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A VIRUS IN THE HEADLINES: A CRITICAL REVIEW OF JOURNALISTIC COVERAGE OF RABIES IN A MAJOR STATEWIDE NEWSPAPER

UM VÍRUS NAS MANCHETES: UMA REVISÃO CRÍTICA DA COBERTURA JORNALÍSTICA DA RAIVA EM UM PERIÓDICO DE GRANDE CIRCULAÇÃO ESTADUAL

UN VÍRUS EN LAS TITULARES: UNA REVISIÓN CRÍTICA DE LA COBERTURA PERIODÍSTICA SOBRE LA RABIA EN UN PERIÓDICO DE GRANDE CIRCULACIÓN ESTADUAL

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Aroldo J. B. Carneiro[1], Jacione S. Bastos[2], Ricardo L. Brito[3], Caio G. Zeppelini[4], Carlos R. Franke[5]

ABSTRACT

The role of wildlife in the epidemiology of rabies has been increasing in Brazil, highlighting the need for effective preventive measures. Health communication is essential for keeping the population informed about developments regarding the disease. We analyzed reports on rabies published from 1970 to 2009 by the leading newspaper in Bahia, aiming to assess the approaches to the disease and characterize the contribution of the press to the development of public knowledge about this zoonosis. A total of 1,381 articles were retrieved from the period: 403 focused on rabies in humans; 689 on pets; 428 on herbivores; 178 on bats; 41 on other wild species; and 141 articles mentioned rabies in a generic context. While the articles presented relevant content to the population, the significance of wild species in the epidemiology of the disease was overlooked.

Keywords: Health Communication. Lyssavirus. Public Health. Zoonosis.

RESUMO

O papel da vida silvestre na epidemiologia da raiva tem aumentado no Brasil, destacando a necessidade de medidas preventivas eficazes. A comunicação em saúde é essencial para manter a população informada sobre os avanços relacionados à doença. Analisamos reportagens sobre raiva publicadas entre 1970 e 2009 pelo principal jornal da Bahia, com o objetivo de avaliar as abordagens sobre a doença e caracterizar a contribuição da imprensa para o desenvolvimento do conhecimento público acerca dessa zoonose. Foram recuperados 1.381 artigos do período: 403 focados na raiva em humanos; 689 em animais de estimação; 428 em herbívoros; 178 em morcegos; 41 em outras espécies silvestres; e 141 artigos mencionaram a raiva em um contexto genérico. Embora os artigos

[1] Dr. in Animal Science in the Tropics. Ministério da Saúde, Secretaria de Vigilância em Saúde e Ambiente. E-mail: aroldoborges@gmail.com
[2] Veterinarian. Universade Federal da Bahia (UFBA). E-mail: jacionebastos@veterinaria.med.br
[3] Dr. in Animal Science in the Tropics. Universade Federal do Oeste Bahia (UFOB). E-mail: lustosaricardo@gmail.com
[4] Dr. in Ecology. Universade Federal da Bahia (UFBA). E-mail: czeppelini@gmail.com
[5] Dr. in Parasitology. Universade Federal da Bahia (UFBA). E-mail: frankeufba@gmail.com

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apresentassem conteúdo relevante para a população, a importância das espécies silvestres na epidemiologia da doença foi negligenciada.

Palavras-chave: Comunicação em Saúde. Lyssavirus. Saúde Pública. Zoonoses.

RESUMEN
El papel de la fauna silvestre en la epidemiología de la rabia ha ido en aumento en Brasil, lo que subraya la necesidad de medidas preventivas eficaces. La comunicación en salud es fundamental para mantener informada a la población sobre la evolución de la enfermedad. Analizamos informes sobre la rabia publicados entre 1970 y 2009 por el principal periódico de Bahía, con el objetivo de evaluar los enfoques sobre la enfermedad y caracterizar la contribución de la prensa al desarrollo del conocimiento público sobre esta zoonosis. Se recuperaron un total de 1381 artículos del período: 403 se centraron en la rabia en humanos; 689 en mascotas; 428 en herbívoros; 178 en murciélagos; 41 en otras especies silvestres; y 141 artículos mencionaron la rabia en un contexto genérico. Si bien los artículos presentaban contenido relevante para la población, se pasó por alto la importancia de las especies silvestres en la epidemiología de la enfermedad.

Palabras clave: Comunicación en Salúd. Lyssavirus. Salúd Pública. Zoonosis.

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1 INTRODUCTION

Rabies is a zoonotic disease known since antiquity, with dog bites being historically associated to the transmission of the disease (Rupprecht et al., 2022). Despite the availability of anti-rabies vaccines since the XIX century, rabies still represents a significant public health issue, causing over 59000 deaths worldwide (WHO, 2018).

