

Avaliação das capacidades de vigilância do Centro de Informações Estratégicas em Vigilância em Saúde do Ministério da Saúde, Brasil.

**Assessment of surveillance capacities of the Center for Strategic Information in Health Surveillance, Ministry of Health, Brazil.**

Evaluación de las capacidades de vigilancia del Centro de Informaciones Estratégicas de Vigilancia en Salud del Ministerio de Salud, Brasil.

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**ABSTRACT:** The Center for Strategic Information in Health Surveillance of the Health Surveillance Secretariat, Ministry of Health, Brazil (CIEVS/MS) was institutionalized in the context of the International Health Regulations (IHR) as the strategy for surveillance of public health emergencies, with the objective to ensure detection, evaluation and reporting of public health events that may constitute public health emergencies of national and international concern, representing the National IHR Focal Point of Brazil. The purpose of this paper is to assess the surveillance capacities of CIEVS/MS. The applied method was the evaluation research using the logic model, whereby the indicators were formulated to evaluate CIEVS/MS work process, according to political, technical and institutional aspects in detection, evaluation and notification components. The surveillance capacities were classified as partially appropriate, revealing the strengths and weaknesses of CIEVS/MS work process. The logic model was an important method to evaluate the health surveillance service. Thus, it is recommended that CIEVS/MS work process be organized and strengthened for proper monitoring of public health emergencies in Brazil.

Keywords: Epidemiological Surveillance. Notice. Emergencies. Public Health.

## INTRODUCTION

Historically, surveillance has been structured as a function of the State, for the fulfilment of functions considered as public interest<sup>1</sup>. From the 1950s, epidemiological surveillance emerges to designate control activities of communicable diseases. In Brazil, the Smallpox Eradication Campaign is considered the milestone of the institutionalization of surveillance actions in the country<sup>2</sup>.

In the context of the development of surveillance of communicable diseases of international importance, it was consolidated the International Health Regulations (IHR), whose first version of 1951 presented the purpose of protection of countries from the international spread of diseases. The IHR, approved in 2005 by the 58<sup>th</sup> World Health Assembly, is in force in the 194 countries members of the World Health Organization (WHO), also denominated as States Parties, since June 15, 2007. According to the Charter of the United Nations and the principles of international law, States have the sovereign right to legislate and implement the legislation in order to fulfil their own health policies, observing the determinations of the Regulations<sup>3</sup>.

The IHR of 2005 contemplates new strategies for surveillance and control of communicable diseases, including events produced by non-biological agents. In addition to representing the expansion of the surveillance scope to public health events, it highlights the risk evaluation criteria and the strategy for the use of the decision-making tool for event notifications<sup>4</sup>. In this regard, it guides the establishment of National Focal Points in the States Parties, permanently accessible for direct communication with WHO IHR Contact Points, in cases of public health emergencies of national and international concern<sup>5</sup>.

The focal points are assigned to facilitate opportune communication of surveillance informations, being responsible for the direct notification to the WHO counterpart in accordance with the Regulations, communication to the National IHR Focal Points of other signatory countries, and dissemination of information to health authorities of their own territory. The Center for Strategic Information in Health Surveillance, Ministry of Health, Brazil (CIEVS/MS), institutionalized by means of the Decree n° 30 of 2005<sup>6</sup>, is the operational unit of the National IHR Focal Point of Brazil.

Considering the constant change in the epidemiological patterns and the need for timely response to relevant grievances in public health, the CIEVS/MS replicates the surveillance strategy based on events. According to the WHO, surveillance based on events is characterized by the fast detection of potential risks to public health from official informations, transmitted by the notification systems, or unofficial, broadcast by the media, health professionals and the population<sup>7</sup>.

In this sense, the CIEVS/MS is responsible for the surveillance of the public health events of

immediate compulsory notice. The competencies of CIEVS/MS involve detection, evaluation, notification and monitoring of risks to public health and public health emergencies of national and international concern; besides the timely communication of informations to the relevant technical units of the federal government, to the Centers for Strategic Information in Health Surveillance of the Health Secretariats of the states (CIEVS/SES), of the capitals (CIEVS/SMS) and the Federal District, and the National IHR Focal Points.

