

# Irregularities in the execution of public resources to combat *Aedes aegypti* in Brazilian states: analysis of managers' justifications based on the attribution theory

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## Abstract

This study aimed to identify the justifications presented by managers operating at the state level in Brazil for irregularities observed in the execution of federal resources destined to combat *Aedes aegypti*. According to the attribution theory, individuals allocate causes perceived for events based on their knowledge, beliefs, and personal motivations. The theory was used to analyze 27 reports on the inspections carried out within the scope of the Inspection Program in Federative Entities (IPFE) during 2016 in the 26 Brazilian states and the federal district. The attribution theory was adopted to analyze 27 reports on the inspections carried out within the scope of the Inspection Program in Federative Entities (IPFE) during 2016 in the 26 Brazilian states and the federal district. The reports were examined through content analysis, descriptive statistics, and the Mann-Whitney test. The results showed the frequent occurrence of irregularities classified in the categories *performance*, *infrastructure*, and *public procurement and contracts*. Furthermore, regardless of the type of irregularity observed, the state managers' justification tends to point to external causes, especially if the irregularity is associated with corruption. This behavior occurs regardless of the state managers' performance. These results indicate that managers' self-serving bias concerning irregularities can be a challenge to achieve the objectives of the *Aedes aegypti* mosquito control program since internal factors affecting the program's outcomes are not highlighted.

**Keywords:** Attribution Theory. Impression Management. *Aedes aegypti*. Irregularities. Public Resources.

## *Irregularidades na execução dos recursos públicos destinados ao combate do Aedes aegypti nos estados brasileiros: análise do perfil das justificativas apresentadas pelos gestores à luz da Teoria da Atribuição*

### Resumo

Identificar as justificativas apresentadas pelos gestores estaduais e do Distrito Federal para as irregularidades observadas na utilização dos recursos federais destinados ao combate do *Aedes aegypti*. Tendo por base a Teoria da Atribuição, que postula que os indivíduos indicam causas percebidas para os eventos com base em suas informações, suas crenças e suas motivações pessoais, foram analisados 27 relatórios referentes às fiscalizações realizadas durante 2016 nos 26 estados e no Distrito Federal no âmbito do Programa de Fiscalização em Entes Federativos (PFEF). A interpretação dos relatórios foi realizada por meio da análise de conteúdo, de estatísticas descritivas e do teste de Mann-Whitney. De modo geral, os resultados indicaram que a ocorrência de irregularidades classificadas nas categorias "Desempenho", "Infraestrutura" e "Licitações e Contratos" foram frequentes. Ademais, observou-se que, independentemente do tipo de irregularidade observado, a justificativa dos gestores estaduais para eventos negativos tende a ser pautada em causas externas, principalmente se o ato irregular for associado a uma possibilidade de corrupção. Essa tendência de comportamento ocorre independentemente do nível de desempenho dos gestores estaduais. Os resultados indicam que o viés autosservidor dos gestores em relação às suas irregularidades pode constituir um desafio à consecução dos objetivos do programa de combate ao mosquito *Aedes aegypti*, pois estes tendem a não destacar os fatores internos que afetam seus resultados.

**Palavras-chave:** Teoria da Atribuição. Gerenciamento de impressão. *Aedes aegypti*. Irregularidades. Recursos públicos.

## *Irregularidades en la ejecución de los recursos públicos destinados a combatir el Aedes aegypti en los estados brasileños: análisis del perfil de las justificaciones presentadas por los gestores a la luz de la teoría de la atribución*

### Resumen

Este estudio tuvo como objetivo identificar las justificaciones presentadas por los administradores de los estados y del Distrito Federal ante las irregularidades observadas en la implementación de los recursos federales destinados a combatir el *Aedes aegypti*. Con base en la teoría de la atribución, que postula que los individuos indican las causas percibidas de los eventos en función de su información, sus creencias y sus motivaciones personales, se analizaron 27 informes sobre las inspecciones realizadas durante 2016 en los 26 estados y el Distrito Federal dentro del alcance del Programa de Inspección de Entidades Federales (PFEF). Los informes fueron interpretados mediante análisis de contenido, estadísticas descriptivas y el test de Mann-Whitney. En general, los resultados indicaron que la ocurrencia de irregularidades clasificadas en las categorías "Rendimiento", "Infraestructura" y "Licitaciones y contratos" era frecuente. Además, se observó que, independientemente del tipo de irregularidad observada, la justificación de los gestores estatales para eventos negativos tiende a basarse en causas externas, especialmente si el acto irregular está asociado a una posibilidad de corrupción. Esta tendencia de comportamiento se da independientemente del nivel de desempeño de los administradores estatales. Estos resultados indican que el sesgo egoísta de los gestores en relación a sus irregularidades puede ser un desafío para lograr los objetivos del programa de control del mosquito *Aedes aegypti*, ya que tienden a no resaltar los factores internos que afectan sus resultados.

**Palabras clave:** Teoría de la atribución. Gestión de impresión. *Aedes aegypti*. Irregularidades. Recursos públicos.

Article submitted on March 30, 2020 and accepted for publication on December 08, 2020.

[Translated version] Note: All quotes in English translated by this article's translator.

DOI: <http://dx.doi.org/10.1590/1679-395120200067>

## INTRODUCTION

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Public health emergencies bring not only new perspectives for this area, but also new challenges in the social, political, economic, environmental and cultural dimensions of societies (Fundação Oswaldo Cruz [Fiocruz], 2020). In the face of this adversity, public management needs to understand the difficulties and problems to be faced, seeking to combat them in the best possible way.

Barata (2000) points out that Brazilian colonization, carried out by the Portuguese in the mid-19th century, led to the spread of many diseases brought by the colonists, such as smallpox and yellow fever, which effectively caused epidemics in the country. Even if due to other factors, this epidemic scenario can still be seen in Brazil.

A more recent example of a public health emergency was observed in 2015, when the country was affected by a triple epidemic of *zika*, dengue, *chikungunya*, pathologies transmitted by the mosquito *Aedes aegypti*. According to the Epidemiological Bulletin nº 03/2016 released by the Ministry of Health (2016a), that year 1,649,008 probable cases of dengue were notified (highest value recorded since 1990, when the Ministry of Health made the notification mandatory), and 20,661 probable cases of *chikungunya* fever in the country. Among these cases, 864 deaths were confirmed. The incidence of the *Zika* virus was also found in 19 Brazilian states.

Another consequence caused by the *Aedes aegypti* mosquito was the increase in the number of births of children with microcephaly. The Health Surveillance Secretariat of the Ministry of Health received notification of 2,975 cases of microcephaly related to infection by the *Zika* virus in 2015, among which, 37 died (Ministry of Health, 2016b). It is clear, therefore, that the country experienced a situation of public calamity.

This adverse context led the Federal Government to declare, in November 2015, a State of Emergency in Public Health of National Importance (ESPIN) (Ordinance n. 1.813, 2015) and convene the Interministerial Strategic Group on Public Health Emergency of National and International Importance (GEI-ESPIL). In December of the same year, through the GEI-ESPIL, the National Plan to Combat *Aedes* and Microcephaly was created and implemented, in partnership with Brazilian states and municipalities, acting on three axes: i) mobilization and fight against the mosquito, ii) service to people; and iii) technological development, education and research (Ministry of Health, 2017a).

