Traditional gestures and practices in the management of digestive colic in draught horses in the Dakar and Thiès regions of Senegal

ABSTRACT

Aims: The aim of this study is to gain a better understanding of the traditional gestures and practices used by horse owners and users in the management of digestive pathologies, in this case colic.
Methodology: The study was a retrospective survey in the Dakar and Thiès regions, involving direct interviews with 540 horse owners and users between February 2023 and October 2023.
Results: The owners and breeders of draught horses were all men with a variety of professional backgrounds, aged under 35 (69.07%) and making a living from breeding (60.74%). All the respondents knew how to recognize a colicky horse at an early stage by the first signs of abdominal pain, and feared the seriousness and urgency of this condition, associating it with a significant risk of mortality. When abdominal pain occurs, most of the people interviewed admit to using mainly traditional first aid, and only call in an animal health professional if this fails or if there are complications.
Conclusion: Horse owners should be aware of the actions and practices to avoid in order not to worsen the prognosis or risk the life of their horse. They should also involve animal health professionals in a collaborative effort for the health and well-being of horses.

Keywords: Retrospective- survey - traditional -gesture - practices – horse - colic – Senegal

1. INTRODUCTION

The relationship between man and horse has evolved from prehistoric times to the Neolithic period. Horses served man as a means of food and transport, and were then domesticated and tamed for work, transport, communication and defence. Nowadays, the horse has become a pet, a sport animal, a leisure animal, a working force in rural areas, a therapy animal, etc. (Hausberger et al., 2014; Digard, 1999; Edenburg, Since the Middle Ages, the horse has been part of the lifestyle of West Africans. A whole tradition, a wh of life built essentially around the horse was to emerge. The Wolofs, Peul's, Toucouleurs, Sarako Maures all had a great passion for horses (Ndiaye, 1978). This is how horse-breeding developed in S making it one of Africa's leading horse-breeding countries (Ndour, 2010).

Horses are highly regarded in society and the various players in the equine sector pay particular attention to their health, making horse care an area requiring a certain level of practical technical expertise and knowledge of equine pathologies.

In Senegal, digestive diseases account for 28.40% of all pathological conditions, second only to skin diseases. Of these digestive diseases, colic is by far the most common (66.67%) (Fall, 2021).

2. MATERIAL AND METHODS

The study took place during 9 months, from February 2023 to October 2023, an ideal period for horse owners to stay in these two major regions and especially in the cities of Dakar (Pikine, Rufisque, Guédiawaye, Dakar and Keur Massar) and Thiès (Mbour, Thiès, and Tivaouane).

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These regions account for a significant proportion of the country's horse population (13.88%), and are home to major construction sites and large warehouses stocked with a variety of goods. This is a favourable environment for horse owners and users from remote villages in the other regions to come and do horse-drawn transport before the start of the rainy season.

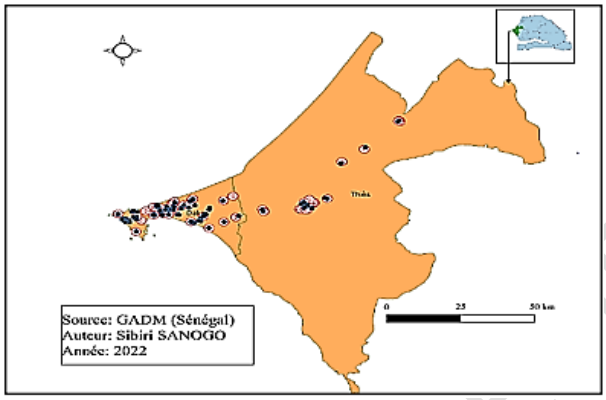


Figure 1: Study area map

2.1. Questionnaires

Two questionnaires were used to collect the data:
- the first for users and protectors of horses, asking them about their identity, their knowledge of horse diseases and colic in particular, how they traditionally manage colic, and questions on colic prevention.
- the second is addressed to sellers of plants and products for traditional therapy to obtain information on plants and their virtues, their method of use.

2.2. Surveyed (participants)

This was a retrospective cross-sectional study of 540 owners and users of draught horses. The survey areas were chosen on the basis of the importance of horse-drawn transport and the number of horses.

