

# STEP-BY-STEP *TUTORIAL*



## Implementing a Ciguatera Poisoning *Epidemiological* Surveillance Program



### Authors

*Dr Clémence, Mahana iti GATTI*

*Dr Mireille CHINAIN*

*Dr Taiana DARIUS*

# Objective *of the TUTORIAL*

This tutorial provides support to set up a Ciguatera epidemiological surveillance program, from building a team in charge of data collection to data sharing at international level. Each country being different, this document will help identify the most appropriate strategy, to best adapt the surveillance program to the local context and objectives of each project country.

**This tutorial will address the following topics:**

1. Preliminary considerations
2. Identifying potential partnerships
3. Defining the roles and tasks of each of the partners
4. Reporting Ciguatera cases
5. Managing Ciguatera data
6. Informing & rising awareness among potential participants to the reporting program
7. Feedback & data sharing
8. Planning work meetings and follow up meetings
9. Sharing CP data at an international level

# 1. Preliminary considerations

First, keep in mind that the work you are about to start aims at the set up of a long-term surveillance program that will require constant efforts, team coordination and dedicated time.

## Different countries with Different objectives:

- Case of countries already aware of the presence of ciguatera locally, and willing to start an epidemiological surveillance to assess the extent of the phenomenon (*number of cases, severity of symptoms*), and identify the areas and marine organisms at risk of ciguatera.  
***For those countries which will start from scratch, this tutorial will provide step-by-step support in building a tailored surveillance network***
- Case of countries not yet affected by ciguatera incidents, but willing to anticipate on the potential emergence of ciguatera risk in their waters, especially in a context of climate change and changing marine environments.  
***This tutorial will provide useful advices on how to get prepared and acquire the capacity to implement a surveillance program***
- Case of countries that currently manage a ciguatera surveillance program, but which needs to be improved, for example by including mapping capacities using Information Technology (IT) Tools.  
***This tutorial will help identify areas for improvement.***

# 1. Preliminary considerations

The first step consists in **DRAWING AN OVERALL PICTURE ABOUT THE CURRENT CP STATUS** in your country: *Are there any official reports of CP cases and/or hospitalized cases, reports of fatal poisoning incidents attributable to CP, data about fish species and fishing areas at risk of ciguatera, etc. ?*

## **Suggested approach :**

**1. Conduct a bibliographic review:** by searching for any information related to CP poisoning events in scientific publications, public health or fisheries annual reports, hospital archives, local newspapers, social media (e.g. *Fishing lovers Facebook group*), etc.

Do not hesitate to perform interviews with retired doctors, nurses, fishermen, or traditional healers, as necessary, for example through a national survey.

**2. Sort and retain the most relevant information**

**3. Compile the data in a synthetic document:** by drafting a clear and succinct document that can be easily understood by a non scientific/medical staff. This document must highlight the need to monitor the risk of ciguatera, either because it already represents a public health problem, which deserves to be better characterized, or because it represents an emerging threat in the context of climate change.

**4. Share this document with any potential collaborative partners:** for example by planning workshops or round table discussions to discuss CP monitoring activities and potential partnerships.

## 2. Identifying potential partnerships

The previous step will help identify entities/agencies/teams best suited as potential collaborative partners

Practically speaking, CP surveillance can be managed by a single entity, or can involve a network of collaborative partners , including:

- Health Ministry/ Public Health Directorate
- Public Health physicians or from the private sector
- Hospital staff
- Research laboratories or Universities
- Environmental/Fisheries agencies
- or Veterinary services.

The type of collaboration will vary from one country to another, depending on the respective mandates, priorities, and human resources and logistics that can be made available by each partner;

### ***What would be the best suited collaborative partners?***

*Those with a high level of interest in the data that will be collected*

*Those strongly committed to dedicate time and/or human resources for CP surveillance on a long term basis*

*Those currently involved in public outreach activities and/or awareness campaigns*

## 2. Identifying potential partnerships

Since the CP surveillance program primarily relies on the collection of medical data (*even if dealing with anonymized data*) and requires the participation of health professionals as the main data providers, it is essential that **Health Authorities** be involved, somehow, in this process of identifying/establishing partnerships.

