Public Sector Procurement of Medicines in the Philippines

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Abstract

The Philippine government plays an increasingly significant role in the provision of drugs and medicines. Over the last half decade, direct public procurement more than doubled from PhP7.8 billion in 2014 to PhP20.1 billion in 2019. In this study, we document government procurement practices as applied to drugs and medicines, with emphasis on instituted information revelation mechanisms to promote transparency. Among the almost 50,000 records in 2019 that we analyzed, we find that about a third of posted procurement opportunities for drugs and medicines had insufficient descriptions available to allow purchase. Further, we find that mandated price caps are associated with longer posting period and greater propensity for failed procurement, but not necessarily with cheaper procurement prices.

Keywords: Public procurement, Drugs and medicines, Drug Price Reference Index, Philippine Government Electronic Procurement System

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1. Introduction

In 2019, the Philippines spent PhP161 billion on pharmaceutical products, representing about a fifth of all total current health expenditures for that year (Philippine Statistics Authority [PSA], 2020). The government remains as a key component of medicine expenditure. In 2020, for example, the national government allotted PhP19 billion for medicine procurement under the Department of Health (DOH). This value excludes government procurement by other agencies, including own procurement by local governments and public health facilities.

Government procurement of pharmaceutical products in the Philippines are governed by a number of policies, including the Republic Act [R.A.] No. 9184, which provides for the modernization, standardization and regulation of government procurement activities, and Executive Order No. 49, series of 1993, which directs the mandatory use of the Philippine National Drug Formulary in government procurement of medicines. More recently, the Department of Health introduced the Philippine Drug Price Reference Index (DPRI) as basis for the maximum government procurement price of pharmaceutical products.

Despite the importance of government procurement in the local pharmaceutical market, there appears to be scant evidence on the efficiency and effectiveness of the above government instruments. A few exceptions on government include those by the World Health Organization [WHO] (2006), which looked into transparency in medicine registration, selection and procurement in the Philippines, and Navarro and Tanghal (2017), which documented the implementation of the R.A. 9184 in several government agencies, including in the DOH.

WHO (2006) noted several strengths of the Philippine government procurement system, including (a) transparency in procedures, (b) use of competitive procedures, (c) use of objective criteria to set quantities for procurement, (d) clear procedures that link payment to delivery, and (e) strong mechanism to monitor and report supplier performance. Navarro and Tanghal (2017), on the other hand, provides a more somber assessment where they noted some issues in the procurement of medical supplies, medicines and drugs, particularly by the DOH, such as delays in procurement, arising from the sheer volume of pharmaceutical products that needs to be procured, as well poor procurement planning, among others.

Several recent studies also noted some key weaknesses of government procurement of medicines. Cheng, et. al. (2020), for instance, noted that eight of 10 local government units that they surveyed do not comply with the DPRI, wherein procurement prices range between 0.35 to 21.27 times of set maximum procurement prices. Lambojon, et. al. (2020), on the other hand, noted the limited availability of essential drugs in government health facilities. Among 50 essential medicines that they covered, only 25.0% on average are available in public

hospitals. They also noted that some generic medicines are cheaper in private hospitals compared to some government health facilities.

This study aims to provide a comprehensive review of government procurement practices, particularly as applied to the procurement of pharmaceutical products. The focus will be to document existing practices and to compare these practices with set guidelines. Attention will also be given to issues that arise from procurement, and the potential remedies government procurement bodies have implemented to address these issues.

2. Policies governing public sector procurement

Public procurement of drugs and medicines in the Philippines are governed by several policies, including on which products may be procured, at what price, and how. Key among these policies are the Government Procurement Reform Act (Republic Act [RA] 9184), the Generics Act (RA 6675), and the Cheaper Medicines Act (RA 9502). Beyond these, there are other important policies that regulate the production and trade of pharmaceutical products (e.g. Food, Drug and Cosmetic Act or RA 3720; Food and Drug Administration Act of 2009 or RA 9711; Comprehensive Dangerous Drugs Act or RA 9165) and the practice of pharmacy professionals (Philippine Pharmacy Act or RA 10918); promote consumer protection (e.g. Consumer Act of the Philippines or RA 7394; Price Act or RA 7581); and set public spending priorities and limits (e.g. annual General Appropriations Act).

In an early study, the World Health Organization (WHO, 2006) assessed the level of transparency and the potential vulnerability to corruption in four countries, including the Philippines, with regard medicine registration, essential medicines selection, and medicine procurement. The study found the Philippines to be "minimally vulnerable" to potential corruption in public procurement, although it also noted that the country may be "marginally vulnerable" in terms of medicine registration and selection. It noted key strengths in public procurement of medicines in the Philippines, including mandating the use of competitive bidding and of standardized bidding documents in government procurement, and having transparent procedures.

