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# Status and Performance of the Disease Surveillance System in Cagayan Valley, Philippines

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## Abstract

Emerging and re-emerging epidemics continue to pose tremendous threats to public health even with medical advances and the availability of vaccines. Effective disease surveillance remains to be appreciated as one of the pillars of the effective communicable disease control program. This study evaluated the status and performance of the disease surveillance system in the different municipalities of the Cagayan Valley Region, utilizing a mixed-method sequential explanatory research design. The overall status of the disease surveillance system in the different municipalities is adequately accomplished. As to performance, the support functions and core functions of the disease surveillance system in most municipalities are fully implemented.

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## Introduction

Infectious diseases place a considerable burden on global health, accounting for an estimated 16% of deaths and tens of millions of healthy years of life lost, primarily in low-middle-income countries (DOH, 2009). In 2019, the Philippines reported outbreaks of dengue, diphtheria, measles, and polio (Wolfe *et al.,* 2021). In the region, eight Japanese encephalitis cases were recorded in Nueva Vizcaya in 2017 (Gallardo *et al.*, 2015), also in 2019, it was reported that a measles outbreak was declared in 4 of 5 provinces (Craig *et al.,* 2018), and in August of the same year, dengue outbreak has been declared in 11 towns which prompted the local health officials to recommend that these areas be placed under a state of calamity (Smith, 2015). Emerging and re-emerging epidemics continue to pose tremendous threats to public health even with medical advances and the availability of vaccines. To avoid the repercussions of an epidemic, early detection and immediate response are emphasized to manage infectious diseases (CHO, 2006). The HIV and severe acute respiratory syndrome (SARS) epidemics underscored the critical role of surveillance in protecting individual nations and the global community (Phalkey *et al.,* 2013).

Effective disease surveillance remains one of the pillars of an effective communicable disease control program in most low and middle-income countries and in this regard, primary healthcare workers in the local government areas remain the mainstay of an effective and functional surveillance system (Mandyata *et al.,* 2017).

One of the essential components of a public health system is the epidemiology and disease surveillance unit having a critical role in preventing the occurrence of diseases and epidemics, this is embodied under Rule IV of the Health Service Delivery; Section 17 of the Implementing Rules and Regulations of the UHC Law. In the country, there are four Surveillance Systems. Administrative Order No. 23 s. 2005 of the Department of Health provides that Disease Surveillance shall be intensified to ensure that the targets for disease elimination, prevention, and control are attained, likewise, Administrative Order No. 36 s.2007, which prescribed the guidelines on the Philippine Integrated Disease Surveillance and Response mandate the Local Government Units to set up a functional City Disease Surveillance System equipped with the necessary resource and adequate local financial support.

The surveillance systems primarily build capacity at all surveillance levels, especially at the district level, with active community participation to detect early and respond to epidemics/other public health emergencies at a local level. The community and health facilities especially health posts are the main sources of information for surveillance (Alemu *et al.,* 2019). Regular and relevant evaluations of these systems are critical to improve performance and efficiency, but each evaluation should be individually tailored, due to the fact that surveillance systems vary widely in their methods, efficiency, and objectives. This highlights the need for these evaluation approaches to be flexible enough to allow for these variations in surveillance systems (Calba *et al.,* 2015).

There is a dearth of research focused on assessing the status and performance of the disease surveillance system in the country, specifically in the region. This study investigated the surveillance system primarily at the Municipal level within the different provinces of the Region and performed a baseline assessment documenting the status and performance of the disease surveillance system structure, core, and support functions as well as to understand the challenges in its implementation.

## Methodology

*Research Design*

This study employed a mixed-method research design following the sequential explanatory approach. A quantitative approach was used to assess the status of the disease surveillance system as well as the extent of its performance in the implementation of its core functions. Consequently, a qualitative approach was utilized to explore the gaps and challenges of disease surveillance among its implementers.

*Locale of the Study*

The study was conducted in 75 selected municipalities in the five provinces of Cagayan Valley Region 2 namely, Batanes, Cagayan, Isabela, Nueva Vizcaya, and Quirino. Interviews of the Disease Surveillance Officer (DSO) and Disease Surveillance Coordinator (DSC) took place primarily at the Rural Health Units of the selected municipalities within the provinces. The focus group discussions of the members of the City/Municipal Epidemiology and Surveillance Units (C/MESUs), Provincial Epidemiology and Surveillance Units (PESUs), Regional Epidemiology and Surveillance Unit, (RESU) and Disease Reporting Units (DRUs) took place in their respective facilities.