In some instances, Health authorities just don't have enough time or human resources to dedicate to the management of such a program. In this case, this work can be delegated to another entity within the frame of a **task delegation agreement**.

*By way of example: in French Polynesia, the Research Laboratory of Marine Biotoxins of the Institut Louis Malardé (ILM) is in charge of collecting CP cases reports, processing these data and editing an annual report, and communicating with health professionals in the frame of an official agreement signed between the Public Health Directorate of French Polynesia and ILM.*

*NB: If available in your country, involving a research laboratory with a known expertise in ciguatera toxin detection could represent an added value, as this lab can help confirm a CP diagnosis, or carry out environmental or laboratory investigations in the context of a poisoning outbreak.*

### 3. Defining the roles and tasks of each of the partners

Once the partner(s) has(ve) been duly identified, it is imperative to:

- 1/ clearly define the respective role(s)/tasks of each of the partners
- 2/ agree on an appropriate communication circuit between partners

Here is an example of how tasks can be distributed within partners:

- **Program supervisor(s)**: he will ensure the proper conduction of the different tasks and internal communication, organize regular meetings, contribute/validate reports and data communication at local/ regional and international levels, supervise CP awareness campaigns,...)
- **Partner(s) responsible for CP data collection**: will provide the different materials and support for CP case reporting, is the focal point for data collection, will ensure the information and communication with health professionals and patients.
- **Partner(s) responsible for data processing** and alert system in case a CP outbreak or an unusual/atypical poisoning event occurs.
- **Partner(s) responsible for editing the annual report** and its dissemination at a local, regional and/or international level.

Whenever possible, it is recommended to formalize the established partnership and the task(s) assigned to each of the partners by way of an **official agreement**.

*Depending on the collaborative entities and availability of Human resources assigned to the tasks, a single person can be in charge of several tasks or, conversely, each task can be managed by several different persons.*

*N.B.: As soon as the list of the different partners is reached, establish a **mailing list** of all partners involved in the management of the CP surveillance program.*

### 3. Defining the roles and tasks of each of the partners

#### LABORATORY OF MARINE BIOTOXINS

- Program co-leader
- Contributes to the conception of the CP case declaration form and its improvement
- Main interlocutor of health professionals and CP patients
- Contributes to CP awareness
- Collects, stores and processes data
- Sends alerts to Health authorities in the event of unusual/atypical poisoning incidents or outbreaks
- Edits the annual CP report and contributes to its dissemination
- Participates to professional and public outreach meetings
- Organizes work meetings on CP
- Ensures data dissemination at a local, regional and/or international level.

#### HEALTH AGENCIES

- Program co-leader
- Contribute to the conception of the CP case declaration form and its improvement
- Contribute to promoting the CP surveillance program among medical structures
- Decide to deploy field investigations in case of epidemic peak or unusual CP events
- Contribute to the annual CP report drafting and diffusion
- Participate to public information
- Participate to data communication at local, regional and international levels
- Participate and/or organize work meetings.

#### MEDICAL STRUCTURES

- CP diagnosis in patients
- Complete CP case declaration forms
- Transmit CP occurrence data to the Laboratory of Marine Toxins (in paper or Excel format)
- Liaise patients with the people managing the CP surveillance program

Example of tasks assigned to the partners involved in the CP epidemiological surveillance program implemented in French Polynesia

## 4. Reporting Ciguatera Cases

- CP surveillance programs exist only in a limited number of countries/regions. Mandatory reporting of CP cases is enforced only in some of these countries (USA, Australia, Hong Kong, etc.)
- Making CP cases reporting mandatory is a decision that should be taken at the level of the country
- Whatever the decision, this issue must be discussed early in the process of CP surveillance program implementation with the due authorities, as it may necessitate promulgating/updating local regulations, a process that can take time.

Currently, CP is not a notifiable disease in French Polynesia. To overcome this situation, rising awareness about the importance of keeping accurate records of CP cases occurrences are conducted on a regular basis among healthcare workers.

