

Capacity of Local Government Units (LGU) to Manage COVID-19 Positive Locally Stranded Individuals (LSI) in the Context of Procurement Data

Project Title: Understanding resiliency of provinces and municipalities in the context of COVID-19 related tenders using an operations research methodology

Principal Investigator: Engr. John Raymond Barajas



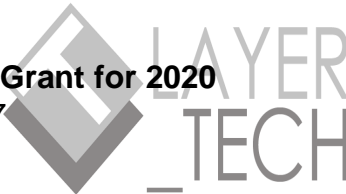
ISO 9001:2015
TÜV Rheinland ID 910863351



Open Contracting: Procurement Analytics Research Grant for 2020

Grant Contract Number: PHOC620-00177

July 20, 2020, 1:00 PM – 2:00 PM



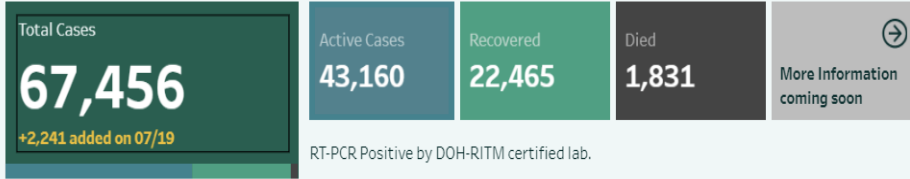


COVID-19 Situation in the Philippines [1]

Filter Epidemiology data by Region: (All) by Province/HUC/ICC: (All) As of July 19, 2020

Filter Epidemiology data by Region: Region V: Bicol Regl... by Province/HUC/ICC: (All) As of July 19, 2020

Nationwide Cases Data



Cases for Region V: Bicol Region



Daily Cases by Date of Onset of Illness

For 76.9% or 51,888 of cases where date of onset of illness is unreported, date of specimen collection was used as proxy.

- Cases
- Recoveries
- Deaths

We urge caution when interpreting data during the highlighted period below, which may be incomplete because of delays in reporting.



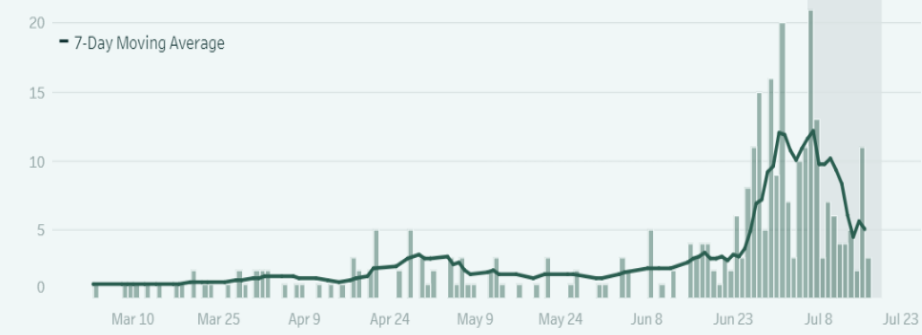
Note: There are still 3018 cases with unreported date of onset of illness and date of specimen collection.

Daily Cases by Date of Onset of Illness

For 79.4% or 266 of cases where date of onset of illness is unreported, date of specimen collection was used as proxy.

