

# **LESSONS LEARNED FROM RESPONDING TO THE CHIDO HURRICANE IN THE INDIAN OCEAN: EXPERIENCE AT THE TERRITORIAL SCALE, FRANCE (MAYOTTE ISLAND)**

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# DEMOGRAPHIC AND HEALTHCARE CONTEXT IN MAYOTTE



- **Population:** 321,000 inhabitants (690 inhabitants/km<sup>2</sup>)
- **Youth Population:** 50% under 18
- **Foreign Nationals:** 48%
- **Poverty Rate:** 77% live below the poverty line



## Healthcare Infrastructure:

- **Low medical density:** 48 doctors per 100,000 inhabitants
- **Healthcare access issues:** 45% of the population give up on medical care



## Housing and Living Conditions:

- **39% of homes are** made of tin, wood, vegetation, or earth (*banga*)
- **29% of homes lack** running water
- **10% of homes** lack electricity



# PRE-EXISTING HEALTH CHALLENGES BEFORE CYCLONE CHIDO



## **Diabetes (Unono 2019):**

Prevalence : **12.1% (ages 18-69)**, with 40% undiagnosed cases

## **HTA (Unono 2019):**

- Prevalence : **38.4% (ages 18-69)** self-reported or measured, 1 in 2 hypertensive individuals was unaware of their condition

## **Coexistence of malnutrition and obesity- double burden- (Unono 2019):**

- **55.9% of adults (15+ years)** overweight or obese ,
- **8,3% of children (ages 0-3)** with moderate or severe malnutrition

## **Infectious diseases still prevalent**

- Ex: Typhoid fever: 57 cases in 2024 and 70 cases from January to March, 2025
- Cholera outbreak from March to July 2024

# IMPACT OF CYCLONE CHIDO ON MAYOTTE INFRASTRUCTURES



- Significant destruction affecting homes and essential infrastructure, including hospitals, schools, and electricity, water, transport, and communication networks
- Health monitoring systems were no longer functional, including data from the hospital emergency department, hospitalisations, intensive care, networks of general practitioners, pharmacists, NGOs and vital statistics.



# DIFFERENT EXISTING SURVEILLANCE SYSTEMS IMPACTED BY CHIDO



Surveillance	Objectifs	status
CHM laboratory	Monitoring of positive results for ARI and GEA / positivity rate	
Notifiable diseases	Monitoring of diseases with epidemic potential	
Oscour – CHM Emergencies Dpt.	Activity monitoring / alert purposes	
CMR – Dispensaries	Activity monitoring / alert purposes	
Mortality	Detection of excess mortality / impact	
Sentinel Pharmacies	Monitoring of medication consumption	
Sentinel Physicians	Activity monitoring	
National Education Services (school health)	Monitoring of activity of middle and high school infirmaries	
Community-based surv.	Data collection on selected illnesses and items during outreach visits in vulnerable populations (precarious neighbourhoods)	

 Fully operational

 Partially functional

 Non-functional

# HEALTHCARE-BASED SURVEILLANCE ADAPTED TO CHM AND CMR



- **Deployment of Healthcare staff from the health reserve (Nurse/doctor/epidemiologist):**
  - Support for hospital services
  - Support for adapting hospital-based surveillance in emergency department
  - Strengthening community-based surveillance systems

## **Health reservists at emergency department (7 AM - 8 PM)**

- Data collection:
  - Total emergency visits, hospitalizations, and deaths recorded daily
  - Categorized by age group
  - Focus on trauma, burns, psychological distress, digestive issues, fever, respiratory conditions, conjunctivitis, skin infections, dengue-like syndromes, and chronic disease exacerbations

# A SYSTEM ADAPTED TO THE FIELD BUT FRAGILE

RECAPITULATIF JOURNÉE DU 06/01/25 CHM UROCA

Nombre de passages aux espaces de consultation = 459

Nombre d'hospitalisation le 06/01/25

Chir **gastro** : F 40ans Plac trauma au pied diabétique  
F 44ans Plac max gauche par mixer

Chir **gastro** : F 35ans Hyperémèse gastrique et hydat.  
Chir **gastro** : H 45ans Abcs profond + ulcère max droite  
Hid adém tons : p  
Hid **gastro** : H 48ans CVI  
F 24 ans diarrhée cholériforme  
H 20ans ad'ose latique + épilepsie  
F 58ans glioblastome  
F 36ans Myxomatose ovarie par AEG  
H 84ans Erypèle HIG.