The Public Health Emergency of National Importance (ESPIN) is characterized by an event that represents risk to the national public health. According to Decree nº 7616, the ESPIN statement occurs in situations of outbreaks or epidemics, disasters or lack of assistance to the population, that go beyond the responsiveness of the state management of the Unified Health System (SUS) or, specifically in epidemiological situations, “present risk of national dissemination, are produced by unexpected infectious agents, represent the reintroduction of eradicated disease or present extensive gravity”<sup>8</sup>.

According to the IHR, the Public Health Emergency of International Concern (PHEIC) means an extraordinary event which is a public health risk in other countries, with potential for international spread and that, generally, requires an international coordinated response<sup>3</sup>. According to the concepts defined by the IHR, “public health risk means a likelihood of an event that may affect adversely the health of human populations”<sup>3</sup>.

The record of information referring to potential public health emergencies monitored by CIEVS/MS is performed on the Event Monitoring System in Public Health (SIME), parallel database, not nominal basis, with aggregate information about the events, and restricted access to registered users.

Whereas the surveillance of public health events is required to provide the alert to the country surveillance system<sup>9</sup>, the role of CIEVS/MS is essential for the surveillance and response to public health emergencies. Therefore, this article aims to present the evaluation of the surveillance capacities of CIEVS/MS according to the IHR, in the detection assignments, evaluation and reporting of potential public health emergencies of national and international concern.

## **DEVELOPMENT**

### **METHODS**

It was developed a case study, of evaluative character, on capabilities of detection, evaluation and notification of potential public health emergencies of national and international importance by the CIEVS/MS, in the period from January to December 2012.

The data sources for analysis and judgment of the indicators were the records of electronic messages of the institutional address and the SIME databases of CIEVS/MS, being performed the

comparison of descriptive information of the public health events in SIME with the data available in electronic mail messages.

The study approach used the logic model of evaluation, of qualitative and quantitative nature. As a strategy of functionality representation of a program through the synthesis of its main components, the logic model summarizes the functioning mechanism of a program or service in a sequence of steps that links the structure, process and results<sup>10,11</sup>.

Whereas the logic model allows defining a set of indicators for the assessment, in both of the structure and the processes and results<sup>11</sup>, were established indicators for evaluating the work processes of CIEVS/MS. The process indicators have been proposed in order to interpret data of continuous and systematic way, besides of enabling the update and adjustments as needed.

For the development of matrices of analysis and judgment, were identified components of the work process of CIEVS/MS involved in the detection, evaluation and notification of potential public health emergencies. The strategic dimensions were selected as the institutional context of the CIEVS/MS, considering the political, technical and organizational aspects.

The political dimension of CIEVS/MS addresses the regulatory issues of detection processes, evaluation and reporting of public health events and potential public health emergencies. It relates to the strategic role of reporting and monitoring of the potential public health emergencies of national and international concern, as regulated by the laws, ordinances and national decrees, as well as by international standards.

The technical dimension refers to the performance of the professionals involved in the work processes of CIEVS/MS. It highlights the responsibilities of everyday tasks, the record of information in the databases and the sharing of information related to public health events and public health emergencies of national and international importance.

The organizational dimension relates to the way the institution is organized to coordinate the surveillance of public health emergencies. This aspect involves the form of decentralized organization of the strategy in the states and capitals, and refers to intersectoral and interinstitutional articulation in the process of information sharing developed by CIEVS/MS.

The first component of the working process of CIEVS/MS refers to the detection, step in which is captured and/or received information on the potential public health emergencies of national and international concern. The detection is divided into two parts: active and passive detection. Active detection represents the capturing activity of rumors about public health events, reported in the media or by the population, with the subsequent confirmation of the veracity of the informations. Passive detection deals with public health events reported to the CIEVS/MS by the CIEVS/SES and CIEVS/SMS; technical units of the Health Surveillance Secretariat in the Ministry of Health (UT/SVS), the State Health Secretariats (UT/SES) and the Municipal Health Secretariats (UT/SMS);

health professionals, health services or partner institutions of the Ministry of Health, through the electronic mail, free direct dial phone or electronic form of notification available on the Health Surveillance Secretariat (SVS) website.