*Mandatory or not?*

*"A Healthcare worker convinced of the interest to report CP cases does not need it to be mandatory to do so. He will spontaneously declare cases seen in consultation."*

## 4. Reporting Ciguatera Cases

Collecting CP data in the Pacific region is often challenging, in light of the wide geographic dispersion of some island groups, their remoteness, the poor availability of internet and IT resources, etc. This highlights the need of resorting to multiple type of reporting media to ensure a comprehensive collection of CP data.

Several reporting supports can be used in parallel:

- The online CP reporting platform available at <https://ciguawatch.ilm.pf>
- Paper forms (in .pdf format) that can be printed and completed manually on site, then transmitted by fax, airmail or email to the team in charge of data collation
- Excel forms that can be completed directly on a computer then transmitted by email
- Direct e-mail exchanges
- Phone calls (*have a blank declaration form ready, so you can directly fill in the information provided by the patient or the staff member of the medical structure*)
- Whatever the reporting methods selected, make sure to limit risk of data duplication, and collect standardized information to ensure data homogeneity.
- NB: for some reasons, some health professionals will prefer paper forms over an online reporting of CP cases, and the general public often prefer direct contact, by phone or email, as it gives people the opportunity to ask for specific questions about their poisoning.
- **There is no ideal option. Let people choose their preferred reporting media.**

*Data Collection tools*

## 4. Reporting Ciguatera Cases

- The Ciguawatch online reporting system

The **Ciguawatch platform** proposes an online CP reporting system along with various data management tools, such as an automatized processing of the data, which can in turn be directly viewed in the form of an interactive dashboard.

The online declaration form includes different sections:

1. Personal information & poisoning context
2. Marine product(s) responsible for the poisoning event (and fishing area if available)
3. Diagnosis context
4. Clinical data
5. Additional observations

- All information can be provided anonymously
- No need to create a specific account to report a case
- Possibility to download the report once completed
- Available 24H/7D
- Data stored on a secure server with restricted access

### Ciguatera Poisoning cases

[Dashboard](#) [Report a case](#)

#### 1. Personal information & intoxication context

Personal informations and cfp context

Your name

Your e-mail

Personal informations and cfp context

The intoxicated person is:

Gender

Age

[→ Next](#)

*Data Collection tools*

## 4. Reporting Ciguatera Cases

### Who can use the online reporting system of the Ciguawatch platform?

- Although the Ciguawatch CP reporting system is primarily intended for public health professionals, it is also available in free access to any one wishing to report a CP case (private physicians or nurses, fishermen, consumers, etc.).
- The amount of information collected can help discriminate data provided by medical staff from data reported by the general public, useful for further data interpretation and validation
- The decision to include data provided directly by non medical persons belongs to each country.
- Alternatively, some countries may choose to limit the access to their national online platform to health professionals only as a first step, then subsequently open the platform to the general public as they get more and more familiar with the reporting system and data management.

*In French Polynesia, the CP online reporting system is open to the general public since 2015.*

*Data Collection tools*

## 4. Reporting Ciguatera Cases

### Paper forms and Excel table

Due to the current IT limitations encountered by many Pacific islands which potentially limits access to the online reporting system, it is crucial to propose/maintain alternate reporting media.

- We strongly invite you to edit a Pdf and/or Excel versions of the online declaration form, that can be completed manually or using a computer, then transmitted to the surveillance program DF Data Manager, by fax, airmail or email
- The Pdf and Excel forms should be accompanied by a **clear and simplified map**, to allow indications of the areas where the toxic fish/marine organism has been caught.

For large countries/regions, it is suggested to divide the territory into several sub-regions.

*In the case of French Polynesia, about sixty different paper and Excel forms (one for each of the 68 inhabited islands) are currently available*

- Make sure the questionnaire fits on **one page** and can be **clearly read** when printed in black and white.
- Note that one form correspond to one case.

*Data Collection tools*

## 4. Reporting Ciguatera Cases

### CONTACT INFORMATION

Health structures/physicians participating to the CP surveillance program should be aware of where and who to send their declaration forms and should also know who is the focal point likely to provide additional information on the ongoing surveillance program.

=> The identity and contact details of the entity (or individual) in charge of the CP surveillance program and data collation must be **explicitly** mentioned on each reporting form.