**Neurologie** : H 0j primauté sur RGU  
F 2j fièvre maternelle post partum avortée  
H 0j grand prima

**Pneumologie** : M 12ms Déshydratation sévère  
M 23ms Décompensation Rga sur bronchite  
M 41ans AEG hépatique  
M 12 mois Aggravation fièvre suite séps  
M 14mois Adénite lymphatique G.

**Repiratoire** : M 57ans Décompensation pathologique  
F 47ans TS médicamenteux.

Nombre de décès :

Form received as a photo on WhatsApp, then entered into a database for analysis

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FICHE DE RECUEIL JOURNALIER DES PATHOLOGIES À LA SUITE DU CYCLONE ONDO Mayotte

Etablissement : CHM nord CHM sud CHM centre CHM petite-terre Dispensaire

Date : 06/01/24 Nombre total de consultations vues ce jour : 459

Ne déclarer que les symptômes post-cyclone & uniquement le symptôme principal

SYMPTÔMES OU SUSPICIONS DE PATHOLOGIE	Nombre de cas				Nombre d'hospital.
	< 5 ans	5-14 ans	15-64 ans	≥ 65 ans	
Plaies < 24h non infectées	A1	A2	A3	A4	
Plaies > 24h et/ou infectées	B1	B2	B3	B4	
Traumatismes et autres que plaies (fractures, corps étrangers, contusions...)	C1	C2	C3	C4	
Brûlures	D1	D2	D3	D4	
Troubles psychologiques (stress, anxiété, angustie, symptômes dépressifs...)	E1	E2	E3	E4	
Signes digestifs (diarrhées, nausées, vomissements, douleurs abdominales...)	F1	F2	F3	F4	
Fièvre	G1	G2	G3	G4	
Pathologies respiratoires : bronchite (< 2 ans)	H1	H2	H3	H4	
Pathologies respiratoires : autres (grippe, asthme...)	I1	I2	I3	I4	
Infections ORL : conjonctivites	J1	J2	J3	J4	
Infections ORL : autres (otites, sinusites, rhinites...)	K1	K2	K3	K4	
Infections cutanées (abcès, furoncles, infections de plaies...)	L1	L2	L3	L4	
Gale	M1	M2	M3	M4	
Maladies vectorielles (dengue, chikungunya, Zika, paludisme...)	N1	N2	N3	N4	
Décompensation de maladies chroniques (diabète, hypertension, maladies cardiaques...)	O1	O2	O3	O4	
Morsure / griffure animale	P1	P2	P3	P4	
Autres	Q1	Q2	Q3	Q4	

Commentaires, détails pour « autres » pathologies ou éventuelles situations de fortes augmentations à l'attention des autorités sanitaires : ...

Donc faire un état de malade, état de réanimation, état de l'heure la plus 30 fois du matin et du soir

Fiche à transmettre à Santé publique France par mail : mayotte@santepubliquefrance.fr ou en photo au 06 33 38 10 10

## Limits

- Paper-based data collection during specific hours
- Dependence on mobile network for remote reporting
- Staff rotation disruptions
- Lack of individual patient data
- Time-consuming process

Recommandation :

