# Guinea Worm in Chad

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## What is Guinea Worm Disease (GWD)?

- Parasitic disease transmitted via contaminated water
- Matures over 1 year in the body until breaking thought the skin's surface
  - Can be 1 meter long
  - Leads to painful blister and pain
  - Pulled out a few cm each day

Image from cdc.gov

Image from USAtoday.com

## Transmission of GWD

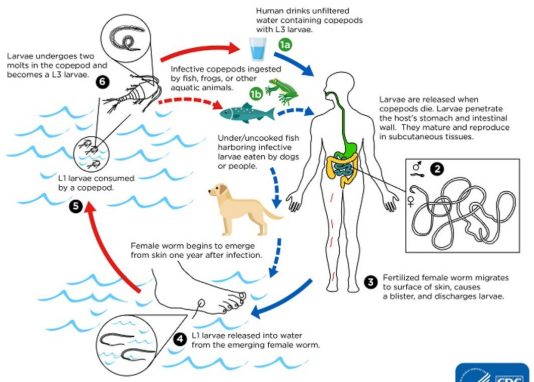


Image from cdc.gov

Humans or dogs consume water (and possibly uncooked fish) containing copepods

↓

Larvae are released, copepods die

↓

Worm matures and begins to emerge

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As worms emerge, larvae can be released back into the water if the host enters water

↓

Copepods consume the released larvae

## Why is GWD a Problem?

- Financial Loss (Biswas et al., 2013)
  - $20,000,000 lost per crop in Nigeria in 2004
  - 11.7 million man days lost in India
- Missed School/Work (Greenaway, 2004)
  - Adults miss 100 days of work
  - Kids miss 25% of the school year

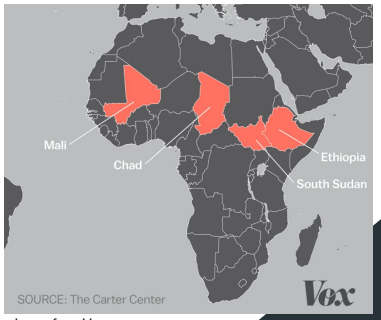



Image from Vox.com

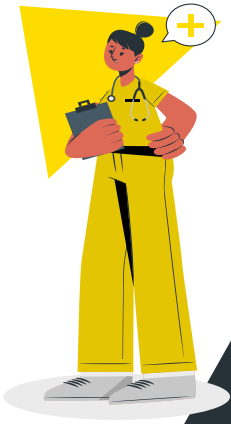
# GOAL:

**Eradicate** Guinea worm in the human population of Chad by 2026, and have 90% contained Guinea worm infections in canines by 2026.

# SMART Objectives

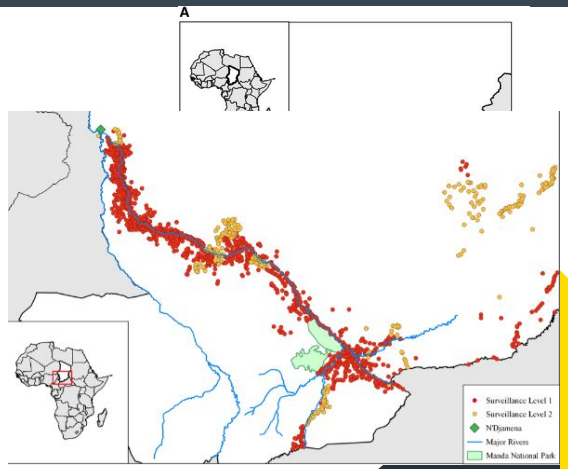
1. Increase the number of villages under surveillance by 8% by 2024 and maintain the surveillance efforts of humans and dogs in Chad through 2026.

2. Decrease the incidence of canine infections with guinea worm by 80% in the Moyen Chari and Chari Baurimi areas by 2024.

