An Evaluation of Public Health Surveillance System in Ministry of Health, Saudi Arabia

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Abstract

Introduction: Public health surveillance systems are essential for monitoring health trends, identifying threats, and enabling timely interventions. In Saudi Arabia, the Ministry of Health's surveillance system faces challenges that impact its efficiency and effectiveness. Aims: This study aims to evaluate the efficiency of the public health surveillance system, specifically focusing on data collection methodologies, the obstacles encountered in information gathering, and the resource challenges involved. The study also seeks to identify the relationships between various data collection methods and the challenges faced. Methods: The study utilized frequency analysis and chi-square tests to analyze the data collected through public health surveillance mechanisms. The data included responses regarding the methods of information collection, obstacles faced, software used, and adequacy of training and resources. Results: The findings indicate a statistically significant association between data collection methods and obstacles encountered. Specifically, monthly reports were associated with a higher frequency of obstacles compared to other methods, such as quarterly reporting. Key issues identified include administrative burdens, inadequate training, and limited use of sophisticated software tools. Approximately 66.7% of the expected counts in the chi-square analysis were less than 5, indicating potential limitations in data reliability. Conclusion: The evaluation of the public health surveillance system reveals significant barriers related to data collection methods and resource allocation. To enhance the system's efficiency, policy interventions are recommended, including optimizing data collection schedules, enhancing training programs, and improving the allocation of resources and tools. Addressing these gaps is vital for strengthening the quality and responsiveness of public health surveillance, thereby enabling more effective public health interventions and decision-making.

Keywords: Public Health Surveillance, Surveillance System, Health Surveillance

Introduction

Public Health surveillance system is one of the crucial components of any public health program and facilities. To evaluate the efficacy of

current policies and programs and to design new ones, policymakers and health practitioners at the international, national, and local levels need accurate and timely data. There are some common problems that affect surveillance systems in both wealthy and developing nations, such as a lack of financial and human resources as well as inadequate infrastructure. The highest burden of disease is found in developing nations, where novel infections are more likely to appear, existing ones to reemerge, and drug-resistant strains are more likely to spread.

In order to minimize morbidity and mortality and achieve better health, a well-designed and effective surveillance system is essential for supplying the data required for appropriate and timely action and reaction, tracking disease patterns, and setting public health goals (CDC Guidelines Working Group, systems. MMWR Morb Mortal Wkly Rep, 2001).

Electronic reporting, which now includes internet-based data entry for informing health agencies and automated input of electronic laboratory findings, has grown in popularity in recent years. A growing body of research shows that electronic reporting has the potential to significantly enhance and improve the quality of surveillance systems by streamlining reporting for the end user, increasing the sensitivity (completeness of reporting), and speeding up the system's response time from event to action (World Health Organization).

The purpose of this article is to analyses public health surveillance systems, including their current role, recent advancements, and potential, in the context of scientific developments in public health surveillance, changing health care and public health environments, and quickly growing technologies for future development.

Activities for public health monitoring are often approved by lawmakers and carried out by public health officials. Systems for monitoring the state of the public's health have been developed to meet a variety of demands. Additionally, according to Thacker and Stroup (1994), public health information systems are defined to encompass a range of data sources that are crucial for public health action and are frequently utilized for surveillance.

Public Health Surveillance System

A surveillance system, on the other hand, is a group of procedures and elements that give public health professionals access to surveillance. Data collection, data quality control, data management, data analysis, data interpretation, information dissemination, and application of the information to public health programs are all part of the surveillance process. Laboratory diagnostics to identify or confirm health conditions; information technologies to support the surveillance processes of data collection, analysis, and dissemination; clinician consultation and reporting; clinician, public health, and laboratory worker education and training; legislation, regulations, and policies that support the conduct of surveillance; systems and directories for disseminating all of the information mentioned above are examples of the enabling components of surveillance systems. Planning the system, assessing system performance, and enabling ongoing data and system quality improvement all depend on well-defined objectives for the surveillance system. The number and type of data variables to be collected (such as demographic or behavioural data variables) should be determined by the surveillance objectives and budget, as well as the population being monitored, the required level of resolution of the data, the required brevity of the information for effective action or response, the frequency of data analysis and interpretation, and the resources needed to support the surveillance system. The same should be true for decisions regarding data gathering, management, analysis, integration, dissemination, security, and privacy. Finding contradictions between the objectives (and their effects on system design and performance) and resources is best done during the planning stage.