2.3. Hardware

KoboToolbox, Microsoft Excel 2013, ArcGIS and R software, deployed on a smartphone and a computer, were used to collect, record, process and analyse the data. Motorbikes and carts are the means of mobility used in the field. Other equipment included office supplies, internet connection and documentation,

2.4. Investigations

The surveys took the form of direct interviews in two stages:

- A pre-test phase after the survey form had been drawn up to improve the questionnaire. This involved 71 owners and horse owners in different areas of the suburbs.
- A survey phase for data collection and recording: this involved 540 horse owners and users who agreed to answer the questions after understanding and approving the consent form. They were available in the mornings before 10am, at break time (warm hours) between 2pm and 4pm, and at break time between 6pm and 9pm. In the mornings and evenings, they are at their homes, and during the day, they can be found at markets, gas depots, building sites, hardware stores, welding and carpentry workshops, and shopping areas.
- The data was collected and recorded using KoboToolBox, processed using Microsoft Excel 2013 and then analysed using R. The map was created using ArcGIS software.

3. RESULTS

- *Horse owners and users*

The people surveyed were all men who owned at least one horse, 52.96% of whom were single and 46.48% married. Their professions varied, with a predominance of breeders (60.74%) and traders (27.96%), with the age group between 15 and 34 being the most represented (68.7%) (Tables 1 and 2). Other professionals included carpenters, fishermen, shopkeepers, veterinary auxiliaries, bakers, mechanics, engineers, commercial agents and teachers.

Table 1: Social characteristics of participants

Parameters	Variables	Numbers of participants	Rate (%)
Sex	Masculine	540	100
	Féminin	0	0.00
Age	Under 16	2	0.37
	15 to 34 years old	371	68.7
	35 to 50 years old	160	29.63
	Over 50	7	1.3
Marital status	Single	286	52.96
	Married	251	46.48
	Divorced	1	0.19

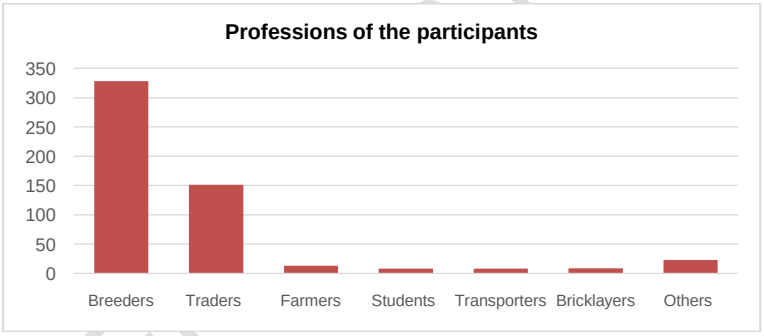
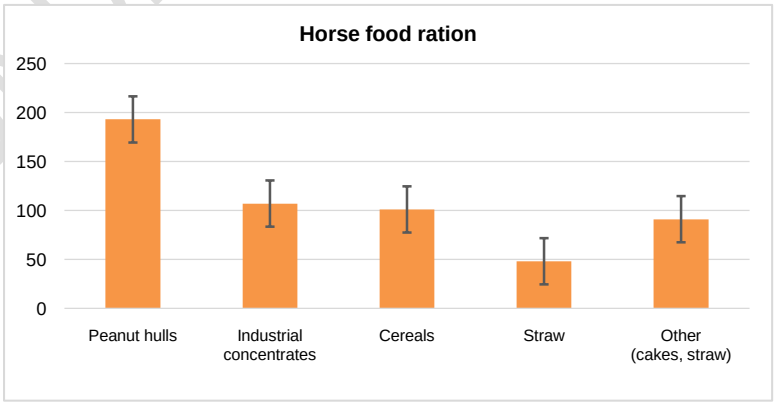


Figure 2: Professions of the participants



Standard deviation = $1,21*10^{-3}$

Figure 3: Horse Food ration of the participants

The people surveyed (93.52%) admitted to taking care of their horses for the first time and not calling in the vet in the event of failure or complications. For example, appointments for routine consultations associated with deworming are kept by very few owners and users (6.3%).