The second component consists of the evaluation, that is, the assessment of the relevance in public health of events detected active or passively by CIEVS/MS. It corresponds to the risk assessment of public health events based on IHR criteria: public health impact; unusual or unexpected event; risk of international spread; risk of international travel or trade restrictions. This component of the work process is longitudinal in relation to the others.

The third component is characterized by notification, communication step of qualified information referring to public health events, evaluated according to the risk rating criteria, the final actors of surveillance for decision making and the necessary response actions. Such component includes the notification of public health emergencies of national and international concern to the national actors and WHO IHR Contact Point in the Americas, the Pan American Health Organization (PAHO), under the terms of the Regulations.

For each component of the CIEVS/MS work process specific indicators were built, considering each one of the strategic dimensions. For each indicator patterns of analysis and judgment have been set.

All events reported and monitored by CIEVS/MS, in the period from January to December of 2012, were evaluated based on the logic model and the matrices of analysis and judgment. The analysis of monitored events was ordered according to specific roadmap for direct observation of CIEVS/MS work processes.

The classification of the capabilities of detection, evaluation and reporting of potential public health emergencies of national and international concern by CIEVS/MS was presented based on the predominance of indicators evaluated as Good in the three strategic dimensions and in the three components of the work process.

The capabilities of detection, evaluation and reporting of potential public health emergencies by CIEVS/MS were assessed, primarily, according to the component of the work process and strategic dimension from the average of monitored events with Good indicator. In the end, the final analysis of CIEVS/MS surveillance capacities was performed in the three strategic dimensions and in the three components, according to the average of monitored events with the Good indicator.

The study was submitted to the Research Ethics Committee of the National School of Public Health and approved according to the statement number 463.174, on November 27, 2013.

## RESULTS

The matrices of analysis and judgment of each component of the CIEVS/MS work process were structured based on the three components and the three strategic dimensions. The form of calculation of the indicators according to the data verification sources is presented in the respective matrices of components (boards 1, 2 and 3).

Board 1. Evaluation and Judgment Matrix: Component Detection

Strategic Dimensions of the Component Detection of the Work Process of CIEVS/MS								
Political			Technical			Organizational		
Indicator	Judgment		Indicator	Judgment		Indicator	Judgment	
<b>Contact of the CIEVS/MS with CIEVS/ SES and/ or UT/SVS to verify the informations within 24 hours from the active or passive detection</b>	Register of the public health event in the Notifications database of the SIME	Contact of the CIEVS/MS with CIEVS/ SES and/or UT/SVS via electronic mail within 24 hours from the active or passive detection	<b>Communication of the CIEVS/ MS with CIEVS/ SES and/or UT/SVS to update the informations within 72 hours from the active or passive detection</b>	Register of updates in the Notifications or Events databases of the SIME	Communication of the CIEVS/ MS with CIEVS/SES and/or UT/ SVS via electronic mail to update the informations within 72 hours from the active or passive detection	<b>Response of the CIEVS/ SES and/or UT/SVS to the request of verification within 24 to 48 hours from the initial contact of the CIEVS/MS</b>	Does not apply to the variables available in the SIME	Response of the CIEVS/ SES and/ or UT/ SVS to the request of verification of the CIEVS/ MS via electronic mail within 24 to 48 hours from the initial contact of the CIEVS/ MS

Source: Elaborated by the authors.

Board 2. Evaluation and Judgment Matrix: Component Evaluation

Strategic Dimensions of the Component Evaluation of the Work Process of CIEVS/MS								
Political			Technical			Organizational		
Indicator	Judgment		Indicator	Judgment		Indicator	Judgment	
<b>Risk evaluation of the public health event discussed at the weekly meeting of the Events Monitoring Committee</b>	Register of the risk evaluation of the public health event in the Events database of SIME according to the weekly meeting of the Events Monitoring Committee	Does not apply to informations available in electronic messages of the institutional address	<b>Risk evaluation of the public health event performed by CIEVS/MS in conjunction with UT/SVS of grievance reference</b>	Risk evaluation description of the public health event in the Events database of the SIME	Information about the risk evaluation of the public health event communicated via electronic mail	<b>Information flow between CIEVS/MS, CIEVS/SES and UT/SVS to support the risk evaluation of the public health event</b>	Does not apply to the variables available in the SIME	Updates related to risk evaluation of the public health event communicated via electronic mail

Source: Elaborated by the authors.