2.1. Government Procurement Reform Act

The Government Procurement Reform Act (GPRA) provides a harmonized framework on public sector procurement in the Philippines. Prior to the GPRA, public procurement was governed by 117 different policy documents, ranging from congressional legislations to presidential orders to line agency issuances (Senate Economic Planning Office [SEPO], 2008; Yilmaz and Venugopal, 2010). Among others, the GPRA simplified screening and qualification processes; introduced price ceilings and capped price adjustments post-award; standardized procurement processes and forms; institutionalized civil society participation; adopted open and competitive bidding as primary procurement mode; and mandated the use of an electronic procurement system to promote transparency and competition (SEPO, 2008).

Despite these many innovations, several implementation gaps have been documented, including inconsistencies in compliance to GPRA processes, difficulties in access and use of the government electronic procurement system, and limitations in monitoring and enforcement mechanisms, among others (Bombay, 2011; Gabriel and Castillo, 2019; Jones, 2009; Navarro and Tanghal, 2017; SEPO, 2008).

2.2. Generics Act

The Generics Act (Section 6) mandates the use of pharmaceutical generic names among all government agencies and personnel "in all transactions related to purchasing, prescribing, dispensing, and administering of drugs and medicines", including drugs and medicines in the Philippine National Drug Formulary (PNDF). Essential medicines included in the PNDF are selected based on efficacy, safety, and cost-effectiveness, with those in its core list "intended to be available at all times in adequate quantities in appropriate dosage forms and at the lowest possible cost" (Department of Health [DOH], 2012, p.2). Eventually, Executive Order (EO) No. 49, seri,es of 1993, mandated the use of the PNDF in all public procurement, effectively limiting the medicines that may be procured by government entities, with some exceptions.

2.3. Cheaper Medicines Act

The Cheaper Medicines Act empowered the President of the Philippines to impose maximum retail prices over any or all drugs and medicines with the recommendation of the DOH Secretary. In addition, the DOH Secretary may implement cost-containment and other measures to effectively reduce the cost of drugs and medicines.

In 2009, EO 821 imposed maximum retail prices on five drug molecules: amlodipine (anti-hypertensive), atorvastatin (anti-cholesterol), azithromycin (antibiotic/antibacterial), and cytarabine and doxorubicin (anti-cancer/anti-neoplastics). This list was recently updated to include 122 molecules through EO 104 in 2020.

The DOH also introduced the Drug Price Reference Index (DPRI) as the mandated procurement price ceiling of essential medicines in DOH facilities, and eventually expanded to all government medicine procurement. The DPRI is calculated as the previous year's median price based on prevailing procurement prices in DOH facilities and in the Philippine Pharma Procurement Inc., a government-owned and controlled corporation created to provide a common facility for pooled medicine procurement. Several updates have been introduced through the years, such as providing as much as additional 30% price adjustment in allowed ceiling prices relative to the DPRI (2016), using the lowest bid price plus 10% margin for patented products and drugs with limited competition (2019), and allowing the use of the maximum instead of median as procurement price ceiling (2020).

3. Government procurement of medicines

Government procurement of drugs and medicines has grown considerably over the years. As shown in Table 1, between 2014 and 2019 government procurement has more than doubled to PhP20.1 billion from only PhP7.8 billion five years prior. When disaggregated by type, local government units procured PhP10.5 billion-worth of drugs and medicines in 2019, about double of its aggregate procurement in 2014. National government, on the other hand, comes at close second with PhP8.3 billion-worth of procurement in 2019, almost 3.5 times its procurement in 2014. Finally, government-owned and controlled corporations, primarily tertiary hospitals, also procured a significant amount at PhP0.4- and PhP1.3-billion in 2014 and 2009, respectively.

Table 1. Government medicine procurement: Philippines, 2014-2019

	2014	2015	2016	2017	2018	2019
A. Level (in current PhP billions)						
Philippines	115.6	119.7	129.1	142.9	156.3	161.6
Government	7.8	10.3	13.4	15.2	18.7	20.1
NG	2.4	3.7	4.8	5.9	8.0	8.3
LGU	5.0	6.2	6.9	8.1	9.6	10.5
GOCC	0.4	0.5	1.7	1.2	1.1	1.3
B. Share (in % of total)						
Philippines	100.0	100.0	100.0	100.0	100.0	100.0
Government	6.8	8.6	10.4	10.6	12.0	12.4
NG	2.1	3.1	3.7	4.1	5.1	5.1
LGU	4.4	5.1	5.4	5.7	6.1	6.5
GOCC	0.3	0.4	1.3	0.8	0.7	0.8