Public health surveillance is a systematic and ongoing process of collecting, analyzing, interpreting, and disseminating data on the health status of a population. It involves the continuous monitoring of health events and risk factors in order to identify patterns, trends, and potential outbreaks of diseases. The ultimate goal of public health surveillance is to inform public health action and decision-making to prevent and control diseases, promote health, and improve the overall well-being of the population.

In Saudi Arabia, public health surveillance plays a crucial role in monitoring the nation's health and ensuring the effectiveness of public health interventions. The Kingdom

has recognized the importance of surveillance in safeguarding the health of its population and has established a comprehensive surveillance system to monitor various health indicators and detect any potential threats to public health.

The importance of public health surveillance in Saudi Arabia can be understood from several perspectives. Firstly, surveillance provides essential data for assessing the burden of diseases and health conditions in the country. By collecting information on the occurrence and distribution of diseases, surveillance helps in identifying high-risk populations, geographic areas with increased disease prevalence, and emerging health threats. This information is vital for planning and implementing targeted interventions to prevent and control diseases.

Secondly, public health surveillance enables the early detection and response to outbreaks and epidemics. By continuously monitoring disease patterns and trends, surveillance systems can quickly identify any unusual increase in the number of cases or the emergence of new diseases. This early warning system allows public health authorities to mobilize resources, implement control measures, and prevent the further spread of diseases. In Saudi Arabia, this is particularly important given the country's geographical location and the potential for the introduction of infectious diseases from neighboring countries.

Thirdly, surveillance plays a crucial role in monitoring the effectiveness of public health interventions and programs. By tracking health indicators over time, surveillance systems can assess the impact of interventions, identify gaps in service delivery, and guide the allocation of resources. This information is essential for evaluating the success of public health initiatives and making evidence-based decisions to improve health outcomes.

Furthermore, public health surveillance is essential for monitoring and addressing the social determinants of health. By collecting data on various risk factors such as socioeconomic status, education, and access to healthcare, surveillance systems can identify disparities in health outcomes and guide the development of targeted interventions to reduce health inequities. In Saudi Arabia, where there are diverse populations with varying social determinants of health, surveillance plays a crucial role in ensuring equitable access to healthcare services and addressing health disparities.

In conclusion, public health surveillance is a critical component of the healthcare system in Saudi Arabia. It provides essential data for monitoring the health status of the population, detecting and responding to disease outbreaks, evaluating the effectiveness of interventions, and addressing health disparities. By investing in robust surveillance systems and ensuring the timely collection and analysis of data, Saudi Arabia can effectively monitor the nation's health and take proactive measures to protect and promote the well-being of its population.

Historical Overview of Public Health Surveillance

Public health surveillance is a critical component of any healthcare system, including Saudi Arabia. It involves the systematic collection, analysis, and interpretation of health-related data to monitor and improve the health of a population. The history of public health surveillance in Saudi Arabia dates back several decades and has evolved significantly over time.

In the early years, public health surveillance in Saudi Arabia was primarily focused on infectious diseases. The Ministry of Health (MOH) played a central role in establishing and maintaining surveillance systems to detect and respond to outbreaks of diseases such as cholera, tuberculosis, and meningitis. These systems relied on manual reporting from healthcare facilities and laboratories, which often resulted in delays in data collection and analysis.

With the advancement of technology and the increasing need for timely and accurate data, Saudi Arabia began to modernize its public health surveillance systems in the late 20th century. The MOH introduced electronic reporting systems, allowing healthcare facilities and laboratories to submit data in a more efficient and timely manner. This shift towards electronic reporting significantly improved the speed and accuracy of data collection, enabling faster detection and response to disease outbreaks.

In the early 2000s, Saudi Arabia faced a significant public health challenge with the emergence of the Middle East Respiratory Syndrome Coronavirus (MERS-CoV). This outbreak highlighted the importance of a robust

surveillance system in detecting and responding to emerging infectious diseases. The MOH, in collaboration with international partners, strengthened its surveillance systems to monitor and control the spread of MERS-CoV. This included enhancing laboratory capacity, implementing real-time electronic reporting, and establishing a national command and control center for disease surveillance.

In recent years, Saudi Arabia has expanded its public health surveillance efforts beyond infectious diseases to include chronic diseases, environmental and occupational health, and risk factors surveillance. The MOH has developed specialized surveillance systems to monitor the prevalence and trends of chronic diseases such as diabetes, cardiovascular diseases, and cancer. These systems collect data from various sources, including healthcare facilities, health surveys, and registries, to provide a comprehensive picture of the burden of chronic diseases in the country.