- Cases
- Recoveries
- Deaths

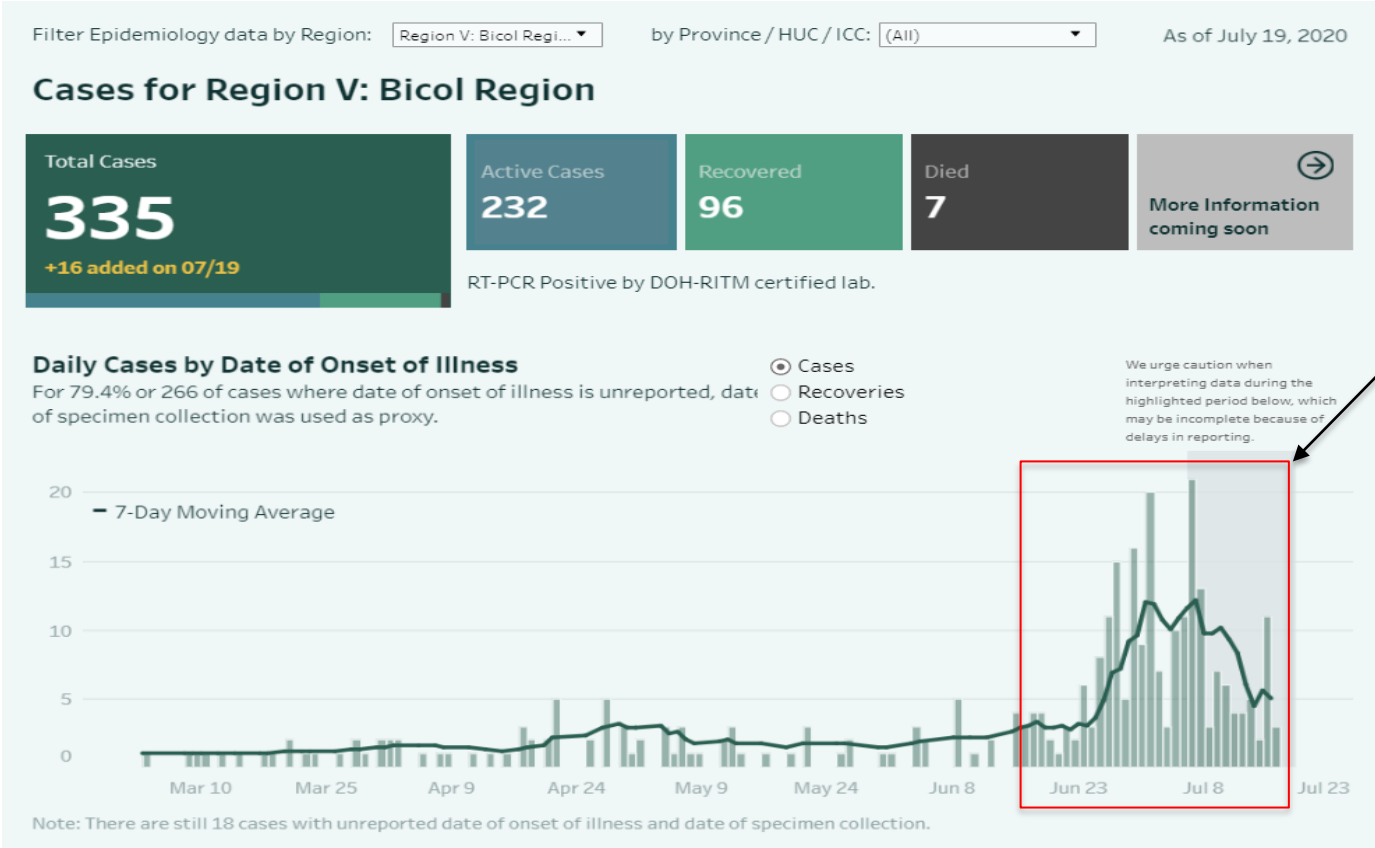
We urge caution when interpreting data during the highlighted period below, which may be incomplete because of delays in reporting.



Note: There are still 18 cases with unreported date of onset of illness and date of specimen collection.

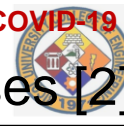


Recent Spike in COVID-19 Cases in Region V [11]



Recently Observed Spike in COVID-19 Cases in Region V

Possible Cause of Recent Spike in COVID-19 Cases [2]



Republic of the Philippines
DEPARTMENT OF HEALTH
CENTER FOR HEALTH DEVELOPMENT - BICOL

Bicol records 9 new cases of COVID-19
Press Release, July 16, 2020

The Department of Health Center for Health Development (DOH CHD) – Bicol records nine (9) new confirmed cases of COVID-19. The total number of COVID-19 cases recorded in Bicol Region is now two hundred forty-four (244). Active cases are one hundred thirty-two (132).