In the area of mobilization and fight against mosquitoes, the main measures were the mobilization and training of community health agents, agents to combat endemic diseases, health and education professionals to provide guidance to the population. In addition, the Federal Government acquired and made available to the states and municipalities the equipment and supplies necessary for the application of insecticides and larvicides (Ministry of Health, 2016c).

In the area of service to people, the Ministry of Health developed and made available to health care professionals in Brazilian states and municipalities guidelines on adequate care for pregnant women and babies. These guidelines were focused on preventing *Zika* virus infection and providing assistance to those born with microcephaly (Ministry of Health, 2016c). The Federal Government also encouraged research that aimed to develop technologies capable of diagnosing the *Zika* virus, as well as the creation of tools designed to control *Aedes aegypti* and the pathologies caused by it (Ministry of Health, 2016c).

In order to implement such measures, in 2016, the Federal Government transferred BRL 2,493,521,092.92 to states and municipalities to be applied in health surveillance actions. Compared to 2015, the government increased the amount of the transfer directed to such actions by almost 47% (Court Union of Accounts [TCU], 2017). However, despite the expenditure for carrying out these measures, it is observed that there was no significant decrease in the notification of pathologies caused by *Aedes aegypti*. According to the Epidemiological Bulletin nº 03/2017 released by the Ministry of Health (2017b), in 2016, 1,500,535 probable dengue cases were found, 271,824 probable cases of *chikungunya* fever and 215,319 probable cases of fever due to the *Zika* virus in the country.

A factor that may have contributed to the low effectiveness of the program is the presence of irregularities in the application of resources destined to combat the *Aedes aegypti* mosquito. In 2016, through the Inspection Program for Federative Entities (PFEF), the Federal Comptroller General (CGU) found that, in 13 of the 27 states inspected, federal

resources destined to combat *Aedes aegypti* were not properly invested (TCU, 2017). CGU auditors found irregularities in the control of inventories and in the storage of insecticides and pesticides, as well as failure in the purchasing and payment processes (CGU, 2016).

This observation reinforces that it is not enough just to have available resources, it is necessary that the public administration operationalizes them in an efficient and effective way. In other words, it is necessary to have a management system that contributes to the good use of resources, contributing to the effective realization of programs and services. Furthermore, if a given public action or service does not reach the objectives set, it is necessary that the responsible managers demonstrate and explain the causes of the ineffectiveness of this management or of irregularities detected. This explanation should be the initiative of managers, so that, taking into account their behavior as well as that of other people, the causes and effects of their administration are analyzed, thus avoiding the error or injustice in the judgment on the other (Gouveia, Clemente, Angel & Martinez, 2000).

This behavior can be explained based on the Attribution Theory framework, elaborated by Heider (1958). According to this theory, people seek to know the reasons for the actions taken by them and others, attributing causes to behaviors they see, rather than assuming that those behaviors are random. This allows people to assume some sense of control over their own behaviors and situations. Thus, attributions are critical to management because the perceived causes of behavior can influence the judgments and actions of managers and employees.

In the case of PFEF, in 2016, upon becoming aware of the irregularities observed, the managers were able to present justifications to the CGU in relation to these. Among the justifications observed in the reports, we find mention of the lack of training, insufficient resources, etc. (CGU, 2016). In this context, there is margin for the practice of impression management, as managers can attribute causes that are not of their control to the irregularities observed, even if they have some influence on such causes.

Given the above and based on the Attribution Theory, it is possible to evaluate the profile of the justifications presented by the managers, since, according to the theory, individuals indicate perceived causes for the events based on their information, their beliefs and their personal motivations (Kelley & Michela, 1980). Under this theoretical scope, impression management is marked by the manifestation of the self-serving bias, which usually manifests itself as a tendency to attribute positive events (e.g. good organizational performance) to internal causes (e.g. manager's capacity) and negative events (e.g. poor organizational performance) to external causes (e.g. unfavorable economy) (Tessarolo, Pagliarussi & Luz, 2010).

As indicated by Kelley and Michela (1980), reputation or social status can affect the causal attributions made by the individual and, consequently, the objectivity of their deductions. Therefore, the manager can disregard the quality of the informational content of the reports in favor of their particular interests, presenting justifications (causes) for the irregularities that do not harm their image (or avoid depreciation of it).

Thus, it is assumed that the way in which the managers justify the irregularities observed by the CGU, considering their personal motivations and information, can accentuate the informational asymmetry between society and public administration. This could eventually hamper the decision-making processes by members of society, making the topic of public interest.

The literature has been concerned with describing these irregularities and analyzing their causes or consequences (Araújo & Santos, 2018; Batista 2013; Laurinho, Dias & Mattos, 2017; Olivieri, Martinelli, Massucato & Silva, 2018; Rodrigues, Santos & Faroni, 2018). However, the content of the justifications has not yet been sufficiently analyzed by the academy.

Given this context, in addition to understanding the types of irregularities that may have occurred in the management of federal resources destined to Brazilian states to combat the mosquito, it is important to analyze the profile of the justifications presented by the state managers, considering their underlying intentions. Therefore, this study seeks to answer the following research question, which is also the general objective of the study: What is the profile of the justifications presented by the state managers regarding the irregularities observed in the implementation of federal resources directed at combating *Aedes aegypti*?

From a motivational perspective, it becomes relevant to highlight possible problems in the preparation of documents that would come from the personal interests of public managers. The causal attributions that managers process regarding the

success or failure of the National Plan to Confront *Aedes* and Microcephaly consist of determinants of their expectations regarding their abilities and performance. Such an attitude can affect public perception, generating losses to society in terms of information. Thus, it is possible to understand the mediating stimuli, which are more prominent in relation to the subjects, which are due to cognitive processes and individual responses that they start to produce about the experienced phenomenon (Formiga, 2004).

Knowing and understanding, also, the attributions (justifications) of managers to their actions, within the scope of social control, contributes so that citizens, as well as the whole organized society, can participate in the inspection of public spending, evaluating government actions and claiming the appropriate application of public resources. Although the manager of public resources has an obligation to apply them in accordance with the relevant legislation, contributing to the well-being of the whole society, this is not always the case. Through research that shows and tries to explain the behavior and actions of managers, citizens are able to increase the work of these managers, consequently improving their results. This citizen participation in public management influences the administrative decision-making, either by instructing the Administration to adopt measures that serve the public interest, or by exercising control over State action.

In the academic and scientific environment, it is noteworthy that, although the Attribution Theory has been widely used in organizational studies, mainly in the accounting context (Aerts, 2005; Merkl-Davies & Brennan, 2017), it was not used to evaluate the narratives elaborated by public sector managers. In view of the above, the present study presents as another relevant aspect the fact of adapting the use of Attribution Theory in organizational studies for the public sector, based on an exploratory study of CGU reports. This allows the analysis of public administration information from an innovative perspective.

