



# Burns among deep-sea fishermen in the Atlantic ocean between Koukoude and Boffa in Guinea, July 2023

Dr. Diallo Thierno Hassane, FETP Intermediate graduate, MD  
Epidemiological surveillance officer, Republic of Guinea



Cape Town, 2024 July 27

WCE

WORLD CONGRESS OF EPIDEMIOLOGY 2024



# Overview



Introduction



Methods



Results



Conclusions



Public health actions and recommendations

**WCE**

WORLD CONGRESS OF EPIDEMIOLOGY 2024



# Introduction (I)



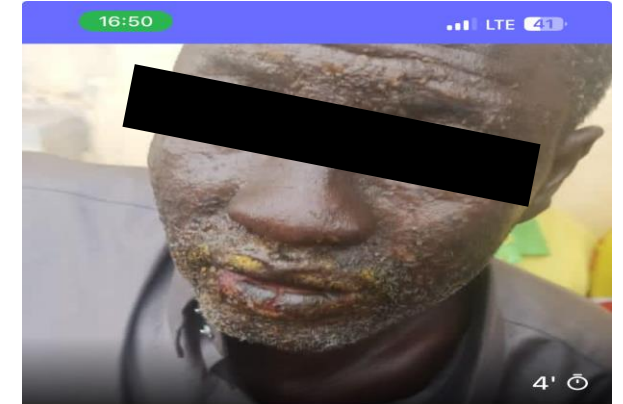
National Health Security Agency



April 14, 2023

INVESTIGATION

Determining the source and extent of the outbreak and take control and prevention measures



**Conakry : plusieurs pêcheurs frappés par une maladie « mystérieuse » en haute mer**

Par 13 avril 2023

Plusieurs pêcheurs des ports de pêche de Bonfi et de Gbessia, dans la commune de Matoto, ont contracté une maladie de la peau en haute mer. Au moins cinquante-quatre (54) victimes de cette maladie ont été recensés au port de pêche de Bonfi. Certains d'entre eux sont



**Burns among Fisherman**

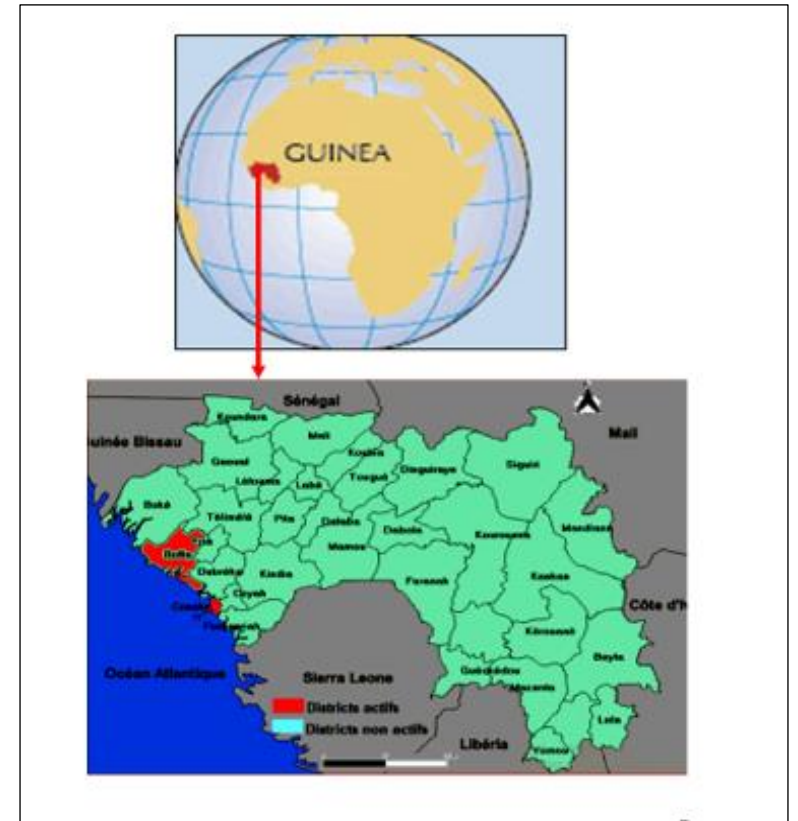
WCE

WORLD CONGRESS OF EPIDEMIOLOGY 2024



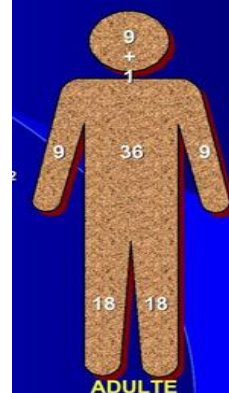
# Method (1/3)

- **Study Design:** Descriptive
- **Period:** April 09 to May 30, 2023
- **Study areas:** Guinea
- **case definition:**
  - All fishermen with burns who had spent time at sea from 09 April to May 30, 2023, in Boke and Conakry regions .