Currently, dogs are still considered the main source of human infections (Franka et al., 2013; Lankester et al., 2014), although wild animals such as bats and non-human primates are recognized as reservoirs and have received increasing attention in epidemiological studies (Favoretto et al., 2013; Stoner-Duncan et al., 2014). In Latin America, human cases caused by dog bites have reduced by 90% in the last three decades and, since 2004, vampire bats became the main source of human infection (Rupprecht et al., 2022). This change comes with the growth of urbanization and the synanthropization of fauna, representing a new public health challenge (Carvalho-Costa et al., 2012; Rupprecht et al., 2022; Torres et al., 2014).

In such context, strategies for communication in health are key for inform, sensibilize and alert people to risk and measures to reduce it (Cavaca & Vasconcellos-Silva, 2015; Rangel-S, 2007). Programs for communication on health must identify and prioritize their target populations, providing precise and science-based information and build trust (Freimuth et al., 2000).

The success of rabies control programs depends on wide popular adhesion to responsible guardianship of animals, the awareness of the importance of vaccinating companion animals, and the collaboration with the health authorities through by notifying suspect cases in animals (Rupprecht et al., 2008; Rupprecht & Kuzmin, 2015). The present study aims to catalogue and critically evaluate the news coverage on rabies published by the major printed newspaper of the state of Bahia, Brazil, between 1970-2009, analysing the approaches taken when reporting about this zoonosis and its epidemiology.

2 MATERIALS AND METHODS

We performed a search in the archives of the A Tarde newspaper, made available in digital form through the “História da Bahia – Da memória impressa ao conteúdo digital” project at the Public Library of the State of Bahia for articles between 1970-1999, and the official A Tarde website for articles published between 2000-2009. The newspaper was chosen for being the largest news media of the state during the study period (2015).

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Searches were performed in all published News articles between 1970 and 2009. Searches were performed using the keywords “raiva” and “hidrofobia” (“rabies” and “hydrophobia” in Portuguese, respectively), using one term at a time. Reports using both terms were recorded only by its first term used. All reports were copied and catalogued by their date of publication, page number and title.

Classification of the articles retrieved followed the scientific areas related to rabies, being divided into the following categories:

- Human Rabies (HR): reports regarding human rabies cases.
- Rabies in Pets (RP): reports regarding rabies in cats and dogs.
- Rabies in Herbivores (RHer): reports regarding rabies in bovines, equines and small ruminants.
- Wildlife Rabies (WR): reports regarding rabies in wild terrestrial animals.
- Bat Rabies (BR): reports regarding rabies in bats.
- Rabies, General (RG): reports without a specific host, not fitting in previous categories.

We performed general descriptive analyses of the results. We performed a Pearson correlation test between the number of HR/RP news reports published between 2000-2009 and the number of human and canine rabies reports in the same period in the city of Salvador. Analyses were performed using SAS 9.1.

3 RESULTS AND DISCUSSION

A Tarde has published a total of 1381 news reports and pieces regarding rabies throughout the study period (1970 – 2009) (Table 1). Ninety-four percent of the reports were retrieved using the term “raiva” (1298/1381), while 6% (83/1381) were retrieved by the term “hidrofobia”. The Frequency of usage of the term “hidrofobia” presented a diminishing trend, with 34 different news articles using the term in the 1970s to 24 between 2000-2009, demonstrating a tendency of associating the term to one of the clinical signs of the disease instead of as a synonym to the disease itself.

Four-hundred and thirty-eight (31.7%) of the news titles included the word “raiva” in them. Examples of titles include: “Public health will start a campaign against rabies [Saúde pública vai abrir campanha contra raiva]” (p.2, 11/07/74); “Rabies: vaccination started and will continue until January the 4th [Raiva: vacinação começou e irá até dia 04 de janeiro]”

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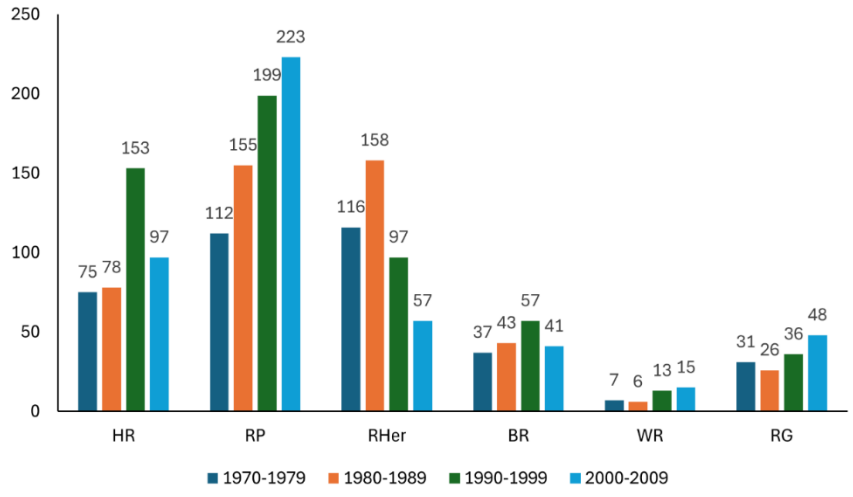
(p.2, 05/10/77); “Elevated animal deaths: rabies [Perdas elevadas de animais: raiva]” (p.7, 06/03/81); “Rabies: a constant threat [Raiva: um perigo constante]” (p.6, 03/04/88); “Learn how to fight against rabies [Saiba como combater a raiva]” (p.6, 17/07/93). The titles of the news articles are key components for attracting the attention of the reader, presenting a synthesis of the main idea of the text (José Menegassi & Izabel Afonso Chaves, 2019). Here, they reflect the perceived gravity of the disease by the recognition and capacity of grabbing attention the name of the disease has.