Source: Commission on Audit (COA), various years. Note: The value for GOCC exclude drugs and medicines paid through Philippine Health Insurance Corporation, the country's social health insurance, which are lumped with other fees in its all case rates. NG – national government; LGU – local government unit; GOCC – government owned or controlled corporation.
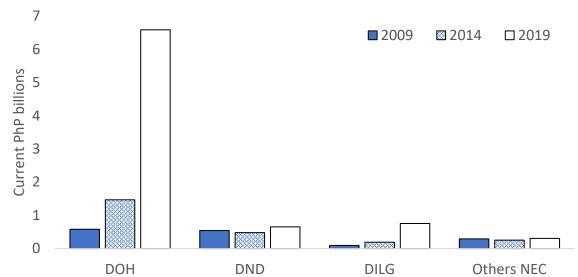
Figure 1. National government medicine procurement by agency: 2009, 2014, 2019

Source: Commission on Audit (COA), various years. Note: DOH – Department of Health; DND – Department of National Defense; DILG – Department of the Interior and Local Government; NEC – not elsewhere classified.

Public procurement comprises a significant portion of the whole Philippine pharmaceutical market. Over the last five years, the government's share increased from 6.8% in 2014 to 12.4% in 2019. These values may be grossly understated, however, since the values we presented do not included drugs and medicines procured through the Philippine Health Insurance Corporation, the country's social health insurance, which are lumped together with other fees in its all case rate.

When disaggregated, Figure 1 shows that the recent increase in national government procurement of drugs and medicines are largely by the DOH. In 2009, DOH procured PhP 0.6 billion-worth of drugs and medicines, which has increased to PhP1.5 billion in 2014, and further to PhP6.6 billion in 2019. This increase coincides with the expansion of its medicine access programs, which include.

Procurement of drugs and medicines among local governments, on the other hand, vary widely, ranging from less than one million- to almost PhP 2-billion in 2019 (Figure 2). LGU procurement are largely concentrated among urban centers and local governments with hospitals. In 2019, the top ten drugs and medicine procuring local governments, top-billed by Makati (PhP 1.9 billion), Bulacan province (PhP 0.5 billion), and Pasay, Taguig and Caloocan (PhP 0.2 billion each), comprise about 40% of all local government procurement of drugs and medicines in that year.

4. Knowledge, attitudes, and practices

In order to gather indications of knowledge, attitudes and practices among public sector workers in charge of drugs and medicine procurement, we conducted a series of focus group discussions and key-informant interviews with representatives from national government agencies (Department of Health, PhilGEPS, PPPI), local governments, and health facilities. We summarize the results below.

4.1. Process

In general, KII/FGD participants appear to be familiar with the GPRA. According to them, the GPRA is their decisive guide for government procurement due to its completeness, focus on transparency and competitiveness, and streamlined processes. They said that they heavily comply with its guidelines, often citing potential repercussions if not followed. One participant explained that it is a penal law.

Majority of the participants stated that they neither find it difficult nor easy to follow. Some participants expressed that new staff may have difficulties due to lack of training or lack of background in procurement, but, eventually, once one becomes familiar with the law and the processes, it becomes easy to follow. Further, out of the seven participant pharmacists, five admittedly reported that the Bids and Awards Committee (BAC) staff has more expertise regarding the procurement process, especially to those pertaining to specific details like the use of PhilGEPS.

When probed about details of their procurement process for drugs and medicines, the participants noted that medicines undergo a similar process with the procurement of non-medical supplies. They are treated as goods that must follow regulations set in the Drug Price Reference Index (DPRI) and the National Drug Formulary (NDF).
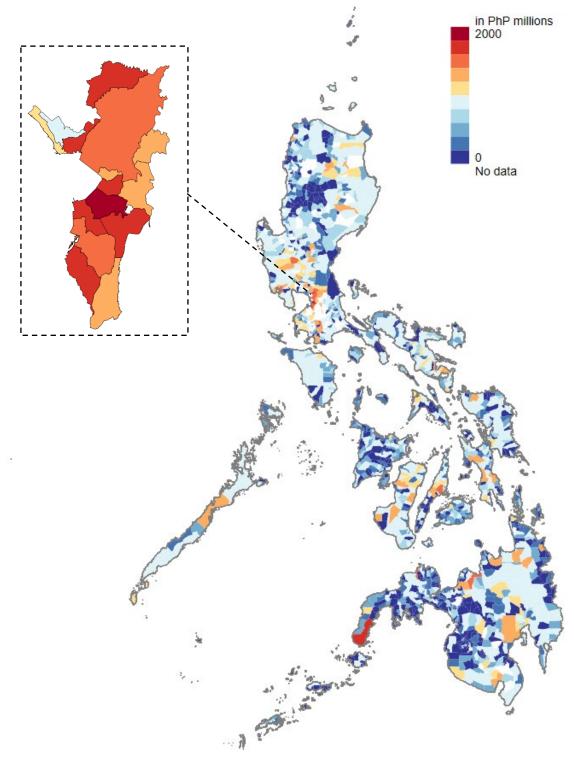
Figure 2. Local government medicine procurement by city and municipality: 2019