*Respondents of the Study and Sampling*

The respondents in the profiling of the municipality and in the assessment of the status and the performance of disease surveillance system in the municipality were the Disease Surveillance Officers (DSOs) and Disease Surveillance Coordinators (DSCs) of the City/Municipal Epidemiology and Surveillance Units (C/MESUs). The FGD participants included (a) City/Municipal Epidemiology and Surveillance Units (C/MESUs) FGD groups (b) Provincial Epidemiology and Surveillance Unit (PESU) group and (c) Regional Epidemiology and Surveillance (RESU) FGD group (d) Disease Reporting Unit (DRU) FGD group. The Focus Group Discussion represented by the four separate groups involved the following: The Municipal level groups were participated by members of the C/MESU Committee; Provincial level group was participated by staff of the PESU per province; Regional Level group was participated by staff of the RESU and DRU group was participated by staff from Department of Health (DOH) referral hospitals. All participants have assumed office for at least 6 months regardless of tenure.

*Research Instruments*

The quantitative phase of the study utilized a pre-tested structured questionnaire for data collection. The data collection tool was developed by reviewing relevant literature and by adapting the content from standardized assessment tools of a surveillance system and related studies. To enhance instrument reliability, the instrument was pre-tested in nearby municipalities with similar characteristics to those in the study. The data collection tool was tested for internal consistency (reliability) using Cronbach's alpha test with a result of 0.802.

The data collection tool was a three-part questionnaire. The first part was to assess the profile of the municipalities in terms of their specific characteristics. The second part assessed the status of the municipal or city disease surveillance system of the municipality in terms of structure; human resource and staffing pattern; manpower activities; management and monitoring schemes and; funding. This part of the questionnaire was patterned with the Local Health System (LHS) Maturity Levels Monitoring Tool of the Department of Health. The final part of the questionnaire includes the assessment of the components of the disease surveillance system based on the Manual of Procedures for the Philippine Integrated Disease Surveillance and Response (MOP-PIDSR) System and the Center for Disease Control and World Health Organization monitoring and evaluation of disease surveillance system. Meanwhile, the qualitative phase conducted through FGD utilized an unstructured questionnaire which focused on identifying the gaps and challenges in the implementation of the disease surveillance. Questionnaires were checked for completeness and consistency.

*Data Collection Process*

The research study undergone series of technical review before it was approved to its final form. Intensive planning and continuous communication with partner agencies were conducted prior to data collection process. Research Ethics Clearance was sought from Region II Trauma and Medical Center (R2TMC). Official authorization from the Local Chief Executives and the Municipal Health Officer was obtained before data collection commenced. Informed consent was voluntarily given by the respondents after the nature and purpose of the study were explained by the researchers. Strict

confidentiality was assured throughout the conduct of the study. Face-to-face interviews were conducted in most municipalities and due to the varying quarantine protocols and Inter – Agency Task Force (IATF) guidelines due to the COVID – 19 pandemic, telephone, and virtual interviews were also conducted in some municipalities. In sum, there were 68 in person interviews, 3 virtual interviews via an online social web-based portal and 4 phone interviews. The questionnaire-guided interview ran for 30 minutes to an hour and were participated by the DSCs and DSOs. As to the conduct of the Focus Group Discussion, the FGDs participated by the members of the C/MESU committee, and the members of RESU committee were done face to face in their respective facilities while the FGD with the PESU and DRU staff was through an online platform. All face-to-face interviews were conducted in a quiet area of the facility conducive for interviews and were done with strict observance of the minimum standard protocol set forth by the IATF guideline for COVID – 19. The data collected were tallied, organized and undergone data cleansing before it was subjected for interpretation and analysis. The study took 14 months to complete.

*Data Analysis*

The data on the status of the disease surveillance system of the municipality and the extent of performance of the disease surveillance system in terms of its core and support functions were analyzed using descriptive statistics. Mean scores were used to describe the data. The hypothesis in the study was tested at 0.05 level of significance. The qualitative part was anthrough though content analysis. The data were manually organized, cleaned and summarized based on thematic areas to supplement quantitative result.