- *Participants knowledge of the signs of colic*

Horse owners and users are well aware of what is known as colic and explain it as "a pain in the belly" or in local languages: "*Birr Bouy meti*" in Wolof (55.94%); "*O foudo dom*" in Sérère (30.65%) or "*réddou moussandou*" in Toucouleur (10.15%). According to the majority of respondents (95.60%), colic is serious in the sense that it poses a vital risk to horses. They said that they were not mistaken in recognizing the signs of colic, but some (4.4%) admitted that colic could be confused with other ailments (lameness) of the horse.
Several signs and symptoms were described by the respondents for detecting colic (Table 2).

Table 2: Signs observed by Horse Owners and Users in horse colic

Signs observed by the participants	Rate (n=540)
Lying down and getting up several times	94 (24.42%)
Rolling on the floor	63 (16.36%)
Turning in circles	49 (12.73%)
Inappetence	41 (10,65%)
Self-auscultation	20 (5.19%)
Striking abdomen	19 (4.94%)
Scraping the ground	18 (4.68%)
Sweating	14 (3.64%)
Complaining of pain	11 (2.86%)
Teeth grinding	9 (2.34%)
Abdominal bloating	8 (2.08%)
Cramping	8 (2.08%)
Difficulty urinating	7 (1.82%)
Difficulty defecating	7 (1.82%)
Other (immobility, dysphagia, dyspepsia, etc.)	17 (4.42%)
Total	**385 (100)**

- *Plants used by the participants in horse colic management*

For the management of horses with colic, most use traditional treatments (plant or product and traditional procedures) (86.85% or 468 CUPs) and 13.15% (72 CUPs) do not and bring their horses directly to an animal health professional.

Table 3: Plants most used by the participants in horse colic management

Plants	Plants Compositions, properties or virtue	Numbers	Rates (%)
Prosopis chilensis	Phenolic compounds, flavonoids and tannins	46	19,66
Moringa oleifera	Vitamins A and C, iron, calcium, amino acids, antioxidants	42	17,95
Acacia nilotica	Rich in tannins, flavonoids, alkaloids and phenolic compounds	30	12,82
	Contains anthraquinones, flavonoids and	23	9,83

Cassia italica	phenolic compounds		
Adansonia digitata	Contains vitamins B6 and C, calcium, potassium and antioxidants	16	6,84
Carica papaya	Contains vitamins C and A, antioxidants and dietary fibre	10	4,27
Azadirachta indica	Contains azadirachtin, triterpenoids, flavonoids and fatty acids	8	3,42
Faidherbia albida	Contains ulcer-healing properties	8	3,42
Magnifiera indica	Vitamins A and C, antioxidants, digestive enzymes and dietary fibre	7	2,99
Nicotiana tabacum	Rich in nicotine	6	2,56
Citrus limon	Contains vitamin C, flavonoids and terpenes	6	2,56
Guiera senegalensis	Rich in tannin and alkaloids	6	2,56
Other plants	Rich in minerals and vitamins with antioxidant and anti-parasitic properties	26	11,11

- *Products used by the participants to manage colic*

Many products are used by the participants to manage colic. The most commonly used product is beer (34.51%), but other products (bicarbonate, yeast, hen's egg, fizzy drinks, cloves, coffee, shea butter, cola, etc.) are also used (23.45%).

Table 4: Products used by the participants

Products used	Numbers	Rate (%)
Beer	78	34,51
Animal faeces	20	8,85
Honey	15	6,64
Edible oil	14	6,19
Coffee	12	5,31
Paraffin oil	11	4,87
Vinegar	8	3,54
Salt water	8	3,54
Oil	7	3,10
Other	53	23,45
TOTAL	**226**	**100**

- *Gestures used by the horse owners and users*

These are the actions taken to relieve and improve the condition of a colicky horse. Hand walking (32.03%) is the most common procedure, followed by resting (28.68%) and taking water (21.60%).

Table 5: Main ways in which respondents manage colic

Gestures used	Rate 537(%)	
Walking by hand	172	(32,03)
Giving water	116	(21,60)
Resting	154	(28,68)
Prayers	48	(8,94)
Giving food	24	(4,47)

Incantation	16	(2,98)
Stop feeding	7	(1,30)
TOTAL	**537**	**100**

- *Difficulties encountered by the participants in the traditional management of colic*

The data collected show that 33 respondents admitted having encountered difficulties in the traditional management of colic. The difficulties cited were of 02 types: - those related to the animal (intolerance, complications of signs) - those related to the PUC (lack of knowledge about plants/products and appropriate techniques; lack of resources).