## Board 3. Evaluation and Judgment Matrix: Component Notification

Strategic Dimensions of the Component Notification of the Work Process of CIEVS/MS								
Political			Technical			Organizational		
Indicator	Judgment		Indicator	Judgment		Indicator	Judgment	
<b>Notification of the public health event to CIEVS/SES, UT/SVS and partners within 24 hours from the active or passive detection</b>	Register of the public health event in the Notifications database of the SIME	Notification of the public health event to CIEVS/SES, UT/SVS and partners via electronic mail within 24 hours from the detection	<b>Sending of updates of the public health event within 24 hours from the receiving or capture</b>	Register of updates of the public health event in the Notifications database of the SIME	Routing of updates of the public health event to CIEVS/SES and UT/SVS within 24 hours from the receiving or capture	<b>Response of the UT/SVS and/or CIEVS/SES within 48 hours of notification of the public health event by CIEVS/MS</b>	Does not apply to the variables available in the SIME	Response of the UT/SVS and/or CIEVS/SES within 48 hours of notification of the public health event by CIEVS/MS

Source: Elaborated by the authors.

### ANALYSIS OF INDICATORS

Based on matrices of analysis and judgment of the work processes of CIEVS/MS, was developed the evaluation of the 58 public health events of national and international importance monitored by the service in the period from January to December of 2012. The evaluation of each component of the CIEVS/MS work process linked to the detection, evaluation and notification of public health events was expressed according to the findings obtained from the analysis of the indicators in three strategic dimensions.

For each indicator were defined standards of analysis and judgment, distributed in the following categories: Good - indicator fully covered; Regular - indicator partially covered; Insufficient - indicator poorly covered; Critical - indicator had no requirement contemplated. Results of the analysis of indicators regarding to each public health event are presented in board 4.

Board 4. Public health events monitored according to the analysis of the indicators (continues)

Public health events	COMPONENTS OF THE WORK PROCESS OF CIEVS/MS								
	Detection			Evaluation			Notification		
	STRATEGIC DIMENSIONS								
	Political	Technical	Organizational	Political	Technical	Organizational	Political	Technical	Organizational
Severe Acute Respiratory Syndrome	Good	Regular	Good	Good	Good	Good	Good	Regular	Critical
Human Rabies	Good	Regular	Good	Good	Good	Good	Good	Regular	Good
Malaria	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Severe Acute Respiratory Syndrome	Good	Good	Good	Good	Good	Good	Good	Good	Good
Brazilian Spotted Fever	Critical	Insufficient	Critical	Good	Regular	Critical	Critical	Critical	Critical
Human Rabies	Good	Good	Critical	Good	Good	Good	Good	Regular	Critical
Human Rabies	Good	Insufficient	Good	Good	Good	Good	Regular	Regular	Good
Meningococcal Meningitis	Regular	Insufficient	Good	Good	Good	Critical	Regular	Critical	Good
Yellow Fever	Regular	Insufficient	Critical	Good	Regular	Good	Regular	Regular	Critical
Alimentary Botulism	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Meningococcal Meningitis	Good	Regular	Good	Good	Good	Good	Good	Regular	Good
Brazilian Spotted Fever	Good	Regular	Good	Good	Good	Good	Good	Critical	Good
Undefined Etiology	Good	Regular	Good	Good	Good	Good	Good	Regular	Good
Meningococcal Meningitis	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Exogenous Intoxication	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Human Rabies	Good	Regular	Good	Good	Good	Good	Good	Regular	Good
Flu Syndrome	Good	Regular	Good	Good	Good	Good	Good	Good	Good
Chikungunya	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Acute Diarrhoeal Disease	Regular	Regular	Good	Good	Good	Good	Regular	Regular	Good
Acute Diarrhoeal Disease	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Exogenous Intoxication	Good	Insufficient	Critical	Good	Good	Good	Good	Good	Critical
Severe Acute Respiratory Syndrome	Good	Insufficient	Critical	Good	Good	Good	Good	Good	Critical
Leptospirosis	Good	Good	Good	Good	Good	Good	Good	Good	Good
American Cutaneous Leishmaniasis	Good	Good	Good	Good	Good	Good	Good	Good	Good
Exogenous Intoxication	Good	Good	Good	Good	Good	Good	Good	Good	Good
Alimentary Botulism	Good	Regular	Critical	Good	Good	Good	Good	Regular	Critical
Acute Diarrhoeal Disease	Good	Insufficient	Good	Good	Good	Good	Good	Regular	Good
Alimentary Botulism	Good	Insufficient	Critical	Good	Good	Good	Good	Good	Critical
Natural Disaster	Critical	Regular	Critical	Good	Good	Good	Critical	Regular	Critical
Natural Disaster	Critical	Insufficient	Critical	Good	Regular	Critical	Critical	Critical	Critical