Figure 1

Classification of the news articles published by A Tarde, categorized, 1970-2009. HR = Human Rabies; RP = Rabies on Pets; RHer = Rabies in Herbivores; BR = Bat Rabies; WR = Wildlife Rabies; RG = Rabies, General



Source: The authors.

Rabies in Pets (RP) was the most frequent category of News articles retrieved 49.89% (689/1381), followed by Rabies in Herbivores (RHer) (428, 30.99%), Human Rabies (HR) (403, 29.18%), Bat Rabies (178, 12.88%), Rabies General (RG) (141, 10.21%) and Wildlife Rabies (WR) (41, 2.96%). An average of 470 news articles involving rabies were published per decade, with a peak of 555 between 1990-1999, and the lowest amount between 1970-1979 (378). The period of 2000-2009 presented the highest amount of news articles within a single category, with Rabies on Pets presenting 233 articles published, while in the 1980-1989 period, Wildlife Rabies presented the lowest number of news articles per category, with six articles (Fig. 1).

Between 1970-1979, Rabies in Herbivores (116, 30.6% of the news articles published

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in the period) and Rabies in Pets (112, 29,62%) were the most frequent subjects covered by the news (Fig. 1). The main themes related to RHer included the sanitary management of herds with vaccination (e.g.: “Sanitary control of herds [Defesa sanitária dos rebanhos]” (p.18, 02/02/74)), outbreaks of bovine rabies in municipalities (e.g.: “Bovine rabies outbreak in R. Cacaueira [Surto de raiva bovina na R. Cacaueira]” (p.5, 03/09/77).

News articles of the period in the category Bat Rabies involve the importance of managing vampire bat populations for livestock safety (e.g: “Training teams for intensive combat against bats [Treinamento de equipes para combate intensivo ao morcego]” (p.3, 18/04/70). Some articles alert to the transmission of the disease involving non-hematophagous bats, as published in “Importance of the hematophagous bat in the epizootiology of bovine rabies [Importância do morcego hematófago na epizootiologia da raiva bovina].

[...] in the beginning, it was believed that only vampire bats [...] were capable of transmitting the rabies virus. Today, evidence indicates that several fruit, nectar and omnivore bats can be infected by rabies and, consequently, spread it [...] (A Tarde, p.5, 16/05/1970, translated by the authors).

The News article “Bat attacks in Pernambués [Morcegos atacam em Pernambués]”, relating bat-on-human attacks, reports that: “this is the first time in several years that the preventive rabies treatment is ministered due to bat bites. It is common to see bats attacking cattle and horses, while humans are rarely targeted” (A Tarde, p. 16, de 20/04/79, translated by the authors). This indicates that, in the 1970s, the role of bats in the epidemiology of human rabies was small, and likely poorly understood as a direct source for infection, as also seen by the low amount of News articles in the category compared to the latter decades.

Table 1

Results of the search on news articles on rabies published by the newspaper A Tarde, 1970-2009

Period	Number of articles (% total)
1970-1979	283 (20.5%)
1980-1989	358 (25.9%)
1990-1999	382 (27.7%)
2000-2009	358 (25.9%)

Source: The authors.

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Some news articles provide an array of information regarding the disease (etiology, epidemiology, hosts, transmission, prophylactics), segregated in their different categories they refer to. For example, the article “Disease with nearly universal outcome: rabies [Enfermidade de evolução quase sempre fatal: raiva]”.

Rabies is an animal disease caused by a virus that has an affinity for the nervous system, affecting humans occasionally or eventually (zoonosis). [...] symptoms that precede death of sick individuals. […] “wild” or “rural” rabies, affecting livestock, mainly bovines [...] rabies cases in dogs have been observed [...] (A Tarde, p. 15, 02/05/70, translated by the authors).

This article had the contribution of a veterinarian, highlighting the importance of the source of the information published to guarantee its verity and quality (Freimuth et al., 2000). Other articles only cite the disease, with focus on other aspects, as is the example of the articles: “State increases health assistance in the countryside [Estado aumenta assistência à saúde em todo o interior]”.