**Results and discussion**

Table 1 presents the status of the municipal disease surveillance system which was evaluated based on the following parameters: structure, human resource, staffing pattern, manpower activities, management and monitoring schemes, and funding. Each parameter was described by the set of indicators. As shown, the overall status of the disease surveillance system in the different municipalities is adequately accomplished, 64% or 48 out of 75 municipalities have documented and completed the requirements included in the components of the surveillance system. This indicates that most of the municipalities in these provinces have an established disease surveillance system that is structured and functional. But, while most of the municipalities have judiciously met the deliverables, there are still other municipalities such as the 27 (36%) included in this study that is desired to be in an accomplished status to be able to fully execute the expected purpose of disease surveillance.

**Table 1.** Distribution of the municipalities of Region II as to status of the Municipal/City Disease Surveillance System.

| Status Level | BAT *(n=5)* | CAG *(n=23)* | ISA *(n=30)* | NVZ *(n=12)* | QUI *(n=5)* | Total *(n=75)* |
|---|---|---|---|---|---|---|
| Accomplished | 4 (80%) | 8 (34.8%) | 20 (66.7%) | 11 (91.7%) | 5 (100%) | 48 (64%) |
| Continuing | 1 (20%) | 15 (65.2%) | 10 (33.3%) | 1 (8.3%) | -- | 27 (36%) |
| Not yet commenced | -- | -- | -- | -- | -- | -- |

One of the major ESR gaps identified in the 2006 formal assessment of the Philippines' ESR system (RETA 6305), was that the disease surveillance system is fragmented, and its components are not evenly developed. This also highlighted that no standards exists for some critical core functions and some standards are not adequately disseminated. Consequently, the DOH – NEC developed a three-year strategic plan for ESR which included a legal and policy review to support the implementation of IHR-2005 and this also jumpstarted the designing and establishment of the PIDSR system.

The surveillance system structure is one of the components of the surveillance and response system for monitoring and evaluating the WHO International (2006). This component includes legislation, surveillance strategy, surveillance implementers and stakeholders, and networking and partnership. In the status of the municipal disease surveillance system structure majority of the municipalities have a documented Baseline Assessment Report or Situational Analysis Section of the Local Investment Plan for Health. Moreover, while the creation of the C/MESUs of most of the municipalities is supported by existing Executive Orders, it has been observed that the office space or workstation for surveillance unit is not apparent and that available resources for surveillance (data management; communication; office supplies; surveillance supplies and logistics) are usually shared resources from the RHU.

The workforce is the single largest expenditure element of most health systems. Thus, the nature, preferences, and quality of the workforce are key aspects of system performance and require careful policy attention. And, with every health system, competent, motivated health workers must be found or trained and provided with career paths and supervision [23]. The surveillance system structure includes the surveillance implementers (WHO, 2006). In this paper, this component is presented as the human resource and staffing pattern. Following establishing ESUs in the LGUs, RA 11332 also states that all ESUs shall have trained required human resource complement and provision of adequate resources.

The majority of the Municipalities in Isabela, Nueva Vizcaya, and Quirino have confirmed that there is an Executive Order designating or appointment letter hiring the staff that completes the M/CESU team. It was noted that in some of the Executive Orders crafted by the LGU, the list of designated committee members is already indicated. However, in the municipalities of Cagayan and Batanes, this showed otherwise, most municipalities in Cagayan and Batanes are still in the process. It was noted that though Executive Orders already exist, the list of dedicated M/CESU staff with training certificates/s issued by the Epidemiology Bureau (EB)/Regional ESU (RESU) of most municipalities in the four provinces except for Quirino lack in identifying the number of M/CESU staff who completed the minimum basic training requirements as prescribed by EB/RESU; the total number of M/CESU staff and percentage of M/CESU staff who completed the minimum basic training requirements prescribed by EB/RESU.

The Technical guidelines on IDSR provide stipulations on the procedures for handling suspected cases of a priority notifiable infectious disease at the facility level. The availability of these guidelines especially at the clinical level and their effective implementation at that level is the foundation of a strong disease surveillance system, particularly in the early detection of priority notifiable infectious diseases and events of public health concern (McNabb *et al.,* 2002). Enumerated in the 2020 revised IRR of RA 11332, Rule VII Section 4 is the specific function of the ESUs at the city and municipal levels. This as well is indicated in the PIDSR.

