PART I: How Integrated (outbreak) Analytics can contribute to a better understanding of cholera and WASH disease prevention and response

CAI CELLULE D'ANALYSES INTÉGRÉES

GLOBAL TASK FORCE ON CHOLERA CONTROL

I.N.S.P. INSTITUT NATIONAL DE SANTÉ PUBLIQUE R.D.Congo

RÉPUBLIQUE DÉMOCRATIQUE DU CONGO LE GOUVERNEMENT

MINISTÈRE DE LA SANTÉ PUBLIQUE, HYGIÈNE ET PRÉVENTION

PNECHOL-MD RDC

MINISTERE DE LA SANTE SECRETARIAT GENERAL UNITE DE GESTION DU PROGRAMME DE DEVELOPPEMENT DU SYSTEME DE SANTE UG-PDSS

REDISSE Regional Disease Surveillance Systems Enhancement

WHAT IS INTEGRATED OUTBREAK ANALYTICS (IOA)?

A **collaborative**, **multi-disciplinary**, and **multi-actor approach** which focuses on developing locally-based solutions to public health problems.

It involves a team that strives to gain a **deeper understanding of disease dynamics** and its **impact on communities**, facilitating a more effective, comprehensive, and accountable response.

IOA **integrates various stakeholders and data types**, both routine and specifically gathered, to gain a holistic understanding of outbreak dynamics and **inform co-developed actions.**

*While its implementation may vary depending on the country, context, and specific health concern, the principles of **collaboration**, **multi-disciplinary work**, **capacity building**, and **evidence-based practice** remain constant.*

KEY PRINCIPLES OF IOA

1. **Integrated & Holistic:** use diverse data sources and expertise to understand disease dynamics and community impacts
2. **Contextual & Localized:** tailor responses to individual communities, beginning with local-level analysis and recommendations
3. **Collaboration & Local Ownership:** prioritise equitable partnerships with national experts, in-country teams, and external partners
4. **Efficient Data Use:** maximize existing data to reduce the burden of data collection and foster data sharing
5. **Evidence-Driven Action:** develop evidence when there's a clear plan for its operational use
6. **Transparent Data Sharing:** share data openly, respecting data protection policies, where applicable
7. **Unified Partnership Approach:** diverse partner collaboration to achieve common objectives

HOW INTEGRATED OUTBREAK ANALYTICS (IOA) CAN SUPPORT CHOLERA RESPONSE

Please refer to the 'What is IOA?' video on the IOA YouTube channel: https://youtu.be/orXdd1FoX4k

Types of information included in Integrated Outbreak Analytics (IOA)

IOA requires **information covering all the factors likely to contribute to the risk**. This information comes from different sources and can be collected and analysed in different ways. For the data collected from these sources to lead to codeveloped actions, it needs to be **interpreted and analysed in collaboration with stakeholders** working in all types of programmes.

(Example) The information that contributed to the integrated analysis in Haut Katanga was as follows:

- **Monitoring case trends** of simple diarrhoea, typhoid, malnutrition (DPS-DHIS2); cholera (PNECHOL-MD)
- **Geopolitical situation & events**: population displacement, cross-border interaction, flooding
- **Gender and social dynamics**: roles and responsibilities of women, children and mer protection/gender risk factors associated with diseases (prevention, transmission and management) (partners CREC, DIVAS, CAI, REACH, Cluster protection)
- **Community situation** (knowledge, behaviour, health vulnerability): access to drinking water, ability to prevent cholera, access to and use of routine health services (MNCH) (WASH cluster partners; CAI)
- **Programmes**: water and sanitation coverage (WASH cluster); CATI/ cadrillage (PNECHOL-MD and cholera partners); vaccination (health cluster partners; PEV)

Collaboration of the Integrated Analytics Cell (CAI) and PNECHOL-MD

Between 2021 and 2022, the CAI developed household surveys which were designed and reviewed by the partners of the GTFCC (Global Task Force on Cholera Control).

