Integrating wildlife into antimicrobial resistance surveillance in South America: A policy agenda based on a One Health approach

Integrando la fauna silvestre en la vigilancia de resistencia antimicrobiana en Sudamérica: una agenda política desde el enfoque Una Salud

Tania Suarez-Yana[1]*

1 Facultad de Veterinaria y Ciencias Biológicas, Universidad Científica del Sur. Lima, Peru.

SOUTH SUSTAINABILITY

Cite as: Suarez-Yana, T. (2026). «Integrating wildlife into antimicrobial resistance surveillance in South America: A policy agenda based on a One Health approach». *South Sustainability*, 7(2), e176. DOI: 10.21142/SS-0702-2026-e176

Received: 2/7/2026
Peer reviewed
Accepted: 29/10/2026

© Los autores, 2026. Publicado por la Universidad Científica del Sur (Lima, Perú)

* Corresponding author:
taniasuarezy@gmail.com / tsuarezy@cientifica.edu.pe

Associate editor:
Jose Eduardo Serrano-Villavicencio

ABSTRACT

Antimicrobial resistance (AMR) constitutes one of the greatest global public health threats, yet wildlife remains systematically absent from national AMR surveillance frameworks. In this policy brief, I analyze the status of AMR National Action Plans across the twelve sovereign countries of South America, revealing that, despite widespread adoption of One Health principles and environmental surveillance components, no country explicitly includes wildlife as a surveillance target, with Uruguay as the only partial exception. I propose an environmental matrix of priority sentinel species by ecosystem and identify clinically relevant priority pathogens aligned with the World Health Organization Bacterial Priority Pathogens List, 2024. Specific recommendations are provided, with the aim of guiding South American policymakers in the operationalizing of wildlife AMR surveillance within a One Health framework.

Keywords: *wildlife, antimicrobial resistance, One Health, national action plan, environmental surveillance, policy makers*

RESUMEN

La resistencia antimicrobiana (RAM) representa una de las mayores amenazas para la salud pública mundial; sin embargo, la fauna silvestre permanece sistemáticamente ausente de los marcos nacionales de vigilancia de la RAM. Este *policy brief* analiza el estado de los Planes de Acción Nacional contra la RAM (PAN-RAM) en los doce países soberanos de Sudamérica, y revela que, a pesar de la adopción generalizada del enfoque Una Salud y de componentes de vigilancia ambiental, ningún país incluye explícitamente a la fauna silvestre como componente de vigilancia (Uruguay es la única excepción parcial). Se propone una matriz ambiental de especies centinela prioritarias por ecosistema, se identifican patógenos prioritarios alineados con la lista de la Organización Mundial de la Salud de 2024 y se ofrecen recomendaciones concretas dirigidas a tomadores de decisiones sudamericanos.

Palabras clave: *animales silvestres, resistencia antimicrobiana, Una Salud, plan de acción, vigilancia ambiental, agentes de cambio*

Introduction

Antimicrobial resistance (AMR) is considered a global threat because of the abuse and misuse of antibiotics in human and veterinary medicine, with impacts on food security and economic stability (Murray *et al*., 2022; World Organisation for Animal Health, 2025). According to forecasts, the AMR burden will increase from 1.91 to 8.22 million associated human deaths by 2050 (Murray *et al*., 2022). In animal health, antibiotics sold for use in livestock are projected to grow from 93.3 to 104.1 tonnes by 2030 (Allel *et al*., 2023). Furthermore, it is estimated that AMR will affect the food security of up to 2 billion people, with approximately US$100 trillion in economic losses expected by 2050, if urgent action is not taken (World Organisation for Animal Health, 2025). This growing burden, together with anthropogenic factors such as urban development and population growth, contributes to the intensification of interactions at the human-animal-environment interface.