Source: 2020 COA audit reports.
Note: Values only include those by cities and municipalities. Procurement by provincial governments are excluded. Inset: National Capital Region.

The importance of the Annual Procurement Plan (APP) and the Project Procurement Management Plan (PPMP) are regularly stressed. Without these, procurement cannot proceed. PPMPs are prepared by the end-user like pharmacists, supply officers, and physicians. These plans are consolidated into the APP.

Out of the thirteen that engaged with the discussion, eight of them were BAC staff. In particular, they can extensively explain all the steps, documents, required number of days, and other details in every phase of the process. Pharmacists were also able to explain their procurement process. However, they would admit that their knowledge is limited based on their role (ex. preparing PPMPs and reviewing deliveries). One pharmacist explained that the BAC would be able to explain the process.

It should be noted that what sets medicines apart from other goods is that they often undergo emergency purchases. This happens when there is an urgent need for the medicine, especially for life-saving ones. Participants express a great deal of concern for patients, stressing the importance of being able to help the people under their care.

In addition to that, two participants explained that PhilHealth is also a concern because health services will be questioned why they were not able to provide medicine and drugs to the patient. They explained that it is connected to No Balance Billing.

A common challenge is when there are no bidders or a low number of bidders which leads to a failed bid. Most participants attribute low prices as the main deterrent. When health services ask suppliers why they didn't participate in the bidding, they are informed that their ABC is too small compared to the market price of the medicine. This becomes a concern because the procurement of medicines is limited by the price range set by DPRI.

A few participants theorized that their location in the province affects the number of bidders, and that there are more suppliers in Metro Manila.

Another layer that adds complexity is that competitive bidding has to fail twice before alternative procurement can be utilized. So, even if there are no bidders, facilities have to repeat the process before they move to alternative modes of procurement.

There are also participants who question the quality of what they procured due to the fact that it's the cheapest offer. There is a concern that the quality of the medicine has been sacrificed for the sake of getting a low cost.

Other issues that were raised include the following: (1) there are times when a medicine is found in the DRPI but not in the NDF, (2) lack of availability, and (3) problems with monitoring inventory. The discrepancy between the DPRI and the NDF is a concern, because the NDF assures that the medicine is of good quality and is widely-used by health services throughout the country.

The participants expressed that their procurement process was heavily affected by the pandemic and the subsequent lockdowns. Though, currently, participants not from NCR reported more types of changes in their procurement.

The most raised issue is the less than ideal performance of the winning bidder. Delays on the delivery can occur, and suppliers will repeatedly ask for an extension. Health services cannot

drop a supplier once the contract has been finalized. They can only request for a waiver from the supplier before they repeat the bidding process. This lengthens the procurement process.

Aside from delivery, the stock of suppliers can also cause problems. Sometimes there is no stock of the medicine, or there is an incompatibility with the specifications like the shelf-life. As an example, a participant explained that most suppliers only have medicines that have a shelf-life that is less than 18 months. However, health services prefer medicine that has a shelf-life of 18 to 24 months.

An additional struggle was that activities used to be face-to-face. Now, certain activities like pre-bid conferences and ocular inspections are done online which has related concerns regarding internet access and electricity disruptions. In addition, there is an observed decrease in the number of participating bidders.

On the side of the health services, the pandemic affected their predictions regarding the flow of their inventory. It was not included in their annual procurement plans, and there was a noticeable change in the trends to their inventory. Fast-moving medicine became slow-moving due to the lack of patients caused by individuals who did not seek medical help because they were avoiding confinement. On the other hand, medicine and supplies related to COVID-19 became high in demand. Health services had to rely on emergency procurement, especially since there are COVID-19 medicines that are not included in the NDF.

There is also an observed jump in price which depends on the availability of the medicine in suppliers. Other COVID-19 related concerns are the following: there are times when BAC members need to be quarantined, and budget remains a concern even though there is increased demand due to the pandemic.

Three participants said that the Bayanihan Act was helpful in easing the challenges in procurement by allowing alternative modes of procurement.