Source: Elaborated by the authors.

## Board 4. Public health events monitored according to the analysis of the indicators (conclusion)

Public health events	COMPONENTS OF THE WORK PROCESS OF CIEVS/MS								
	Detection			Evaluation			Notification		
	STRATEGIC DIMENSIONS								
	Political	Technical	Organizational	Political	Technical	Organizational	Political	Technical	Organizational
Natural Disaster	Good	Good	Good	Good	Regular	Good	Good	Regular	Good
Natural Disaster	Good	Good	Good	Good	Regular	Good	Good	Good	Good
Natural Disaster	Good	Good	Good	Good	Regular	Good	Good	Regular	Good
Measles	Regular	Regular	Good	Good	Good	Insufficient	Regular	Regular	Good
Measles	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Chikungunya	Regular	Regular	Good	Good	Regular	Good	Regular	Regular	Good
Viral Meningitis	Regular	Regular	Critical	Good	Regular	Good	Regular	Regular	Insufficient
Cholera	Regular	Good	Good	Good	Regular	Good	Regular	Regular	Good
Acute Diarrhoeal Disease	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Whooping Cough	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Alimentary Botulism	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Yellow Fever	Regular	Regular	Critical	Good	Good	Insufficient	Regular	Critical	Critical
Meningococcal Meningitis	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Measles	Regular	Regular	Insufficient	Good	Good	Critical	Regular	Critical	Critical
Flu Syndrome	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Exogenous Intoxication	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Human Rabies	Regular	Regular	Insufficient	Good	Good	Good	Critical	Regular	Insufficient
Malaria	Regular	Regular	Good	Good	Regular	Insufficient	Regular	Regular	Good
Flu Syndrome	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Acute Chagas Disease	Regular	Regular	Critical	Good	Regular	Critical	Regular	Regular	Critical
Hantavirus	Regular	Regular	Critical	Good	Regular	Critical	Regular	Regular	Critical
Yellow Fever	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Human Rabies	Regular	Good	Good	Good	Good	Insufficient	Regular	Regular	Good
Brazilian Spotted Fever	Regular	Good	Good	Good	Good	Good	Regular	Regular	Good
Hepatitis A	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Undefined Etiology	Good	Good	Good	Good	Good	Good	Good	Regular	Good
Meningococcal Meningitis	Critical	Insufficient	Critical	Good	Regular	Critical	Critical	Critical	Critical
Acute Diarrhoeal Disease	Good	Regular	Good	Good	Good	Good	Good	Good	Good

Source: Elaborated by the authors.

### **Component Detection**

The analysis of the political dimension showed that, of the total events, 31 (53%) presented the indicator classified as Good, and 23 events (40%) the Regular indicator.

The technical dimension allowed evaluating the work routines of CIEVS/MS connected to the obtaining of data and record of updates of the public health events monitored. The evaluation identified 28 events (48%) with Good indicator and 20 events (34%) with Regular indicator.

The organizational dimension allowed evaluating the articulation between the CIEVS/MS, the CIEVS/SES and the UT/SVS in the communication process related to public health events of national and international importance. It was found that the organizational indicator was Good in 42 events (72%). In turn, 14 events (24%) with Critical indicator were classified.