On the 9 new cases, two (2) are from Aroroy, one (1) from Legazpi City, one (1) from Tabaco City, one (1) from Manito, one (1) from Oas, one (1) from Naga City, one (1) from Bagamanoc and one (1) from Matnog.

- Bicol#236 – a 25-year old Filipino male from Aroroy, Masbate. He arrived from Tarlac on June 20, 2020. He is asymptomatic and is quarantined at an LGU quarantine facility.
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Releasing of other details about the said patient is at the discretion of the Local Government Unit (LGU) concerned guided by the provisions of the Data Privacy Act.

Appeal to Public

COVID-19 confirmed cases in Bicol Region are increasing. The public especially the Locally Stranded Individuals (LSIs), Returning Overseas Filipinos (ROFs) and close contacts of confirmed COVID-19 cases must strictly follow quarantine and isolation procedures. Everyone must follow all the health protocols such as social distancing, use of facemask especially when outdoors, hand washing, cough etiquette, healthy lifestyle and to stay at home. Cooperation and discipline from the public are crucial at this time of crisis.

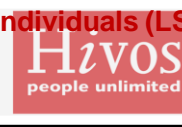

ERNIE V. VERA, MD, MPH, CHA, CESO IV
Regional Director

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Project Objective

**COVID-19
RELATED
PROCUREMENT
ACTIVITIES**



Accomodate

Contain




Treat

Questions to be Answered



Which LGUs are **most capable** of managing influx of COVID-19 positive LSIs?

Which LGUs are **least capable** of managing influx of COVID-19 positive LSIs?




Be **KIND** to address stigma during #coronavirus

-  Share the latest facts & avoid hyperbole
-  Show solidarity with affected people
-  Tell the stories of people who have experienced the virus



Learn more to Be **READY** for #COVID19:
www.who.int/COVID-19

 UNITED NATIONS
  World Health Organization

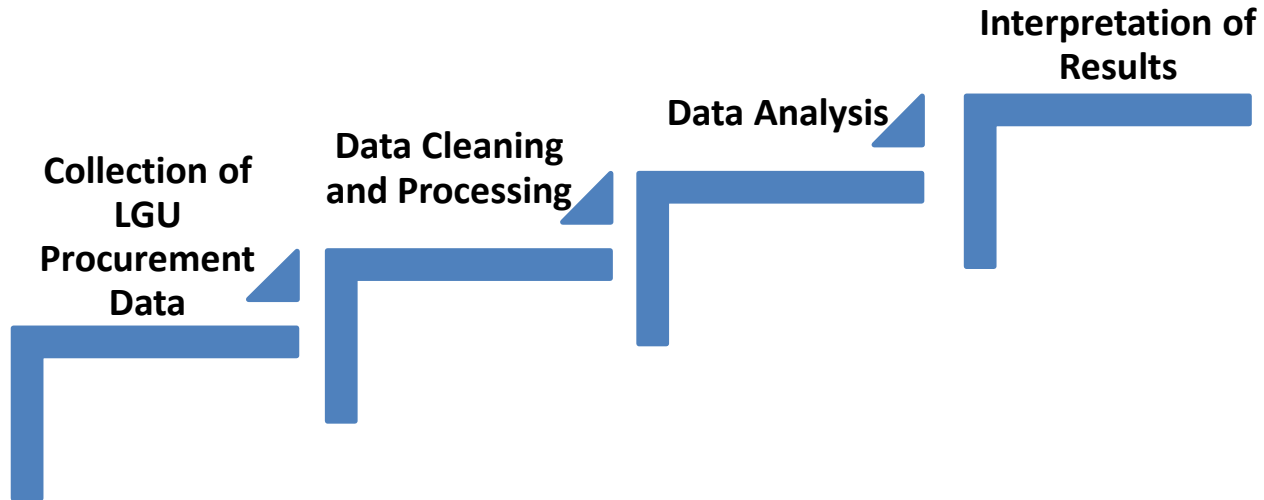
Be **KIND** to address fear during #coronavirus