### DATA ANONYMIZATION

When reporting a CP case online, declarants are free to provide their name and email contact

*In French Polynesia, as data are centralized and further processed at the Laboratory of Marine Biotoxins, CP case reports issued by medical structures are systematically anonymized prior to their transmission to ILM.*

In the event additional information is needed for further investigations, it is recommended to contact the medical staff who issued the reporting form.

If a direct contact with the patient is required, CP surveillance program managers must obtain the patient's consent.

## 5. Managing Ciguatera data

- CP data are collected on a daily basis throughout the year, with likely seasonal fluctuations, thus requiring constant availability and regular data processing efforts, most notably during a peak of an outbreak.
- Countries who will use different media for data collection must ensure that all the documents **are centralized at the same address/ email/ phone contact.**
- One essential role of the **National CP Data Manager** is 1/ to gather all collected data and 2/ feed these data onto the online reporting system so to build a unique, updated database.
- This work can be done as the paper forms/emails/phone calls are received, on a daily or weekly basis.
- It is recommended to keep a scanned version of the paper forms and store your Data on a secured server with restricted access.
- A statistical analysis of the data can be performed once or twice a year, or more frequently in response to special queries from Health agencies or local authorities. This task may require involving *ad hoc* personnel or additional human power.

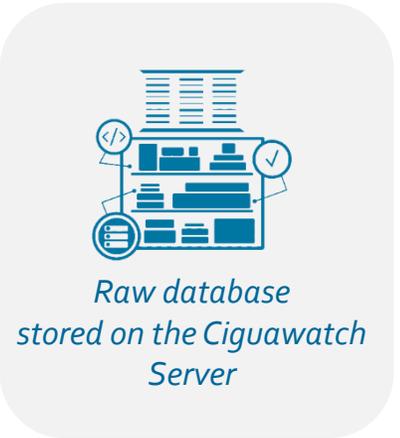
# 5. Managing Ciguatera data



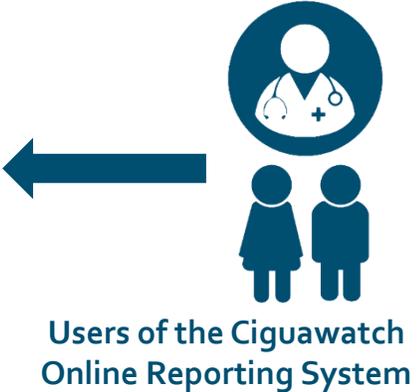
Alternate data reporting media  
(other than the online reporting system)



Ciguawatch  
Online reporting system



Raw database  
stored on the Ciguawatch  
Server



Users of the Ciguawatch  
Online Reporting System

Example of CP data management

## 5. Managing Ciguatera data

Analysis of CP data generally covers the following topics :

- **Total number of CP cases declared annually** (*for the whole country, or by archipelago, island or medical structures*)
- **Total number of CP cases declared monthly** (*to assess a potential seasonal trend in CP cases, or evaluate the potential impacts of climatic and/or anthropogenic disturbances on CP occurrence, such as cyclones, mass fish mortality events, coral bleaching episodes, etc.*)
- **Trends of CP cases number and I.R. over the years** (I.R.= number of CP cases/10,000 inhab.).
- **Number of isolated cases as opposed to collective poisonings / large disease clusters** (*i.e. when two or more consumers are involved in the same poisoning event*)
- **“TOP 10” of the marine products most frequently involved in CP poisonings** (*for the whole country, or by region, archipelago or island*)
- **Fatal cases vs. hospitalized cases vs. ambulatory cases** (*to assess the severity degree of CP cases*)
- **Patients’ CP history** i.e. the number of previous ciguatera poisonings experienced by a patient

## 5. Managing Ciguatera data

### Managing CP data using the Ciguawatch Dashboard.

- The Dashboard Administration System of the Ciguawatch Platform allows direct modifications of a CP report.
- Only the National CP Data Manager (NDM) is granted access to this space and can further modify/ delete outliers.
- Once connected, the NDM can select the CP reports of interest with the help of filters (for instance, CP data by years) .
- After selecting a specific report, the NDM have access to all the information filled in and can modify them as necessary.
- Note that for the overall management and statistical analysis of complete datasets, a table containing all the raw data can be downloaded from the Dashboard Administration System.