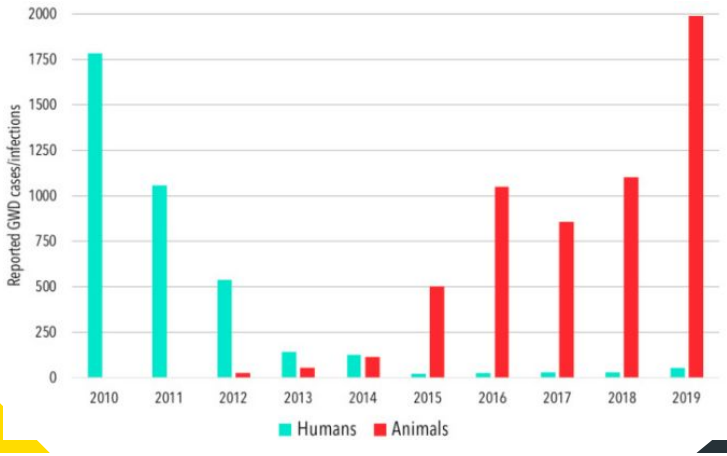


## Objective 1

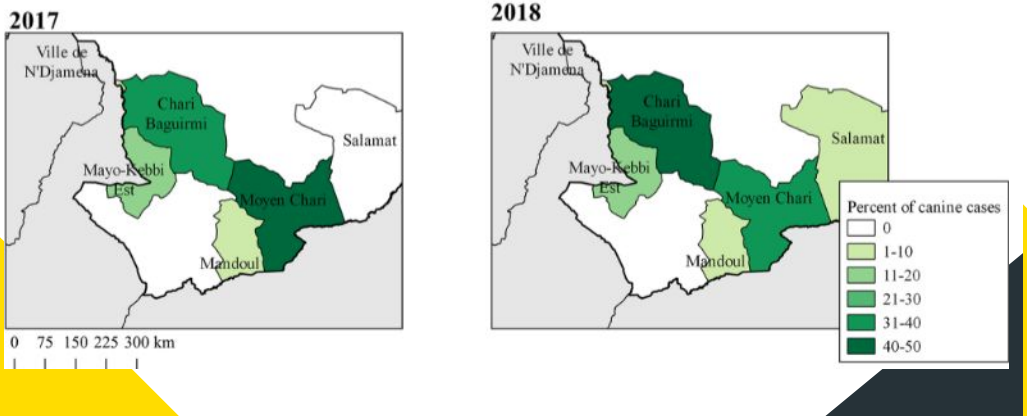
- Barriers- Lack of education about disease, Why report?, volunteers.
  - Incentives offered.
  - Community education.
  - Training more volunteers.




## Objective 2



# Objective 2




# Objective 2

- Barriers: $$, containing dogs.
  - Incentives for dog owners.
  - Proactive tethering.
  - Veterinary education.

# SMART Objectives

**3** Safe drinking water will be accessed by 95% of Chad's population by 2030 as monitored by MOPH.

**4** MOPH will perform and record preventative education events at least once a month and household checks to all villages twice weekly by 2024.

# Objective 3

- Monitor water access at:
  - Ponds
  - hand-dug/step-wells
  - Cisterns
- UNICEF built > 110 water points in 260 villages

# Objective 4

- Teach:
  - GWD and how it spreads
  - Location of nearby underground wells
  - Use of water filters
- Home visits at least twice weekly correlate to better knowledge of GWD
- Barrier:
  - uneven household visit frequency


# LOGIC MODEL

- Surveillance & Case Containment
- Provision of Safe Drinking Water
- Vector Control (Copepods)
- Health Education & Community Mobilization

# Input

### Carter Center

- Compile & distribute correct and accurate data
- Provide 2 million USD to the involved programs and partners

### Chad's National Ministry of Public Health

- Oversee, educate, and train technicians to speak to the villagers

### U.S. Center for Disease Control & Prevention

- Verify if the worm of a suspected patient is truly Guinea Worm.

### Internal Committee of the Red Cross

- Develop wells

# Surveillance & Case Containment

### Community Campaigns

Educate the residents of the signs and symptoms of Guinea Worm Disease (GWD)

### Surveillance System

Will rely on a cash reward to residents who report suspected (GWD) in humans & dogs

Approximately 17 USD & 3 bars of soap will be rewarded

## Outcome

**Within 24 hours**

Individual will be identified

Individual has not entered any water sources

**Within 7 days**

Individual will receive proper treatment & continue to follow up with appointments

Local health provider will provide education to discourage individual from entering any water sources

CDC will confirm or disprove the case

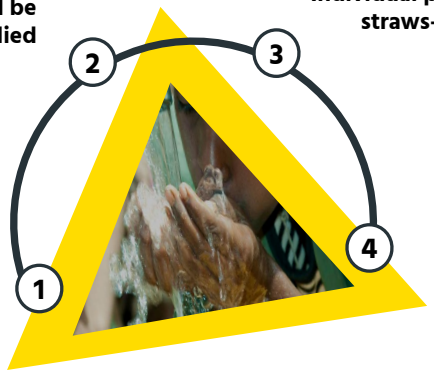
**By 2026**

GWD will be eradicated in human cases

Continue for at least 5 years

## Provision of Safe Drinking Water

1. **Bore-hole wells and deep hand dug wells will be developed**
2. **Fine mesh cloth filters will be supplied**
3. **Individual pipe filters- used as straws- will be given**
4. **Education will be provided on location of safe drinking water and safely drinking water**



## Outcome

**Within 6 months**

Residents will be oriented to safe drinking water near them.