## THEORETICAL FRAMEWORK

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### Irregularities in the management of federal public resources

CGU inspects the management of federal public resources for Brazilian states and municipalities. The final product of these inspections is a report by an inspected federated entity, which contains a description of the irregularities found by CGU's auditors, and, even, the justifications presented by the managers in relation to the evidences found (CGU, 2018; Zamboni, 2012).

The Brazilian literature uses the reports of inspections carried out by CGU auditors as a database for the survey of irregularities that occurred in the management of public resources. These reports are mainly derived from the Inspection Program for Public Draws (PFPS) created in 2003 (currently entitled Program of Inspection in Federative Entities [PFEF]). The studies by Albuquerque and Ramos (2006) and Ferraz and Finan (2008) are considered the precursors in the use of these reports. The authors considered the number of irregularities reported in CGU's inspection reports as a proxy for the corrupt behavior of municipal public managers.

Recent studies have also used the findings in the CGU reports as a database for surveying the irregularities that have occurred in the management of federal public resources by Brazilian states and municipalities. As examples, we can mention the studies by Araújo and Santos (2018); Batista (2013); Batista, Rocha and Santos (2020); Laurinho et al. (2017); Lopes and Doula (2019); Olivieri et al. (2018); Rodrigues et al. (2018); and Rodrigues, Faroni, Santos, Ferreira and Diniz (2020) who considered the reports coming from the PFSP, as well as the studies by Paschoal, Santos and Faroni (2020), in which the reports from the inspection program "External Demands" were analyzed.

Batista (2013), for example, analyzed the influence of political dynamics on the incidence of corruption and mismanagement in Brazilian municipalities during 2003 and 2004 using CGU reports. The author classified the irregularities reported in the inspection reports in 19 categories. The most frequent irregularities found by Batista (2013) were failures in the execution of the program or construction (use of public resources in actions other than those for which they were designated and unfinished or not started construction works) and failures and fraud in the bidding processes (directing bids and errors in the documentation).

In turn, Laurinho et al. (2017) investigated the irregularities that occurred in the public health bidding processes in the municipalities. Through the analysis of 102 reports from PFPS and referring to the period from 2010 to 2012, the authors

classified the irregularities found by the CGU auditors into two categories: corruption and inefficiency. The category with the highest number of findings was inefficiency, and irregularities were found in documents in the bidding process and no bidding was carried out on a recurring basis.

Similar results to Batista (2013) and by Laurinho et al. (2017) were found by Rodrigues et al. (2018) and why Olivieri et al. (2018). Rodrigues et al. (2018), in a survey of irregularities that occurred in the management of the Growth Acceleration Program (PAC) during the years 2008 and 2009, observed in the inspected municipalities the frequency of indications of errors and fraud in the bidding processes and weaknesses in the management of the resources destined to the PAC (errors in the documentation of projects sent to the federal government and delays in resolving pending issues).

Focusing on federal public resources for basic education in Brazilian municipalities, Olivieri et al. (2018) analyzed 51 reports from the PFSP in 2014 and identified evidence of misuse of resources, as well as corruption. The authors found recurrent irregularities in the management of school infrastructure (inadequate food storage and school transport vehicles in precarious conditions) and fraud in public tenders (collusion, fractioning of expenses, improper use of the bidding waiver).

The work of Araújo and Santos (2018) aimed to analyze the irregularities that occurred in the management of federal public resources destined to Brazilian states, using 106 reports from 2004 to 2009 and 2016. The main findings of the research indicated that there is a similarity in the types of irregularities found in the literature that considered the Brazilian municipalities. According to Araújo and Santos (2018), the overbilling of purchases made by the states was recurrent and the incidence of weaknesses in the application and control of federal public resources (inadequate inventory control and poor facilities).

Lopes and Doula (2019) investigated the irregularities that occurred in the process of purchasing foodstuffs carried out by Brazilian municipalities with resources from the National School Meals Program (PNAE). The inspection reports of 108 municipalities in the North and Northeast regions for the period from 2009 to 2016 were analyzed. Corroborating the findings of the previously cited studies, Lopes and Doula (2019) found that the most recurrent irregularities in the public procurement process were: undue waiver of bidding, irregularities in the setting up of bidding processes and overpricing and overbilling.

Just like the studies by Olivieri et al. (2018) and by Lopes and Doula (2019), the study by Rodrigues et al. (2020) focused on the analysis of irregularities that occurred in the implementation of federal public resources for basic education in Brazilian municipalities. Rodrigues et al. (2020) analyzed 323 reports from the inspections carried out by CGU between 2011 and 2015, as well as classified the irregularities pointed out in two categories: corruption and mismanagement. In the category of corruption, the authors noted that there were frequent indications of i) fraud in the preparation of the bidding documents for the bidding processes and in the course of the bidding process and ii) making payments without proof of purchase or of the supply of the product or service. Regarding irregularities pertaining to the "poor management" construct, failures in the control of input and related stocks were recurrent.

Batista et al. (2020) used the indications of inconsistencies present in CGU's inspection reports as an indicator of government performance. These indications were classified as corruption or mismanagement. As in the studies cited above, the category of corruption covered the inconsistencies related to public tenders (e.g. assembly of bidding process, bidding direction and overpricing). The others were classified in the category of poor management (inoperability of municipal councils and use of unsuitable vehicles for transporting students). Batista et al. (2020) highlight that the expressive numbers of irregularity indicate the need to adopt measures that aim to reduce these problems in the implementation of public policies.

In turn, for the development of their research, Paschoal et al. (2020) considered another CGU inspection program, "External Demands". In addition to the irregularities observed in the reports generated in this program, the authors also analyzed the justifications that municipal managers presented for their occurrence. This information present in the CGU reports was analyzed in the light of the Fraud Triangle and Fraud Diamond theories. The sample covered by the survey covered 259 reports related to the temporal gap between January 2015 and May 2018.

The research findings by Paschoal et al. (2020) indicated that the four factors of the conceptual framework of the Triangle and Diamond Fraud theories were present in the observations and justifications contained in the reports: opportunity, incentive, rationalization and capacity. The justifications presented by the managers were classified in the rationalization factor. Regarding

the content, the authors observed that the managers used justifications related to: personal problems faced by the individual; socially valid moral act; comparison with the act performed by other managers to reduce the severity of the act performed; shift of responsibility to third parties; and victimization (individual claims that they are “forced to do”).

The results of the studies presented above show similarities in the types of irregularities that occur in the management of federal public resources destined to different programs in the areas of health, education, basic sanitation and social assistance. This context shows that similar irregularities may have occurred in the application of resources destined to other actions, such as the action to combat *Aedes aegypti*, the object of study in this research. It is noteworthy that no studies were found that specifically addressed the management of these resources. It should also be noted that there are few studies that analyzed the results of the inspections carried out by the CGU in the Brazilian states.

It can be seen that much of the literature focused on the classification of irregularities found in CGU reports, grouping them into acts of corruption or misuse of public resources, as well as possible subclassifications. However, other information contained in CGU's inspection reports are the justifications presented by the managers in relation to the irregularities pointed out by the controllership auditors. This aspect of the reports has been neglected by the literature, with few exceptions, as in the study by Paschoal et al. (2020), which considers the Triangle and Diamond Fraud theories as a theoretical framework in the analysis of the content of CGU's inspection reports.