The participants discussed several strategies that they had implemented to cope with their procurement challenges. For medicine that cannot be procured, the general practice is that facilities adjust the specifications in order to procure medicine. Often procurement staff communicate with end-users and look for alternative therapies that can still address the needs of the patients.

In addition, facilities reach out to other nearby health services and LGUs, and see if they have available stock. In essence, resources are shared within a network.

In times of need, like the COVID-19 pandemic, facilities resort to other modes of procurement. Participants noted that the new issuance from GPPB that allowed them to use emergency procurement more helped with COVID-19.

Health services also had to adjust their trends and practices in the management of their inventory. As an example, one adjusted their buffer stock to make room for issues with procurement. One also discussed the need to consider accepting partial delivery due to the need to have a supply. Other solutions were also discussed. One participant, for instance, talked about adjusting the budget of the bid itself, while another talked about how they used retention for the use of new drugs that were being tested by the FDA.

4.2. Posting

In general participants, BAC Staff in particular, appear to be familiar with the Philippine Government Electronic Procurement System (PhilGEPS). According to them, it is an easy and transparent way to reach out to suppliers all over the Philippines. Sometimes, even foreign companies find opportunities in PhilGEPS. This helps increase competition in the bidding process. In addition, procuring agencies may see which companies are eligible and have a platinum membership in PhilGEPS.

In general, PhilGEPS is seen to be easy or somewhat easy to use, although opinions appear to vary based on context, i.e., whether pre- or during the pandemic. All of the features are deemed useful. Though, some features could be improved like features regarding Notice of Award, re-bidding, and electronic payments.

The issues that were raised regarding PhilGEPS are related to the internet connection of health services, and the system performance of PhilGEPS. There are times when PhilGEPS is slow, and the participants attributed this to heavy traffic from other government agencies. In order to address this, they have to bring their work home, and upload the bid files at night when there is less traffic. This concern was raised for all regions, even NCR.

System maintenance is also a concern. One participant stated they are only informed through the PhilGEPS website, which they don't check regularly. The issues that were raised regarding PhilGEPS are related to the internet connection of health services, and the system performance of PhilGEPS. There are times when PhilGEPS is slow, and the participants attributed this to heavy traffic from other government agencies. In order to address this, they have to bring their work home, and upload the bid files at night when there is less traffic. This concern was raised for all regions, even NCR.

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4.3. Price-setting

FGD/KII participants are familiar with the DPRI, and say that they comply with it. Aside from following the GPRA, participants also stated that they have to follow DPRI because it is also being monitored by COA.

In general, the participants expressed that they see the value in the DPRI. It can reduce the need for market scanning since there is already an established price range, which makes it easy to compute for the approved budget of contract (ABC). However, the DPRI can cause problems in the procurement of specific medicines. This can be noted in the responses that said that the utility of the DPRI is on a case to case basis.

One participant explained that for medicine that has a lot of suppliers, using the DPRI causes no problems. However, for medicines that have only a few suppliers, particularly sole-providers, there are problems because the ABC is too low in comparison to the market price. Even if they adjust the price and increase it by 20%, the ABC is still considered too low.

Because of the low ceiling price in the DPRI, the participants expressed that they often encounter failed bids. This is experienced throughout every region. They then have to resort to

alternative modes of procurement such as shopping, small-value procurement, or negotiated procurement. As an alternative to DPRI, they calculate the ABC using market scan or using a previous winning bid and invoices as reference.

Participants hope that, in the future, the prices in the DPRI will be closer to the market price that they encounter.

A few participants raised that there should be a regional variation to the DPRI. They explained that though the DPRI price can work for areas like Metro Manila, it may be inaccurate for far flung areas. In addition, they suggested to include the performance of suppliers as a criteria due to the issues encountered with delivery, and have set and timely publication so that health services do not need to adjust their PPMPs.

5. Information revelation mechanisms

In addition to the FGDs/KIIs, we also made a cursory analysis of the PhilGEPS database to assess the degree information revelation mechanisms have been followed, and to gather indications of its use. In particular, we tagged almost 50,000 posted procurement of drugs and medicines in PhilGEPS in 2019. For each of these postings, we tagged whether the posting has available information that identifies the active ingredient, dosage, form, and quantity of the drugs and medicines that is to be procured. For a subset of the active ingredients, we identified sentinel drugs based on the PNDF and the country's burden of disease to identify commonly used drugs and medicines, which we further process for analysis.

5.1. PhilGEPS

We devised a "suking tindahan" test to assess the completeness of information in procurement postings in PhilGEPS. The idea is that whether any person can use the information that is readily available in PhilGEPS to procure the drug and medicine in any pharmacy. It must be noted though that more detailed information may be available in actual procurement notices, which may not be available in PhilGEPS.