# Method (1/2)

- **Active research:**
  - Health facilities
  - Landings
  - Interview with cases and Community
- **Estimating the extent of burns:**
  - Wallace's Rule of Nine
- **Analysis :**
  - Epi Info 7.2.2.6. and Excel 2016
  - Median, Proportion



# Method (1/5)

## Laboratory procedures



Samples on the high seas



yellowish water



Reception, storage and analysis of samples  
Sea water sampling  
physicochemical analysis



Blood sampling in burn victims



storage and analysis of samples for extension assessment



Mixed space survey on the high seas

# RESULTS

## Active search and cases interviews results on occurrence of lesions, Guinea, April-May 2023.

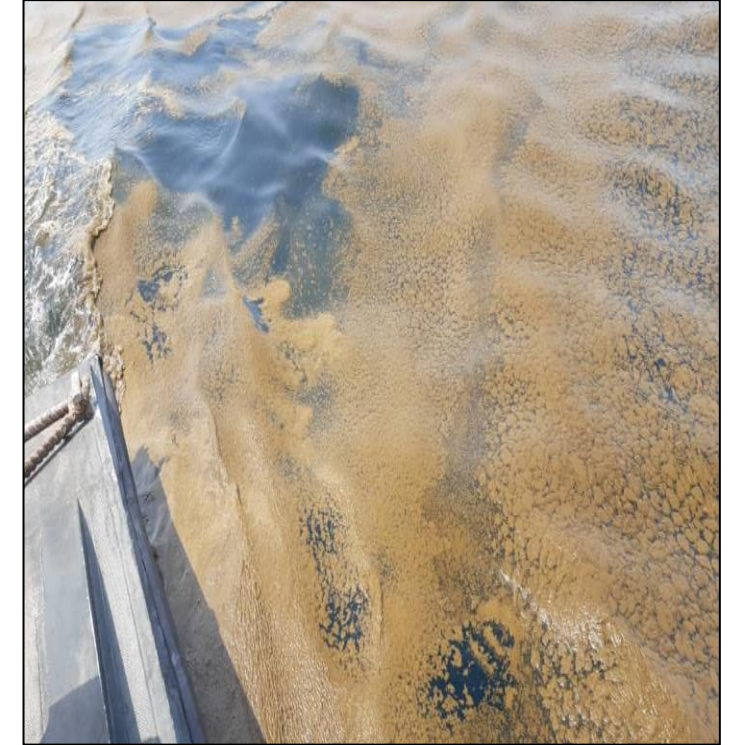
### Identification of 422 cases



"According to the information gathered from the five patients hospitalized in the clinic, on Friday 07 April 2023, during an outing on the high seas to catch fish arrived 270 km off the Guinean coast between Koukoude and Boffa, on Tuesday 11 April 2023 in an area where the water had a yellowish colour with a boiling appearance when exposed to the sun's rays, accompanied by unusual heat. "

"Other cases confirmed that they had seen a boat spilling a substance into the high seas during the night and that the water was yellowish in the morning. They also said that they had used the yellowish water for ablutions and washing, and that they had prepared and eaten fish caught in the area. Some had reacted to the heat rising from the water in their pirogues. It was only after more than 24 hours on Wednesday 12 April 2023 that they all began to react. "

# Map 1 of the area affected by the spill off the coast of Guinea, Guinea, April 2023



**Figure 1: Map of the area affected by the spill off the coast of Guinea (Image CNHB) April-May 2023 CNSHB: Centre National des Sciences Halieutiques de Boussourah**