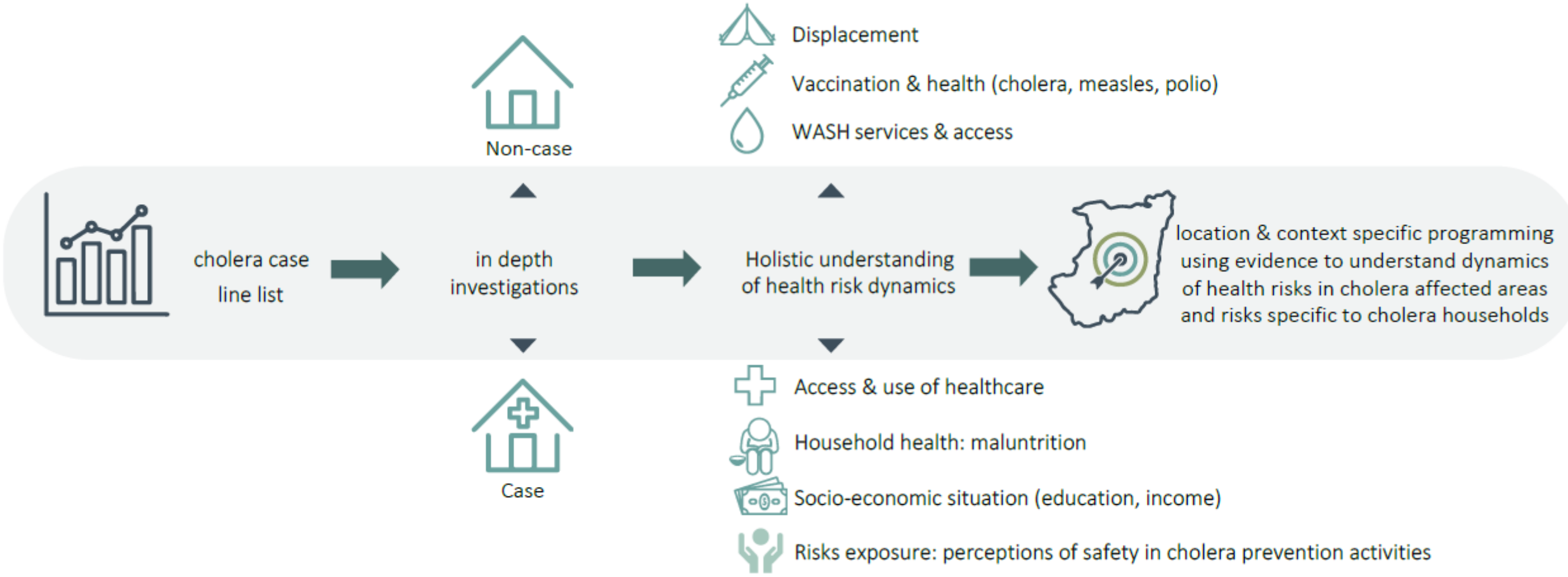
In 2023, the CAI strengthened its support and collaboration with the National Programme for the Elimination of Cholera and other Diarrhoeal Diseases (PNECHOL-MD), in order to :

1. **Reinforce line lists**: improve the quality of data collection, management and sharing (improve the quality of existing data).

2. **Explain trends and risks**: conduct collaborative and integrated analyses when trends or risks are observed and cannot be explained.

3. **Strengthen a comprehensive information base on cases and risk dynamics**: develop In-depth Investigations linked to line lists that provide detailed information on cholera cases to better understand context-specific risks.

In-depth investigation process developed in 2023 by CAI / GTFCC and PNECHOL-MD partners



PART II: case study – Democratic Republic of the Congo

Using INTEGRATED ANALYSES to support prevention and response to cholera and diarrhoeal diseases: PNECHOL-MD collaboration with the Cellule d'Analyses Intégrées (CAI) and the Integrated Outbreak Analytics (IOA) approach

INVESTIGATIONS: in figures 2024

HAUT KATANGA					
ZS	CAS (LL)	CAS trouvé	% CAS trouvé	NON-CAS	TOTAL
KENYA	201	122	61%	121	243
KAMPEMPA	159	73	46%	86	159
SAKANIA	215	171	80%	315	486
KATUBA	65	41	63%	64	105
KISANGA	58	43	74%	79	122
Total HK 2024	698	450	**64%**	665	1115
NORD KIVU					
GOMA	247	168	68%	223	391
KARISIMBI	116	83	72%	162	245
NYIRAGONGO	332	210	63%	217	427
Total NK 2024	695	461	**66%**	602	1063

Representative samples of suspect households were taken at each site (95% CI, 5% ME).