In order to address AMR, comprehensive surveillance systems will be required that go beyond the scope of clinical settings. To date, the human and animal compartments taken into consideration have been hospitals, livestock and aquaculture, as well as crops/plants and, more recently, ecosystems within the context of the environmental compartment (World Health Organization *et al*., 2025; World Organisation for Animal Health, 2025). However, wildlife has not been systematically included in AMR surveillance strategies. Wild animals form part of ecosystems and play an important role in disseminating antimicrobial-resistant bacteria, AMR genes and mobile genetic elements such as plasmids, particularly in the case of wild birds (Arnold *et al*., 2016). Previous studies have reported that gulls can acquire and disseminate AMR at both the continental and intercontinental level (Ahlstrom *et al*., 2021; Zeballos-Gross *et al*., 2021). In South America, extended-spectrum beta-lactamase (ESBL)-producing *Escherichia coli* have been reported at a high prevalence in seabirds within the Humboldt Current Marine Coastal Ecosystem, suggesting a link to human-related contamination sources (Pribul *et al*., 2025; Suarez-Yana *et al*., 2024). Because antimicrobial resistance (AMR) contamination spans both urban and rural ecosystems, addressing it requires a One Health (OH) approach that integrates human, animal and environmental health.

Among the thirteen countries in South America, some have adopted AMR National Action Plans (AMR-NAPs) under a One Health approach. However, previous evidence suggests that despite recognition of the need for environmental monitoring, wildlife has not been explicitly included as part of AMR surveillance activities in the region (Benavides *et al*., 2024).

In this context, this policy brief analyzes the current status of AMR-NAPs in South American countries, with regard to the inclusion of wildlife and their role as surveillance sentinels, while proposing recommendations for regional policymakers, together with a framework for environmental matrices and sentinel species for regional AMR surveillance.

Focus and discussion

Wildlife as part of AMR surveillance

Wildlife species are integral to the One Health (OH) antimicrobial resistance (AMR) cycle, and yet their role remains poorly defined within current surveillance frameworks. Nevertheless, various epidemiological terms have been used when referring to their involvement in the OH-AMR cycle (Ewbank *et al*., 2026). Evidence shows that wildlife acts primarily as a carrier and disseminator of AMR rather than as a reservoir, given the lack of longitudinal studies confirming the long-term maintenance of resistance in wild populations, particularly wild birds (Ahlstrom *et al*., 2021; Ewbank *et al*., 2026; Zeballos-Gross *et al*., 2021). Wild bird species create unique AMR dissemination pathways based on their specific ecological behaviors. Because birds frequent natural habitats alongside agricultural, urban, landfill and wastewater treatment sites, mapping their movements is critical to tracking resistance (Lagerstrom *et al*., 2024; Suarez-Yana *et al*., 2024). South America is home to exceptional biodiversity across diverse ecosystems, including bird, mammal and amphibian species, many of which face increasing anthropogenic pressure in both protected and urban settings, and where the wildlife-livestock-human interface is particularly intense, due to expanding agricultural frontiers (Ameca *et al*., 2024; Goymer, 2017). There is, therefore, an urgent need to identify key wildlife sentinel species for inclusion in OH-AMR surveillance.

AMR National Action Plan status in South America

In order to establish integrated AMR and antimicrobial use (AMU) surveillance, countries with their own different capacities, resources and contexts prioritize activities in specific sectors or interfaces, translated into an AMR National Action Plan (AMR-NAP) (World Health Organization *et al*., 2025). At a global level, in 2015 the Quadripartite (FAO, WHO, OIE and UNEP) established a Global Action Plan on AMR (GAP-AMR), with the aim of guiding more than 170 countries in the updating of their AMR-NAPs under an OH approach (World Health Organization, 2026). The 2026-2036 GAP-AMR focuses on enhancing AMR national surveillance systems by strengthening health systems and laboratory capacity, while including more environmental components, such as wildlife and plants (World Health Organization, 2026). In this policy brief, I assessed the inclusion of wildlife in the OH-AMR actions applied in the twelve sovereign countries of the South American continent (Table 1).