**Image of the toxic product spilled off the coast of Guinea**

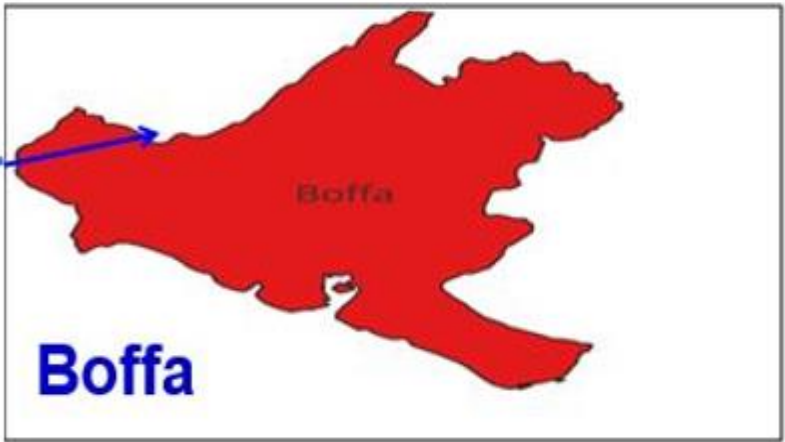


# Physicochemical analysis of seawater sample, April-May 2023

Physicochemical parameters	Limit value (MG/L) WHO Guidelines	Methods	Values obtained
pH	7,5 (sea water)	Phenol red	1,42
Turbidity (NTU)	25 NTU	ISO 7027	<b>2400</b>
Dissolved oxygen (mg/L)	5,5	A.M. de Winckler modified	5,38
Copper (mg/L)	0,02	A.M. EPA	<b>0,2</b>
Nickel (mg/L)	0,07	A.M. PAN	0,03
Silica (mg/L)	2	A.M 4500-SiO2	<b>160</b>
Nitrites (mg/L)	3	A.M. Ferrous sulphate.	<b>38</b>
Zinc (mg/L)	4	A.M. Zincon.	0,54
Phosphate (mg/L)	0,01	A.M. Acide aminé.	<b>5,7</b>

Source INSP Lab

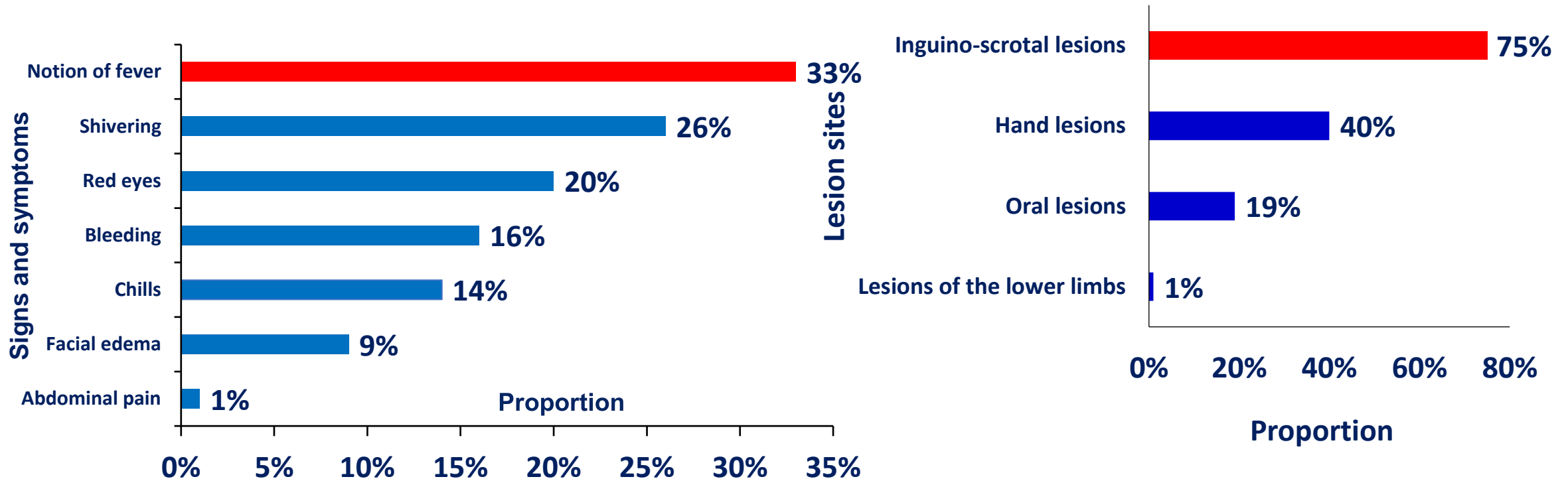
# Health districts affected by the chemical spill off the coast of Guinea, April-May 2023