Furthermore, Saudi Arabia has recognized the importance of surveillance for environmental and occupational health. The MOH, in collaboration with other government agencies, has established surveillance systems to monitor and respond to environmental hazards, occupational diseases, and workplace injuries. These systems collect data on exposure to pollutants, occupational health risks, and work-related injuries, enabling the identification of high-risk industries and the implementation of preventive measures.

In addition to disease surveillance, Saudi Arabia has also focused on monitoring risk factors that contribute to poor health outcomes. The MOH conducts regular surveys to collect data on behavioral risk factors such as smoking, physical inactivity, and unhealthy diet. This information helps inform public health interventions and policies aimed at reducing the burden of preventable diseases.

The integration of surveillance systems has been a key priority for Saudi Arabia. The MOH has worked towards integrating various surveillance systems to enhance data sharing and coordination between different sectors. This integration allows for a more comprehensive and holistic approach to public health surveillance, enabling the identification of interconnected health issues and the development of targeted interventions.

In conclusion, public health surveillance in Saudi Arabia has come a long way, evolving from manual reporting systems to sophisticated electronic surveillance systems. The country has made significant progress in monitoring and responding to infectious diseases, chronic diseases, environmental and occupational health, and risk factors. The integration of surveillance systems and the use of advanced technologies have further strengthened the surveillance infrastructure in Saudi Arabia. However, challenges remain, including the need for continuous improvement, capacity building, and international collaboration. The future of public health surveillance in Saudi Arabia lies in leveraging technological advancements, enhancing international partnerships, and addressing the emerging challenges to ensure the health and well-being of the nation.

The Growing Use of Surveillance Systems

Although infectious diseases were initially the primary focus of public health surveillance principles and practices, today's public health surveillance systems are used to track and predict a wide range of health outcomes (such as infectious disease, injury, chronic disease, mental health, and occupational and environmental health outcomes) and health determinants (such as risk behaviors, health care services, and socioeconomic factors). Surveillance systems have recently been created to monitor the existence, development, or evolution of infectious organisms in the environment in addition to monitoring individual risk factors and outcomes. For instance, a recent surveillance study looked at whether bioaerosol sampling techniques are appropriate for routinely monitoring for viruses in settings that encourage aerosolization. The use of monitoring systems for communicable diseases has also increased, for instance to track how vaccination campaigns affect virus evolution in order to inform vaccine development and maintain vaccine efficacy. In order to improve the public health response and to provide information for decisions about the creation, modification, or improvement of health or risk communication messages, several public health agencies have also chosen to closely monitor health communications and news media—especially during a public health emergency.

Purpose of Evaluating Public Health Surveillance System

To make sure that issues of concern to public health are being tracked effectively and efficiently, public health surveillance systems must be evaluated. Periodic evaluations of public health monitoring systems are necessary, and the evaluations should contain suggestions for enhancing their usefulness, effectiveness, and quality. These recommendations are meant to organize the assessment of a public health surveillance system. There are defined general subjects that can incorporate program-specific traits. The effectiveness of a public health monitoring system's operation in achieving its goals is the main topic of evaluation. System features such simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness, and stability should be evaluated when evaluating public health monitoring systems. Certain public health informatics difficulties for public health surveillance systems are inherent in these qualities due to the ongoing development of technology, the significance of information architecture, and related issues. Comparable hardware and software, a standardized user interface, standardized data formats, proper quality checks, and adherence to confidentiality and security standards are some of these issues (Yasnoff et al., 2000).

The techniques, scope, purposes, and aims of public health monitoring systems vary, therefore characteristics that are significant to one system may not be significant to another. The qualities that are most crucial to the system's goals should be highlighted in a public health surveillance system. The ability of a public health monitoring system to identify a health-related incident, for example, could be improved, but this could come at the expense of other qualities like timeliness or simplicity. As a result, when evaluating the public health monitoring system, the factors that are most important to a particular system's goals must be taken into account. The recommendations in this study define numerous tasks and associated activities that might be applied in the context of the traits that are of the highest priority.

Technological Advances in Public Health Surveillance

Technological advancements have revolutionized the field of public health surveillance, enabling more efficient and effective monitoring of the nation's health. In Saudi Arabia, these advancements have played a crucial role in enhancing the surveillance system and improving public health outcomes. This section explores some of the key technological advances in public health surveillance in Saudi Arabia. One of the most significant technological advancements in public health surveillance is the implementation of electronic health records (EHRs). EHRs have replaced traditional paper-based medical records, allowing for the seamless collection, storage, and retrieval of patient data. In Saudi Arabia, the Ministry of Health has implemented a national EHR system, known as the Saudi National Electronic Health Record (SN-EHR). This system enables healthcare providers to access and share patient information in real-time, facilitating timely and accurate disease surveillance.