***In North Kivu and Haut Katanga, it was not possible to find 100% of the suspected cases identified in the line list.*

Reasons for being unable to find all suspect case households

North Kivu:

- Constant movement of IDPs – to other sites, or back home
- IDPs sometimes give false addresses (particularly in informal sites)
- Households closed/ adults out collecting wood, finding work etc.

Haut Katanga:

- Households move because of shame and discrimination
- Households hide cases (shame)
- Absence of respondents during the day

Investigation figures for 2023:

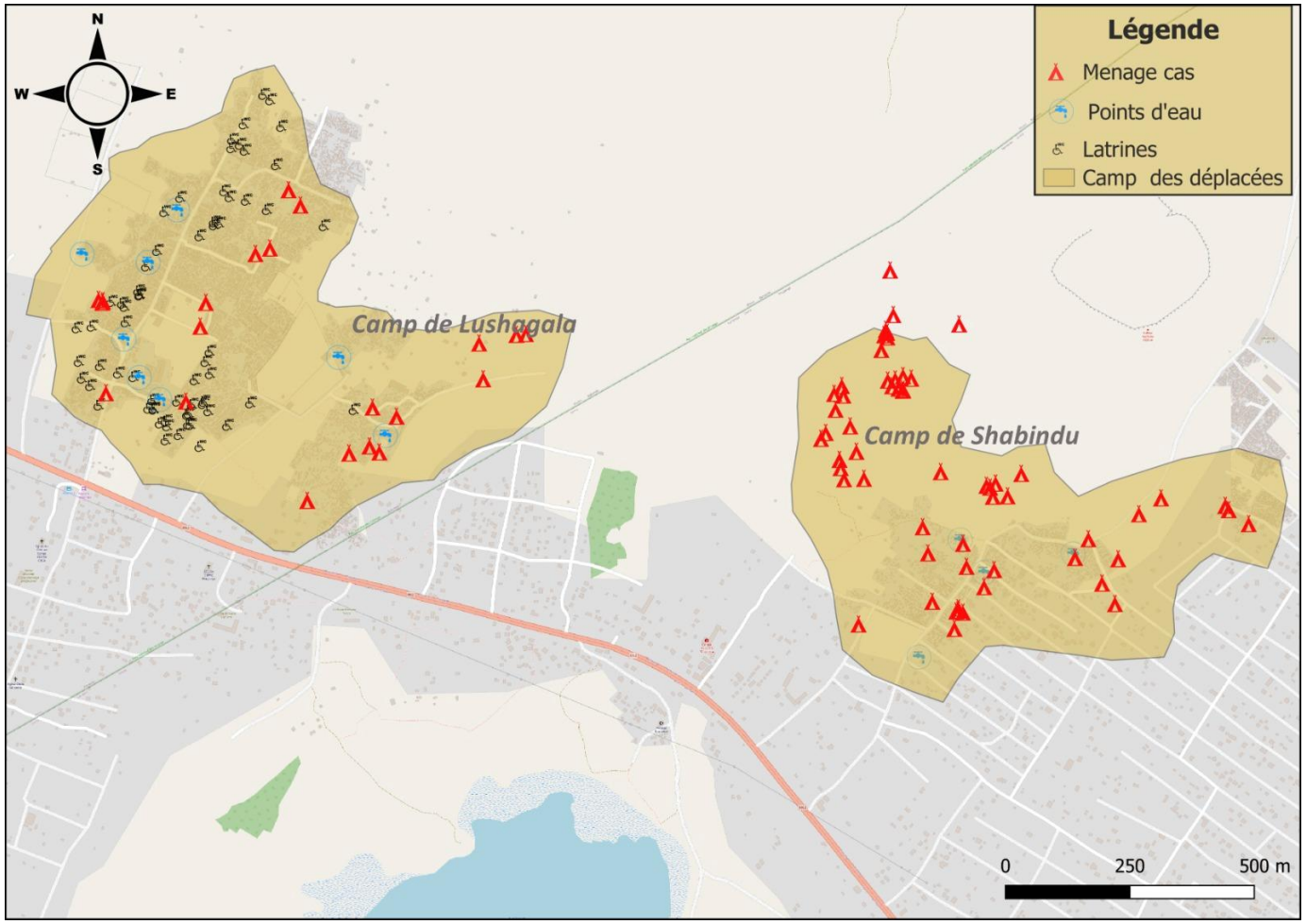
4780 in-depth surveys were carried out across 17 health zones in 5 cholera-endemic provinces: *North Kivu, South Kivu, Tanganyika, Haut-Katanga* and *Lualaba.*