-  Show empathy with those affected
-  Learn about the disease to assess the risks
-  Adopt practical measures to stay safe

Learn more to Be **READY** for #COVID19:
www.who.int/COVID-19

 UNITED NATIONS
  World Health Organization

Conduct of the Research





Procurement Data Source

HOME OPPORTUNITIES OPEN DATA PBB 2019 HELP REGISTER LOGIN

OPEN DATA

- Standard Reports and Datasets**
CLICK TO VIEW
- Registered Suppliers**
CLICK TO VIEW
- List of Buyer Coordinators for 2020 APP-CSE**
CLICK TO VIEW
- PBB 2019**
CLICK TO VIEW
- Infographics**
CLICK TO VIEW

GOVPH DOF-BLGF ABOUT US TRANSPARENCY CITIZEN'S CHARTER REGIONAL OFFICES TOOLS Search

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF FINANCE
BUREAU OF LOCAL GOVERNMENT FINANCE

Philippine Standard Time:
Sunday, July 15, 2020 8:22:26 PM
source: PKGASA

HOME / STATISTICS

STATISTICS

- PUBLIC SECTOR FINANCIAL POSITION
- CONTRIBUTION OF LOCAL REVENUE TO GDP
- LGU FISCAL DATA

ANNOUNCEMENTS

- Notice of Appointments Issued
- BLGF reminds local treasurers on assessment of local taxes, fees and charges
- BLGF sets FY2020 collection target of local treasurers at Php307.08B

Republic of the Philippines
gppb
Government Procurement Policy Board

Department of Budget and Management
**Government Procurement Policy Board
Technical Support Office**

Republic of the Philippines
gppb-tso
Government Procurement Policy Board
Technical Support Office

Awarded Contracts

Home Market Listings Awarded Contracts Project Requirements Procuring Entities Suppliers CSO Enrollment Comments Login

[Procuring Entities with awarded contracts](#) | [Total Amount per Supplier](#) | [Awarded Contracts](#)

Project Name	Approved Budget	Start Date	End Date	Name Of Awarded Company	Amount Awarded	Date Of Award	Notice Of Award	Acceptance Da	Contract/PO	Annual Procure	Procuring Entity
Human Grade Disinfectant Solution And Fac	PHP108,864	2020-04-08	2020-04-18	Baweritrik Corporation	PHP108,864	2020-04-02	..DataFiles/Act1/	2020-04-08	..DataFiles/Act1/	..DataFiles/Act1/	OPWH REGIONAL OFFICE IV-B
Procurement Of Relief Goods	PHP686,000	2020-04-16	2020-04-23	Tinans Dried Fish And Egg Dealer	PHP632,800	2020-04-16	..DataFiles/Act1/	2020-04-16	..DataFiles/Act1/	..DataFiles/Act1/	Local Government Unit Of Gamu, Isabela
Procurement Of Relief Goods	PHP686,000	2020-04-16	2020-04-23	Tinans Dried Fish And Eggs	PHP632,800	2020-04-15	..DataFiles/Act1/	2020-04-15	..DataFiles/Act1/	..DataFiles/Act1/	Local Government Unit Of Gamu, Isabela
Procurement Of Relief Goods	PHP1,577,000	2020-04-17	2020-04-24	Green Season Rice Mill & Grain Center	PHP1,535,500	2020-04-15	..DataFiles/Act1/	2020-04-15	..DataFiles/Act1/	..DataFiles/Act1/	Local Government Unit Of Gamu, Isabela

Period Covered:

January 1, 2020 – May 31, 2020

Area of Focus: Region V



Procurement Data Source

HOME OPPORTUNITIES OPEN DATA PBB 2019 HELP REGISTER LOGIN

OPEN DATA

- Standard Reports and Datasets
CLICK TO VIEW
- Registered Suppliers
CLICK TO VIEW

Cleaning

GOVPH DOF-BLGF ABOUT US TRANSPARENCY CITIZEN'S CHARTER REGIONAL OFFICES TOOLS Search

Philippine Standard Time
Sunday, July 19, 2020 8:22:06 PM
Source: PAGASA

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF FINANCE
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Department of Budget and Management
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Republic of the Philippines
gppb-tso
Government Procurement Policy Board
Technical Support Office