General Objective:

Study for evaluation of Public Health surveillance system in Ministry of health based in major city, Saudi Arabia.

Specific objectives:

1- To identify the methods of data collection for surveillance system.

2- To study the ways in which data is analyzed for surveillance system.

3- To determine explanation and interpretation methods for surveillance system.

4- To determine methods of information dissemination and feedback for surveillance system.

5- To identify obstacles and constraints facing the surveillance system.

6- To investigate how the report of infectious diseases, particularly in the event of an epidemic.

Study Area:

The study area has covered health information system department, Ministry of Health- Saudi Arabia and health information system department in the hospitals.

Study Population:

Study will be done in Ministry of Health and Hospitals based in major cities in Saudi Arabia (Jeddah, Riyadh, Dammam and other City), Ministry of Health and Hospitals, including Heads, Directors, managers, and other related persons (department of research, surveillance, preventive health, community health, policy and planning and other healthcare providers) has been included and consulted in this study.

Consent Form:

The consent form was translated to Arabic and each Hospital has been informed about the aim of the study and their total coverage head Health information system Department. After approval by Director of health information system department in the Ministry of Health, the forms were distributed in assigned Hospital.

Data Collection:

The structured questionnaire was distributed to the staffs in medical record department to get their feedback about the public health surveillance system.

Data Analysis:

It is essential to understand the current state of public health surveillance in the Ministry of Health. The following data provides insights into various aspects of information collection, challenges faced, and the tools used, which help in identifying areas for improvement.

Below tables represents the data and analysis in response to the questions.

What are the methods used to collect health information?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Monthly reports	31	77.5	77.5	77.5
	Quarterly reports	7	17.5	17.5	95.0
	Selected areas	2	5.0	5.0	100.0
	Total	40	100.0	100.0	

The data collection methods primarily rely on monthly reports (77.5%), followed by quarterly reports (17.5%) and selected areas (5%). This indicates a strong preference for monthly reporting, but the reliance on a single method may lead to inefficiencies, particularly in ensuring consistent and accurate data quality.

Are there any obstacles and constraints you face in gathering information?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	11	27.5	27.5	27.5
	No	10	25.0	25.0	52.5
	Sometimes	19	47.5	47.5	100.0
	Total	40	100.0	100.0	

Almost half of the respondents (47.5%) sometimes experience obstacles in data gathering, while 27.5% consistently face issues. This suggests significant challenges in the data collection process that need to be addressed to ensure smooth operations and effective data reporting.

If the question 2 answer is yes or sometimes what the of these obstacles and constraints

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Administrative Obstacles	12	30.0	41.4	41.4
	Technical Obstacles	8	20.0	27.6	69.0
	Financial Obstacles	8	20.0	27.6	96.6
	others, if any	1	2.5	3.4	100.0
	Total	29	72.5	100.0	
Missing	System	11	27.5		
Total		40	100.0		

Among respondents facing obstacles, the majority cite administrative issues (41.4%) as a significant barrier, followed by technical and financial obstacles (27.6% each). This points to systemic problems in the administrative structure and inadequate technical support that need resolution for efficient data collection.

Do you face any obstacles in writing and sending reports?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	20.0	20.0	20.0
	No	21	52.5	52.5	72.5
	Sometimes	11	27.5	27.5	100.0
	Total	40	100.0	100.0	

While more than half of the respondents (52.5%) do not face issues in report writing, a substantial proportion (20% consistently and 27.5% sometimes) do encounter problems. This indicates the need for improving reporting tools and processes to reduce these obstacles.

If the answer of question no-4 is yes or sometimes than what is the main cause/ problems?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Network problems	9	22.5	42.9	42.9
	Shortage of technicians	4	10.0	19.0	61.9
	Inadequate training of employees	8	20.0	38.1	100.0
	Total	21	52.5	100.0	
Missing	System	19	47.5		
Total		40	100.0		

The most commonly reported cause of obstacles in reporting is network problems (42.9%), followed by inadequate training (38.1%) and a shortage of technicians (19%). Addressing these issues by improving infrastructure and providing proper training can reduce the occurrence of such obstacles.

Which software is basically used in the data analysis in your setup?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sophisticated statistical programs	15	37.5	38.5	38.5
	Not Sophisticated statistical programs	24	60.0	61.5	100.0
	Total	39	97.5	100.0	
Missing	System	1	2.5		
Total		40	100.0		

A significant proportion (60%) of respondents use non-sophisticated statistical programs for data analysis. This indicates a potential gap in access to advanced analytical tools, which may hinder the accuracy and depth of the data analysis performed in the surveillance system.