It is assumed that the knowledge and understanding of how managers justify their actions in the application of public machinery resources can contribute to the inspection of public spending by society. This analysis makes it possible to identify the ability of managers to take responsibility for their actions and provides society with a critical look at the way public agents express themselves when justifying irregularities in their management.

Thus, it is highlighted that Attribution Theory offers a theoretical framework particularly interesting for the evaluation of the profile of the justifications presented by public managers based on motivational explanations. The theory can specifically assist in the understanding of how managers attribute causality to the irregularities pointed out in their management of public resources, addressing motivational factors and the agents' ability to understand these factors.

## Attribution Theory

The Attribution Theory is based on the study by Heider (1958). The author is concerned with “surface issues”, which are events that occur in everyday life on a conscious level, instead of the unconscious processes studied by psychology. It indicates that human relationships considered “obvious” or “intuitively understood” can be as challenging and psychologically significant as the most profound and strange phenomena. Birnberg, Luft and Shields (2007) claim that Heider started the study of how people attribute causes to their behaviors, as well as to the behaviors of other people, so that they can explain and predict behaviors in their environments.

Positive behavior, including success, has the potential to improve the self-esteem of the person responsible for the behavioral cause, according to Kelley and Michela (1980). The authors state that the motivation for “self-enhancement” should result in self-attribution (attribution to internal cause) of positive behaviors. They argue that, similarly, negative behaviors can have negative implications for the individual's self-esteem, unless the causal responsibility is attributed to a factor not controlled by the manager (attribution to external cause), which would be a form of self-protection.

For Birnberg, Frieze and Shields (1977), research in the area of Attribution Theory indicates that the individual's attributions are a joint function of the information one has about the immediate situation, as well as their stable tendencies to make particular attributions (their motivations). More specifically, Kelley and Michela (1980) claim that Attribution Theory assumes individuals' causal attributions are affected by their information, beliefs and motivations. Therefore, a wrong causal attribution performed by a person can originate both from the self-serving bias and from their cognitive limitations.

In line with the above, Aerts (2005) states that the informational model of attributional asymmetry emphasizes the limited capacities for processing human information in achieving a causal understanding of events, highlighting that people tend to expect favorable results. Otherwise, a motivational interpretation places more emphasis on the consequences of the attribution process to the assigner itself, which can lead to a skewed attribution. However, the author notes that if the motivational foundations of self-serving attributive biases are indeed crucial, either in isolation or in conjunction with informational influences, the effect of these biases should be clear in contexts of strong incentives for impression management (Aerts, 2005).

In view of the above discussion, the present study starts from the premise that motivational interpretation is essential for the understanding of the causal attributions carried out by the state managers. This assertion is justified by the strong influence of the manager's political life, which implies the need for them to present a "good image" before society. Thus, the next section presents a motivational interpretation derived from the Attribution Theory applicable to the public sector.

## The Application of the Attribution Theory to the public sector

In order to understand the utility of Attribution Theory in the present study, a parallel was made with organizational studies that use it. Although the theory has been widely applied to organizational studies (Aerts, 2005; Merkl-Davies & Brennan, 2017), there is still no appropriate theoretical framework for the public sector. The present study sought to present an adaptation of this theory to apply it to the public sector.

Aerts (2005) indicates that studies that assess causal attribution in the context of organizations based on annual financial reports have documented a tendency to attribute results or positive effects to the company's own actions, while the negative results are associated with factors external to the company or to chance. The author adds that this pattern of explanation is considered to be self-serving precisely because it defines the situations in a way that is advantageous for the company. Tassarolo et al. (2010) found that self-serving attributions are an instance of causal justification that allows managers to avoid blame for "bad news" (e.g. drop in sales, drop in profits, etc.) described in the annual reports.

Birnberg et al. (2007) claim that many studies have observed that the focal person tends to attribute their own behavior to external causes. The authors indicate that, in management accounting, this finding allows creating a basis to explain and predict how individuals will subjectively justify the deviations observed between the expected performance based on the budget and the performance actually observed in practice. As previously explained, when their capacity can be questioned, the manager tends to make causal attributions based on external factors (Kelley & Michela, 1980).

In this study, we assume that the pattern of self-serving behavior is observed when public managers need to justify the irregularities pointed out by CGUs auditors, since these can be compared with the "bad news" observed in organizational contexts or with the deviations observed in relation to budgets. Thus, it is based on the premise that state managers will justify most of the irregularities raised by CGU by associating them to external causes.

This premise is appropriate for the public context because it takes into account the different goals presented by the public managers under analysis (state managers). While organizational managers need to achieve profit targets, avoid budget deviations, etc., public managers have goals that can be quite different from those observed in the private organizational context. In particular, we assume that these managers will focus on improving their image before society, since their focus is on maintaining public office or even the search for new opportunities within the political environment.

In the present study, since the application of resources for the control of *Aedes aegypti* is analyzed, deviations in desirable behavior include factors such as irregularities in the control of stocks and in the storage of insecticides and larvicides, problems in bidding processes and failure in payment processes, among others. The self-serving bias entails, on the part of the state managers, the attribution of "blame" for these irregularities to external factors, aiming to improve their image or to avoid possible depreciation of it before the population. Therefore, it is assumed that the political bias results in less accountability (low level of transparency), which is detrimental to the electoral process and society. According to the above, this type of behavior is assumed for both managers of states with better performance (with fewer irregularities) and those of less efficient states.

## METHODOLOGICAL PROCEDURES

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### Data collection

The reports of the 2nd Cycle of the PFEF of the CGU, carried out during 2016 in the 26 states and the Federal District, are the database of this research. PFEF emerged in 2015, after the reformulation of CGU's former PFPS. The main change from PFPS to PFEF was in the methodology for selecting federative entities (states and municipalities) to be inspected. In addition to the public sweepstakes methodology applied in PFPS, in PFEF two more selection criteria are used, namely: i) census: all federative entities in the sample are inspected, and ii) vulnerability matrix: the most vulnerable federative entities are chosen for the occurrence of irregularities (CGU, 2018).

As in PFPS, in PFEF CGU auditors carry out an on-site visit to selected federal entities. This visit aims to examine the accounts and documents, perform personal and physical inspection of the works and services being carried out, in addition to collecting information from the population through interviews and questionnaires. The final product of the inspection is the reports issued by CGU's auditors, which include: i) description of the programs and their respective inspected actions (number of inspected actions and the amount of resources allocated to such actions); ii) description of the evidence of irregular acts found by CGU auditors in the execution of programs that use federal resources; and iii) the justifications of the governors in relation to the evidence found and the judgment of these justifications by the CGU (CGU, 2018).

Thus, with the structure of the PFEF reports, it was possible to carry out a survey of irregularities in the application of federal public resources destined to the 26 Brazilian states and the Federal District to combat *Aedes aegypti*, as well as the collection of justifications from state managers in relation to the occurrence of these irregularities. Such irregularities and justifications are described in the 27 inspection reports of the 2nd PFEF Cycle, in 2016, whose objective was to verify "[...]the regularity of the application of decentralized federal public resources to all 26 state governments and the Federal District" during 2015 (CGU, 2016).