AREA	REGION	PROVINCE	DIED	RECOVER	UNCLASSI	CUMULAT	GOWN	AV	GLOVES	HEADCOG	GOOGLES	COVERALL	SHOECOV	FACESHIE	SURGMAS	N95MASK	HEAD	PP1	BODY	PP1	HAND	PP1
BACACAY	REGION V	ALBAY	0	1	2	3	6	25.75	6	1	6	6	13.5	41.25	31.25	93	12	25.75				
DARAGA II	REGION V	ALBAY	0	8	6	14	48.25	2472.5	11.25	7.5	70	8.25	41.25	625	47.5	732.5	118.25	2472.5				
GUINOBAT	REGION V	ALBAY	1	5	0	6	3	165	97.5	7	4	0	7	61	7	179.5	7	165				
LEGAZPI C	REGION V	ALBAY	1	12	18	31	422.8571	18805.14	881.9286	382.4286	489.4286	693.4286	219.5	13657.21	525.7143	15666.79	912.2857	18805.14				
LIGAO CITY	REGION V	ALBAY	0	1	3	4	103.5	184	119.1667	0	43.16667	103.3333	40.33333	6394.333	100	6653.833	146.6667	184				
ONS	REGION V	ALBAY	0	0	1	1	0	100	20	5	16	0	10	10	0	45	16	100				
LABO	REGION V	CAMARINI	1	1	2	4	20.375	168.5	191.625	5.125	12.875	60.75	16	242.75	30.375	485.875	33.25	168.5				
IRIGA CITY	REGION V	CAMARINI	0	1	0	1	54.11111	3722.222	1696.111	26.77778	36.66667	83.11111	48.77778	572.2222	135.1111	2479	90.77778	3722.222				
NAGA CITY	REGION V	CAMARINI	1	4	2	7	182.875	3131.813	1142.438	133.4375	143.875	448.625	268.625	2340	282.25	4166.75	326.75	3131.813				
TIGAON	REGION V	CAMARINI	0	2	1	3	17.5	200	0	17.5	0	10	7.5	0	0	25	17.5	200				
MATNOC	REGION V	SORSOGON	0	1	0	1	20	300	8	0	9	1.5	100	500	1.5	609.5	29	300				

Pre-Processing

Awarded Contracts

Home Market Listings Awarded Contracts Project Requirements Procuring Entities Suppliers CSO Enrollment Comments Login

Procuring Entities with awarded contracts | Total Amount per Supplier | Awarded Contracts

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Procurement Of Beaf Goods	PHP68.000	2020-04-16	2020-04-23	Trens Dried Fish And Egg Dealer	PHP68.000	2020-04-16	JDDataFBsAc11	2020-04-16	JDDataFBsAc11	JDDataFBsAc11	Local Government Unit Of Camu, Isabela	
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Procurement Data Processing Method [3]-[6]

Identification of LGU Attributes

Internal Revenue Allotment (IRA) (I1, Input): This criterion pertains to the share of revenues an LGU will receive from the Philippine National Government.

Total Approved Budget Contract (ABC) (I2, Input): This criterion pertains to the sum of ABCs of all COVID-19 related tenders made by an LGU.

Total Number of Contracts (I3, Input): This criterion corresponds to the total number of COVID-19 related tenders made by an LGU.

Number of Active Cases (I4, Input): This criterion corresponds to the total number of active COVID-19 cases reported per LGU as of June 14, 2020.

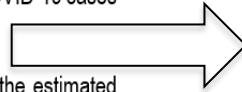
Approximate Number of COVID-19 Positive LSI (I5, Input): This criterion corresponds to the estimated number of LSIs that are confirmed to be COVID-19 positive in each LGU.

Recovered (O1, Output): This criterion corresponds to the total number of recovered COVID-19 patients for each LGU.