Filters will be distributed to all residents

**Within 2 years**

Level of access to safe drinking water will increase from 60% to 70%

**By 2030**

Level of access to safe drinking water will increase to 95%

## Vector Control

Chad's GWEP will train staff to identify contaminated water sources and how to apply a mild insecticide to eliminate adult copepods.

Staff will rely on data from surveillance program and prior transmission seasons and geographic occurrences to identify contaminated water sources.

## Outcome

**Within 3-4 days**

Contaminated water sources will be treated with temephos, a mild insecticide followed by monthly treatment

**Within 1 month**

The water will be free of mature cyclops copepods

**By 2026**

No incidences of Guinea Worm infection caused by drinking contaminated water

## Health Education & Community Mobilization

GWEP staff will educate communities through household visits and organized events, like "Worm Weeks," to share information about the disease **(how it's spread, preventative actions, containment measures, and how chemical treatment makes contaminated water potable).**

GWEP will tag permanent and nomadic communities to identify their clients.

Nomadic communities are of special concern because they were not well-detected in previous surveillance systems

## Outcome

**Within 1 month**

Residents can demonstrate preventative & containment measures

**After 6 months**

Community members are observed tethering dogs, destroying fish guts, drinking from safe water sources, and using water filters.

**By 2026**

Guinea Worm Disease in humans is eradicated and canine cases see a 50% decrease

## Monitoring and Evaluation

<u>Zero reported cases with active surveillance for three years</u>

- Surveillance: Home visits, surveys
- Containment: Case studies
- Screening: Environmental sampling of water sources
- Certification of eradication by WHO

# Reflection

## Challenges:

Given this effort has been in place for many years how do we adapt efforts to reach full eradication.

General understanding of life in another country and concerns of the populations.

## What worked:

Working as a team to scour research and current GWD reports to determine what is working in Chad and other locations with success.

Creating deadlines.

## We Learned:

Joint effort is necessary in order to create a global health plan.

We need assistance through a number of organizations to address eradication efforts.

# Thank You!

Do you have any questions?



## Surveillance

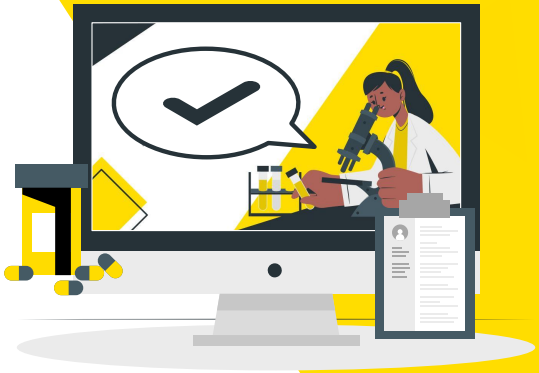
- Home visits
- Surveys and questionnaires
  - Knowledge of Guinea worm (signs & symptoms, modes of infection)
  - Awareness of rewards
  - Frequency of house visits by GWEP workers
  - Contaminated water sources
  - Tethering of infected animals

## Containment

- Case reports
  - Suspected reported human and animal cases
  - Confirmed vs not confirmed
  - Contained vs not contained
    - Detected within 24 hours
    - Individual received medical care
    - Individual received education
    - Individual did not enter sources of water
    - Case verified

## Environmental Screening

- Monthly testing suspected water sources
  - Loop mediated isothermal amplification assay
- Demonstration of fine cloth mesh and filters



## Certification

- **2023 Precertification**
  - Formal request to WHO
  - Records of continued surveillance and prevention
  - Evaluation by ICT
- **2026 Certification**
  - ICCDE certifies country
- **Post-certification**
  - Continued surveillance till global eradication

# SMART Objectives

Increase the number of villages under surveillance by 8% by 2024 and maintain the surveillance efforts of humans and dogs in Chad through 2026.

Venus has a beautiful name