The horse owners and users recognise the value of adopting preventive measures against colic in horses.

Table 6: Preventive measures practised by participants

Preventive measures and suggestions	**Rate (%)**	
Feed hygiene (quantity, quality and rationing)	157	40,36
Rest (02 horses alternating)	84	21,59
Deworming (by a vet)	54	13,88
Dental care (by a veterinary)	23	5,91
Look after your horse's well-being (care and vitamins)	20	5,14
Call a veterinary if there is any sign of illness	14	3,60
Avoid overloading	13	3,34
Housing hygiene (comfort and cleanliness	13	3,34
Improving traditional treatments	11	2,83
TOTAL	**389**	**100**

4. DISCUSSION

An exclusive interview with horse owners and users on traditional gestures and practices used in colic management was the main data collection method. This method was used by Sanogo (2022) and Ngom (2021) who also worked on horses in Senegal and has advantages and limitations. It is quick and gives the interviewer the opportunity to ask additional questions or seek clarification. However, it requires the interviewer to have a very good command of the questionnaire and the subject in order to better explain the objectives of the study to the respondents. Direct interviewing is expensive because of the time needed to conduct interviews and the cost of travel (FAYE (2015).

In fact, this method is expensive and the investigator is always faced with periods of inconvenience from certain stakeholders. Worse still, some owners do not understand the extent of this work and sometimes associate it with spying, and others ask for a financial sum or medical care at the end of the survey to take part in the study as if it were a service. The survey was carried out in the presence of horse owners and users, with a questionnaire being completed beforehand. An online questionnaire would not be appreciated by breeders given their level of literacy and lack of time. Furthermore, our questionnaire did not ask owners in advance about their level of knowledge of a normal horse before talking about their knowledge and management of colicky horses, unlike Bowden et al, (2019), who followed this principle.

The owners and users of draught horses are all men and belong to different professions. The age group between 15 and 34 is the most dominant, with 68.7% of respondents. Breeders, farmers, traders, transporters, shopkeepers, students, businessmen and civil servants all use draught horses to earn money. This supports the hypothesis of the socio-economic importance of draught horses in Senegal. The same observation was made by Ngom (2021) and Faye (2015). Some pupils and students use horses to earn money while waiting for the start of the school year, and shopkeepers use their horses to transport their goods.

During our investigations, we found that horses work an average of 10 hours per day. This is comparable to the comments of Faye (2015), who links this to overexploitation of horses leading to a significant deterioration

in their health and welfare. As such, it would be caused by the often-difficult economic living conditions of breeders.

The study shows that 60.74% of those surveyed live from their livestock. It is therefore understandable that a draught horse user who does not yet have enough income to take care of himself and his horse's needs should remain active until late in the day. In the same vein, it is understandable that the medical care, housing and health of these horses are relegated to second place, as our study shows. For 97.40% of those surveyed, their horses live in the open air without proper housing, sometimes the level of sanitation remains to be desired, and 92.52% of those surveyed take care of their horses' first aid, with little regard for deworming, deworming or proper dental care. All these shortcomings are closely linked to the occurrence of colic, according to (Wild et al., 2021), because digestive parasites are a real risk factor for colic (Gonçalves et al., 2002).

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Owners describe various symptoms to recognize colic, such as a horse lying down and getting up again in an unusual way, turning in circles, rolling on the ground, having difficulty urinating and defecating, etc. Almost all (97.47%) horse owners and users know how to recognize these signs, which everyone associates with the suspicion of colic. Scantlebury et al (2014) and Bowden et al (2019) have established the same signs for recognizing colic. The singular character of the Scantlebury et al. study (2014) lies in the fact that in addition to these signs, which they describe as behavioural and objective, they also report other types of signs, which they describe as subjective and which are based on knowledge of the horse and its normal way of being. These signs also allow owners to realize that their horse is ill or has colic. These are signs such as "a horse that seems a little apathetic", "a horse that is uncomfortable", "a sad horse", "a horse that feels sorry for itself".

Apparently, the majority (around 70%) of our respondents, often young people under the age of 35, have not acquired this characteristic, which takes into account the breeder's experience. They are therefore alerted only by the most visible and objectively recognizable signs.