Based on the detailed analysis by means of electronic messages, it was observed that, among the not covered or incipient events, nine (56%) were reported by CIEVS/MS to CIEVS/SES and UT/SVS on Fridays or during weekends. Such result demonstrates that the uninterrupted accessibility of surveillance services of public health emergencies consists of influencing factor of the work process.

### **Component Evaluation**

The analysis of the political dimension reflected the systematic process of risk assessment of the public health events in the weekly meetings of the Events Monitoring Committee (EMC), in addition to the standardization of nomenclature of the National Public Health Risk (RSPN) according to the IHR. Considering that the RSPN classification has started to be used to demonstrate that the public health events monitored by CIEVS/MS represent potential risks to the national public health, all events were contemplated in this dimension and the indicator was Good in 100%.

The analysis of the technical dimension demonstrated the articulated work of CIEVS/MS with the other technical units of the SVS to perform the risk assessment of public health events. It was classified with Good indicator in 45 events (78%). The 13 remaining events (22%) had Regular indicator.

As the organizational dimension relates to the way the institution is organized to coordinate surveillance and risk classification of public health emergencies, the indicator sought to evaluate the continuity of the risk assessment process of monitored events. It was observed that 47 events (81%) were classified with Good indicator.

### **Component Notification**

The political dimension relates to the regulated role of CIEVS/MS of gathering advanced communication mechanisms for the monitoring of public health emergencies both in national and international levels. Therefore, sought to evaluate the opportunity of reporting of public health events by the CIEVS/MS to the CIEVS/SES, UT/SVS and other actors. It was observed that 30 events (52%) were classified with Good indicator and 23 events (40%) presented Regular indicator.

The analysis of the technical dimension allowed observing the update of information in the SIME databases, in addition to enabling the verification of response and timely routing of information by CIEVS/MS. Only 10 events (17%) were classified with Good indicator. The Regular classification was presented in 41 events (71%) and Critical in 7 events (12%).

The organizational dimension, finally, allowed evaluating the work of CIEVS/MS in liaison with other technical units of the SVS and CIEVS/SES. It was verified that 41 events (71%) presented Good indicator. However, 15 events (26%) resulted in Critical indicator.

As observed in the organizational dimension of the component detection, timely response to CIEVS/MS depends on the functioning and accessibility of CIEVS/SES and UT/SVS during the nocturnal periods, weekends and holidays. In this context, among the events which indicator was classified as Insufficient or Critical, nine (53%) were notified on Fridays or on weekends.

### **Surveillance Capacities**

The capabilities of detection, evaluation and reporting of potential public health emergencies of national and international concern by CIEVS/MS were classified based on the predominance of indicators classified as Good in the three strategic dimensions and in the three components of the work process. Therefore, the possibilities of classification were defined according to the following categories: Appropriate - over 70% of indicators classified as Good in the three dimensions and in the three components; Partial or partially appropriate - between 50% and 70% of indicators classified as Good in the three dimensions and in the three components; Insufficient - between 30% and 50% of indicators classified as Good in the three dimensions and in the three components; Incipient - below 30% of classified indicators as Good in the three dimensions and in the three components.

Considering the relevance of each strategic dimension and each component of the work process, there was no difference on weighting factors for the definition of the prevalence of indicators. Therefore, the prevalence of indicators classified as Good was based on the simple arithmetic average of the number of events with indicator Good in the three strategic dimensions and in the three components of the work process.

The analysis results of the monitoring capacities of the CIEVS/MS are shown in table 1.

Table 1. Surveillance capacities of CIEVS/MS according to the distribution of events with indicator Good for strategic dimension and work process component

Detection		Components of the Work Process				Surveillance Capacities
		Notification		Total		
Strategic Dimensions	Political	31 (53%)	58 (100%)	30 (52%)	40 (68%)	Partial
	Technical	28 (48%)	45 (78%)	10 (17%)	28 (48%)	Insufficient
	Organizational	42 (72%)	47 (81%)	41 (71%)	43 (75%)	Appropriate
	<b>Total</b>	34 (58%)	50 (86%)	27 (46%)	37 (64%)	Partial
<b>Surveillance Capacities</b>		Partial	Appropriate	Insufficient	Partial	Partial

Source: Elaborated by the authors.