In your opinion feedback or information's coming to you are from the top authority quickly and timely?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	35.0	35.0	35.0
	No	19	47.5	47.5	82.5
	Sometimes	7	17.5	17.5	100.0
	Total	40	100.0	100.0	

Nearly half (47.5%) of the respondents report not receiving timely feedback from authorities, and only 35% receive prompt responses. This lack of timely feedback highlights a need for improving communication channels and response times to facilitate effective decision-making.

What are the administrative obstacles and constraints you face in your section?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The lack of Cooperation from Director	5	12.5	16.1	16.1
	The manager does not involve us in decision-making	16	40.0	51.6	67.7
	Other's, if any	10	25.0	32.3	100.0
	Total	31	77.5	100.0	
Missing	System	9	22.5		
Total		40	100.0		

The most prominent administrative obstacle is the lack of involvement in decision-making (51.6%), followed by a lack of cooperation from directors (16.1%). This suggests that improving involvement and fostering cooperation at all levels is essential for enhancing the overall efficiency of data collection efforts.

What are the technical problems that confront you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lack of training courses for employees	16	40.0	43.2	43.2
	Lack of work tools and equipment	16	40.0	43.2	86.5
	Network failures	3	7.5	8.1	94.6
	Other's, if any	2	5.0	5.4	100.0
	Total	37	92.5	100.0	
Missing	System	3	7.5		
Total		40	100.0		

The two primary technical challenges reported are a lack of training courses (43.2%) and lack of tools (43.2%). This indicates that both the skills of employees and the availability of necessary tools need to be improved to reduce technical problems effectively.

Is there any training courses given to you or your staff for technical statistics and health information management?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1	2.5	2.5	2.5
	No	38	95.0	95.0	97.5
	Sometimes	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

The data reveals a severe lack of training opportunities, with 95% of respondents indicating that they have not received training. Addressing this gap is crucial for building the capacity of health workers and enhancing data collection quality.

If the answer for question.10 is yes or sometimes What is the type of training

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Training is constant	5	12.5	100.0	100.0
Missing	System	35	87.5		
Total		40	100.0		

For the small percentage (5%) who did receive training, it was described as "constant training." This suggests that while some training is available, the vast majority of respondents do not benefit from such opportunities, indicating the need for expanding training programs.

Do you see that the data and interpretation reflected in the health information system positively?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	85.0	85.0	85.0
	No	6	15.0	15.0	100.0
	Total	40	100.0	100.0	

Most respondents (85%) believe that the health information system positively impacts their work. This is an encouraging sign that despite existing challenges, the system holds value and offers a solid foundation for improvement.

Is the supportive supervision of the regions and provinces sufficient?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	35.0	35.0	35.0
	No	26	65.0	65.0	100.0
	Total	40	100.0	100.0	

The majority (65%) of respondents report insufficient supportive supervision. This suggests that enhancing supervisory support is a key area where improvements could help in overcoming data collection challenges.

Is the data used in the data collection and reporting is sufficient?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	24	60.0	60.0	60.0
	No	16	40.0	40.0	100.0
	Total	40	100.0	100.0	

While 60% believe that the data used in reporting is sufficient, 40% do not. This indicates a need for reviewing data sufficiency and accuracy to ensure consistent and comprehensive reporting across the system.

Information feedback you come with in detail for all levels

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	24	60.0	60.0	60.0
	No	16	40.0	40.0	100.0
	Total	40	100.0	100.0	

Only 60% of respondents indicated that feedback is received in detail for all levels, suggesting that there is room for improving transparency and thoroughness in information sharing to enhance data quality.

Do employees have adequate capacities in the health information system?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	19	47.5	47.5	47.5
	No	11	27.5	27.5	75.0
	some of them	10	25.0	25.0	100.0
	Total	40	100.0	100.0	

The data shows mixed opinions on employee capacities, with 47.5% indicating adequacy, 27.5% indicating inadequacy, and 25% saying only some have the necessary skills. This indicates a need for targeted capacity-building initiatives.

Are data collection and reporting tools sufficient?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	21	52.5	52.5	52.5
	No	19	47.5	47.5	100.0
	Total	40	100.0	100.0	

About half of the respondents (52.5%) feel that data collection tools are sufficient, while the other half disagree. Improving the availability and quality of data collection tools could have a positive impact on the efficiency and accuracy of data gathered.

