Transaction ID	awards	awards/id	Award ID
2	audit	audit_risk	Risk Parameter			
3	encoder	t_start	Start Time			
4	encoder	t_end	End Time			
5	encoder	t_duration	Duration (minutes)			
6	encoder	batch	Batch (1 or 2)			
7	gppb	project	Project Name	awards	awards/title	Title
8	gppb	abc	Approved Budget	planning	planning/budget/amount	Amount
9	gppb	g_startdate	Start Date	awards	awards/contractPeriod/startDate	Start date
10	gppb	g_enddate	End Date	awards	awards/contractPeriod/endDate	End date
11	gppb	supplier	Name Of Awarded Company	awards	awards/suppliers/name	Organization name
12	gppb	noa_amount	Amount Awarded	awards	awards/value	Value
13	gppb	g_awarddate	Date Of Award	awards	awards/date	Award date
14	gppb	g_noa_link	Notice Of Award	awards	awards/documents/url	URL
15	gppb	g_acceptdate	Acceptance Date	awards	awards/description	Description
16	gppb	po_link	Link to Contract/PO			
17	gppb	app_link	Link to Annual Procurement Plan (APP)	planning	planning/documents/url	URL
18	gppb	pe_name	Procuring Entity Name	tender	tender/procuringEntity	Procuring entity
19	gppb	pe_citymuni	Procuring Entity Address - City /	tender	tender/procuringEntity/a	Locality

				Municipality		ddress/locality	
20	gppb	pe_province	Procuring Entity Address - Province	tender	tender/procuringEntity/address/region	Region
21	app	app_projectyes	Is the transaction included in APP? (Yes/No)			
22	app	app_amount	Amount per APP	planning	planning/budget/amount/amount	Amount
23	app	app_podifference	Difference of Amount per APP and Amount per PO			
24	audit	encoder_person	Assignment			
25	audit	remarks	Remark(s) (if applicable)			
26	po	po_date	Date	tender	tender/awardPeriod/startDate	Start date
27	po	po_doctype	Doc. Type			
28	po	po_docno	Doc. No.			
29	po	po_supplier_name	Supplier	awards	awards/suppliers	Suppliers
30	po	po_blacklist	Is the Supplier blacklisted based on GPPB website? (Yes or No)			
31	po	po_supplier_bgy	Supplier Address - Number, Street, Barangay	tender	tender/tenderers/address/streetAddress	Street address
32	po	po_supplier_citytown	Supplier Address - Town/City	tender	tender/tenderers/address/locality	Locality
33	po	po_supplier_address	Supplier Address - Province	tender	tender/tenderers/address/region	Region
34	po	po_procmode	Mode of procurement	tender	tender/procurementMethod	Procurement method
35	po	po_description	Material Description	contracts	contracts/description	Contract description
36	po	qty	Quantity	contracts	contracts/items/quantity	Quantity
37	po	unit	Unit of Measurement	contracts	contracts/items/unit	Unit
38	po	price	Unit Price	contracts	contracts/items/unit/value	Value
39	po	currency	Currency	contracts	contracts/value/currency	Currency
40	po	amt	Amount	contracts	contracts/value/amount	Amount
41	po	po_difference	Difference			
42	po	po_pesignlastname	Authorized signatory - Last Name	parties	parties/identifier/legalName	Legal Name
43	po	po_pesignfirstname	Authorized signatory - First Name	parties	parties/identifier/legalName	Legal Name

44	po	po_pesignposition	Authorized signatory - Position	parties	parties/roles	Party roles
45	po	po_pesigncomment	Authorized signatory - Comment(s) on Name	parties	parties/details	Details
46	po	po_bidsign	Signed by bidder?			
47	po	po_orsdate	Date of ORS/BURS/OBR			
48	po	po_orsnum	ORS/ BURS /OBR No.	planning	planning/budget/description	Budget Source
49	po	po_ntp	With Notice to Proceed			
50	po	po_goods	Nature of Procurement Transaction - Goods? (Yes/No)			
51	po	po_services	Nature of Procurement Transaction - Services? (Yes/No)			
52	po	po_infrastructure	Nature of Procurement Transaction - Infrastructure? (Yes/No)			
53	po	class_main	GPPB Classification - Main Classification	contracts	contracts/items/classification	Classification
54	po	class_sub	GPPB Classification - Sub Classification	contracts	contracts/items/additionalClassifications	Additional classifications
55	po	po_remarks	Remark(s)			
56	noa	noa_date	Date	awards	awards/date	Award date
57	noa	noa_rfq	RFQ No.			
58	noa	noa_suppliername	Supplier	awards	awards/suppliers/name	Organization name
59	noa	noa_signlastname	Authorized signatory - Last Name	awards	awards/suppliers/contactPoint/name	Name
60	noa	noa_signfirstname	Authorized signatory - First Name	awards	awards/suppliers/contactPoint/name	Name
61	noa	noa_signposition	Authorized signatory - Position	awards	awards/suppliers/contactPoint/name	Name
62	noa	noa_namecomment	Authorized signatory - Comment(s) on Name			
63	noa	noa_bidsign	Signed by bidder?			
64	noa	noa_amt	Amount	awards	awards/value	Value
65	noa	noa_difference	Difference			
66	noa	noa_remarks	Remark(s)			
67	audit	a1	Is the Selection Recorded for the Appropriate Amount?			
68	audit	a2	Is the amount awarded within the approved budget?			
69	audit	a3	Is PO dated after Notice of Award?			