Total PPE (O2, Output): This criterion corresponds to the sum of all head, hand, shoe, and body PPE made available in hospitals for each LGU.

Total Bed (O3, Output): This criterion corresponds to the sum of ICU units, isolation beds, bed wards, and mechanical vents dedicated for COVID-19 positive patients for each LGU.

Number of Hospital (O4, Output): This criterion pertains to the total number of hospitals within the area of scope of each LGU.



Determination of LGU Capacity

$$\text{Max } \phi + \varepsilon \cdot \left(\sum_{i=1}^m s_i^- + \sum_{r=1}^s s_r^+ \right)$$

s.t.

$$\sum_{j=1}^n \lambda_j \cdot x_{ij} + s_i^- = x_{io}, \quad i = 1, \dots, m$$

$$\sum_{j=1}^n \lambda_j \cdot y_{rj} - s_r^+ = y_{ro} \cdot \phi, \quad r = 1, \dots, s$$

$$\sum_{j=1}^n \lambda_j = 1$$

$$\lambda_j \geq 0, \quad j = 1, \dots, n$$

$$s_i^- \geq 0, \quad i = 1, \dots, m$$

$$s_r^+ \geq 0, \quad r = 1, \dots, s$$

$$\phi \text{ free}, \quad \varepsilon \ll 1$$

Estimation of LSI Data

Cross-Examination of DOH-CHD Bicol Press Releases



Republic of the Philippines
 DEPARTMENT OF HEALTH
 CENTER FOR HEALTH DEVELOPMENT - BICOL

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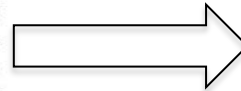
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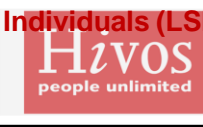
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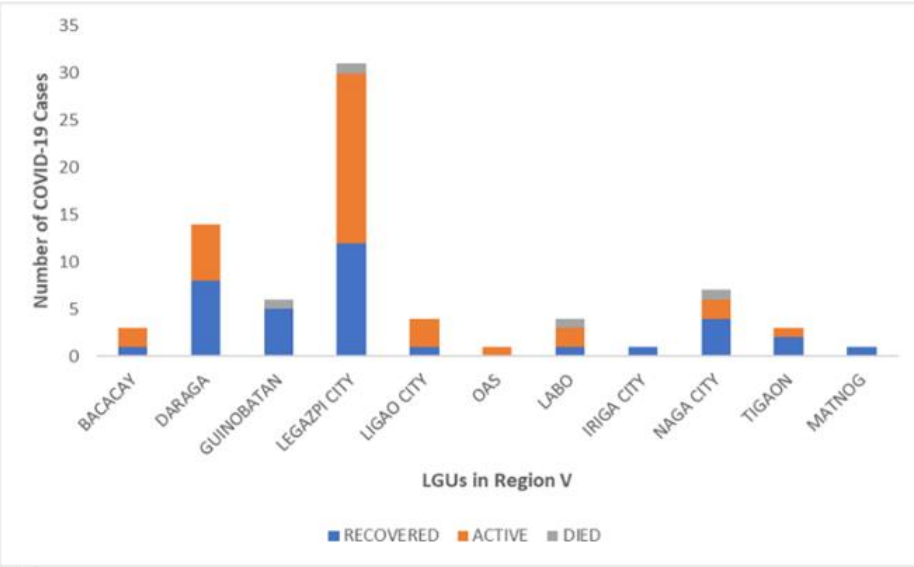