Table 2 shows that among 46,932 drugs and medicines procurement notices posted in PhilGEPS, only a subset have information to identify active ingredients (81.4%), dosage (71.6%), form (71.7%), and quantity (70.6%). Only 63.9% have enough information to pass our "suking tindahan" test. Among commonly used drugs in our sentinel list, totaling 5,403 procurement postings, more than three-fourths pass our "suking tindahan" test.

Table 2. *Suking tindahan* test for medicines in PhilGEPS database: 2019

	All drugs		Sentinel drugs	
	Count	Share	Count	Share
Total records	46,932	100.0	5,403	100.0
With active ingredient(s)	38,223	81.4	5,204	96.3
With dosage	33,580	71.6	4,630	85.7
With form	33,653	71.7	4,553	84.3
With quantity	33,136	70.6	4,422	81.8
With complete information	29,967	63.9	4,151	76.8

Source: Authors' calculations based on PhilGEPS data.

Among those procurement postings that passed our "suking tindahan" test, majority were posted as through competitive bidding (58.7%), followed by alternative procurement modes, such as shopping (18.1%), negotiated procurement after two-failed biddings (3.6%), and other negotiated procurement (19.4%). There appears to be no statistical difference in the procurement mode among drugs and medicines in our sentinel and non-sentinel list (Table 3).

Majority of the procurement postings in PhilGEPS on drugs and medicines are by national government agencies (72.1%), including its regional offices. This is despite the value of local government procurement of drugs and medicines surpassing those of the national government (Table 1). This may suggest that the value of local governments procurement is below the PhP50,000 threshold to be required for posting in PhilGEPS.

It is noteworthy that among the procurement posting that passed our "suking tindahan" test, less than two in every five are reported as ending in an award, i.e., in procurement success.

Table 3. Distribution of posted procurement with complete information by procurement status, procuring agency government level, and procurement status

	Assignment type		
	Non-sentinel	Sentinel	All
With complete information (Count)	25,816	4,151	29,967
By procurement mode (%)			
Competitive bidding	58.4	60.5	58.7
Shopping	18.6	15.0	18.1
Negotiated, others	19.1	21.4	19.4
Negotiated, two failed biddings	3.6	3.1	3.6
Others, not elsewhere classified	0.2	0.1	0.2
By government level (%)			
Local	25.9	40.4	27.9
National	74.1	59.6	72.1
By status (%)			
Not awarded	61.6	60.1	61.4
Awarded	38.4	39.9	38.6

Source: Authors' calculations based on PhilGEPS data.

5.2. Drug Price Reference Index

We focused on a subset of molecules in our sentinel drugs list that are procured more frequently through PhilGEPS. Table 4 shows the DPRI for these molecules between 2012 and 2021. For many of the medicines, the DPRI are decreasing, including for amlodipine, clopidogrel, and losartan. For some, the trend is increasing, such as for metformin and metronidazole. While for others, the DPRI is largely constant (amoxicillin) or even erratic (cloxacillin).

Table 5 shows that more than half of posted procurement calls in PhilGEPS for amoxicillin, losartan, metronidazole, paracetamol do not follow the set DPRI as ceiling prices. Further, more than seventy five percent of awarded contracts for paracetamol, losartan, and amoxicillin used procurement prices above the DPRI.

Table 4. Drug Reference Price Index of selected drugs: 2012, 2015, 2019, 2021

Active ingredient	Dose/Form	2012	2015	2019	2021
Amlodipine	10mg tablet	...	2.25	0.67	0.53
Amoxicillin	500mg capsule	1.28	1.27	1.28	1.28
Clopidogrel	75mg tablet	7.54	3.69	1.29	1.11
Cloxacillin	500mg capsule	3.45	2.70	3.00	2.78
Losartan	50mg tablet	3.14	1.30	0.79	0.80
Metformin	500mg tablet	0.77	2.93	0.63	0.54
Metronidazole	500mg tablet	0.93	0.74	1.25	1.20
Paracetamol	500mg tablet	0.23	0.23	0.29	0.45

Source: DOH (2020)

Table 6 disaggregates the average duration and probability of procurement success by molecule/form, DPRI compliance, and mode of procurement. Overall, procurement through competitive bidding appears to take longer compared with other modes, although there appears to be no discernable pattern by DPRI compliance. In terms of procurement success, on other hand, DPRI compliance appear to result in greater likelihood of bidding failures. Further, other procurement modes are not more likely to result in greater procurement success.