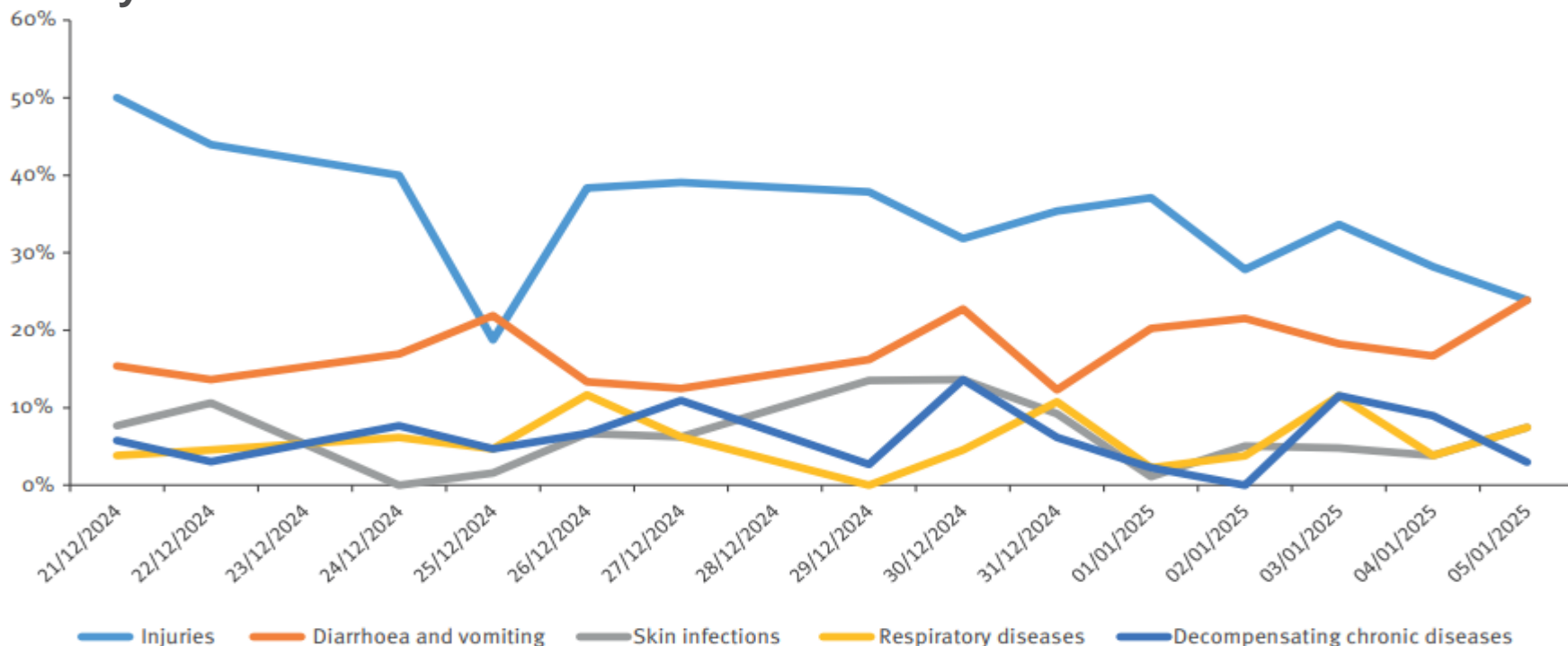
F 20ans Hémoencéphale  
F 24ans Révision utérine  
F 57ans AVC  
F 16 ans Convulsion

20ans F 58ans Décompensation cardiaque

# SURVEILLANCE AT THE CHM EMERGENCY DEPARTMENT (RESULTS)



Main reasons notified for consulting Mayotte's Hospital Emergency department, in percentage of total attendance , Mayotte, 21 December 2024–5 January 2025



- From 21 December 2024–5 January 2025, main reasons for emergency visits: wounds and traumas, followed by diarrhea and vomiting

# Community-Based Surveillance (CBS)

## Definition (WHO, 2018)

- Systematic detection and reporting of significant health events by the community
- Integrated into the "classical" surveillance system
- Based on standardised and continuous data collection
- Sometime used when traditional surveillance systems are ineffective, failing, or non-existent
- Designed for hard-to-reach populations

## CBS objectives after Chido in Mayotte

- Alert on syndromic signals in vulnerable populations: injuries, mental disorders, access to food and water
- Interventions: Health reservists also provide first aid care to the population

# CBS Methodology



- Every week, outreach visits are conducted in precarious neighborhoods by mediators from local associations, health professionals of the health reserve, and SpF epidemiologists
- The neighborhoods visited vary from week to week, and the information collected is reported by the individuals themselves; it does not constitute medical diagnoses
- Data are collected using a specific questionnaire and then entered into an online application for analysis. Information is analyzed at household level
- CBS help to establish general trends and estimated prevalence of public health issues poorly or not at all covered by other surveillance systems, and level of access to food and water

# CBS Questionnaire

Date : ... / ... / .....