### Analysis procedures

We adopted the Content Analysis technique to interpret and classify the indications made by the auditors and the justifications of the managers present in the corpus consisting of CGU inspection reports. The main method of analysis used was the categorial, which consists of a process of classification of the analyzed content according to previously defined categories (Bardin, 1977). Finally, statistical procedures were carried out to analyze whether there is an association between the self-serving bias on the part of managers and the performance level of the states.

In line with other studies in the literature that analyzed corpora arising from CGU's inspection activity, we adopted the Structured Text Analysis [STA] (Januzzi, 2011; Olivieri et al., 2018). STA can be described as

[...] one of the Content Analysis techniques used in situations in which a structured interpretation – formal, standardized, targeted – of ideas, messages and informational content present in documents, texts, articles or corpus in general is required (Januzzi, 2011).

In accordance with Olivieri et al. (2018), the following steps were followed, as they were shown to be adequate to the theme and objectives of the present study: i) identification of the irregularities pointed out by the CGU in the application of federal public resources destined to combat *Aedes aegypti*; ii) development of a coding system based on the objectives of the study to classify the data obtained through the CGU reports; iii) testing of the classification system; iv) application of the classification system; v) analysis of coding reliability; and finally vi) analysis and interpretation of results.

For the first stage, data were collected on the irregularities pointed out in the PFEF reports, as explained in the previous section. In the second stage, we present the description of the categories used in the classification for irregularities and justifications in Box 1 and Box 2. Box 1 presents the classification criteria for the indications of irregularities by the CGU and for the justifications of the managers regarding the application of federal public resources destined to the Brazilian states to combat *Aedes aegypti*.

**Box 1**  
**Coding system used in the analysis of irregularities and justifications**

Coding system employed in the analysis of irregularities		
Category	Code	Description
Bids and Contracts	BIC	- Irregularities in the execution of bidding processes.
Deviation of resources	DR	- Lack of proof of costs incurred in the provision of services and regularity of payments. - Overbilling - Overpricing
Performance	PER	- Timeliness in the application of federal public resources destined to combat <i>Aedes aegypti</i> . - Insufficiency of actions to combat the <i>Aedes aegypti</i> mosquito.
Infrastructure	INFRA	- Problems in the facilities used to store the inputs (insecticides and larvicides). - Problems in the control of insecticide and larvicide stocks. - Lack of inputs.
Human Resources	HR	-Problems related to endemic agents (insufficient number, lack of training, irregular hiring).
Unauthorized application of resources	UAR	-Payment of ineligible expenses with resources from the Health Surveillance Block.
Not related to the Executor agent	NREA	- Irregularities not related to the examined unit (state governments and the Federal District).
Coding system employed in the analysis of justifications		
Category	Code	Description
Internal causes	IC	- The manager acknowledges that his/her management was not correctly investing the resources destined to combat <i>Aedes aegypti</i> .
External causes	EC	- The manager does not recognize that irregularities in the application of resources destined to combat <i>Aedes aegypti</i> are the responsibility of his/her management, attributing them to external factors.
Did not provide justification	DNP	- Absence of manifestation of the examined unit (state and Federal District government) after the presentation of the facts by the CGU auditors.
Justification not requested by CGU	NR	- CGU did not request a statement from the examined unit.

Source: Elaborated by the authors.

In order to analyze whether the practice of impression management was prevalent on the part of state managers, states were also analyzed individually in terms of their number of irregularities, as well as the profile of the justifications presented by their managers. Based on the number of irregularities, the following classification was made: states with good performance, regular performance and poor performance. Furthermore, based on the way in which the managers justified the irregularities pointed out by the CGU, the states were classified as: high, intermediate or low level of accountability. The criteria for classifying states in each of these categories are set out in Box 2.

For the third and fourth stages, two researchers, who analyzed the adequacy of the proposed categories, did the classification of irregularities according to the categories studied individually. For the fifth stage, the researchers compared their classifications. In the event of divergence between the proposed classifications, a third researcher was consulted to provide an opinion on the most appropriate classification. This process was used in order to guarantee the internal reliability of the data classification.

**Box 2**  
**Classification of states regarding the number of irregularities and the level of accountability of managers**

Category	Description
States with a high level of accountability	States that presented a percentage of justifications based on internal causes greater than 50%.
States with intermediate level of accountability	States that presented a percentage of justifications based on internal causes equal to 50%.
States with a low level of accountability	States that presented a percentage of justifications based on internal causes below 50%.
Good performing states	States that did not present irregularities and, consequently, did not have a request for justification by the CGU.
Regularly performing states	States that presented a number of irregularities below the average of irregularities.
Poorly performing states	States that had a higher than average number of irregularities.

Note: In this box, we consider only the irregularities that led CGU to request justifications from state managers. The percentage of justifications based on internal causes is calculated on the total of justifications requested by CGU. In addition to justifications based on internal causes, state managers could present justifications based on external causes or not provide justification for irregularities. The average of irregularities was calculated considering only states that presented them.

Source: Elaborated by the authors.

After the application of the first five stages of the STA, we proceeded to the stage of analysis of the collected and classified data. It is noteworthy that, in the present study, it is assumed that the main tendency on the part of managers is to not take responsibility for their irregularities, which would characterize a low level of accountability. This expectation derives from the premise that managers will attribute external causes to their own irregularities because they believe that assuming an error can be politically unfavorable. Thus, it is assumed that this trend of causal attribution to external factors does not depend on the performance level of the analyzed state.

To identify whether the level of accountability is associated with the performance of the states, the Mann-Whitney test for median differences between groups was estimated (Mann & Whitney, 1947). The test was performed in order to identify whether the practice of associating blame with factors external to the manager's control is prevalent only in states with poor performance, or if this practice is expected even for states with regular performance. The lack of statistical difference between the groups will show that the practice of impression management is prevalent on the part of the state managers, regardless of their performance. We emphasize that a non-parametric test was adopted based on the result of the normality test by Shapiro and Wilk (1965).

## RESULTS AND DISCUSSIONS

### Descriptive statistics of the states

Initially, a descriptive analysis of the socioeconomic characteristics of the states, the incidence of dengue cases (reported by the Ministry of Health through the Epidemiological Bulletin nº 3, of 2016) and the irregularities found by CGU auditors in the application of federal public resources destined to combat *Aedes aegypti* was carried out (Table 1). We emphasize that data are presented only for dengue cases, since the statistics on the other diseases transmitted by *Aedes aegypti* (*zika* and *chikungunya*) are not reported by states in epidemiological bulletins released by the Ministry of Health.