→ 1429 suspected households (73%) were found and included in the in-depth household surveys (out of 1971 in the LL).

Kenya HZ, Haut Katanga – cholera cases often found in unsanitary areas where people are ashamed of how they live.

1. THE IMPORTANCE OF GEO-LOCATING CASES: EXAMPLES FROM NORTH KIVU

- Cases are **principally found in IDP sites.**
- These cases are concentrated in the **areas of the sites where the new arrivals are located.**



Carte 1: cas suspects de choléra a Karisimbi 95% dans les sites de Lushagala et Shabindu

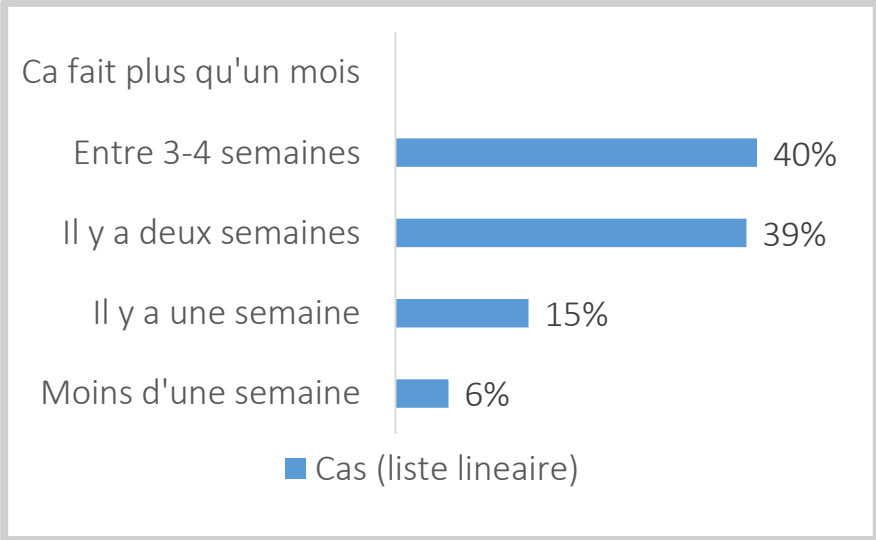
NOMBRES ET POURCENTAGES DES CAS DE CHOLERA DÉPLACÉES ET VIVANT DANS LES SITES		
Zone de santé	# de cas et % vivants dans les sites	# de cas et % vivants dans les sites
KARISIMBI	158 / 98%	79 /95%
GOMA	30 / 81%	168/ 100% *** 100% a Bulengo*
NYIRAGONGO	181 / 98%	208/99% ***75% a Rusayo*
Total 2024		455 / 99%

