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**ENHANCING THE EFFECTIVENESS OF SURVEILLANCE SYSTEMS IN PACIFIC ISLAND COUNTRIES AS EARLY WARNING SYSTEMS FOR DETECTING AND RESPONDING TO COVID-19 OUTBREAKS: KEY STRATEGIES AND RECOMMENDATIONS**.

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**ABSTRACT**:

The coronavirus disease 2019 (COVID-19) pandemic has uncovered the need for health systems to be strengthened in order to be able to respond quickly to any potential future outbreaks. In response, the Pacific Syndromic Surveillance System (PSSS) is currently being used by many countries within the Pacific Islands for tracking and addressing infectious disease outbreaks, including COVID-19. To maximise its usefulness as an early warning system, investments must be made in strengthening data quality, data sharing, health facility capacity, technology, and ongoing evaluation of surveillance systems. Doing so will ensure that the PSSS and other surveillance systems can remain effective tools for monitoring and respond to infectious disease outbreaks in the Pacific Islands.

**Keywords**: COVID-19, Coronavirus disease 2019, Syndromic Surveillance, Early warning system.

**INTRODUCTION**:

The coronavirus disease 2019 (COVID-19) pandemic has revealed the need to reinforce health systems worldwide so that they can respond more quickly to outbreaks of diseases. Meckawy et al. [1] conducted a systematic review of syndromic surveillance early warning systems (EWS) and ascertained that the most successful implementations require extensive assets to be effective, which most high-income countries can afford. However, Pacific Island countries, which often have limited resources and distinctive difficulties, have adopted the Pacific Syndromic Surveillance System (PSSS) as a viable way to detect COVID-19 outbreaks [2]. The PSSS is affordable, but its effectiveness has been limited by poor data quality, unreliable information technology support and a lack of analytical skills among users [2].

Strategies to improve data quality, data sharing, health facility capacity, technology, and evaluation will enhance the effectiveness of syndromic surveillance systems [1, 3]. Furthermore, appropriate technology can create a more streamlined approach to capturing and analysing data. Finally, evaluation of the systems and the

data collected should be regularly conducted to ensure the systems function correctly and achieve the desired outcomes. This article will provide an overview of how the effectiveness of syndromic surveillance systems used in Pacific Island countries can be improved by investing in the mentioned factors.

Improving data quality:

A key challenge in developing effective syndromic surveillance systems is ensuring high-quality data. Data quality is critical to enable syndromic surveillance systems to generate accurate and reliable information, which can inform public health actions [4]. Pacific Island countries' health authorities must review, revise and update data collection and reporting guidelines. The guidelines must be easy to follow, even in rural and remote health facilities.

Data standardisation and comparison can help reduce the obstacles associated with data sharing, such as varying formats and terminology. By implementing clear guidelines, identifying data sources and conducting effective analyses will become easier [5]. For example, outpatient visits and emergency department encounters can be utilised to identify and prevent the spread of COVID-19 [6]. Furthermore, standardising data collection and analysis will improve data comparison between health facilities and health provider agencies. This will provide a better

understanding of the situation and help to create more informed public health policies.

Health authorities must undertake regular in-service programs to train health workers to ensure high-quality data. The programs should cover various topics, such as syndrome definitions, collection protocols, quality assessment, quality assurance processes, and reporting formats [7]. These courses are essential for health professionals to possess the necessary skills and knowledge to assess and record health information accurately. This will guarantee the highest quality of data to inform public health actions.

Enhancing data sharing:

Data sharing is critical to enhancing the effectiveness of syndromic surveillance systems to serve as EWS. Without adequate information being shared between health facilities and agencies, these systems may not be able to understand the health situation comprehensively and respond promptly. Strategies to improve data sharing include developing protocols for data exchange and incentives for health facilities and agencies to share data quickly and reliably [8]. Doing so will allow for the broadest possible range of data to be captured, providing health authorities with a more accurate picture of the health situation in the country.

Data sharing among Pacific Island countries is often hampered by several obstacles, ranging from technical issues like incompatible information systems to more complex issues such as data ownership, confidentiality and privacy [4, 7]. Health authorities should work with other government sectors and industry partners to promote and facilitate data sharing to build better health system architecture and address these barriers. By doing so, data sharing will become more efficient and beneficial to all countries involved, allowing them to access and use crucial health-related information more easily.

Establishing a centralised database offers an effective way to improve data sharing. This database should be able to collect and store information from different sources like health institutions, clinics, and laboratories [9]. By having an integrated health information system, communication of syndromic surveillance data between health facilities and agencies can be made more efficient, thus allowing for a quicker response to detect and manage infectious disease outbreaks [9]. Such a system can also aid in better management of health resources and improve healthcare quality.

Strengthening the capacity of health facilities:
Health facilities are an integral part of syndromic surveillance systems. They collect, report, and analyse data, helping to ensure the effectiveness

of these surveillance systems. Strengthening the capacities of health facilities is a vital step in improving the efficacy of syndromic surveillance [10]. This can be done through improved training, access to resources, and implementing technology that helps streamline data collection and reporting [10, 11]. By doing so, syndromic surveillance systems can become more effective, providing greater protection for populations and improving public health outcomes.

To increase the effectiveness of health centres, health departments must offer assistance and instruction to their staff on how to collect and report data accurately. Educating their personnel on the significance of data accuracy and the influence the data gathered has on public health policy is of paramount importance [11]. Furthermore, health departments must provide resources such as electronic data capture tools and data management software to simplify the process of data collection and reporting [11]. Doing so will ensure that the data used by health authorities is accurate and current.