*Please contact us to be granted access to the Dashboard Administration System*

## 6. Informing and Rising Awareness among Potential Participants to the reporting program

- Once the national CP surveillance program is on the tracks, information and awareness campaigns should be initiated to inform/rise awareness among medical structures and basically anyone likely to be interested in participating to this program.
- This may require an official letter from Health authorities widely disseminated by e-mail or postal mail, or through information flyers, booklets and/or public meetings.
- Awareness campaigns could also be conducted in the form of side events at medical, scientific, meetings/workshops, or through medical forums.
- The use of local media (TV, Radio, Newspapers, social media...) to reach the targeted audience could be another option.
- Provide all the supports available for CP data collection (*link to the online reporting system, blank form (pdf), Excel table, etc*) and let the audience choose their preferred reporting media, but clearly notify that there is no need to duplicate the same information on different supports.
- In the event reporting CP cases is mandatory in your country, provide the official decrees to the audience

## 7. Feedback & data sharing

To ensure a sustainable CP surveillance program and encourage data collection especially among medical professionals, it is **ESSENTIAL** to show that all the efforts dedicated to collect and share these data are of real use to the community.

- Whether the reporting of CP cases is mandatory or not in your country, it is important to keep in mind that the persons who provide CP data (mainly health professionals), does it on a voluntary basis
- Therefore, it is important to provide them with regular feedbacks on how their data are exploited.
- This also applies to the general public willing to declare their poisoning directly on the online reporting system.
- To this end, you currently have two tools at your disposal:
  - the CP Annual Reports
  - the interactive Dashboard accessible through the Ciguawatch platform

## 7. Feedback & data sharing

- Providing an annual report on the CP status of your country is usually sufficient. However, an intermediary report can prove necessary for instance in the event of a mass CP outbreak.
- This report, based on the analyses of data collected during the past 12 months, is a valuable decision-making tool for local authorities with regards to CP risk management. This report should be transmitted in priority to Health Ministry/Public Health Directorate, hospitals/medical structures, Fisheries Agencies, as well as to all the participants who currently contribute to the surveillance program.
- This report can also serve as a useful information support for the general public. It is therefore recommended, to make it widely available with the prior consent of the due authorities.
- This document should be concise, written in a comprehensible manner to reach a wide audience, and easy to share and print (*e.g. with a limited number of pages, acceptable size file so it can be easily sent by email*).

*CP Annual Reports*

## 7. Feedback & data sharing

- First, make sure all the data collected during the past year from the different reporting media (*paper forms, Excel docs, e-mail exchanges, phone calls, etc.*) have been integrated in the online reporting system.
- This database should be the **sole source** of information used for CP data exploitation, in order to avoid multiplying data sets from different origins.
- Only the NDM is granted access to this database and can download raw data set from the platform.

*Priori to the statistical analysis of your dataset, it is highly recommended to touch base with each (participating) medical structures (by phone or email), to ensure no reports are actually missing. This work, although time-consuming, can be useful as it provides an opportunity to (i) discuss potential areas for improvement in the reporting process or (ii) understand why some structures do not participate to the ongoing surveillance program.*

## 7. Feedback & data sharing

### Data presentation format:

- Prefer graphics and figures to long text descriptions.
- Each time a species name is mentioned, it is recommended to provide both the scientific and local/common names along with a picture of fish specimens if available.
- Do not hesitate to call on a national/international CP expert, to assist you in drafting recommendations.
- Also consider translating the report in local language(s) as the needs dictate.

## 7. Feedback & data sharing

### *CP Annual Reports*

#### CP report content:

- There is no need to populate the report with too many data.
- Inform the audience on their possibility to obtain more specific and detailed information, on demand.

The main piece of information provided generally concerns:

- Annual trends of CP
- Monthly CP incidence rates
- Total number of cases and CP events per island and archipelago
- Cp case distribution by age and sex
- The context of poisoning : isolated cases vs. collective poisoning vs. large disease clusters
- History of previous ciguatera vs first ciguatera poisoning
- Fish species or marine organisms involved
- Parts of the fish consumed
- List of symptoms
- Number of hospitalized cases
- Number of fatal cases

In any case, the content of this report must be defined **beforehand** with Health authorities and/or decision-makers.