**Table 1**  
**Descriptive analysis of socioeconomic characteristics, dengue incidence and total state irregularities**

Characteristics	Mean	SD	Minimum	Maximum	CV (%)
Population	7,182,669	8,907,007	450,479	44,396,484	124.00
Area (Km <sup>2</sup> )	315,329.90	377,420.30	5,802	1,570,745	119.69
Amount Inspected (BRL)	20,923,938.70	23,176,675.26	984,523.98	85,927,264.75	110.77
Incidence of Dengue	596.66	539.80	16	2,500.60	90.47
Number of Irregularities	5.22	4.15	0	14	79.50

Note: the amount inspected corresponds to the amount of federal funds allocated to the Health Surveillance Block and inspected by CGU auditors; *incidence of dengue*: incidence of cases for every 100 thousand inhabitants; *number of irregularities*: quantity found by the CGU. SD: standard deviation; CV: coefficient of variation.

Source: Epidemiological Bulletin nº 3 of 2016 and Reports of the Inspection Program for CGU Federative Entities.

Regarding the socioeconomic characteristics of the 26 states and the Federal District, Table 1 shows that, on average, states have a population of approximately 7 million. In addition, it is noted that each state received, on average, BRL20,923,938.70 to be applied in surveillance, prevention and control of diseases and conditions, which includes the fight against the *Aedes aegypti* mosquito. It is noteworthy that this value corresponds to the amount of federal resources destined to the states and the Federal District during 2015, period in which the CGU auditors evaluated the use of resources destined to combat *Aedes aegypti*.

Regarding the statistics released by the Ministry of Health on diseases and conditions, it appears that in 2015, on average, 596.66 dengue cases were registered for every 100 thousand inhabitants. According to the maximum and minimum values of the variable that indicates the incidence of dengue, it is noted that there are states, such as Rio Grande do Sul, that presented less than 20 cases for every 100 thousand inhabitants, while in Goiás this value was higher than 2,500 cases.

In relation to the irregularities found by the CGU auditors in the application of federal resources destined to combat *Aedes aegypti*, it appears that, on average, approximately five irregularities were found per state. However, there is a high coefficient of variation in the irregularities presented by each state. In the sample analyzed by this study, there are states in which there were no irregularities in the application of resources (Pará, Goiás and São Paulo), and others, such as Pernambuco, where the number of irregularities was greater than 13.

Table 2 presents the descriptive statistics for each type of irregularity found by CGU auditors in the application of federal resources to combat *Aedes aegypti*, considering the entire sample of the study. We identified 156 irregularities, among which 141 were related to the executing agent of the resources.

**Table 2**  
**Descriptive analysis of irregularities**

Irregularity	Total	Median	Mean	SD	Minimum	Maximum	CV (%)
Tenders and contracts	24	0	0.89	1.72	0	8	193.26
Misuse of resources	18	0	0.67	0.92	0	3	137.31
Performance	49	2	1.81	1.62	0	6	89.50
Infrastructure	34	1	1.26	1.40	0	6	111.11
Human Resources	11	0	0.41	1	0	5	243.90
Unauthorized application of resources	5	0	0.19	0.48	0	2	252.63
Not related to the executing agent	15	0	0.56	0.70	0	2	125.00

Note: SD: standard deviation; CV: coefficient of variation.

Source: Research Data.

Based on the information presented in Table 2, we observe that the largest part of the irregularities related to the executing agent is related to the item performance (49 cases – 34.75%). This reveals that the timeliness in the application of resources and the insufficiency of actions to combat *Aedes aegypti* are the main challenges to be overcome by state managers.

There were also frequent occurrences of irregularities by the executing agent classified in the infrastructure categories (34 cases – 24.11%) and bids and contracts (24 cases – 17.02%). Regarding the first type of irregularity, it was observed that there were problems in the facilities used for the storage of inputs and in the stock control of insecticides and larvicides. In turn, with regard to the purchase processes with federal resources intended to combat *Aedes aegypti*, the following irregularities were identified by the CGU auditors: realization of expenses without a contract, improper use of the bidding waiver and indications of bid rigging and collusion in the bidding waiver processes.

Although the study by Olivieri et al. (2018) focused on federal resources for basic education in municipalities, the results were similar to those of the present study. The authors reported that there were frequent problems in the facilities used for storing inputs, irregularities in stock control and evidence of fraud in bidding processes (bid rigging, collusion and misuse of bidding waivers). Rodrigues et al. (2018) also found similar irregularities in the Brazilian municipalities under analysis on the application of federal resources destined to PAC, as well as by Araújo and Santos (2018) and Batista (2013) in a study on federal public resources destined to Brazilian municipalities and states. This situation indicates similarities in the occurrence of irregularities at the state and municipal levels, as well as between different programs contemplated with federal public resources.

The smallest number of irregularities identified by CGU in the application of resources destined to combat *Aedes aegypti* refers to the unauthorized application of resources (five cases – 3.55%), that is, infractions related to the payment of expenses considered ineligible with the resources of the Health Surveillance Block.

It is noteworthy that the present study did not have as main objective the distinction between corruption and misapplication of public resources, observed in several other studies (see section 2.1). However, it should be noted that, for the population benefiting from public services, both categories of irregularity are harmful, as they result in the reduction of the beneficial potential of the resources distributed by the union to the states, which implies an inefficient fight against *Aedes aegypti*. Nevertheless, some insights into the difference in the justifications of managers based on these categories (corruption and poor management) can be extracted, as discussed below.

In view of the losses generated by irregularities in the management of public resources, an attempt was made to analyze whether managers were able to take responsibility for their actions. Tables 3 and 4 show the descriptive statistics related to the types of justification used by managers (internal and external causes) and the types of justification related to each class of irregularities.

**Table 3**  
**Descriptive analysis of the justifications**

Irregularity	Total	Median	Mean	SD	Minimum	Maximum	CV (%)
Internal causes	9	0	0.33	0.62	0	2	187.88
External causes	61	1	2.26	2.75	0	10	121.68
Did not provide justification	59	0	2.19	3.92	0	13	179.00
Justification not requested by the CGU	12	0	0.44	0.75	0	3	170.45

Note: SD: standard deviation; CV: coefficient of variation.

Source: Research Data.

The CGU requested justification for 129 irregularities identified. It is noteworthy that no justifications were presented by the managers for a significant portion of the irregularities (59 cases), although the CGU requested them. It is assumed that this lack of justification on the part of managers is harmful to the public, which is deprived of explanations about the misuse of its resources collected through taxes.

Most of the 70 justifications presented by state and Federal District managers indicate that they associated the causes of the irregularities observed with factors that are beyond their control (61 cases). Only in nine cases did managers attribute the occurrence of irregularities to internal factors. This finding is in line with the observations by Paschoal et al. (2020) that public managers show third parties-blaming behavior for their failures, as well as the use of other external justifications.

Among the justifications based on internal causes by managers, as shown in Table 4, we highlight that none of these are related to the irregularities that occurred in the bidding processes and in the payment processes related to the program to combat *Aedes aegypti*. This is a particularly alarming data, since, according to the literature, these categories of irregularities are usually associated with corruption (Batista, 2013).

The fact that none of the justifications provided by managers for the irregularities commonly associated with acts of corruption was based on internal factors may be a symptom of the potential for political influence on accountability. Although both mismanagement of public resources and corruption are detrimental to society, it can be assumed that the public views corruption less favorably. Based on this premise, the result of the present study can be interpreted as an indication that managers tend to consider this information when presenting justifications for their irregularities. Nevertheless, it is unlikely that the public manager will assume responsibility for acts that can be associated with corruption, although, in some (rare) cases, they take the blame for the mismanagement of public resources.