However, in the assessment of the status of manpower activities evaluated in terms of the existence of an approved technical guideline/manual of operations on epidemiology and surveillance system, it has shown that most municipalities in Isabela and Batanes have not yet started the drafting of the technical guidelines or MOP. Meanwhile, Cagayan and Quirino are on a continuing status, this presents that some of the municipalities already have an existing MOP while some have none or are still in the process of drafting. On the other hand, as presented, the province of Nueva Vizcaya has the most municipalities with an accomplished status.

Monitoring a surveillance system is defined by DOH as the routine process of data collection and the measurement of surveillance programs or process changes over time using previously agreed-upon plans, schedules, and indicators. In the performance

of disease surveillance and response functions, only authorized personnel from the DOH and its local counterparts are granted the statutory and regulatory authority to enforce such functions. Under RA 11332, the ESU shall capture and verify all reported notifiable diseases and health events of public health concern; provide timely, accurate, and reliable epidemiologic information to appropriate agencies; conduct disease surveillance and response activities; coordinate needed response. All the municipalities in each of the provinces of the region have accomplished this area.

**Table 2.** Performance of the Disease Surveillance System of the Municipalities of the different provinces in Region 2.

| Parameters | BAT | CAG | ISA | NVZ | QUI | Total Mean Score |
|---|---|---|---|---|---|---|
| Case identification, investigation, registration and confirmation of notifiable diseases | 2.93 | 2.84 | 2.91 | 2.92 | 2.98 | 2.90 |
| Notification and reporting of cases | 2.65 | 2.84 | 2.80 | 2.86 | 2.93 | 2.82 |
| Epidemic control measures | 2.70 | 2.53 | 2.64 | 2.74 | 2.87 | 2.65 |
| Storage, management, analysis and interpretation of data | 2.68 | 2.47 | 2.58 | 2.63 | 2.84 | 2.58 |
| Capacity of human resource | 2.20 | 2.16 | 2.38 | 2.42 | 2.43 | 2.32 |
| Information-education and training activities | 2.13 | 2.21 | 2.32 | 2.27 | 2.53 | 2.28 |
| Epidemic response plan | 2.93 | 2.82 | 2.83 | 2.90 | 3.00 | 2.86 |
| Management of logistics, feedback and use of information | 2.43 | 2.35 | 2.52 | 2.23 | 2.89 | 2.44 |
| Contact tracing and monitoring & evaluation of cases | 3.00 | 2.80 | 2.69 | 3.00 | 3.00 | 2.82 |
| Deployment of special teams | 2.88 | 2.05 | 2.13 | 2.82 | 3.00 | 2.33 |
| Weighted Mean | 2.65 | 2.51 | 2.58 | 2.68 | 2.85 | 2.60 |

Legend: 1.00-1.66 (Not yet implemented); 1.67-2.33 (Partially implemented); 2.34-3.00 (Fully implemented).

One significant support function of surveillance activities is the financial resource. Despite the availability of a budget line for surveillance; this is inadequate for training and resources (Tabish, 2009). In terms of funding, the existence of a budg*et al*location for the implementation of epidemiology and surveillance technical guidelines/manual of operations as reflected in an ordinance or work and financial plan must be in place. Most municipalities in Quirino have complied while in the municipalities of Isabela and Batanes, this is still in process. However, in Cagayan and Nueva Vizcaya, most municipalities have not yet created a budg*et al*location for implementing epidemiology and surveillance technical guidelines/manual of operations as reflected in an ordinance or work and financial plan. But it was noted that most of the municipalities in the different provinces have an allocated budget for disease surveillance coming from the RHUs, and that supplies and resources utilized for disease surveillance are sufficiently augmented by the RHUs.

The most commonly cited challenges that describe the system structure where the absence of an official workstation; the absence of a committed unit head and the availability of plantilla positions; the fast turnover of trained staff; multiple workloads and; lack of financial resources.

Though most participants recognize the existence and establishment of a Municipal Epidemiologic and Surveillance Unit (MESU), according to participants a workstation separate from the RHU is still lacking. The most staff mentioned that the resources they usually use for disease surveillance functions are

resources shared by the Rural Health Unit. There would be a significant impact if there is a separate workstation for the MESU staff where resources are also made available to efficiently perform the duties and functions expected of disease surveillance.

On the other hand, in terms of disease surveillance support functions, the commonly raised challenges were the shortage of supplies and equipment; insufficient compensation and allowances; lack of manpower; confusion and inconsistency in system coordination, and; lack of training and orientation.