The analysis of the capabilities of detection, evaluation and reporting was performed according to the work process component, and the final result was considered from the simple arithmetic average of the number of events with indicator Good distributed in three strategic dimensions.

On the component detection, the capacity of CIEVS/MS was classified as partially appropriate. On the component evaluation, on the other hand, the capacity of CIEVS/MS was classified as appropriate. Finally, on the component notification, the capacity of CIEVS/MS was classified as insufficient.

The capabilities of detection, evaluation and notification of CIEVS/MS were also analyzed according to the strategic dimensions, and the final result was considered from the simple arithmetic average of the number of events with indicator Good distributed in the components of the work process.

On political dimension, the capacity of CIEVS/MS was classified as partially appropriate. According to the technical dimension, the capacity of CIEVS/MS was classified as insufficient. On organizational dimension, in turn, the capacity of CIEVS/MS was classified as appropriate.

The surveillance capacities of CIEVS/MS were calculated according to the total capacities of detection, evaluation and notification on the work process components and strategic dimensions. According to the components of the work process, the total capacities of CIEVS/MS were classified as partially appropriate. Similarly, according to the strategic dimensions, the total capacities of CIEVS/MS were classified as partially appropriate.

Therefore, the surveillance capacities of CIEVS/MS were evaluated as partially suitable, which corresponds to the criterion of 50 percent to 70 percent of indicators classified as Good in the three strategic dimensions and on the three components of the working process.

## CONCLUSION

The assessment of CIEVS/MS surveillance capacities contributes to the process of monitoring of the surveillance actions and response to public health emergencies in Brazil, as well as enables to subsidize the management of work processes related to surveillance based on events.

The results of the analysis of process indicators show the situational diagnosis of the surveillance strategy for public health emergencies in the scope of the SVS. In this context, they reveal the potentialities and weaknesses of the work processes of CIEVS/MS and underlie the importance of the organization of activities for the proper fulfillment of the objectives of the service according to the IHR.

The observed potentialities focus on the component evaluation and organizational dimension. Such diagnostic reveals that the actuation of CIEVS/MS stands out in the development of the risk assessment of public health events and the effective liaison with the actors involved in the surveillance and response to public health emergencies.

Moreover, were observed weaknesses in the components detection and notification, as well as in the political and technical dimensions. These results mean that there is need to improve the following work processes: proper register of information in databases; reporting and rapid communication of public health events; update of the monitored events; appropriate routing of information.

Usually, the surveillance systems based on indicators are evaluated according to the qualitative attributes (simplicity, flexibility, stability, quality of data and acceptability), quantitative attributes (sensitivity, representativeness, opportunity and positive predictive value) and utility<sup>12</sup>. However, in the face of lack of international reference for the evaluation of surveillance systems based on events, the application of the logic model in the analysis of work processes has revealed to be an important method for evaluation of the service responsible for the surveillance of public health emergencies in the country.

Considering that the epidemiological intelligence results from the confluence of information obtained from the surveillance strategies based on indicators and surveillance based on events<sup>13,14</sup>, the surveillance of public health emergencies could be improved according to the use of data generated in the routine of epidemiological surveillance, in order to facilitate the confirmation of the veracity of informations and produce alerts for timely identification of potential public health emergencies.

Furthermore, knowing that the surveillance strategy based on events is professed by the WHO with the purpose of warning and rapid response to public health emergencies<sup>15</sup> and that such strategy was applied during the London 2012 Olympic Games, being evaluated as useful, acceptable, stable and reliable<sup>16</sup>, it is recommended that the work processes of CIEVS/MS are systematized and

strengthened for the appropriate surveillance of the public health emergencies in Brazil, moreover, for the monitoring of potential public health emergencies during the mass gathering events<sup>17</sup>, such as the World Cup and the Olympic Games.

### **Contribution of the authors**

The first author worked on the conception, research, methodology and writing. The other authors worked on guidance, critical review, analysis and final outlining. The article results from the thesis presented to the National School of Public Health Sergio Arouca to obtain the degree title of Master of Public Health.

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