**Table 4**  
**Total justifications by type of irregularity**

Irregularity	BIC	DR	PER	INFRA	HR	UAR
Internal causes	0	0	1	7	1	0
External causes	10	7	23	12	6	3
Did not provide justification	13	11	18	13	2	2
Justification not requested by the CGU	1	0	6	3	2	0

Note: *BIC*: Bids and Contracts; *DR*: Deviation of Resources; *PER*: Performance; *INFRA*: Infrastructure; *HR*: Human Resources; *UAR*: Unauthorized Application of Resources.

Source: Research Data.

The results shown in Table 4 reveal that the managers' justification for negative events tends to be mostly based on external causes, regardless of the type of irregularity observed. These results are in line with the premise of the study set out in section 2.3, revealing that the self-serving bias can have a great impact on the way managers attribute causality to negative events in the public sector. In the organizational context, behavior is considered biased and self-serving when those who perform poorly tend to explain it by giving greater weight to environmental characteristics that are beyond their control (Libby & Rennekamp, 2012). Similarly, in the context of the present study, the attribution of irregularities in the application of federal resources to external causes may represent a bias in the attributive process by state managers.

It is noteworthy that, as explained above, the attributions made by individuals are affected by their information, beliefs and motivations (Kelley & Michela, 1980). This leads to different implications. First, the attribution of managers can be caused by their cognitive limitations. In this case, state managers may be unable to recognize their limitations in the application of federal resources to combat *Aedes aegypti*, which reveals a worrying aspect of state management, especially when considering the ineffectiveness of the program to combat the *Aedes aegypti* mosquito.

The attribution of irregularities to external factors can also be related to the intention of managers to practice impression management, with the purpose of improving the image of their management before society. This possibility is plausible when considering the strong context of incentive for the management of impressions in which these managers are inserted (Aerts, 2005), after all, they seek their reelection or the election of some candidate from the allied base (closely linked to the maintenance of their positions).

This opportunistic behavior can turn out to be harmful, as the investors of resources seek to attribute the ineffectiveness of the program to factors that are not of their control, which can prolong the performance of individuals who are not properly trained for the task of the mosquito control program. This is due to the fact that the distortion of information caused by the personal motivation of the public manager may imply greater informational asymmetry between the manager and society, impairing the decision-making of individuals in electoral processes, for example. Thus, we realize that the practice of impression management by public managers is a problem that must be monitored, so that the effectiveness of public management and the smoothness of electoral processes are not impaired.

In general, the findings point to a low level of accountability on the part of state managers. One aspect that can influence the results obtained in this section is the joint treatment of the entire sample related to such managers. Thus, in the next section, statistical tests are carried out to control whether the result related to managers' accountability is associated with the level of performance of managers in specific states.

### Analysis of the association of performance and the level of accountability of managers

In the previous section, we demonstrated that most of the justifications of the state managers were apparently motivated by the self-serving bias, according to the premise that political motivations would influence causal attributions. This reveals that, in general, Brazilian state managers have low accountability.

It would be possible to argue that less efficient state managers would be affecting the sample mean. However, when analyzing the states individually, it is clear that this is not the case, as observed in the descriptive data shown in Table 5 and in the comparison of medians in Table 6.

**Table 5**  
**Descriptive statistics of the performance and level of accountability of the states**

Category	States	Total	Percent
States that have been asked to provide justifications to the CGU.	AC, AL, AP, AM, BA, CE, DF, ES, MA, MS, MT, MG, PB, PR, PE, PI, RJ, RN, RS, RO, RR, SC, SE, TO	24	88.89%
<b>High accountability states:</b> percentage of justifications based on internal causes greater than 50%.	AL	1	3.70%
<b>States with an intermediate level of accountability:</b> percentage of justifications based on internal causes equal to 50%.	AM, ES	2	7.41%
<b>Low accountability states:</b> justifications based on external factors and/or the absence of justifications were prevalent (more than 50%).	AC, AP, BA, CE, DF, MA, MS, MT, MG, PB, PR, PE, PI, RJ, RN, RS, RO, RR, SC, SE, TO	21	77.78%
States that did not provide justification for 50% or more irregularities pointed out by the CGU.	AP, CE, DF, MT, PE, RN, RS	7	25.93%
States that did not provide justification for the irregularities pointed out by the CGU.	MT, PE, RN, RS	4	14.81%
<b>Good performing states:</b> did not have a request for justification by the CGU.	GO, PA and SP	3	11.11%
<b>Poorly performing states:</b> presented a number higher than the average of requests (5.35) for justifications for the irregularities pointed out by the CGU.	AC, BA, DF, MT, PB, PE, RN, SE	8	29.63%
<b>Regularly performing states:</b> presented a number below the average of requests (5.35) for justifications for the irregularities pointed out by the CGU.	AL, AP, AM, CE, ES, MA, MS, MG, PR, PI, RJ, RS, RO, RR, SC, TO	16	59.26%

Source: Research Data.

Table 5 shows the states whose irregularities were requested by the CGU to be justified by the managers and how they manifested about them. The results shown in this table allow the identification of the states with the highest number of irregularities, as well as the level of accountability of the managers of each federative unit. It should be noted that, in order to simplify the presentation of the results of this section, the term “irregularities” will be used to refer only to those for which the CGU requested justifications from state managers.

Only three of the states analyzed did not have a request for justification by the CGU (GO, PA and SP) and were classified as states with good performance. The others were classified into groups of “regular performance” or “poor performance”, which are, respectively, those with a number of irregularities below or above the average of irregularities in all states (5.35 irregularities). The high level of states that present irregularities is consistent with the ample evidence in the literature of misapplication of public resources and the incidence of corruption in their management (Batista, 2013; Laurinho et al., 2017; Rodrigues et al., 2018; among others) and reinforces the importance of access to quality information on the part of society so that it can evaluate public management and make correct decisions in electoral processes.

Among the 24 units in the Brazilian territory with poor or regular performance, only one (AL) presented a percentage of justifications classified as “internal causes” higher than the percentage of justifications classified as “external causes”. Therefore, only one state had a high level of accountability on the part of its managers, with one irregularity only. Furthermore, only in two states (ES and AM) the percentage of justifications attributed to external factors was the same as that attributed to internal factors (50% for each). This percentage was classified as an intermediate level of accountability. In 21 states, the number of justifications based on external factors and/or the absence of justifications were prevalent, which reveals low accountability.

It is perceived that the attribution of blame to controllable factors by the majority of state managers who presented irregularities is rare, with few exceptions. In this context, we performed a Mann-Whitney test (Table 6) to investigate whether there is an association between greater accountability and state performance in terms of irregularities. It is noteworthy that the option for the Mann-Whitney test over the t test is due to the fact that it is a small sample and because the compared variables do not present a normal distribution according to the Shapiro-Wilk test at the 5% level.