DOI: 10.21142/SS-0702-2026-e176

Table 1. List of South American countries with an AMR National Action Plan (AMR-NAP), and their inclusion or not of the One Health approach and wildlife surveillance

Country	Implementation of AMR NAP and status	One Health approach	Environmental surveillance	Wildlife surveillance	Reference
Argentina	Yes, from 2022-2025, under Law N° 27680	Yes	Yes, including wastewater analysis	No, wildlife component or surveillance not mentioned	(*Ley de Prevención y Control de la Resistencia a los Antimicrobianos, 2022; Ministerio de Salud*, 2022)
Bolivia	No, but health laboratories implemented WHONET software in 2025	Not mentioned	Not mentioned	Not mentioned	(Pan American Health Organization, 2025)
Brazil	Yes, updated from 2026-2030	Yes	Yes, but does not mention which components	Not mentioned	(*Ministério da Saúde*, 2026)
Chile	Yes, from 2021-2025	Yes	Yes, including agricultural settings	No, only the identification of specific pathogens in the environment is mentioned	(MINSAL, 2021)
Colombia	Yes, last updated in 2018	Yes, although not specified as OH	Yes, including agricultural settings	Not mentioned	(*Ministerio de Salud*, 2018b)
Ecuador	Yes, updated from 2019-2023	Yes	Yes, including agricultural settings	Not mentioned	(*Ministerio de Salud Pública*, 2019)
Guyana	Yes, last updated in 2019	Yes	Yes, including agricultural settings	Not mentioned	(Pan American Health Organization, 2019)
Paraguay	Yes, from 2024-2028	Yes	Yes, including agricultural settings	Not mentioned	(*Ministerio de Salud Pública y Bienestar Social*, 2024)
Peru	Yes, from 2017-2021	Yes	Yes, including agricultural settings and wastewater analysis	Not mentioned	(MINSA, 2017)
Surinam	No	No	No	No	Not found
Uruguay	Yes, from 2024-2028	Yes	Yes, including agricultural settings and wastewater and solid waste analysis	Yes, it is mentioned in the Research section to promote resistome surveillance in agriculture and wildlife	(*Ministerio de Salud*, 2018a)
Venezuela	Yes, although not publicly available*	Not mentioned	Not mentioned	Not mentioned	(*Delegación de la República Bolivariana de Venezuela*, n.d.)

* Venezuela has an AMR-NAP; however, full documentation is not publicly available.

Among the twelve sovereign countries of South America, ten have implemented an AMR-NAP under a One Health approach, of which six have active, up-to-date plans. Importantly, all those countries with an active NAP recognize the importance of environmental surveillance, including agricultural settings and wastewater analysis, demonstrating a regional commitment to a broader AMR framework. However, wildlife remains absent from AMR surveillance across the region, with Uruguay being the only exception, where wildlife is mentioned in the context of resistome research. Critically, even this inclusion lacks specificity regarding the target species or ecosystems to be surveyed. This pattern reveals a structural gap. The One Health framework is adopted rhetorically, but not operationalized for wildlife, leaving a key component of the AMR cycle systematically invisible within regional policy.

Environmental matrix including wildlife as sentinels for AMR surveillance

Because AMR-NAPs require more guidance on integrating wildlife into environmental surveillance, a set of criteria for selecting ideal wildlife species is needed. This selection must take into consideration species' ecological behavior, breeding cycles, migration patterns and synanthropic activity, given that these traits have been associated with AMR acquisition and dissemination across environmental compartments (Doyle *et al*., 2025). In Table 2, an environmental matrix is proposed for the selection of suitable wildlife species in South America.

Table 2. Environmental matrix for suitable AMR surveillance using wildlife species as sentinels in South America