Although some of the MESUs have available funds to finance their supplies, particularly personal protective equipment, service vehicles to conduct disease surveillance, medicines, and oxygen tanks, most MESUs rely on the availability of supplies from the Rural Health Units and support from their respective Local Government Units. In addition, there is a need to capacitate and upgrade facilities and laboratories to provide and deliver sufficient services on time.

As staff shortage is in the backdrop, defined roles and responsibility also challenges the participants. The lack of manpower is common at all levels of epidemiology and surveillance units (ESUs). The lack of manpower is associated with the system structure of the disease surveillance system in which ESU staff performs multiple tasks and workloads. Since there are no available plantilla positions for the Disease Surveillance Officers (DSO), personnel of the RHU are tapped to perform the functions of an ESU committee which in turn compromises other programs in the RHU and also affects the disease surveillance core function, particularly in disease reporting.

As the term disease surveillance system implies, a well-organized and coordinated flow of algorithms should be followed at all system levels. An effective response to such outbreaks and ensuring the required data is collected and reported in a timely manner requires sufficient resources and a trained workforce. The lack of staff training and orientation was also raised as a concern. Although several pieces of training have been conducted at the provincial and municipal levels, the fast turnover of staff compromises the competency level of the unit members. Also, the community health workers have no proper training and orientation regarding the disease surveillance system.

Table 2 presents the performance of the disease surveillance system of the municipalities in the different provinces of Region 2. The weighted mean of all of the parameters of disease surveillance system performance in Batanes is 2.65, in Cagayan is 2.51, in Isabela is 2.58, in Nueva Vizcaya is 2.68 and in Quirino is 2.85. This indicates that the enumerated support functions and core functions of a disease surveillance system in most MESUs are fully implemented. Thus, most MESUs are performing and functional. However, as shown in the table, in terms of the total mean score in each of the parameters across the different provinces, the capacity of human resources has a total mean score of 2.32, information-education and training activities is 2.28 and the deployment of special teams is 2.33. This indicates that these disease surveillance functions are partially implemented by most of the municipalities. It can be gleaned that the capacity of human resource, information education and training, and the deployment of special teams are still lacking in some of the MESUs and these needs to be improved to support and reinforce the disease surveillance system in the municipalities.

Disease surveillance is a cornerstone of outbreak detection and control. Evaluation of a disease surveillance system is important to ensure its performance over time (Tabish, 2009). Routine monitoring of surveillance system indicators yields information to assess the current performance of the surveillance system and provides early warning of potential system deviations. Analysis of performance monitoring data allows public health organizations to set goals for system performance improvement. The following outline the performance in the support and core surveillance functions of the City/Municipal

Epidemiology and Surveillance Units in the different provinces of Region 2. These are based on the elements of surveillance in the Indicators for Monitoring Quality of Surveillance and Response of the PIDSR.

In every health system, competent, motivated health workers need to be found or trained and provided with career paths and supervision (Phalkey *et al.,* 2013). In the country, four disease surveillance response systems are being utilized. As revealed in the study, the PIDSR is mostly utilized. IDSR provides a framework for strengthening surveillance, response, and laboratory core required by the revised International Health Regulation [IHR (2005)]. In turn, the IHR regulations can serve as a driving force to sustain a national commitment to surveillance. The ability to report events of potential public health concern is grounded on strength of the surveillance system's capacities. As seen in most assessments, unstructured and irregular supervision, lack of sustainable training strategies, and little or no bottom-up approach feedback lead to an overburdened, under-compensated, and demoralized peripheral staff that affects surveillance quality within the IDSR (Inquirer, 2019).

Partial implementation of the adequate number of trained staff in PIDSR was seen in Cagayan and Nueva Vizcaya. It has been observed that the MESUs lack staff, but there is at least one designated and trained staff which comes from the RHU staff. The MHO is designated as the Team Leader or the DSO, in other MESUs, the designated DSO or DSC is the PHN; a Registered Medical Technologist and an Encoder is also designated but they are as well the regular staff of the RHU. In the study of Tabish (2009), only the national surveillance focal person had a post-graduate degree in field epidemiology with extensive training in disease surveillance. Lack of required skills among the surveillance personnel was reported in many studies, and it was found that there was multitasking done by health workers, who were given the additional role of surveillance activity. If health workers are involved in the surveillance program merely as an additional job responsibility, they will invariably display poor commitment (WHO, 2018). In the study of Saleh *et al.* (2021), a percentage of IDSP positions were vacant in the state despite the availability of financial resources leading to multiple responsibilities on existing staff including the SSO and the DSOs, this finding is commonly reported by several other low and middle-income countries. Further, the SSO and DSOs were selected ad-hoc, frequently transferred, and saw surveillance as an additional burden. Developing a permanent cadre of skilled surveillance personnel is key to program viability and should be actively pursued.