> [...] Regarding infectious disease, such as tuberculosis, leprosy, polio, measles, whooping cough, diphtheria, tetanus, meningitis, rabies, ISTs, typhoid fever, hepatitis, food-borne infections, leptospirosis and Other endemic diseases, the secretariat for health intends to intensify immunization and control activities in all levels of the service network (A Tarde, p.6, 17/05/85, translated by the authors).

> “Anti-rat campaign postponed for today [Campanha contra ratos foi adiada para hoje]”

> [...] One-hundred personnel were trained by the Zoonosis Control sector of the SMS, with 20 for Pelourinho and 80 for the other boroughs that the campaign will cover. The agents will apply 500 thousand baits (poison doses) in several foci of rat proliferation, a host for diseases such as leptospirosis, bubonic Plague, rabies, Salmonellosis and others. [...] (A Tarde, p.7, 13/04/88, translated by the authors).

Publications that did not present relevant information regarding the disease were classified as Rabies, General (RG), with only mentions to the disease, without mentioning any other aspect of it. Publications such as there do not divulge important information on transmission routes, hosts, prophylactic measures available and prevention strategies, with little contribution to the awareness and information of the public.

Some articles even vehicle erroneous information. For example, the article presented above includes rabies as one of the diseases transmitted by urban rodents, although current

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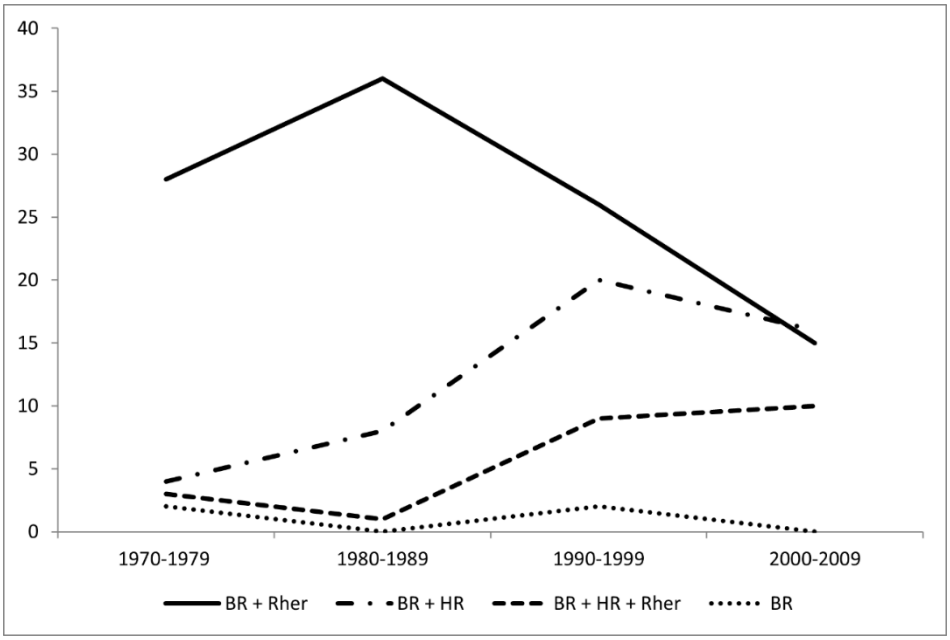
evidence indicates that they represent low risk of rabies transmission and do not require a post-exposure prophylactic course after an accident involving rat bites (BRASIL, 2014).

News articles in the category Human Rabies focused in presenting the number of deaths caused by the disease, *e.g.:* “Rabies causes another two deaths in the countryside [Raiva provoca mais 2 mortes no interior]” - “Another two fatal human cases of rabies were detected in the municipality of Uruçuca, in the southern region of the state of Bahia [...] humans were bitten by vampire bats [...]” (A Tarde, p.3, 18/02/83, translated by the authors). On prophylaxis “Desperate father steals anti-rabies vaccines [Pai aflito furtou vacina anti-rábica]”:

> [...] Resident of Lauro de Freitas, a man noticed in the early morning that the dog that had bitten his five-year-old son, was agonizing. When he sought health assistance in Salvador, he faced a dire reality: the one reference health center for this kind of vaccination is closed during the weekends. [...] (A Tarde, p.3, 21/09/86, translated by the authors).

Figure 2

Distribution of news articles on Bat Rabies published in A Tarde, 1970-2009, regarding their involvement in human, herbivore and bats alone



Source: The authors.