Ecosystem body	Wildlife species	Reasoning	Feasibility	Reference
Riverine, wetlands, and agricultural settings	Birds: waterfowl (Anseriformes), shorebirds (Charadriiformes)†.	Social and opportunistic species co-existing in mixed-species flocks in wetlands or riverine bodies close to agricultural settings. Also, they exhibit migratory behavior.	Current waterfowl and shorebird monitoring programs in South America facilitate cloacal sampling for AMR research, as well as the collection of water and Avian Influenza (AI) samples.	(Doyle *et al.*, 2025)
	Mammals: neotropical river otter (*Lontra longicaudis*), southern river otter (*Lontra provocax*), coypu (*Myocastor coypus*)†.	Habitat degradation and fragmentation increase human-wildlife conflict and drive species to move from pristine to human-dominated areas. As top predators and omnivorous scavengers (for coypu), they bioaccumulate toxins, heavy metals, including AMR bacteria and genes.	Ongoing conservation projects using capture methodology can be used for direct fecal collection. Confiscated, roadkill, and dead animals can be used as a non-invasive and effective opportunity.	
Intertidal, beaches, peri-urban, and urban settings	Birds: gulls (Laridae)	Gulls, primarily in the family Laridae, are recognized as synanthropic birds that forage in natural and human-contaminated areas. During the breeding season, nests are found near human-inhabited areas.	Animal health authorities from South American countries have strengthened AI monitoring. AMR monitoring can be incorporated during AI sample collection from seabirds.	(Suarez-Yana *et al.*, 2024)
Intertidal and beaches	Birds: pelagic seabirds (*Pelecanus thagus, Sula variegata, Spheniscus humboldti, Leucocarbo bougainvilliorum, Nannopterum brasilianum*)†.	Pelagic seabirds are not necessarily opportunistic, but they are always in contact with marine water and pelagic fishes, bioaccumulating pollutants, including AMR.	Ongoing seabird monitoring programs and conservation projects facilitate direct cloacal sampling and fecal collection. AMR monitoring can be integrated into the collection of samples for avian influenza monitoring.	
	Mammals: marine otter (*Lontra felina*)†.	Habitat degradation and fragmentation increase human-wildlife conflict and moving from pristine to human-related areas. As top predators, otters bioaccumulate toxins, heavy metals, including AMR bacteria and genes.	Conservation projects using capture methodology can be used for direct fecal collection. Non-invasive collection is feasible where fresh feces are found.	
Tropics and dry forests	Mammals: non-human primates (*Saguinus* sp., *Ateles chamek, Lagothrix lagothricha, Cebus unicolor, Sapajus apella*), deer (Cervidae).	Highly mobile animals with different ecological behaviors. Habitat degradation and illegal trade increased human-wildlife contact, including an AMR dissemination pathway. Primates are seed dispersers found in trees in tropical forests. They have different foraging habits and specialized behavior, with large social aggregations. Deer are large animals in large aggregations, and roadkill, and non-threatened species are selected for recreation hunting.	It is challenging to collect fresh feces directly. For primates, fecal collection occurs in sanctuaries or rescue centres. For deer, samples can be collected from the recreational hunting of non-threatened species in non-protected areas.	(Bazalar-Gonzales *et al.*, 2024; Doyle *et al.*, 2025)
Dry forests, agricultural, and peri-urban settings	Mammals: foxes (*Lycalopex culpaeus, Lycalopex sechurae, Lycalopex gymnocercus, Lycalopex griseus*).	Foxes are carnivores and top predators that interact with backyard poultry and are subject to illegal trade.	Conservation projects with capture methods can be used for direct sample collection. Also, confiscated, roadkill and dead animals can be used for non-invasive collection.	(Cevidanes *et al.*, 2020; Sacristán *et al.*, 2020)
Peri-urban and urban settings	Birds: vulture (*Cathartes aura*)†, Andean condor (*Vultur gryphus*).	These birds expand their foraging resources contaminated by anthropogenic 'pathogen pollution'. Their migratory behavior includes extensive movements interacting with human-modified areas and protected areas.	Non-invasive fecal collection can be carried out when foraging in dumps, landfills or resting areas.	(Fuentes-Castillo *et al.*, 2020)
Agricultural peri-urban, and urban settings	Mammals: rodents (*Rattus rattus, Rattus norvegicus*), bats (*Desmodus rotundus, Tadarida brasiliensis*).	Rodent species are typically found in urban or human-modified areas, including agricultural and rural settings. They are opportunistic and recognized vectors of zoonotic diseases. Bats make large movements with migratory behavior interacting with livestock settings in the case of hematophagous bats, and rural settings in the case of insectivorous and fruit bats.	Rodent control programs run by farmers and local municipalities should include AMR monitoring. Animal health authorities in South American countries run rabies control programs. AMR monitoring can be incorporated during rabies sample collection.	(Benavides *et al.*, 2018, 2021)

† Proposed as sentinel candidates based on their ecological traits and proximity to anthropogenic contamination sources.