We further finetune our analysis by using regression models to control for possible confounding of observed and unobserved characteristics. We sequentially add covariates to assess the sensitivity of our estimates to unobserved confounding. We looked at awarded price for those successful procurement (Table 7), log-posting duration (Table 8), and propensity of procurement success (Table 9).

Overall, we find that procuring agency characteristics, captured through the agency fixed effects, is important in the outcomes that we looked into. In some outcomes, the conditional R^2 from adding agency fixed effects is greater than 50 percentage points. Procurement mode appears to matter only for duration, but not for prices or procurement success. Procurement posting period appear to matter for prices and procurement success, but not for duration. Quantity for procurement appear to matter only for prices, but not for duration or procurement success.

Table 7 shows that DPRI compliance is not associated with cheaper prices among success procurement using the full model. Table 8 shows, however, that DPRI compliance is associated with about 10% longer posting period, or roughly 2 days more, compared with postings that are not DPRI-compliant. Table 9 shows that DPRI compliance is associated with a 17.7% probability of procurement failure, suggesting longer delays in the procurement process.

6. Policy implications

The analysis we presented suggests that government is an important driver in the local pharmaceutical market. With the fiscal rebalancing brought about by the Mandanas-Garcia ruling, local governments are projected to have greater share in public procurement of drugs and medicines, at least in the near future.

Table 5. Reference, budgeted, and awarded prices per unit of selected drugs

Active ingredient	Dose/Form	Reference price per unit			Budgeted price per unit			Awarded price per unit		
		DPRI	Generic	Originator	25th	50th	75th	25th	50th	75th
Amlodipine	10mg tablet	0.67	0.70	8.00	0.67	0.79	3.00	0.49	0.70	3.55
Amoxicillin	500mg capsule	1.28	1.30	11.70	1.28	1.65	3.40	1.31	1.75	3.40
Clopidogrel	75mg tablet	1.29	1.36	75.50	<0.01	<0.01	1.29	1.11	1.19	1.62
Cloxacillin	500mg capsule	3.00	9.50	...	2.28	2.28	2.78	2.43	2.80	4.30
Losartan	50mg tablet	0.79	1.00	20.50	0.90	1.08	5.00	2.32	2.58	3.14
Metformin	500mg tablet	0.63	0.65	12.64	<0.01	<0.01	0.63	0.49	0.70	1.25
Metronidazole	500mg tablet	1.25	1.20	11.75	0.94	1.25	3.00	1.07	1.25	3.02
Paracetamol	500mg tablet	0.29	0.40	...	0.25	0.48	2.69	0.40	0.69	2.80

Source: DOH (2020), author's calculations based on PhilGEPS database.

Table 6. Procurement duration and success by selected characteristics

Active ingredient	Dose/Form	Competitive bidding		Other modes	
		DPRI-compliant	Non-compliant	DPRI-compliant	Non-compliant
A. Mean days from posting to closing					
Amlodipine	10mg tablet	20.3	21.3	2.6	4.3
Amoxicillin	500mg capsule	22.2	22.7	3.3	4.5
Clopidogrel	75mg tablet	21.2	22.2	5.5	4.5
Cloxacillin	500mg capsule	22.5	19.4	3.8	6.2
Losartan	50mg tablet	20.7	22.0	2.2	5.1
Metformin	500mg tablet	20.7	21.4	6.6	4.5
Metronidazole	500mg tablet	22.8	20.0	2.8	4.1
Paracetamol	500mg tablet	22.6	36.6	4.5	4.9
B. Share of procurement processes ending in award					
Amlodipine	10mg tablet	60.0	71.6	25.0	28.9
Amoxicillin	500mg capsule	40.0	58.6	0.0	37.9
Clopidogrel	75mg tablet	66.7	60.0	5.9	23.1
Cloxacillin	500mg capsule	51.2	75.9	28.6	9.1
Losartan	50mg tablet	25.0	49.5	20.0	24.2
Metformin	500mg tablet	50.0	59.0	6.3	37.0
Metronidazole	500mg tablet	27.6	71.0	10.5	31.3
Paracetamol	500mg tablet	5.6	61.0	11.4	34.8

Note: Authors' calculations based on PhilGEPS data.

Responses of KII/FGD respondents suggest that government personnel in charge of procurement processes appear to generally follow prescribed public procurement rules even to potentially the detriment of procurement success, thereby nullifying any potential benefit from these innovations.

That being said, there may be a need to rethink price setting in the public procurement of drugs and medicines. As we have shown in our analyses, DPRI-compliance is associated with long procurement posting and higher propensity for procurement failure, but not with lower procurement price. There may be a need to rethink how DPRI is calculated, potentially expanding it to include trends in market prices rather than tender prices, to insulate it from erratic price changes based on few tenders, taking into consideration its intended function as price revelation mechanism.