Other news articles categorized under Human Rabies focused on the viral transmission through accidents with animals, highlighting the zoonotic Character of the

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disease, as is the case for the report “Stray dogs infest city with the closure of dog pounds [Cães vadios infestam a cidade com extinção das carrocinhas]”:

> [...] These animals, although appearing docile, present serious risk for the population as, with a single bite, they might transmit hydrophobia [...] hydrophobia can be transmitted by dogs, as well as by bats, hoary foxes, cats and other animals, through contact with their saliva [...] (A Tarde, p 2, 02/08/1978, translated by the authors).

The category Rabies on Pets (RP) included news articles that reported on information for pet owners, with vaccination campaigns being the main subject of the articles. Examples of news reports included in the category: “Take your dog to get vaccinated, rabies still kills [Leve seu cão para vacinar, pois a raiva está matando]” (p.18, 30/07/74); “Crowd took dogs for vaccination Yesterday [Cães lotaram ontem postos de vacinação]” (p.3, 28/09/86); “Today is the day to vaccinate your dogs against rabies [Hoje é dia de vacinar os cães contra raiva]” (p.5, 04/11/89); “Anti-rabies vaccination in street fair achieves good results [Vacinação anti-rábica em feira tem bom resultado]” (p.3, 08/10/93); “ SESAB vaccinates dogs and cats against rabies [SESAB vacina cães e gatos contra a raiva animal]” (p.2, 20/09/97).

In the 1980s, RHer (158, 33.9% of the news articles published during the decade) and RP (155, 33.26%) continue as the most frequent categories. All categories, except for RG, had more news articles published during the period, reflecting an increase in the relevance of the theme. However, the increase of articles in the RHer category apparently do not reflect an increase in cases compared to the 1970s, as only 42 (26.58%) of the articles published in the category report rabies outbreaks in livestock, with high presence of articles reporting the activities deployed to protect livestock.

During the 1990s, RP (199, 35.85% of the news articles published) and HR (155, 27.38%) were the most common categories of news articles published (Fig. 1). This change observed in the most common themes is likely associated to the elevated number of human cases (N=49) recorded in the state of Bahia in the 1990s, with cases peaking in 1992 (N=12). In 1992, the city of Salvador recorded nine cases of human rabies caused by dog bites (e.g.: “Salvador leads in human deaths by rabies” [Salvador lidera casos de morte por raiva humana]” (p.3, 29/09/92).

The high prevalence of canine rabies and the occurrence of human cases caused by dog bites in the 1990s required prompt and proportional response by the sanitary authorities

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given the visibility given to the issue. The control measures implemented at the time, including the collection of stray dogs by the dog pound services, caused popular revolt due to the treatment given to captured animals. This kickstarted a wave of criticism on the method as a prophylactic against human rabies, as seen in articles such as: “Animal sacrifice [Sacrificio de animais]” -“[...] The owner of 30 animals [...] in panic with the possibility of new cases of rabies, authorized the sacrifice, while the Bahia Society for the Defense of Animals [Sociedade Bahiana de Defesa Animal] (Sbada) showed up to the area [...] trying to identify a preventive method” (A Tarde, p.2, 29/09/92); and “Entities protest, but dog cull continues [Entidades protestam mas prossegue caça aos cães]”:

Animal rights advocacy entities heavily criticize the return of the dog pound services, resumed since last year to reduce the cases of canine and human rabies in Salvador [...] Only this year, the Zoonosis Control Center captured 682 stray dogs and cat, with only 98 being rescued by the owners within the 72-hour deadline [...] (A Tarde, p.3, 14/09/94, translated by the authors).

Although dogs are the main sources of human rabies infection, during the same period (the 1990s), two outbreaks of human rabies transmitted by the common vampire bat *Desmodus rotundus*, in 1991 and 1992, took place in the municipalities of Aporá and Conde. As a result, the number of news articles on Bat Rabies increased 32.5% compared to the 1980s, informing on the epidemiology of bat-borne rabies: “Bats kill one and injure 96 [Morcegos matam um e ferem 96]” (p.3, 17/11/1990) and “Another victim of rabies-transmitting bats is admitted [Internada mais uma vítima dos morcegos que transmitem raiva]” (p.3, 18/07/1991). The magnitude of the outbreaks is described by Gonçalves e colaboradores18, who reported 308 bat-on-human attacks in the municipality of Aporá, with three dead, and five bat-on-human attacks in Conde, with two deceased.

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Table 2

Pearson's correlation between the number of news articles on rabies and the occurrence of human and dog rabies, 2000-2009

	Cases of human rabies in Bahia	Cases of canine rabies in Bahia	Cases of human rabies in Salvador	Cases of canine rabies in Salvador
Articles on Human Rabies	0.22669 (0.5288)	0.11797 (0.7455)	*0.75708 (0.0112)*	0.61311 (0.0594)
Aticles on Rabies on pets	0.38050 (0.2781)	0.35035 (0.3210)	*0.79713 (0.0058)*	0.62865 (0.0516)

Source: The authors.