DOI: 10.21142/SS-0702-2026-e176

Priority pathogens for AMR surveillance in wildlife should align with the WHO Bacterial Priority Pathogens List 2024, which maintains carbapenem-resistant and ESBL-producing Enterobacteriaceae as critical priorities (Sati *et al*., 2025). Based on the environmental matrix proposed in Table 2, the priority pathogens to be surveilled in South American wildlife include ESBL- and carbapenemase-producing *E. coli*, ESBL- and carbapenemase-producing *Klebsiella pneumoniae*, which have been detected previously in wildlife and urban settings within the region (Benavides *et al*., 2018; Ewbank *et al*., 2022; Hayer *et al*., 2023; Suarez-Yana *et al*., 2024).

Conclusions and recommendations

The COVID-19 pandemic demonstrated that zoonotic threats emerging at the human-animal-environment interface can rapidly escalate into global health crises, highlighting the urgency of implementing comprehensive OH surveillance systems (Doyle *et al*., 2025). Within this framework, South American countries have a critical opportunity to strengthen their AMR-NAPs by closing the structural gap identified in this policy brief: the systematic absence of wildlife as a surveillance component, despite the adoption of OH frameworks.

Specific recommendations for regional policymakers:

1. Include wildlife in the revision and updating of AMR-NAPs across South American countries, following the GAP-AMR 2026–2036 established by the Quadripartite.
2. Define priority sentinel species by ecosystem, based on their ecological behavior and proximity to anthropogenic contamination sources, using the environmental matrix proposed in Table 2 as a practical guidance tool.
3. Integrate wildlife AMR surveillance into existing monitoring programs, including wildlife health programs, biodiversity networks and national veterinary laboratories, in order to maximize efficiency and avoid the duplication of resources, which is a critical consideration in the context of the region's resource-limited settings.
4. Establish a regional data-sharing network for wildlife AMR surveillance, articulated with existing platforms such as the WHO Global Antimicrobial Resistance and Use Surveillance System (GLASS), in order to enable cross-border comparability and joint analysis.
5. Fund pilot studies in well-characterized systems where human and domestic animal AMR data are already available, prioritizing high-intensity wildlife-livestock-human interface zones such as Amazonian agricultural frontiers, Andean pastoral landscapes and coastal ecosystems.
6. Strengthen national capacities in environmental microbiology and genomics for ARG characterization in wildlife, promoting regional technical cooperation and knowledge transfer between countries with more developed laboratory infrastructure and those with emerging capacities.

Addressing AMR in wildlife is not an isolated environmental or veterinary concern; it is a public health challenge that calls for coordinated, intersectoral action. Health, environmental and agricultural ministries must work jointly, in order to ensure that wildlife surveillance becomes an operational, funded and systematically implemented component of national and regional AMR strategies. South America's exceptional biodiversity, combined with the growing availability of genomic tools and existing monitoring platforms, positions the region as a potential model for integrated OH AMR surveillance globally.

Author's contribution

Tania Suarez-Yana: Conceptualization, research, original draft, writing, revising, editing and supervision.

Research funding

This research was self-financed and received no external funding.

Conflicts of interest

The author has no conflicts of interest to declare.

Artificial intelligence disclosure

During the preparation of this work, the author used Claude (Anthropic) for language editing, grammar checking and revision of the writing style in the manuscript drafts. Following use of this tool, the author revised and edited the content as needed, and assumes full responsibility for the content of the publication.