Approximate Number of LSI in
 Identified LGUs

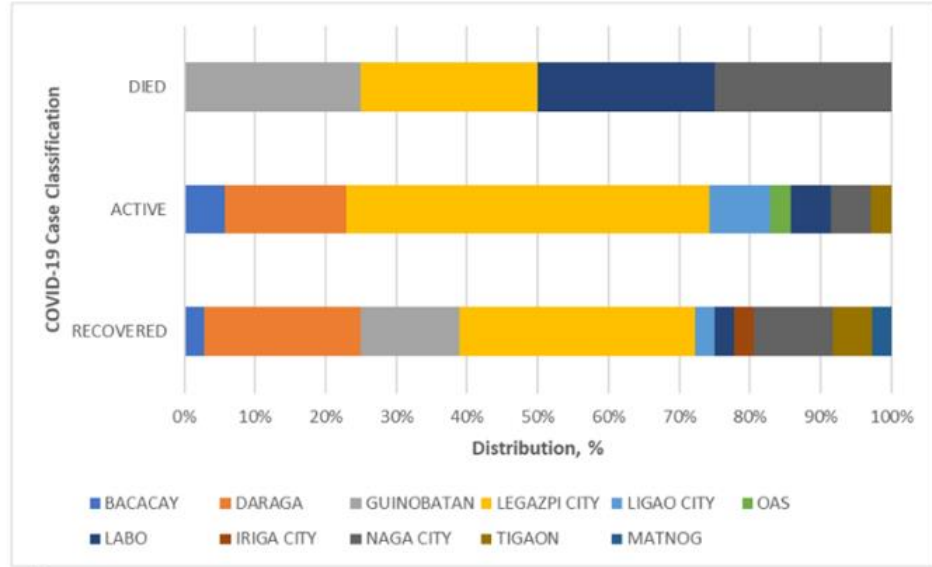


Classification of COVID-19 Cases in Region V

COVID-19 Cases in Region V

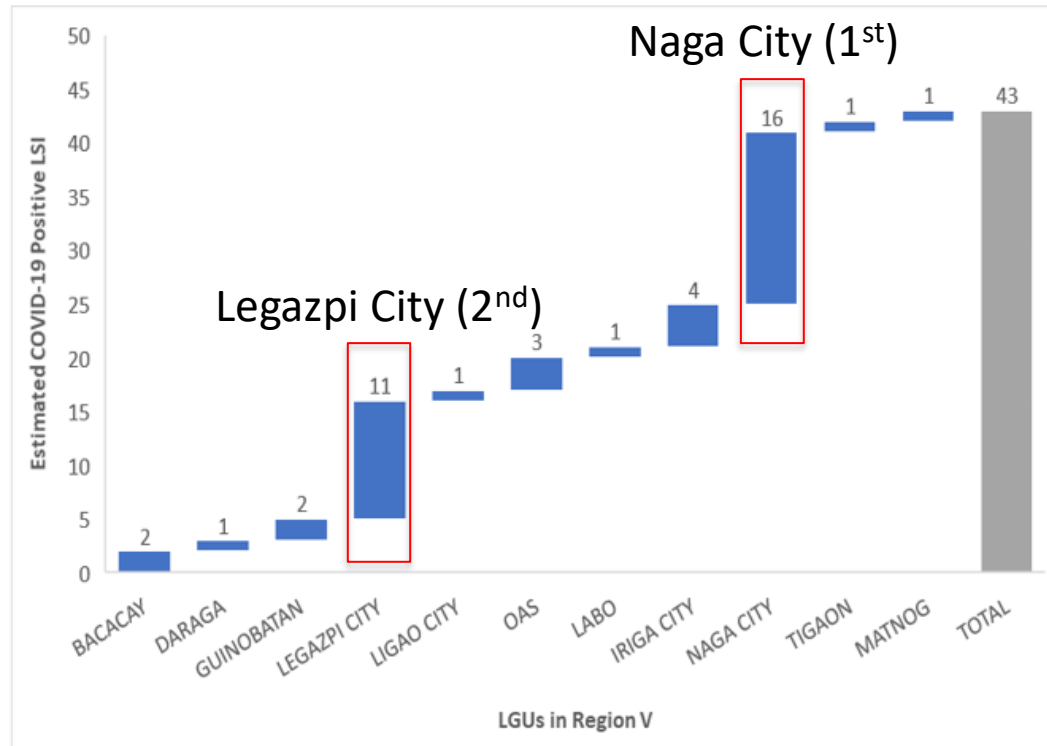


Classification of COVID-19 Cases in Region V



Note: This visualization represents COVID-19 data as of **June 14, 2020**. This was purposely done to maintain consistency with the collected procurement data.