The Evolution of BR and HR throughout the decades is present in Figure 2, demonstrating that, in spite of bat-borne rabies being more common in livestock, the role of bats in the epidemiology of human rabies gained significant attention with time.

In the 2000s, rabies transmission was still intense, with five human deaths and 458 canine cases confirmed. Between 2000-2005, the city of Salvador presented three human and 117 canine cases, while only one canine case was detected after the outbreak was controlled. This has contributed to the increase of news reports on the subject, with 223 articles on the RP category (46.36% of the articles published in the decade), and 97 (19.33%) on the HR category.

The number of news articles classified as RP and HR followed the trend of canine cases in the capital of the state (Salvador), not corresponding to the epidemics occurring in the countryside (Fig. 3). Only the number of human cases reported in the capital correlated to the amount of news articles on HR and RP (Table 2), indicating that, in spite of the statewide coverage of A Tarde as a news vehicle, the news repercussed mostly the cases notified in Salvador and neglected the countryside. This behavior reflects and reinforces the trend of neglect and sub notification of the disease, particularly when far from the main city centers, where housing, infrastructure and healthcare are lacking (Cavaca & Vasconcellos-Silva, 2015; Rupprecht & Kuzmin, 2015; Stoner-Duncan et al., 2014). It is also clear that human cases – the extreme of the epidemiological chain of rabies – have higher impact in the news cycle than animal cases – which represent lost opportunities for higher positive impacts on health by reporting in preventive and protective measures. This relationship highlights the need for the involvement of the press in a One Health approach for rabies prevention (Lankester et al., 2014).

News pieces notifying human rabies cases in the 2000s criticized the presence of

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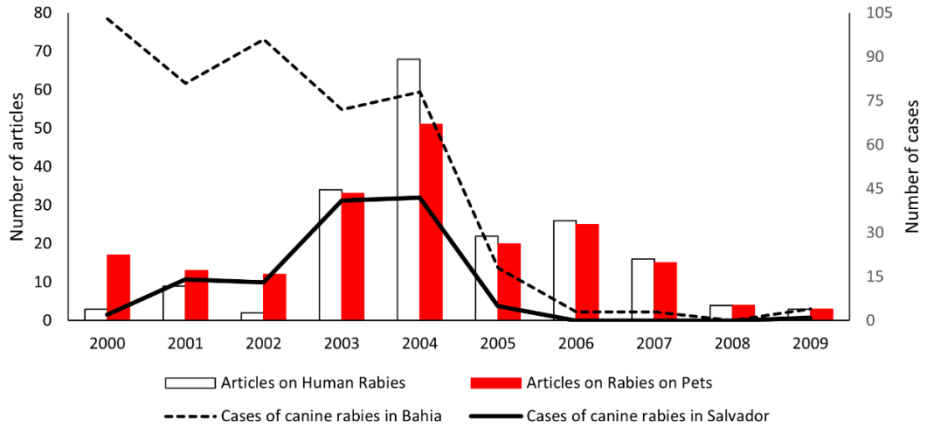
stray dogs in the streets, drawing attention to the environmental and sanitary conditions faced by the people afflicted by the disease:

The dire sanitary and infrastructural conditions, and the large number of stray dogs, together with the lack of conscience on the severity of human rabies, can hinder the celerity and efficacy of official action in the São Miguel community, in Salvador [...] ("Human rabies cases cause alert in a community [Caso de raiva humana preocupa comunidade]" – A Tarde, p. 3, 11/03/2001, translated by the authors).

Figure 3

Distribution of news articles published on Human Rabies and Rabies on Pets, per year, compared to the cases of rabies in dogs in the city of Salvador and the state of Bahia, 2000-2009



Source: The authors.

Often, publications denoted a critical position regarding the measures applied for the control of the rabies outbreaks, including the capture and euthanasia of stray cats and dogs, as observed in "Pets marked for death – stray cats and dogs live under the threat of the death corridor and lethal injection, with no right for jury and defense [Bichinhos marcados para morrer - Cães e gatos vadios vivem sob a ameaça de ir para o corredor da morte e sofrer uma injeção letal, sem direito a júri e defesa]" (24/07/2003), reporting 7140 dogs and 337 cats that were euthanized by the Zoonosis Control Center in Salvador, 2000-2003. This number of euthanized animals were also cited in other reports such as: "Stray dogs and cats still under threat [Cães e gatos de rua ainda sob ameaças]" (p. 5, 7/8/2003); "Stray dogs and cats kept without protection [Cães e gatos de rua mantidos sem proteção]" (p.8, 25/9/2003); "Responsible ownership makes a difference [Posse responsável faz a

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diferença]" (p.5, 30/09/2003) and "New technique makes neutering cheaper [Nova técnica barateia esterilização]" (p.07, 10/10/2003). In these reports, the 8th Technical Guide of the World Health Organization (WHO, 1992), that suggest the change in rabies control methods in Bahia. This technical report was key for the change of law and practice from controlling dog and cat populations by capture and euthanasia to vaccination and neutering to achieve effective control (Putra et al., 2013).