Village :

Quartier :

Refus : ☐

Asso :

Une personne (ou plusieurs) qui montre des **signes de stress, peur ou de détresse** (changement de comportement), depuis le cyclone ?

Enfant ≤ 15 ans ☐ Oui ☐ Non ☐ Ne sait pas

Adulte > 15 ans ☐ Oui ☐ Non ☐ Ne sait pas

Une personne (ou plusieurs) qui, depuis au moins hier, a la diarrhée **OU** vomit ?

Enfant ≤ 15 ans ☐ Oui ☐ Non ☐ Ne sait pas

Adulte > 15 ans ☐ Oui ☐ Non ☐ Ne sait pas

Une personne (ou plusieurs) qui, depuis au moins hier, a de la fièvre ?

Enfant ≤ 15 ans ☐ Oui ☐ Non ☐ Ne sait pas

Adulte > 15 ans ☐ Oui ☐ Non ☐ Ne sait pas

Une personne (ou plusieurs) qui, depuis au moins hier, tousse ?

Enfant ≤ 15 ans ☐ Oui ☐ Non ☐ Ne sait pas

Adulte > 15 ans ☐ Oui ☐ Non ☐ Ne sait pas

Au sein de votre foyer, est-ce que vous vous faites beaucoup piquer par les moustiques ?

☐ Oui ☐ Non ☐ Ne sait pas

Au sein de votre foyer, est-ce que vous avez plus de difficultés à vous procurer de la nourriture qu'avant le cyclone ?

☐ Oui ☐ Non ☐ Ne sait pas

Eau principale : boisson

Robinet SMAE : ☐

Rampe : ☐

BFM : ☐

Citerne : ☐

Puits : ☐

Rivière / ravine : ☐

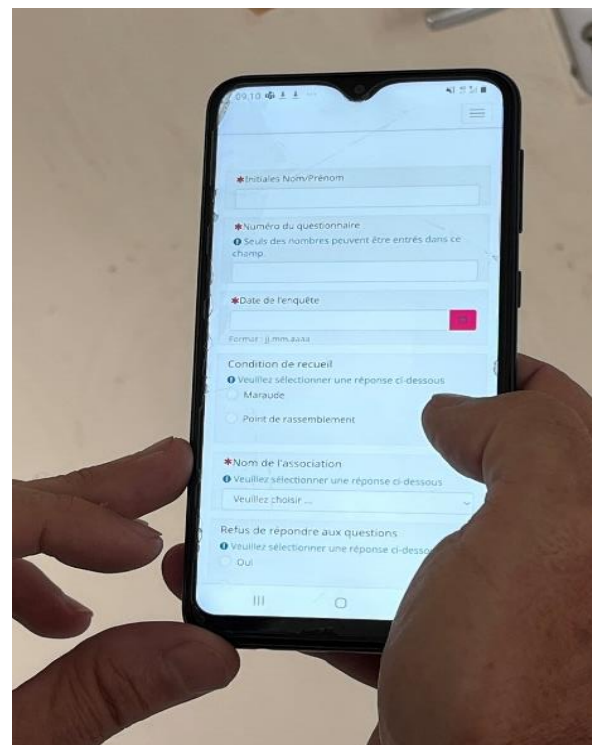
Pluie : ☐

Eau en bouteille : ☐

COMMENTAIRES :

APPEL AU 15 pour avis ? ☐ Oui ☐ Non raison : .....

- ➔ Data collection carried out by association **mediators and health reservists** during outreach missions
- ➔ Collected on paper forms and then entered into an online questionnaire



# CBS primary results



123 visited households in W52–2024, information was not of satisfactory quality.