An adequate number of trained staff in VPDS and ESR are partially implemented in the municipalities of Cagayan, Nueva Vizcaya, and Isabela. It was noted that the MHO or the PHN is the only staff trained on these surveillance systems. Also regarding the adequate frequency of Surveillance and Outbreak Investigation-related training, it was noted that only every other year that the MESU staff of Cagayan, Isabela, and Quirino are trained in at least one of the following; PIDSR training, surveillance-related training, or outbreak investigation training.

The lack of training however was related to the occurrence of the pandemic. Moreover, only the municipalities of Nueva Vizcaya have fully implemented an adequate number of trained staff in Data Analysis. Unfortunately, it was noted that in Batanes and Cagayan, most municipalities don't have training in this area. Weak data analysis at every level was observed in some studies in other states. The DSU is better trained and receives frequent feedback from the SSU compared to facilities giving them a position advantage for data analysis (Saleh *et al.*, 2021).

Further, regular orientation among staff on PIDSR and VPDS is usually conducted quarterly or annually. Cagayan and Quirino partially implement the conduct of orientation, and this only happens when needed. But on the other hand, an adequate number of trained staff in the Infection Control Committee was fully

implemented in these two municipalities. In Isabela and Nueva Vizcaya, orientation is conducted when needed. And for Batanes, no orientation was conducted. The supervisory check on PIDSR which is done by the PESU and RESU on a regular basis was observed in the MESUs of Cagayan, Isabela, and Quirino. This was partially implemented in Batanes and Nueva Vizcaya, supervisory checks are usually done when needed in most of the municipalities.

Lastly, the deployment of special teams is considered part of the epidemic response plan and this function is immediately instituted in response to an outbreak or epidemic, such as the case in Covid – 19 responses. While this was explicated by most municipalities, this function was considered partially implemented because most MESUs lack a documented Statement of the purpose of the special team, the Specific composition of special teams, and the Specific protocol in the actual deployment of special teams. A similar situation was revealed in the study of Alemu *et al.*, (2019), that even though there is an established rapid response team/ technical committee in the district and health facilities, it lacks functionality or regular monthly meeting at all levels. Most of the team members were not trained in epidemic preparedness and response. Also, the rapid response team did not review their plans, actions, and learned experiences.

Among the key challenges perceived by the participants, the following influence the disease surveillance core functions: hesitance of the community to participate; delay in reporting; miscommunications and non-endorsement of specimens, and; strict policy implementation.

The participation of the community plays a vital role in the successful implementation of the disease surveillance system. To have accurate and complete data reports on time, the cooperation of the community is much needed. However, the participants stated various experiences where they encountered non-participation from their constituents. Some are due to misinformation and disinformation, lack of cognizance which led to self-medication, acceptance and mental health challenges, social stigma, lack of food supplies, limited source of income and daily finances, violence and stubbornness, and cultural and religious beliefs.

Also, from the in-depth interviews, participants relayed some delays in reporting which is associated with the system structure of disease surveillance. Due to multiple workloads, the timeliness of reporting is not being observed. Another factor discussed under the core functions of surveillance is miscommunications and non-endorsement of specimens. Since there is no established system process, multiple miscommunications and uncoordinated endorsements occur. Lastly, strict policy implementation was also raised by the participants. Policymakers should also be policy implementers

## Conclusion

Generally, the status of the disease surveillance system across the province in the region has satisfactorily met the deliverables except in the areas of human resource and staffing, manpower, and funding which has implications for disease surveillance support and core functions. Moreover, in terms of performance, the disease surveillance system is also satisfactory, as it was able to implement the functions highlighted in the Manual of Operations of the Philippine Integrated Disease Surveillance and Response. While most of these indicators are fully implemented, improvement in the capacity of human resources information-education and training activities, and deployment of special team must also be addressed so as these are very significant and vital in the performance of disease surveillance function.

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