Are there policies and guidelines for reporting?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	32	80.0	80.0	80.0
	No	8	20.0	20.0	100.0
	Total	40	100.0	100.0	

Although 80% of respondents confirm the existence of reporting guidelines, 20% do not. This gap points to a need for greater awareness and training regarding these guidelines to ensure all staff are informed.

Do you think that many of the parallel data that has been developed by the collection systems of different programs and agencies, is consistent with your health information system?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	24	60.0	60.0	60.0
	No	16	40.0	40.0	100.0
	Total	40	100.0	100.0	

A significant portion (40%) of respondents indicated that parallel data systems are not consistent with their health information system. Harmonizing these systems could help in reducing confusion and improving data consistency.

Do you have special reports to report infectious diseases?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	23	57.5	57.5	57.5
	No	17	42.5	42.5	100.0
	Total	40	100.0	100.0	

About 42.5% of respondents indicate a lack of special reports for infectious diseases. Establishing standardized reporting processes for infectious diseases is essential for timely response

Do you have clear list of reportable/ notifiable list of diseases?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	25	62.5	62.5	62.5
	No	15	37.5	37.5	100.0
	Total	40	100.0	100.0	

With 37.5% indicating no clear list of reportable diseases, there is a clear need for disseminating such lists to ensure that all health personnel are aware of the requirements for infectious disease reporting.

What is the frequency to report such diseases?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 - 24 Hours	13	32.5	32.5	32.5
	1 Day	14	35.0	35.0	67.5
	10 Days	4	10.0	10.0	77.5
	Others	9	22.5	22.5	100.0
	Total	40	100.0	100.0	

The variability in reporting frequency—from within 24 hours to 10 days—points to inconsistency in practices. Establishing a standardized reporting timeframe could enhance responsiveness in managing public health risks.

Is there any specific guidelines to report of infectious diseases, particularly in the event of any epidemic?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	35.0	35.0	35.0
	No	26	65.0	65.0	100.0
	Total	40	100.0	100.0	

The lack of awareness about guidelines for infectious diseases (reported by 65%) suggests the need for more comprehensive dissemination of protocols, particularly for managing outbreaks effectively.

If yes, Please specify

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		32	80.0	80.0	80.0
	Corona	3	7.5	7.5	87.5
	files archives, electronic healhrecoprd	2	5.0	5.0	92.5
	Need training	2	5.0	5.0	97.5
	Public Health	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

The responses indicate ambiguity in specific reporting requirements, with 80% of respondents providing no specifications. This highlights a need for clearer and more detailed guidelines for reporting infectious diseases to ensure proper compliance.

Role of Public Health Surveillance in Saudi Arabia

Public health surveillance plays a crucial role in Saudi Arabia's healthcare system, providing valuable information for monitoring and improving the nation's health. The Kingdom of Saudi Arabia recognizes the importance of surveillance in preventing and controlling diseases, promoting health, and ensuring the well-being of its population. This section will explore the role of public health surveillance in Saudi Arabia, highlighting its significance, objectives, and key components.

Significance of Public Health Surveillance in Saudi Arabia

Public health surveillance is essential for identifying and monitoring the occurrence of diseases, injuries, and other health-related events in Saudi Arabia. It serves as a foundation for evidence-based decision-making, enabling policymakers and public health officials to develop effective strategies and interventions to protect and promote the health of the population. By collecting, analyzing, and interpreting health data, surveillance systems in Saudi Arabia provide valuable insights into the burden of diseases, risk factors, and trends over time.

One of the primary roles of public health surveillance in Saudi Arabia is to detect and respond to disease outbreaks promptly. By monitoring the occurrence of infectious diseases, such as respiratory infections, foodborne illnesses, and vaccine-preventable diseases, surveillance systems can identify outbreaks early, allowing for timely interventions to prevent further spread. This is particularly crucial during Hajj and Umrah seasons when millions of pilgrims from around the world gather in Saudi Arabia, increasing the risk of disease transmission.

Furthermore, public health surveillance in Saudi Arabia plays a vital role in monitoring and controlling chronic diseases. With the rising prevalence of non-communicable diseases, such as diabetes, cardiovascular diseases, and cancer, surveillance systems provide essential data on the burden of these conditions, risk factors, and the effectiveness of prevention and control programs. This information helps guide healthcare policies and interventions aimed at reducing the impact of chronic diseases on the population.

Objectives of Public Health Surveillance in Saudi Arabia

The public health surveillance system in Saudi Arabia has several key objectives:

Early Detection and Response: Surveillance systems aim to detect and respond to health threats promptly, including infectious diseases, environmental hazards, and other public health emergencies. By identifying outbreaks early, public health officials can implement timely interventions to prevent further spread and minimize the impact on the population.