Many horse owners and users decide to do traditional treatment first. The same facts have been highlighted by Scantlebury et al (2014) who refer to a 3-option attitude: "wait and see first", "start treatment" and "seek veterinary assistance". These 3 options may or may not be combined. If a treatment decision is taken, medical procedures are most often based on traditional plants. These treatments involve the use of plants, with more than 20 plants cited, and the use of products and healing gestures according to the owners. This is confirmed by the results of Ndoye (1988) and Ngom (2021). This phenomenon is not only applied in the veterinary field in Senegal, as traditional therapy is also highly developed here in the field of human health, as Gueye (2019) acknowledges. According to this author, in Senegal, as in the rest of the African continent, 80% of the population use traditional medicine. Given the socio-economic role of the horse in Senegal (see Bélei (1991) and Ndiaye (1978)), we can understand the close link between traditional treatments in human medicine and that in veterinary medicine in Senegal.

Thus, the practices of using plants to treat humans have been copied in animals, including horses. This is evidenced by the conformity between certain plants in the study by Gueye (2019) and those found in our study. These include Adansonia digitata, Prosopis chilensis, Acacia albida and Ximenia.

According to this author, the use of these remedies for treatment in human and veterinary medicine is often due to the non-existence of health structures at local level, and also to the fact that this knowledge of traditional treatments is passed down from generation to generation within the same family as a family heirloom. These same reasons are the main reason why these ancestral practices and knowledge are used in animal husbandry to save sick animals. Moreover, other practices in addition to those using plant sources are cited by Wild et al (2021), as is our study. These include the use by CUPs of beer, coffee, oil, vinegar and salt water in our study.

There is every indication that owners, with their lack of means, are forced to turn to traditional treatments that they know or can pay for from product merchants or traditional gestures at a lower cost to try and cure their horse. According to the breeders, the results obtained with beer, which is more widely used, are good, as is the case with Prosopis chilensis and Moringa oleifera. If a can of beer can cure colic, costing no more than 1,000 CFA francs, or a sachet of Moringa oleifera costing 200 CFA francs on the market in Senegal, while veterinary treatment would cost much more, the choice is quickly made in favour of beer or a sachet of Moringa oleifera to treat colic.

Almost all owners know that certain factors cause colic in horses, such as dental problems, deworming or deworming. This is an essential and positive step, as it can help raise awareness of colic prevention. The fight against fatigue can be based on shortening the horses' working hours, even if this arrangement seems a little complicated to manage, as each owner has his own social and economic realities, which are not easy to change. Any other action that improves the standard of living of horse owners would help to reduce the need to

overwork or overexploit horses. In addition, improving horse feed is a priority for all those involved in equine activities.

5. CONCLUSION

The horse is considered to be man's noblest conquest and is an animal that carries civilisation, symbolism and prestige. Admired and revered for generations, the horse continues to be present in several sectors of human activity, particularly in Senegal, where it is used as a working tool for rural and urban traction, as well as in horse racing and equestrian sports. Its socio-economic role is undeniable. However, the meaning of this role is not in line with the special attention that horses deserve from horse owners and users in particular, but also from those involved in the equine industry in general. Horse owners and users need to pay more attention to horses while managing or minimising the many constraints that can affect the performance and welfare of horses in Senegal. Health is one of the main constraints, so managing it should be more than just a concern. With the recurrent traditional practices that some horse owners and users indulge in when faced with a disease; practices that more often than not worsen the animal's situation, animal health experts are often called upon to provide appropriate solutions.
Horse owners should be aware of the actions and practices to avoid in order not to worsen the prognosis or risk the life of their horse. They should also involve animal health professionals in a collaborative effort for the health and well-being of horses.

Horse care practitioners need to improve their diagnostic (approach to consultation and complementary examinations) and therapeutic (molecules and their appropriate uses) approaches.

ETHICAL APPROVAL
The study was conducted after receiving approval from University Ethics Committee which was recognized by the Senegal Authority.

CONSENT
A written informed consent was obtained from each horse owner and users before initiation of the study.

REFERENCES

1. BELEI D., 1991. Contribution to the knowledge of infectious and parasitic pathology of horses in Togo. Thesis: Med. Vet. : Dakar; 16. 139p.

2. BOWDEN A., BRENNAN M. L., ENGLAND G. C. W. et al., 2019. Horse owners' knowledge, and opinions on recognizing colic in the horse. Equine Veterinary Journal, pp.1-6.