- Another 237 households were surveyed during W01–2025 across 14 neighborhoods
  - 87 (37%) reported stress or psychological issues among adults and 78 (33%) among children.
  - Twenty-eight (12%) reported physical injuries among children and 48 (20%) among adults, all linked to cyclone Chido.
  - Fever and cough were prevalent, mostly affecting children.
  - Gastroenteritis cases were reported in 32 (14%) of households among children and in 15 (6%) among adults.
  - Malnutrition was diagnosed among children together with dehydration among breastfeeding mothers, worsened by uneven food distributions.
  - Access to bottled water remained very low (< 10% of households)
- Access to the drinkable water network increased: 36% in W52–2024 vs 82% in W01–2025, while consumption of untreated water decreased: 88% in W52–2024 vs 38% of households in W01–2025.

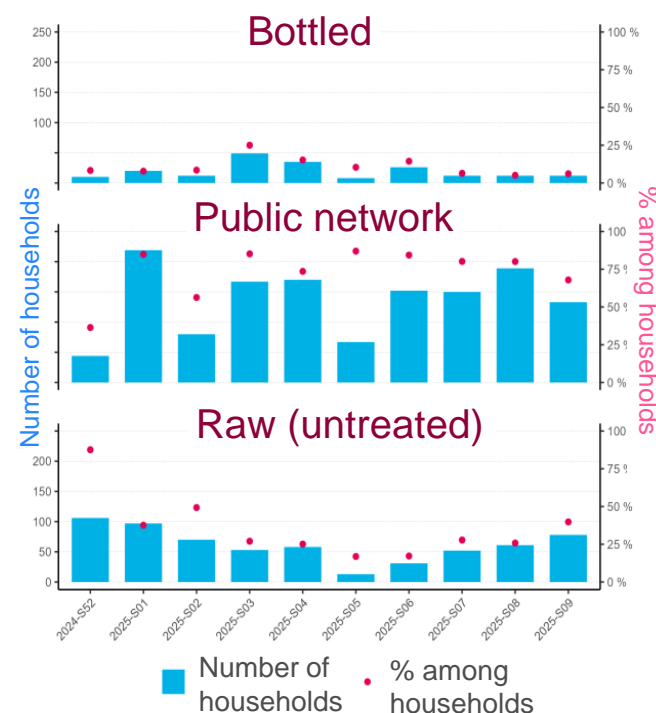
# UPDATE OF RISK ASSESSMENTS, MARCH 2025



Uncontrolled major initial risks:

- **Food insecurity and malnutrition:** breastfeeding women and children under 5
  - 75-80% of visited households declare access to food is more difficult than before Chido (*source CBS, W08-2025 and W09-2025*)
- **Access to clean water:** dehydration, waterborne diseases, skin diseases, wounds superinfections (*Figure, source CBS, W09-2025*)
- **Mental health issues:** 15-25% of visited households declare mental health issues in, at least, 1 adult  $\geq 15y$  and 1 children  $< 15y$  (*source CBS, W08-2025 and W09-2025*)
- Increased CDs risks: **Typhoid fever** and **chikungunya**

*Water consumption according to available sources, W52-2024 to W09-2025 (vulnerable populations)*



# CONCLUSION: LESSONS LEARNED FROM CHIDO AND FUTURE PERSPECTIVES



- **Rapid Response & Adaptation**
  - Deployment of health reservists
  - Surveillance systems adapted to field constraints
- **Strengthening Health Surveillance**
  - Hospital and community-based surveillance as complementary approaches
  - Identification of key post-cyclone risks: injuries, infectious diseases, malnutrition, mental health issues
- **Ongoing Challenges & Areas for Improvement**
  - Better structuring of data collection processes
  - Sustaining surveillance and response efforts
  - Strengthening the resilience of health infrastructures
- **Towards Better Preparedness for Future Crises**
  - Capitalizing on acquired experience
  - Developing action plans tailored to island-specific challenges