Syndromic surveillance is a critical component of disease monitoring and response, and healthcare providers must be equipped to take full advantage of it. Health facilities should be supported in integrating syndromic surveillance into everyday activities. By integrating syndromic surveillance data collection and reporting into existing health information systems, health authorities can help

ensure that health facility staffs know the importance of this type of surveillance and have the necessary tools to participate in the system.

Investing in technology:

Health authorities should invest in suitable technology to quickly detect and respond to outbreaks. Automated tools such as electronic health records, mobile applications, and data visualisation tools can help streamline data collection and analysis [10, 11]. This would provide health authorities with real-time information and the ability to respond swiftly to contain the spread of diseases. Such technology would also offer convenience and accuracy for health authorities and their staff, as data collection and analysis can be conducted quickly and accurately. This would help reduce the impact of disease outbreaks and keep communities safe.

Mobile applications were trialed in Papua New Guinea (PNG), but these systems were not adopted into the national health information system [10]. Such initiatives need re-visiting. Other examples include data visualisation tools that incorporate geographical information systems which can identify the geographical location of potential health threats [12]. Additionally, electronic health records can be used to track patient data, which can further assist in identifying patterns of illness and alerting authorities and health professionals to potential outbreaks [13].

Conducting regular evaluations:

To ensure the efficacy of syndromic surveillance systems, health authorities must regularly evaluate them. Evaluations should assess the system's ability to detect and respond to outbreaks and identify improvement areas. Through such evaluations, health authorities can identify gaps in the surveillance systems and work to close them [11]. They can also measure the impact of interventions and identify potential areas for further improvement. By conducting regular evaluations, health authorities can ensure that the syndromic surveillance systems are practical and efficient.

**CONCLUSION**:

The success of Pacific Island nations in identifying and responding to COVID-19 outbreaks rests on the effectiveness of their surveillance systems. Health authorities must prioritise data quality, data sharing, capacity building, technological investments, and regular evaluations to ensure the efficient detection and management of outbreaks. These strategies are vital for ensuring Pacific Island communities' health and well-being and strengthening health systems to contain COVID-19.

**REFERENCES**:
1.  Meckawy R, Stuckler D, Mehta A, Al-Ahdal T, Doebbeling BN. Effectiveness of early

warning systems in the detection of infectious diseases outbreaks: a systematic review. BMC Public Health. 2022 Nov 29; 22(1):2216.

2. Itaki R. Assessment of the association between rainfall and climate-sensitive infections using syndromic surveillance systems: A literature review with implications for syndromic surveillance in Pacific Island countries. Pac J Med Sci. 2023. 23(2); 58-68.

3. Craig AT, Kama M, Samo M, Vaai S, Matanaicake J, Joshua C, Kolbe A, Durrheim DN, Paterson BJ, Biaukula V, Nilles EJ. Early warning epidemic surveillance in the Pacific island nations: an evaluation of the Pacific syndromic surveillance system. Trop Med Int Health. 2016 Jul; 21(7):917–27.

4. Paterson BJ, Kool JL, Durrheim DN, Pavlin B. Sustaining surveillance: Evaluating syndromic surveillance in the Pacific. Global Public Health. 2012 Aug;7(7):682–94.

5. William B. Lober, L. Trigg, B. Karras. Information System Architectures for Syndromic Surveillance. https://www.cdc.gov/mmwr/preview/mmwrht ml/su5301a37.htm

6. Itaki R, Alexander H, Albert P, Gallen P, Gallen M, Perman P. A short report on the COVID-19 response and preparedness activities in Pohnpei, Federated States of Micronesia. 2020; 20(2):21–6.

7. Craig AT, Joshua CA, Sio AR, Teobasi B, Dofai A, Dalipanda T, Hardie K, Kaldor J, Kolbe A. Enhanced surveillance during a public health emergency in a resource-limited setting: Experience from a large dengue outbreak in Solomon Islands, 2016-17. PLoS ONE. 2018; 13(6).

8. Detmer DE. Building the national health information infrastructure for personal health, health care services, public health, and research. BMC Med Inform Decis Mak. 2003 Dec; 3(1):1.

9. Yan W, Palm L, Lu X, Nie S, Xu B, Zhao Q, Tao T, Cheng L, Tan L, Dong H, Diwan VK. ISS--an electronic syndromic surveillance system for infectious disease in rural China. PLoS One. 2013 Apr 23; 8(4):e62749. doi: 10.1371/journal.pone.0062749.

10. Rosewell A, Ropa B, Randall H, Dagina R, Hurim S, Bieb S, Datta S, Ramamurthy S, Mola G, Zwi AB, Ray P, MacIntyre CR. Mobile phone-based syndromic surveillance system, Papua New Guinea. Emerg Infect Dis. 2013 Nov; 19(11):1811-8. doi: 10.3201/eid1911.121843.

11. Kitur U. Health information challenges for Papua New Guinea. Pacific Health Dialogue. 2012. Apr 1; 18(1):29-31.

12. Rosewell A, Shearman P, Ramamurthy S, Akers R. Transforming the health information system using mobile and geographic information technologies, Papua New Guinea. Bull World Health Organ. 2021 May 1; 99(5): 381-387A.

13. DeWitt M. Automatic Contact Tracing for Outbreak Detection Using Hospital Electronic Medical Record Data. Epidemiology: 2020 September http://medrxiv.org/lookup/doi/10.1101/2020.0 9.08.20190876