70	audit	a4	Is PO dated after acknowledgment of Notice of Award by the bidder?			
71	audit	a5	Difference Between PO date and NOA date (days)			
72	audit	a6	Is PO dated after ORS/BURS/OBR date?			
73	audit	a7	Is NOA dated after ORS/BURS/OBR date?			
74	audit	a8	Is Signed by bidder (NOA) dated after NOA?			
75	audit	a9	Is Signed by bidder (NOA) dated after ORS/BURS/OBR date?			
76	audit	i_encoder	Encoder			
77	audit	i_reviewer	Reviewer			
78	audit	i_reviewer2	2nd Level Reviewer			
79	audit	remarks1	Remarks			
80	audit	remarks2	Remarks			
81	risk	r1	Count of contracts with risk 1 Unclear data or signatures in documents			
82	risk	r2	Count of contracts with risk 2 Missing basic information			
83	risk	r3	Count of contracts with risk 3 Lacking description or specification			
84	risk	r4	Count of contracts with risk 4 Inconsistent amounts among documents			
85	risk	r5	Count of contracts with risk 5 Missing document or broken weblinks			
86	risk	r6	Count of contracts with risk 6 Inconsistent dates or times			
87	risk	r7	Count of contracts with risk 7 Purchase inconsistent with purpose			
88	risk	r8	Count of contracts with risk 8 Large time lapsed between order and award (see Section E4)			
89	risk	r9	Count of contracts with risk 9 Transaction entered twice			
90	risk	r10	Count of contracts with risk 10 Many same orders to the same supplier			
91	risk	r11	Count of contracts with risk 11 Significant typographical and			

			mathematical errors			
92	risk	r12	Count of contracts with risk 12 Transactions with suspended suppliers			
93	risk	r13	Count of contracts with risk 13 Inconsistent supplier information			
94	risk	r14	Count of contracts with risk 14 Price is risky			
95	risk	r15	Count of contracts with risk 15 Material differences in amounts			
96	risk	r1_value	Value of contracts with risk 1 Unclear data or signatures in documents			
97	risk	r2_value	Value of contracts with risk 2 Missing basic information			
98	risk	r3_value	Value of contracts with risk 3 Lacking description or specification			
99	risk	r4_value	Value of contracts with risk 4 Inconsistent amounts among documents			
100	risk	r5_value	Value of contracts with risk 5 Missing document or broken weblinks			
101	risk	r6_value	Value of contracts with risk 6 Inconsistent dates or times			
102	risk	r7_value	Value of contracts with risk 7 Purchase inconsistent with purpose			
103	risk	r8_value	Value of contracts with risk 8 Large time lapsed between order and award (see Section E4)			
104	risk	r9_value	Value of contracts with risk 9 Transaction entered twice			
105	risk	r10_value	Value of contracts with risk 10 Many same orders to the same supplier			
106	risk	r11_value	Value of contracts with risk 11 Significant typographical and mathematical errors			
107	risk	r12_value	Value of contracts with risk 12 Transactions with suspended suppliers			
108	risk	r13_value	Value of contracts with risk 13 Inconsistent supplier information			

109	risk	r14_value	Value of contracts with risk 14 Price is risky			
110	risk	r15_value	Value of contracts with risk 15 Material differences in amounts			
111	duration	d0_award2end	award to end (days) = g_enddate - noa_date	awards	awards/contractPeriod/durationInDays	Duration (days)
112	duration	d1_award2po	award to purchase (days) = po_date - g_awarddate			
113	duration	d2_po2start	purchase to start (days) = g_startdate - po_date			
114	duration	d3_start2end	start to end (days) = g_enddate - g_startdate			
115	duration	d4_noacheck	noa (cbt) to noa (gppb) (days) = g_awarddate - noa_date			
116	duration	d5_noa2bidsign	noa to bidsign (days) = noa_date - noa_bidsign			
117	duration	d6_bidsign2po	bidsign to po (days) = po_bidsign - po_date			
118	duration	d7_award2start	award to start (days) = g_startdate - noa_date			
119	duration	d8_start2accept	start to accept (days) = g_acceptdate - g_startdate			
120	duration	d9_accept2end	accept to end (days) = g_enddate - g_acceptdate			

Note 6.2. Item-Level Variables

variable number	category	varname	var label	ocds section	ocds path	ocds title
1	uid	uid	Transaction ID	contracts	contracts/awardID	Award ID
2	noa	amount	Subcategory Amount Awarded			
3	po	description	Material Description	awards	awards/items/description	Description
4	po	qty	Quantity	contracts	contracts/items/quantity	Quantity
5	po	unit	Unit of Measurement	contracts	contracts/items/unit	Unit
6	po	price	Unit Price	contracts	contracts/items/unit/value/amount	Amount
7	po	currency	Currency	contracts	contracts/items/unit/value/currency	Currency
8	po	sub_amount	Subcategory Amount			
9	po	difference	Subcategory Difference			
10	po	class_main	GPPB Classification - Main	contracts	contracts/items/classification	Classification
11	po	class_sub	GPPB Classification - Sub	contracts	contracts/items/additionalClassifications	Additional classifications