## Attack rate of burns among fishermen by reporting site (landing stages) Guinea, April-May 2023

Site notification	Population	Number of cases	Cumulative attack rate per 1000 anglers
Port of Bonfi	2400	55	22,91
<b>Port of Boulbinet</b>	<b>2640</b>	<b>240</b>	<b>90,90</b>
Port Autonome	1248	6	4,81
Small boat harbour	1300	1	0,77
<b>Port of Koukoudé</b>	<b>612</b>	<b>120</b>	<b>196,08</b>
Port of Koba	234	6	25,64

# Clinical characteristics of burns among fishermen in Guinea, April-May 2023



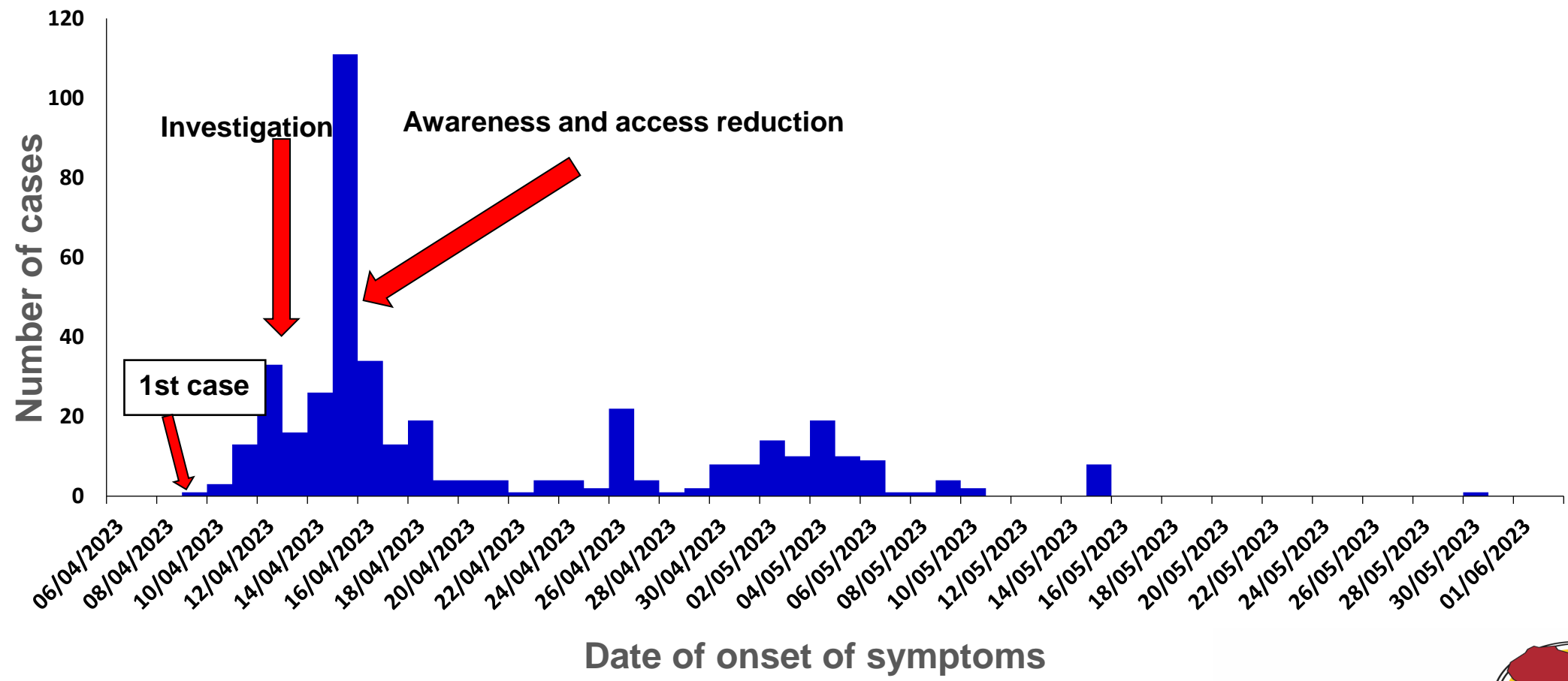
No death, Hospitalisation: 30(7%), Degree of burn  $\leq$  5%: 392 (93%)