Monitoring Disease Burden and Trends: Surveillance systems provide data on the occurrence, distribution, and trends of diseases and injuries in Saudi Arabia. This information helps assess the burden of diseases, identify high-risk populations, and evaluate the effectiveness of public health interventions.

Identification of Risk Factors: Surveillance systems play a crucial role in identifying and monitoring risk factors associated with various health conditions. By collecting data on behavioral, environmental, and occupational risk factors, public health officials can develop targeted interventions to reduce the prevalence and impact of these risk factors on the population's health.

Evaluation of Public Health Programs: Surveillance data is essential for evaluating the effectiveness of public health programs and interventions in Saudi Arabia. By monitoring key indicators and outcomes, such as vaccination coverage, disease incidence, and health behaviors, surveillance systems provide valuable insights into the impact of interventions and guide programmatic improvements.

Supporting Evidence-Based Decision Making: Public health surveillance provides the evidence base for decision-making in Saudi Arabia's healthcare system. Policymakers, public health officials, and healthcare providers rely on surveillance data to develop policies, allocate resources, and implement targeted interventions to address the nation's health priorities.

Components of Public Health Surveillance in Saudi Arabia

The public health surveillance system in Saudi Arabia

consists of several key components:

Data Sources: Surveillance systems in Saudi Arabia utilize various data sources, including healthcare facilities, laboratories, vital registration systems, and other relevant sources. These sources provide data on disease diagnoses, laboratory results, mortality, and other health-related events.

Data Collection Methods and Tools: Public health surveillance in Saudi Arabia employs a range of data collection methods, including case reporting, surveys, registries, and syndromic surveillance. These methods collect data on diseases, risk factors, and health behaviors, using standardized tools and protocols.

Data Management and Analysis: Surveillance data is managed and analyzed using robust information systems and analytical tools. This ensures data quality, confidentiality, and accessibility for timely analysis and interpretation.

Data Reporting and Dissemination: Surveillance data is reported and disseminated to relevant stakeholders, including public health officials, policymakers, healthcare providers, and the general public. This facilitates timely decision-making, program evaluation, and public awareness.

Result and Discussion

In the results and discussion section, we provide an overview of the key findings from the data analysis, highlighting significant relationships and patterns observed. The following analysis focuses on examining the association between the methods of data collection and the obstacles experienced in gathering information.

H_0 (Null Hypothesis): There is no significant association between the method of data collection and the occurrence of obstacles in gathering information in the public health surveillance system.

H_1 (Alternative Hypothesis): There is a significant association between the method of data collection and the occurrence of obstacles in gathering information in the public health surveillance system.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Methods of Data Collection * Obstacles in Gathering Information	40	100.0%	0	0.0%	40	100.0%

Methods of Data Collection * Obstacles in Gathering Information Crosstabulation

			Obstacles in Gathering Information			Total
			Yes	No	3	
Methods of Data Collection	Monthly Reports	Count	11	10	10	31
		% within Methods of Data Collection	35.5%	32.3%	32.3%	100.0%
		% within Obstacles in Gathering Information	100.0%	100.0%	52.6%	77.5%
	Quarterly Reports	Count	0	0	7	7
		% within Methods of Data Collection	0.0%	0.0%	100.0%	100.0%
		% within Obstac les in Gathering Information	0.0%	0.0%	36.8%	17.5%
	3	Count	0	0	2	2
		% within Methods of Data Collection	0.0%	0.0%	100.0%	100.0%
		% within Obstacles in Gathering Information	0.0%	0.0%	10.5%	5.0%
Total		Count	11	10	19	40
		% within Methods of Data Collection	27.5%	25.0%	47.5%	100.0%
		% within Obstacles in Gathering Information	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests			
	Value	df	Asymptotic Significance (2 - sided)
Pearson Chi-Square	12.835[a]	4	.012
Likelihood Ratio	16.366	4	.003
Linear-by-Linear Association	8.880	1	.003
N of Valid Cases	40		
a. 6 cells (66.7%) have expected count less than 5. The minimum expected count is .50.			

The Chi-square test was conducted to examine the relationship between the methods of data collection and the obstacles faced in gathering information within the public health surveillance system. The results indicate a statistically significant association between the two variables, as evidenced by a Pearson Chi-square value of 12.835 with a p-value of 0.012 ($p < 0.05$). This suggests that the method used to collect data—such as monthly reports, quarterly reports, or other methods—significantly influences whether obstacles are experienced in the information-gathering process. Specifically, the cross-tabulation shows that obstacles were more frequently reported when using monthly reports compared to other methods. For example, 35.5% of the monthly report method responses indicated obstacles. In contrast, no obstacles were reported under quarterly reporting and other methods. The observed relationship may reflect differing levels of administrative burden, resource allocation, or technical challenges across different data collection schedules.