Bibliographic references

Ahlstrom, C. A., Van Toor, M. L., Woksepp, H., Chandler, J. C., Reed, J. A., Reeves, A. B., Waldenström, J., Franklin, A. B., Douglas, D. C., Bonnedahl, J., and Ramey, A. M. (2021). «Evidence for continental-scale dispersal of antimicrobial resistant bacteria by landfill-foraging gulls». *Science of the Total Environment*, 764, 144551. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0048969720380827

Allel, K., Day, L., Hamilton, A., Lin, L., Furuya-Kanamori, L., Moore, C. E., Van Boeckel, T., Laxminarayan, R., and Yakob, L. (2023). «Global antimicrobial-resistance drivers: An ecological country-level study at the human–animal interface». *The Lancet Planetary Health*, 7(4), pp. e291-e303. Available at: https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(23)00026-8/fulltext

Ameca, E. I., Nie, Y., Wu, R., Mittermeier, R. A., Foden, W., and Wei, F. (2024). «Identifying protected areas in biodiversity hotspots at risk from climate and human-induced compound events for conserving threatened species». *Science of the Total Environment*, 938, 173192. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0048969724033394

Arnold, K. E., Williams, N. J., and Bennett, M. (2016). «"Disperse abroad in the land": The role of wildlife in the dissemination of antimicrobial resistance». *Biology Letters*, 12(8), 20160137. Available at: https://pubmed.ncbi.nlm.nih.gov/27531155/

Benavides, J. A., Salgado-Caxito, M., Torres, C., and Godreuil, S. (2024). «Public Health Implications of Antimicrobial Resistance in Wildlife at the One Health Interface». *Medical Sciences Forum*, 25(1). Available at: https://www.mdpi.com/2673-9992/25/1/1

Benavides, J. A., Shiva, C., Virhuez, M., Tello, C., Appelgren, A., Vendrell, J., Solassol, J., Godreuil, S., and Streicker, D. G. (2018). «Extended-spectrum beta-lactamase-producing *Escherichia coli* in common vampire bats *Desmodus rotundus* and livestock in Peru». *Zoonoses and Public Health*, 65(4), pp. 454-458. Available at: https://pubmed.ncbi.nlm.nih.gov/29575785/

Doyle, C., Wall, K., Fanning, S., and McMahon, B. J. (2025). «Making sense of sentinels: Wildlife as the One Health bridge for environmental antimicrobial resistance surveillance». *Journal of Applied Microbiology*, 136(1), lxaf017. Available at: https://academic.oup.com/jambio/article/136/1/lxaf017/7953334

Ewbank, A. C., Benavides, J. A., Sacristán Yagüe, C., Esperón Fajardo, F., and De La Torre, A. (2026). «A call for precision: Rethinking epidemiological terms applied to wildlife in antimicrobial resistance studies». *ASM Animal Microbiology*, 1(1), e00017-25. Available at: https://journals.asm.org/doi/10.1128/asmam.00017-25

Ewbank, A. C., Fuentes-Castillo, D., Sacristán, C., Cardoso, B., Esposito, F., Fuga, B., de Macedo, E. C., Lincopan, N., and Catão-Dias, J. L. (2022). «Extended-spectrum β-lactamase (ESBL)-producing *Escherichia coli* survey in wild seabirds at a pristine atoll in the southern Atlantic Ocean, Brazil: First report of the O25b-ST131 clone harboring *bla*CTX-M-8». *Science of the Total Environment*, 806. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0048969721056163

Goymer, P. (2017, March 23). «Spotlight on South America». *Nature Ecology & Evolution*, 1(4), 0129. Available at: https://www.nature.com/articles/s41559-017-0129

Hayer, J., Salgado-Caxito, M., Opazo-Capurro, A., Muñoz, P. G., Millán, J., Piñeiro, A., Munita, J. M., Rivas, L., and Benavides, J. A. (2023). «Multiple clonal transmissions of clinically relevant extended-spectrum beta-lactamase–producing *Escherichia coli* among livestock, dogs and wildlife in Chile». *Journal of Global Antimicrobial Resistance*, 34, pp. 247-252. Available at: https://pubmed.ncbi.nlm.nih.gov/37463613/