# Demographic characteristics of cases of burns among fishermen, Guinea, April-May 2023

Characteristics	n=420
Age, median(range)	30(10-70 years).
Age groups	n(%)
< 18	12(2,84)
<b>18 -29 years</b>	<b>176(41,71)</b>
<b>30- 41 years</b>	<b>143(33,89)</b>
42- 53 years	72(17,06)
54-65 years	14(3,32)
≥ 65 years	5(1,18)
Sex	
<b>Male</b>	<b>422(100)</b>
Female	0(0)
Profession	
<b>Fishermen</b>	<b>422(100)</b>
Other professions	0(0)

# Epidemic curve for burns among fishermen, Guinea, April-May 2023



# Prevention and control measures

Coordination meetings between fisheries and ANSS authorities

Restriction on fishing in the area for ninety days

Investigation of cases

Management of all cases in health facilities

Raising awareness among fishermen through direct contact and the media

**WCE**

WORLD CONGRESS OF EPIDEMIOLOGY 2024



# Limits

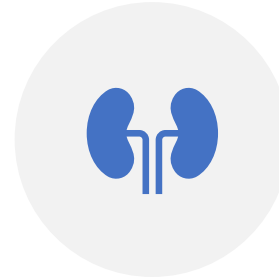
- The lack of materials and equipment to carry out extensive testing on samples taken at sea and
- the movement of fishermen at the time of the event were our limitations.



# Conclusion



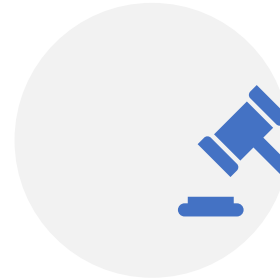
Victims: fishermen, mostly young men, no death.



Inguino-scrotal lesions and lesions of the hands were the most frequently observed.



All came into contact with yellowish, boiling seawater from an unknown source.



All the cases were managed and the ban on access to the areas helped to limit the event.



# Recommendations

## ❑ The national fisheries surveillance and policing center

- Reinforce surveillance of ships on the high seas to prevent other events.

## ❑ To the Ministry of Health:

- Capacity-building for management of public health events at gateway level
- Carrying out in-depth scientific studies of the seawater samples taken

# Bibliographic references

1. WHO EMRO | Brûlures | Thèmes de santé [Internet]. World Health Organization - Regional Office for the Eastern Mediterranean. 2023 [cité 21 juin 2023]. Disponible sur: <http://www.emro.who.int/fr/health-topics/burns/index.html>
2. Han D, Wei Y, Li Y, Zha X, Li R, Xia C, et al. Epidemiological and Clinical Characteristics of 5,569 Pediatric Burns in Central China From 2013 to 2019. *Front Public Health*. 29 mars 2022;10:751615.
3. Brûlures, [Internet]. 2018 [cité 21 juin 2023]. Disponible sur: <https://www.who.int/fr/news-room/fact-sheets/detail/burns>
4. Prise en charge des brûlures graves à Abidjan (Côte d'Ivoire) - Société de l'Anesthésie Réanimation d'Afrique Francophone [Internet]. [cité 21 juin 2023]. Disponible sur: <https://web-saraf.net/?Prise-en-charge-des-brulures-156>
5. Kouabenan ASA, Toure M, Sule MA, Oussou MA, Diabaté A. Aspects épidémiologiques et cliniques des brûlures cutanées graves en milieu hospitalier en Côte d'Ivoire/Epidemiological and Clinical Aspects of severe Cutaneous Burns in Hospital in Cote d'Ivoire
6. Essid J, Mokline A, Fraj H, Aloui A, Mayoufi H, Eljemi I, et al. Brûlure Et Atteinte Oculaire: Incidence, Facteurs De Risque Et Pronostic. *Ann Burns Fire Disasters*. 30 sept 2022;35(3):194-8.
7. Kassous FN, Mokline A, Messadi AA. Brûlures Chimiques: Étude Rétrospective Sur Un An Dans Le Centre De Traumatologie Et Des Brûlés De Ben Arous À Tunis. À Propos De 123 Cas. *Ann Burns Fire Disasters*. 30 sept 2020;33(3):203-8.
8. Fortin JL, Bitar MP, Marx T, Macher JM, Desmettre T, Ravat F, et al. Épidémiologie descriptive de la brûlure dans un territoire de santé exemple du « territoire nord franche-comté » durant l'année 2014. *Ann Burns Fire Disasters*. 30 juin 2015;28(2):83-7.

# FIELD PHOTOS12



**Appendix 2:** Investigation team at the HUXA clinic in Nongo



**Appendix 3:** Investigation team in the plastic surgery department of the Donka national hospital

# Acknowledgements