3. DIOUF L., 2016. Dominant pathological conditions in horses in the DAHRA area (Senegal). Thesis: Med. Vet. : Dakar; 17. 144p.

4. FALL A.B., 2003. Use of reproduction and selection techniques to improve horse production in Senegal. Thesis: Equine center manager license: Rabat; 3.

5. FAYE M., 2015. State of the welfare of draft horses in Rufisque. Thesis: Med. Vet. : Dakar; 54.112p.

6. GUEYE F., 2019. Traditional medicine of Senegal examples of some medicinal plants from the traditional Senegalese pharmacopoeia. Thesis: Pharm. : Marseilles; 175p.

7. HAUSBERGER M., ROCHE H., HENRY S. et al., 2008. An examination of the home-horse relationship. Applied science of animal behavior. Flight. 109, No. 1, pp. 1-24.

8. LY C., FALL B., CAMARA B. et al., 1998. Urban horse-drawn transport in Senegal - Situation and economic importance in the city of Thiès. Journal of breeding and veterinary medicine in tropical countries. Flight. 51, No. 2, pp. 165-72.

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9. MANDE Ch., 1990. Contribution to the study of African horse sickness in Senegal: serological surveys in recent outbreaks. Thesis: Med. Vet. : Dakar; 26.

10. NDIAYE M., 1978. Contribution to the study of horse breeding in Senegal. Thesis. Med. Vet. : Dakar; 15. 199p.

11. NDIAYE M., 1979. Contribution to horse breeding in Senegal Thesis: Med. Vet. : Dakar; 15, 183p.

12. NDIAYE O., 2010. Epidemiology of African horse sickness in Senegal: case of the 2007 epizootic. Thesis: Med. Vet. : Dakar; 28. 158p.

13. NDOUR C. K., 2010. Bio morphometric characteristics and the main pathologies of the draft horse's foot in the Dakar region (Senegal). Thesis: Med. Vet. : Dakar; 12.141p.

14. NDOYE D.P., 1988. The racehorse in Senegal Thesis: Med. Vet. : Dakar; 29, 126p.

15. NGOM M. D., 2021. State of the welfare of draft horses in Rufisque and surrounding areas (Senegal). Thesis: Med. Vet. : Dakar; 37. 81p.

16. REEVES M.J.; SALMAN M.D. and SMITH G., 1996. Risk factors for equine acute abdominal disease (colic): results from a multi-center case-control study. -Preventive Veterinary Medicine, 26 (3): 285-301.

17. SANOGO S. 2022. State of the management of digestive colic in Senegal Thesis: Med. Vet. : Dakar; 77.97 p.

18. SCANTLEBURY C. E., PERKINS E., PINCHBECK G. L. et al., 2014. Could it be colic Horse-owner decision making and practices in response to equine colic. BMC Veterinary Research. No. 10, Suppl. 1, pp. 2-14.

19. TINKER M.K.; WHITE N.A.; LESSARD P.; THATCHER C.D.; PELZER K.D.; DAVIS B. and CARMEL D.K., 1997. Prospective study of equine colic risk factors. -Equine Veterinary Journal, 29 (6):454-458.

20. WILD I., FREEMAN S., ROBLES D., 2021. Owners' Knowledge and Approaches to Colic in Working Equids in Honduras. Animals. Flight. 11, No. 2087, pp. 1-16.

21. GOVERNMENT OF SENEGAL, 2021. Ministry of Livestock. Livestock Directorate (DIREL) Annual report: Dakar: DIREL. 150p.

22. GOVERNMENT OF SENEGAL, 2021. Ministry of Economy and Finance. National Agency for Statistics and Demography. Economic and social situation in Senegal. Annual report: Dakar. 24p.

23. SENEGAL. Ministry of Livestock (MINEL), 2008. Directorate of Livestock. Horse desk. Monthly activity report on the situation of the stud farms (February 2008). Dakar: DIREL.

WEBOGRAPHY

24. ANSD, 2022. Employment Survey. Available at: https://www.ansd.sn/Indicateur/enquete-emploi (page consulted on 04/13/2023)

25. ANSD, 2023. Demographic projections. Available at: https://www.ansd.sn/Indicateur/projections-demographics (page consulted on 10/13/2023)

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