Lagerstrom, K. M., Scales, N. C., and Hadly, E. A. (2024). «Impressive pan-genomic diversity of *E. coli* from a wild animal community near urban development reflects human impacts». *iScience*, 27(3), 109072. Available at: https://www.sciencedirect.com/science/article/pii/S2589004224002931

Murray, C. J. L., Ikuta, K. S., Sharara, F., Swetschinski, L., Robles Aguilar, G., Gray, A., Han, C., Bisignano, C., Rao, P., Wool, E., Johnson, S. C., Browne, A. J., Chipeta, M. G., Fell, F., Hackett, S., Haines-Woodhouse, G., Kashef Hamadani, B. H., Kumaran, E. A. P., McManigal, B., and Naghavi, M. (2022). «Global burden of bacterial antimicrobial resistance in 2019: A systematic analysis». *The Lancet*, 399(10325), pp. 629-655. Available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02724-0/fulltext

Pribul, B. R., Da Silva Nascimento, L., Marinato, C. E. G., Silveira, M. C., Rodrigues, D. C. S., Sued-Karam, B. R., Serwy, D. M., Ogrzewalska, M., Bueno, M. G., D'Alincourt Carvalho-Assef, A. P., De Souza, M. M. S., and Rocha-de-Souza, C. M. (2025). «Detection of ESBL-producing *Escherichia coli* carrying *bla*CTX-M-8 in magnificent frigatebird (*Fregata magnificens*) from Brazil: A One Health perspective». *Frontiers in Microbiology*, 16, 1671302. Available at: https://www.frontiersin.org/journals/microbiology/articles/10.3389/fmicb.2025.1671302/full

Sati, H., Carrara, E., Savoldi, A., Hansen, P., Garlasco, J., Campagnaro, E., Boccia, S., Castillo-Polo, J. A., Magrini, E., Garcia-Vello, P., Wool, E., Gigante, V., Duffy, E., Cassini, A., Huttner, B., Pardo, P. R., Naghavi, M., Mirzayev, F., Zignol, M., and Tacconelli, E. (2025). «The WHO Bacterial Priority Pathogens List, 2024: A prioritization study to guide research, development and public health strategies against antimicrobial resistance». *Lancet Infectious Diseases*, 25, pp. 1033-1043. Available at: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(25)00118-5/fulltext

Suarez-Yana, T., Salgado-Caxito, M., Hayer, J., Rojas-Sereno, Z. E., Pino-Hurtado, M. S., Campaña-Burguet, A., Caparrós, C., Torres, C., and Benavides, J. A. (2024). «ESBL-producing *Escherichia coli* prevalence and sharing across seabirds of central Chile». *Science of the Total Environment*, 951, 175475. Available at: https://www.sciencedirect.com/science/article/pii/S0048969724056250

World Health Organization (WHO). (2026, May 13). «Proyecto de plan de acción mundial actualizado sobre la resistencia a los antimicrobianos 2026-2036». Available at: https://apps.who.int/gb/ebwha/pdf_files/EB158/B158_18-sp.pdf

World Health Organization (WHO), Food and Agriculture Organization of the United Nations (FAO), United Nations Environment Programme (UNEP), and World Organisation for Animal Health (WOAH). (2025). *Quadripartite guidance on One Health integrated surveillance of antimicrobial resistance and use*. Geneva: WHO, FAO, UNEP, and WOAH. Available at: https://www.who.int/publications/b/79427

World Organisation for Animal Health (WOAH). (2025). *The State of the World's Animal Health*. Paris: WOAH. Available at: https://www.woah.org/en/document/the-state-of-the-worlds-animal-health-2025/

Zeballos-Gross, D., Rojas-Sereno, Z., Salgado-Caxito, M., Poeta, P., Torres, C., and Benavides, J. A. (2021). «The Role of Gulls as Reservoirs of Antibiotic Resistance in Aquatic Environments: A Scoping Review». *Frontiers in Microbiology*, 12(703886), pp. 105-121. Available at: https://www.frontiersin.org/journals/microbiology/articles/10.3389/fmicb.2021.703886/full