*N.B.: Over the years, the list of persons and organisms wishing to receive the annual report will likely increase. It is recommended to establish a mailing list with their contact details, to be updated on a regular basis*

## 7. Feedback & data sharing

*The Ciguawatch  
CP Dashboard*

### *CP data at a glance using the Ciguawatch CP Dashboard.*

- The Ciguawatch CP Dashboard was developed in order to provide an interactive and user-friendly overview of the CP status of countries from the South Pacific region.
- This tool is based on the automatized treatment of data entered onto the online reporting system, thus offering an access to the most recent CP data available within the region.
- This tool is a practical illustration of how the information shared by data providers can be quickly exploited and made available for the rest of the community. Indeed, once a CP report is validated, the information it contains are directly integrated and shown on the Dashboard's interactive map and graphs.
- If necessary, the NDM is given the possibility to modify individual reports using the Dashboard Administration System.
- Filters are available to facilitate specific searches.

**Sharing the link of this Dashboard may be a good tool to incite medical professionals and the general public to actively participate to CP case reporting programs.**

**As more and more data are continuously entered onto the CIGUAWATCH online reporting system, the dashboard content will expand and gain in accuracy.**

## 8. Planning work meetings and follow-up meetings

CONDUCTING REGULAR WORK MEETINGS AND FOLLOW-UP MEETINGS is essential to take stock of the progress made in data collection and discuss about potential obstacles. It is KEY to ensure a sustainable surveillance program.

### Managing Team work meetings

- At the start of the program, there may be need to meet 3 to 4 times a year.
- These meetings can be further spaced out to twice a year when the different partners get more and more familiar with all the process.
- These meetings can be conducted midyear or prior to the drafting of the annual report.
- In the event of an unusual/atypical or significant toxic incident, a special meeting may be held in order to:
  - fully document the current situation,
  - establish a communication plan intended at the general public in close partnership with Health authorities, if the needs dictate,
  - alert all relevant audience, local mayors, fishermen community, *etc*
  - set up field investigations and samplings as necessary.

### Follow-up with medical professionals

The medical professionals are your main data providers. As a first step, it could be necessary to regularly touch base with them, by phone or email, and make sure they become familiar with the reporting system and get used to reporting every single CP cases of patients seen in consultation.

**Also make sure they know who to contact if they seek for information about the CP surveillance program.**

## 9. Sharing data at an International level

All countries currently running a CP surveillance program are strongly invited to make their data available at regional and international levels.

- This effort is ESSENTIAL to assess the extent of ciguatera risk at a regional and global scale, especially in a context of global change.
- Moreover, providing such data can be an asset in the frame of international/European calls for proposal and/or funding requests.

Below are some examples of international database/ scientific events:

### *The Harmful Algae Event Database (HAEDAT) of the UNESCO*

An effective way to share CP related information with the scientific community is to integrate your data within the **Harmful Algae Event Database (HAEDAT)** developed by [IOC](#), [ICES](#) and [PICES](#) (<http://haedat.iode.org/>). HAEDAT is a meta-database holding records on harmful algal events with impacts on humans, harmful algae monitoring and management systems worldwide.

Identification of one referent per country in charge of data entry onto the HAEDAT database is required. Contact us for more information on the IOC-UNESCO HAEDAT and if you wish to contribute to CP events data sharing.

### *International conferences on Harmful Algae*

You are encouraged to attend International Conferences organized by the **International Society for the Study of Harmful Algae** (oral or poster communication) <https://issha.org/>. These conferences are particularly appropriate to share your data with a scientific community well aware of the ciguatera issue. Consider making joint presentations with other countries from the Pacific region. These conferences are a good place to find technical supports and potential partners to set up future actions.

[ciguawatch.ilm.pf](http://ciguawatch.ilm.pf)



For more information: [contact.ciguawatch@ilm.pf](mailto:contact.ciguawatch@ilm.pf)