**Table 6**  
**Comparison of states with different performances in relation to their justifications**

Group	States with less than average total irregularities (regular performance)		States with more than average total irregularities (poor performance)		Mann-Whitney test	
	Median	Mean	Median	Mean	z	prob>z
Number of observations	16		8		24	
Percentage of justifications based on internal causes	0	16.14%	0	5.14%	-0.610	0.5418
Percentage of irregularities without justification	0	20.63%	56.95%	51.74%	1.575	0.1153

Note: The two-tailed Wilcoxon test was used for the median. None of the groups presented a statistically different median at the 5% level of significance.

The significance of the z statistic (prob>z) indicates whether the group of firms with poor performance has a median statistically higher (z positive) or lower (z negative) than the group with regular performance.

The level of accountability was measured as the percentage of justifications based on internal causes.

Source: Research Data.

Based on the analysis of the Mann-Whitney test, it is clear that states with an above average number of irregularities – for which the CGU requested justification – presented levels of causal attribution to internal factors statistically similar to those presented by states with lower levels of irregularity at the 5% significance level. This shows that the practice of blaming external factors and the absence of justifications are prevalent both in states with high levels of irregularity (poor performance), and in those where the total number of irregularities is below average (regular performance). Therefore, although it is intuitively believed that more effective managers tend to assume responsibility and/or to be self-critic,

we observed that these behaviors do not vary according to the performance of managers in the application of public resources (measured by the number of irregularities).

In short, the evidence points to a tendency for managers to reject guilt, regardless of the level of performance of these. It can be argued that this type of stance has the purpose of influencing public opinion, which tends to harm the electoral process and, consequently, the quality of the service provided by the public sector. This explanation is compatible with the motivational interpretation of Attribution Theory (Aerts, 2005; Birnberg et al., 1977; Kelley & Michela, 1980).

It is noteworthy that, although the interpretation based on cognitive limitations can also be adapted to the results of the present study, the motivational explanation has a greater capacity to explain the fact that none of the managers have presented causal attribution to internal factors for the irregularities commonly associated with acts of corruption. Considering the motivational aspect linked to political life, this finding reveals that managers prevent their image from being linked to acts condemned by the active society, especially when the degree of disapproval of the act is higher, as is the case with corruption.

## FINAL CONSIDERATIONS

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The objective of this research was to identify the profile of the justifications presented by state and Federal District managers for the irregularities observed by CGU's auditors in the use of federal resources destined to combat *Aedes aegypti*. To achieve this goal, content analysis was used in conjunction with the analysis of descriptive statistics and the Mann-Whitney test. The guiding basis of the analysis was the framework of the Attribution Theory, which helps to understand how individuals attribute causality to events.

Among the categories of irregularities considered, the results of the study showed that the ones that registered the largest number of findings were as follows: performance; structure; and bids and contracts. These findings indicated that were frequent: i) non-timeliness in the application of federal public resources destined to combat *Aedes aegypti*, ii) problems in the facilities used for the storage of inputs and in the stock control of insecticides and larvicides; and iii) realization of expenses without a contract, improper use of the bidding waiver and indications of direction and collusion in the bidding waiver processes.

It should be noted that the CGU asks managers to justify these irregularities. When individuals – in this case, managers – seek a specific explanatory cause for carrying out a task, they “[...]tend to experience specific emotional reactions that, in turn, significantly influence the perception of expectations of behaviors and future results” (Dela Coleta & Alves Godoy, 1986, p. 1). Although it is the daily practice of public managers to make attributions, it is necessary to pay attention to the fact that they are not always correct, and it may occur, in a situation of irregularities, the case of a manager underestimating the influence of personal factors and overestimating the influence of situational factors when evaluating the results of the management of public resources under his/her responsibility. That is, when observing the occurrence of fraud, it is more likely that a person assumes that such occurrence was more due to an external factor and less due to his or her action. This contributes to a distortion of society's understanding of the management of those resources and, consequently, to the misunderstanding and acceptance of error by the citizens.

With regard to the justifications presented by state managers in the context of combating *Aedes aegypti*, the research results showed that, regardless of the type of irregularity observed, the justification of state managers for negative events tends to be based on external causes. These results reveal that the self-serving bias can have a great impact on the way managers attribute causality to negative events. A relevant aspect is that the motivation for the causal association with external factors is greater when it comes to irregularities that can be interpreted as acts of corruption.

A relevant aspect is that the motivation for the causal association with external factors is greater when it comes to irregularities that can be interpreted as acts of corruption. This type of vision can lead managers, when they do not recognize that the aspects under their control were not satisfactory, to not pay attention to the factors of their own performance that may suffer improvements.

It is noteworthy that the possibility that these managers understand the internal factors that led to the irregularities cannot be ruled out, although they do not recognize them in their justifications. This type of behavior can be motivated by the attempt of impression managing, after all, managers seek to present a good image before society. Nevertheless, this type of

attributional behavior can also be considered bad for public management, because it can lead to the reelection of managers who were inefficient in the application of federal resources.

An alternative interpretation to impression management is that managers effectively perceive that the cause of the irregularity is beyond their control. However, this may imply reluctance on the part of them to try actions for a better management. Thus, understanding people's attributions (justifications) can have a strong effect on the manager's performance and managerial effectiveness.

Given the above, the results of the present study contribute to demonstrate the importance of the evaluation and monitoring of public managers and their actions, as well as their explanations in the face of irregularities and/or inefficiencies in the execution of actions to combat the epidemic of *zika*, dengue, *chikungunya*. Thus, knowing the positive or negative causes of resource management in the fight against *Aedes aegypti*, the citizen will have a greater knowledge of the actions of public managers, being able to exercise social control and to contribute to the institutional control carried out by inspection agents of public resources.

Another contribution of this research is the knowledge about how managers explain the causes of their behavior and management. Thus, those responsible for public resources act based on their attributions and possibly inappropriately if the attributions are not valid. Knowing the perception of these individuals better contributes to the improvement of the public resources management, mainly those destined to fight epidemics. Through a better understanding of how managers justify their actions, new perspectives, dynamics and instruments can be used so that resources are better used and public services are provided with more quality. Spending control can also be improved. Thus, both management and inspection need to be continually modernized, efficient and effective, to keep up with the evolution of social needs.

This study had some limitations. A limiting aspect was the database used to identify irregularities. Although CGU reports are frequently used in the literature, they focus only on the application of federal resources destined to states and municipalities. Thus, other sources of data can be used to measure problems in the application of public resources, such as the audit reports of the Courts of Accounts.

It is necessary that the premises of the present study be tested in the context of other programs to which public resources are destined. In this sense, another important limitation that deserves to be highlighted is that the findings of this research cannot be generalized, that is, they are restricted only to the period and the sample contemplated here. However, it can be assumed that the self-serving bias will be present in the contexts of application of federal resources in other programs, which may be an interesting topic to be analyzed in future studies. Therefore, we suggest that future research analyze the justifications presented by public managers in other areas, such as education and social assistance. New studies will enable a comparison between these areas, as well as a possible generalization of the results of the present study.

## ACKNOWLEDGEMENTS

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To the Research Support Foundation of the State of Minas Gerais. Doctoral Scholarship Daniele Silva Rodrigues.

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