There may also be a need to more intently pursue pooled procurement at the province level if a national-level pooled procurement mechanism is difficult to pursue. As shown by our analysis, procurement at greater quantities is associated with lower procurement prices.

Table 7. OLS model: log awarded price

	(1)	(2)	(3)	(4)	(5)
DPRI-compliant (=1)	-3.352**	-3.980**	-0.133	0.018	0.113
	(1.526)	(1.614)	(0.261)	(0.311)	(0.271)
Procurement mode: Shopping (=1)				0.984	0.603
				(0.894)	(0.600)
Procurement mode: Negotiated, others (=1)				0.271	0.035
				(0.306)	(0.301)
Procurement mode: Negotiated, two failed biddings (=1)				0.034	-0.048
				(0.357)	(0.332)
Quarter posted: Q2 (=1)				-0.125	-0.210
				(0.203)	(0.203)
Quarter posted: Q3 (=1)				-0.271	-0.162
				(0.165)	(0.144)
Quarter posted: Q4 (=1)				-0.471**	-0.412**
				(0.227)	(0.198)
Quantity (in natural log)					-0.341***
					(0.094)
Constant	0.892***	0.244	-0.073	0.03	3.114***
	(0.281)	(0.448)	(0.136)	(0.167)	(0.866)
SKU fixed effects		Yes	Yes	Yes	Yes
Procuring agency fixed effects			Yes	Yes	Yes
Adjusted R-squared	0.182	0.235	0.838	0.844	0.864
BIC	2209.811	2215.322	1420.096	1432.711	1376.913
Observations	459	459	459	459	459

Note: Authors' calculations based on PhilGEPS data.

Table 8. OLS model: log posting duration

	(1)	(2)	(3)	(4)	(5)
DPRI-compliant (=1)	-0.187	-0.222	0.185*	0.110***	0.102***
	(0.364)	(0.372)	(0.100)	(0.032)	(0.031)
Procurement mode: Shopping (=1)				-1.626***	-1.600***
				(0.305)	(0.303)
Procurement mode: Negotiated, others (=1)				-1.556***	-1.526***
				(0.087)	(0.096)
Procurement mode: Negotiated, two failed biddings (=1)				-0.878***	-0.889***
				(0.179)	(0.183)
Quarter posted: Q2 (=1)				0.084	0.089
				(0.068)	(0.067)
Quarter posted: Q3 (=1)				0.015	0.015
				(0.072)	(0.071)
Quarter posted: Q4 (=1)				0.059	0.057
				(0.060)	(0.059)
Quantity (in natural log)					0.019
					(0.015)
Constant	2.354***	2.299***	2.168***	2.91***	2.73***
	(0.080)	(0.106)	(0.047)	(0.071)	(0.159)
SKU fixed effects		Yes	Yes	Yes	Yes
Procuring agency fixed effects			Yes	Yes	Yes
Adjusted R-squared	0.008	0.014	0.573	0.882	0.883
BIC	2902.905	2937.458	1893.267	515.444	514.821
Observations	1096	1096	1096	1096	1096

Note: Authors' calculations based on PhilGEPS data.

Table 9. Linear probability model: procurement process ending in award

	(1)	(2)	(3)	(4)	(5)
DPRI-compliant (=1)	-0.232***	-0.251***	-0.168***	-0.171***	-0.177***
	(0.076)	(0.074)	(0.043)	(0.034)	(0.035)
Procurement mode: Shopping (=1)				-0.223***	-0.202**
				(0.074)	(0.083)
Procurement mode: Negotiated, others (=1)				-0.300**	-0.276**
				(0.136)	(0.119)
Procurement mode: Negotiated, two failed biddings (=1)				-0.061	-0.071
				(0.123)	(0.122)
Quarter posted: Q2 (=1)				-0.147**	-0.143**
				(0.063)	(0.062)
Quarter posted: Q3 (=1)				-0.103	-0.103
				(0.066)	(0.066)
Quarter posted: Q4 (=1)				-0.150**	-0.152**
				(0.064)	(0.065)
Quantity (in natural log)					0.016
					(0.016)
Constant	0.484***	0.571***	0.467***	0.694***	0.546***
	(0.048)	(0.068)	(0.031)	(0.066)	(0.164)
SKU fixed effects		Yes	Yes	Yes	Yes
Procuring agency fixed effects			Yes	Yes	Yes
Adjusted R-squared	0.044	0.055	0.520	0.557	0.558
BIC	1525.577	1554.55	683.873	632.858	635.28
Observations	1096	1096	1096	1096	1096

Note: Authors' calculations based on PhilGEPS data.

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