The newspaper's clear stance defending the animals was important for the change in practice regarding strays, culminating with their report on the legal decision that changed the policy on stray animals "Justice forbids animal massacre – Injunction requires changes in the zoonosis policy of Salvador, ending the abuse against stray dogs and cats [Justiça proíbe massacre de animais - Liminar obriga a Prefeitura de Salvador a mudar política de zoonoses, pondo fim aos maus-tratos a cães e gatos de rua]" (p. 7, 06/11/2003). However, the injunction in question was overturned by the President of the Justice Court of Bahia, on allegations of interference with the zoonosis control activities: "City Hall regains license to kill [Prefeitura tem de volta a licença para matar]" (A Tarde, p.4, 04/12/2003). The day after the publication, the first human death by rabies in the state in 2003 was reported, in the municipality of Dias D'Ávila, in the metropolitan region of Salvador, as reported in "Rabies kills and alters health authorities [Raiva mata e alerta a saúde]" (p.1, 05/12/2003). A second human death was recorded in Salvador about a week after in Salvador, as reported by A Tarde as: "Boy infected by Rabies dies [Morre garoto contaminado pela raiva]":

> [...] The parents of Lucas had hopes for his recovery as they did not know the gravity of the disease. Desolated, they denounce that the population is not properly informed on the risks, and there are other stray dogs in their borough, Paripe, in the Railway Suburbs, presenting suspicious behavior. [...] "We couldn't believe that a single scratch caused by the neighbour's dog in my son's leg would end up like this. The scratch didn't even hurt or got inflamed. It's very hard to accept this fatality, only now I understand the disease, I understand what happened. The government should work more in such a grave issue and bring information to families and schools. Our kids are innocent; they do not know the risks they face. I did not know that rabies kills and that the dog's saliva or a scratch could transmit it. Our Neighbours did not know it either. We have no way to save our children from such a cruel disease", commented the roadworker Luís Henrique da Silva Santos, 34 years [...] "The doctor said that Lucas would die in front of him. Imagine our Shock. We only knew that the disease existed, not that it is fatal", commented Luís Henrique (A Tarde, p.3, 12/12/2003, translated by the authors).

This testimony, published in its entirety by the newspaper, is an example of the

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importance of raising awareness and properly informing the population on prevention against rabies. The emphasis given by the newspaper to the lack of knowledge by the population, followed by relevant informative content on the disease and its prevention, demonstrate the commitment of A Tarde as a vehicle for fundamental public information. Another relevant aspect observed in the report is the lack of preparation and sensitivity by the medical staff on dealing with the disease and the relatives of the victims, as they inform the expected negative outcome in front of the patient – a child. In the state of Bahia, in 2003, besides the two aforementioned cases, a third fatality occurred in the municipality of Tororó (540 km of distance from Salvador), which was not covered by the media.

After confirmation of a human rabies case in Salvador in 2004, as reported by a front cover article by A Tarde: “New human rabies case [Surge novo caso de raiva humana]” (29/07/2004), several follow-up stories were published to incite debate on the current rabies prevention policies: “Rabies takes City Hall to court once again [Raiva leva prefeitura novamente à justiça]” (p.3, 04/08/2004); “After death, prevention [Depois da morte, a prevenção]” (p.3, 06/08/2004); culminating in the article “Other words for cats and dogs [Outras palavras para cães e gatos]” (p.3, 23/11/2004) reporting that the City Hall of Salvador signed a disciplinary term together with the Public Ministry and the Ministry of the Environment. The term rules, among other changes in the activities of the rabies control plan, the implementation of the castration program that, together with the cat and dog vaccination campaigns, replaced the practice of capture and euthanasia permanently.

This change in public policy was likely influenced by the emphatic media coverage promoted by A Tarde. The readership of the newspaper recognized the role of the news coverage in the change: “I would like to congratulate the journalism team of A Tarde for their competence and responsibility in covering the Public Ministry’s efforts in protecting the animals through the ratification of the disciplinary term [...] This would never be possible without the political pressure exerted by A Tarde [...]” (p.2, 26/11/2004, translated by the authors).

Data from the Zoonosis Control Center of Salvador indicates that between 2007– when capture and euthanasia of stray animals was suspended and the castration service was implemented – and 2014, 21434 castration surgeries were performed. The changes in control measures adopted by the municipality managed to control the circulation of the virus in the city, and since only one pet was found positive in 2009. This case involved a dog infected by the VAg3 viral strain, commonly associated to the common vampire bat,

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Desmodus rotundus.