Estimated LSI Data for Region V



Note: This visualization represents extract LSI data as of **July 8, 2020**.

Crucial LGU Attributes

Table 1. Ranking of LGU Attributes

Criterion Name	Criterion Code	Weight (Overall)	Overall Rank	Weight (Output)	Output Criterion Rank	Weight (Input)	Input Criterion Rank
Recovered	O1	0.1405	2 nd	0.3159	1 st	-	-
Total PPE	O2	0.1151	4 th	0.2587	2 nd	-	-
Total Bed	O3	0.1090	5 th	0.2451	3 rd	-	-
Number of Hospital	O4	0.0802	8 th	0.1803	4 th	-	-
Internal Revenue Allotment	I1	0.0765	9 th	-	-	0.1377	5 th
Total Approved Budget Contract	I2	0.0947	6 th	-	-	0.1706	3 rd
Total Number of Contracts	I3	0.0938	7 th	-	-	0.1689	4 th
Number of Active Cases	I4	0.1549	1 st	-	-	0.2790	1 st
Approximate Number of COVID-19 Positive LSIs	I5	0.1353	3 rd	-	-	0.2438	2 nd



Capacity of LGUs in Region V to ACT on LSIs

High

- High recovery rate
- >3 hospitals in vicinity
- Mod-High no. of LSIs
- Mod-High no. active COVID-19 cases

Moderate

- Low recovery rate
- 1-2 hospitals in vicinity
- Low no. of LSIs
- Low no. active COVID-19 cases

Low

- Low recovery rate
- 1-2 hospitals in vicinity
- Mod-High no. of LSIs
- Mod-High no. active COVID-19 cases

Table A.1. List of LGUs and their Resiliency Scores

Area	Province	Region	Resiliency Score	Resiliency Classification
Bacacay	Albay	Region V	0.8417	High
Daraga (Locsin)	Albay	Region V	0.8422	High
Guinobatan	Albay	Region V	0.8384	High
Legazpi City	Albay	Region V	0.8376	High
Ligao City	Albay	Region V	0.8453	High
Oas	Albay	Region V	0.5956	Moderate
Labo	Camarines Norte	Region V	0.8373	High
Iriga City	Camarines Sur	Region V	0.8377	High
Naga City (Camarines Sur)	Camarines Sur	Region V	0.8368	High
Tigaon	Camarines Sur	Region V	0.8421	High
Matnog	Sorsogon	Region V	0.8374	High



Conclusions

- It is suggested that LGUs who would fall under the classification of **“Low”** to limit the entry of LSIs into their area if the LGU do not have the capacity to immediately conduct COVID-19 tests on-site to these arriving individuals.
- It is also suggested that LGUs with resilience categorized as **“Low”** thoroughly review the implementation of their Annual Procurement Plan (APP). The greatest number of COVID-19 related tenders with ABCs observed to be significantly larger than that of **“Moderate”** and **“High”** groups were observed in these LGUs. This is **indicative of possible inefficiencies in the execution of the public procurement process and awarding of COVID-19 related tenders.**
- To prevent further spread of COVID-19, LGUs classified as **“Moderate”** and **“High”** is strongly suggested to implement stringent health protocols while ensuring that arriving LSIs are not discriminated.



Conclusions

- As a long-term solution to sustain resiliency of the health system of an LGU, it is further suggested that those LGUs grouped as **“Moderate”** and **“Low”** invest heavily in their present health system to **increase the number of hospitals located within their boundaries to at least three (3)**.
- Alongside this investment, it is also advised that **each hospital should have a total of at least 10,000 PPEs** to mitigate the impact of health system shocks induced by unwarranted surges in confirmed COVID-19 cases.

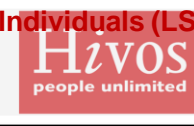


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Thank you for listening!

Let us therefore make every effort to do what
leads to peace and to mutual edification.

- Romans 14:19 -



heartlight.org

<https://www.verseoftheday.com/en/11192013/>



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