However, it is important to note that 66.7% of the expected cell counts were less than 5, which violates the Chi-square test assumption of minimum expected frequencies. This implies that caution should be exercised when interpreting these results, as the reliability of the test may be compromised. Despite this limitation, the findings highlight that the method of data collection plays an important role in the occurrence of obstacles, thereby providing critical insights for improving data collection efficiency in public health surveillance.

The hypothesis testing was conducted using the Chi-square test to determine if there was a significant association between the method of data collection and the occurrence of obstacles in gathering information in the public health surveillance system. The results yielded a Pearson Chi-square value of 12.835 with a p-value of 0.012 ($p < 0.05$), indicating a statistically significant relationship between the method used for data collection and the frequency of obstacles experienced. Based on these results, the null hypothesis (Hÿ)—which states that there is no significant association between the method of data collection and the occurrence of obstacles—was rejected. The findings support the alternative hypothesis (H_1), confirming that the method of data collection significantly influences the likelihood of facing obstacles during information gathering. This highlights the need for targeted interventions to optimize data collection practices and reduce barriers to efficient public health surveillance.

Conclusion:

The role of public health surveillance in Saudi Arabia is multifaceted, encompassing disease surveillance, risk factor surveillance, surveillance for special populations, data analysis and interpretation, system evaluation and improvement, and future directions in surveillance. By fulfilling these roles, public health surveillance contributes significantly to the nation's health and well-being, enabling evidence-based decision-making, timely response to health threats, and the implementation of effective interventions.

Reporting and Dissemination of Infectious Disease Data

The timely reporting and dissemination of infectious disease data are crucial for effective public health action. The MOH regularly publishes surveillance reports that provide an overview of disease trends, outbreak investigations, and control measures. These reports are made available to healthcare professionals, policymakers, and the general public. In addition to reports, the MOH also utilizes various communication channels, such as websites,

social media, and press releases, to disseminate information on infectious diseases and promote public awareness.

The MOH actively collaborates with international organizations, such as the World Health Organization (WHO), to share infectious disease data and contribute to global surveillance efforts. This collaboration allows for the exchange of information, best practices, and expertise in the field of infectious disease surveillance.

In conclusion, the infectious disease surveillance system in Saudi Arabia plays a vital role in monitoring and controlling the spread of infectious diseases. Through the collection, analysis, and dissemination of data, public health authorities can detect outbreaks, track disease trends, and implement appropriate control measures. The integration of electronic reporting systems and international collaboration further strengthens the surveillance system and enhances its effectiveness in safeguarding the nation's health.

Policy Implications

The findings from the Chi-square test indicate that the method of data collection significantly impacts the obstacles faced in gathering information for public health surveillance. To improve data collection efficiency, policymakers should consider the following implications:

1. **Optimize Data Collection Methods:** Since monthly reports are associated with a higher occurrence of obstacles, shifting towards methods with fewer reported issues—such as quarterly reporting—may help reduce administrative and technical burdens. Streamlining data collection schedules could alleviate the pressure on health workers and improve data quality.
2. **Resource Allocation:** The significant obstacles encountered with monthly reports may indicate inadequate resource allocation. Policymakers should ensure that sufficient resources, including human resources, training, and technical support, are provided for data collection methods that have higher administrative requirements.
3. **Training and Capacity Building:** Technical challenges associated with certain data collection methods highlight the need for additional training and capacity building for personnel involved in data collection. Providing regular training sessions to staff on effective data collection and handling techniques could minimize errors and reduce the occurrence of obstacles.
4. **Develop Clear Guidelines:** Establishing clear and standardized guidelines for data collection methods can help minimize the occurrence of obstacles. Policymakers should develop detailed guidelines that specify best practices for each data collection method to ensure consistency and reduce confusion among data collectors.
5. **Evaluate and Adapt Data Collection Practices:** Continuous evaluation of data collection methods is essential. Policymakers should implement feedback mechanisms to gather insights from field staff on obstacles faced, allowing for timely adjustments and improvements to data collection practices.

These policy implications aim to improve the overall efficiency of public health data collection and reduce barriers to gathering accurate and reliable health information. Implementing these changes can lead to more effective surveillance and ultimately better-informed public health decision-making.

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