Hence, the increased journalistic coverage on the theme of rabies, especially the coverage of the 2004 cases (Fig. 3), both contributed to change in public policy (Cavaca & Vasconcellos-Silva, 2015), and brought awareness on the importance of preventive care and risk reduction (Lardon et al., 2010) in health professionals and general population alike.

The 2000s were marked by human rabies outbreaks involving *D. rotundus* in the states Pará and Maranhão, between 2004 and 2005, emblematic cases of the epidemiological profile of rabies in Brazil, as bats substituted dogs as the main sources of human infection (Rupprecht et al., 2022). Although fewer articles were published on Bat Rabies in the 2000s compared to the other categories, they were characterized by the technical rigor on the information provided regarding the role of bats in the epidemiology of the disease, as seen in the following report:

> [...] Rabies in herbivores (cattle, for example) is an incurable, always fatal disease caused by a virus of the family Rhabdoviridae, genus Lyssavirus, that infects mammals, particularly bovines, equines, swine, dogs, cats, bats and other animals. It also infects humans. In the rural areas, its main transmitter is the vampire bat *Desmodus rotundus* [...] In urban areas, dogs are the main source of infection. The health authorities alert that people should never have direct contact (manipulate) with bats or other animals with signs of the disease, as well as eat milk and meat from animals suspected of being infected, under risk of contracting the virus. [...] ("Authority alert [Alerta das autoridades]" –A Tarde, p. 4, 04/09/2000, translated by the authors).

News articles such as the previous example are important to inform the population on how to deal with animals suspected of rabies, becoming a fundamental resource to the prevention of human cases and the diagnosis of suspected animal cases. An example is the following article "Bovine rabies outbreak raises worries in Caculé – vampire bats responsible for 231 animal deaths [Surto de raiva bovina já preocupa em Caculé – Morcegos hematófagos responsáveis por 231 mortes de animais]":

> [...] after its death [the sick animal] you should call a veterinarian to collect brain samples which will be sent for laboratory confirmation (A Tarde, p. 11, 02/06/2002, translated by the authors).

The most recent cases of rabies notified in Salvador were three non-hematophagous bats, being one black Myotis (*Myotis nigricans*, insectivorous) in 2011, one pale spear-nosed bat (*Phylostomus discolor*, omnivorous) and one lesser spear-nosed bat (*P. elongatus*,

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omnivorous) in 2015, as recorded in the database of the Central Health Laboratory of Bahia (LACEN/BA). These records, together with the high positivity rate of *D. rotundus* detected in the state (Carneiro et al., 2010), alert the health services of the high risk of bat-to-human. The risk of bat-to-pet transmission is also considered very high given that cats and dogs are likely to investigate, play with and/or eat bats that fell on the floor – a behavior typical of rabies-positive bats (Genaro, 2010; Morikawa et al., 2012).

The evidence of change in the epidemiological profile of rabies in Salvador, with bats becoming the main source of infection, has been observed in other urban centers, and require the adoption of novel strategies for surveillance and control (Rupprecht et al., 2022; Stoner-Duncan et al., 2014). The public needs to be properly informed on the risks and prevention measures under the new conditions, opening opportunities to engage the communities in surveillance, prevention and control on their animal companions, but potentially also in wildlife (Rupprecht et al., 2008; Rupprecht & Kuzmin, 2015).

Kotait et al. (2003) highlight the contribution of media to inform the population on how to proceed in situations involving bats in urban centers, especially regarding the risk of exposure to the rabies virus, the importance of notifying suspected cases, the correct methods to bat colonies in buildings, but without neglecting the importance of bats in the health and equilibrium of the biosphere.

Rabies in Wildlife was consistently the least frequent category, with a peak of 15 news articles in the 2000s. Reports in this category involved wildlife trafficking, citing rabies as one of the zoonosis that trafficked animals could carry. In this context, the hoary fox (*Cerdocyon thous*) and the common marmoset (*Callithrix jacchus*), given their potential for animal-on-human transmission, particularly in the Northeastern region on Brazil (Aguiar et al., 2011; Carnieli et al., 2008; Favoretto et al., 2013).

5 CONCLUSION

The publication of news articles on rabies in the newspaper A Tarde followed the epidemiologic pattern of occurrence through time, with emphasis on the involvement of pets, herbivores and humans in different outbreaks. The coverage regarding the involvement of wildlife was deficient, with the exception of bats given their increasing epidemiological importance. The coverage and quality of the content was considered adequate, informing the readers on the disease, its risk and how to protect oneself. Some reports, however, presented errors in terminology and involved species. In spite of the adequate coverage, it

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was still possible to detect that information on prophylaxis and other preventive measures were not sufficient and likely require broader media coverage beyond printed media. Coverage was correlated only with the number of human cases in Salvador, highlighting the neglected status of the disease, and the disproportionate effect of human cases in newsworthiness.

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