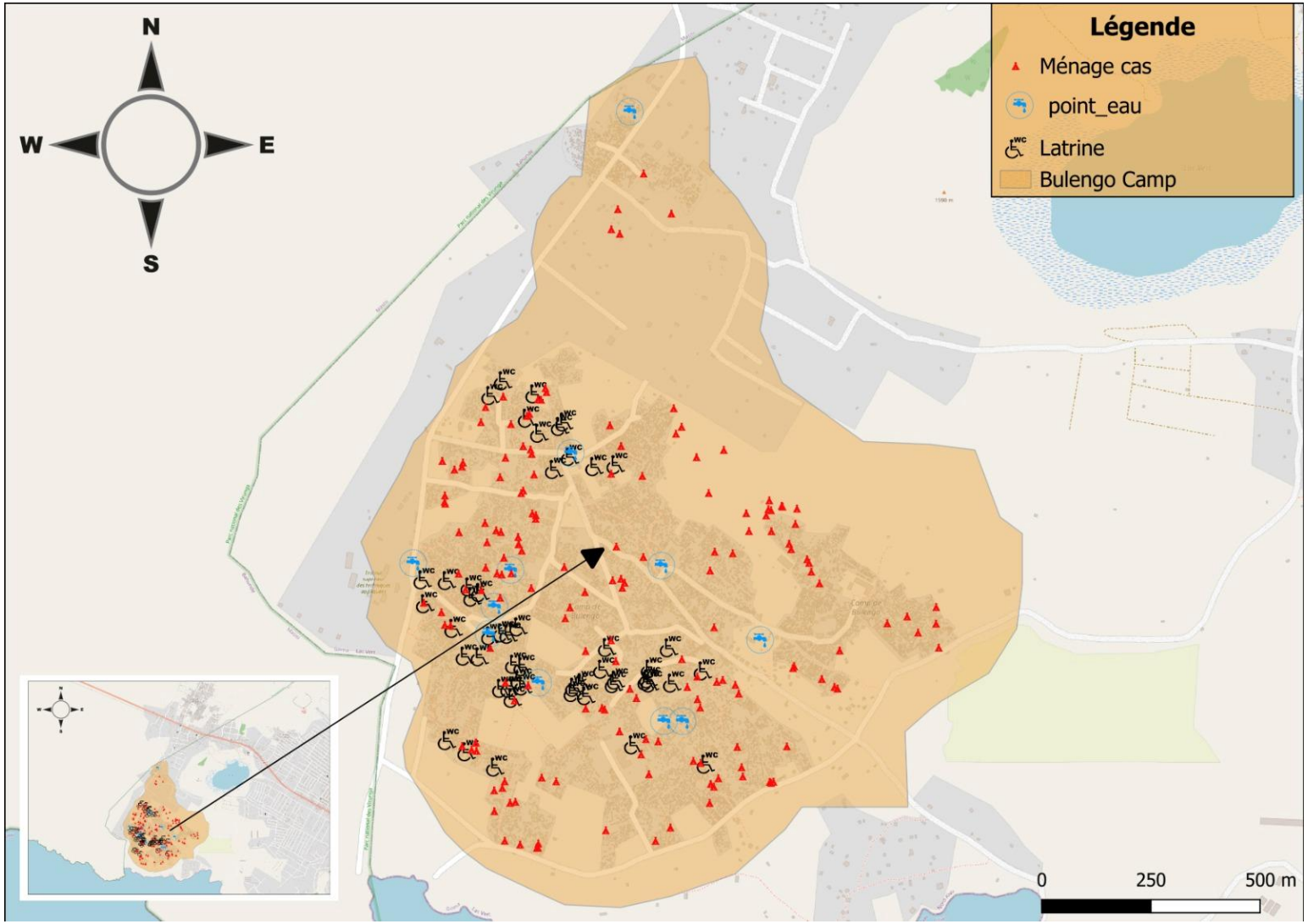
Cholera exposure factors for new arrivals at the sites

- **Lack of latrines in new blocks** - some newly created for new arrivals, but many still under construction.
- Many new arrivals have not received kits, including tarpaulins - ***poorly constructed shelters and domestic sanitation.***
- New arrivals are forced to set up **shelters on the outskirts,** where existing WASH facilities are limited.

100% of confirmed and suspected cholera cases in the Goma health zone were identified in the **Bulengo site**, and **60%** of these cases concerned **people who had arrived in the previous 3 months.**

Period since displacement, suspect cholera cases Nyiragongo (2024)

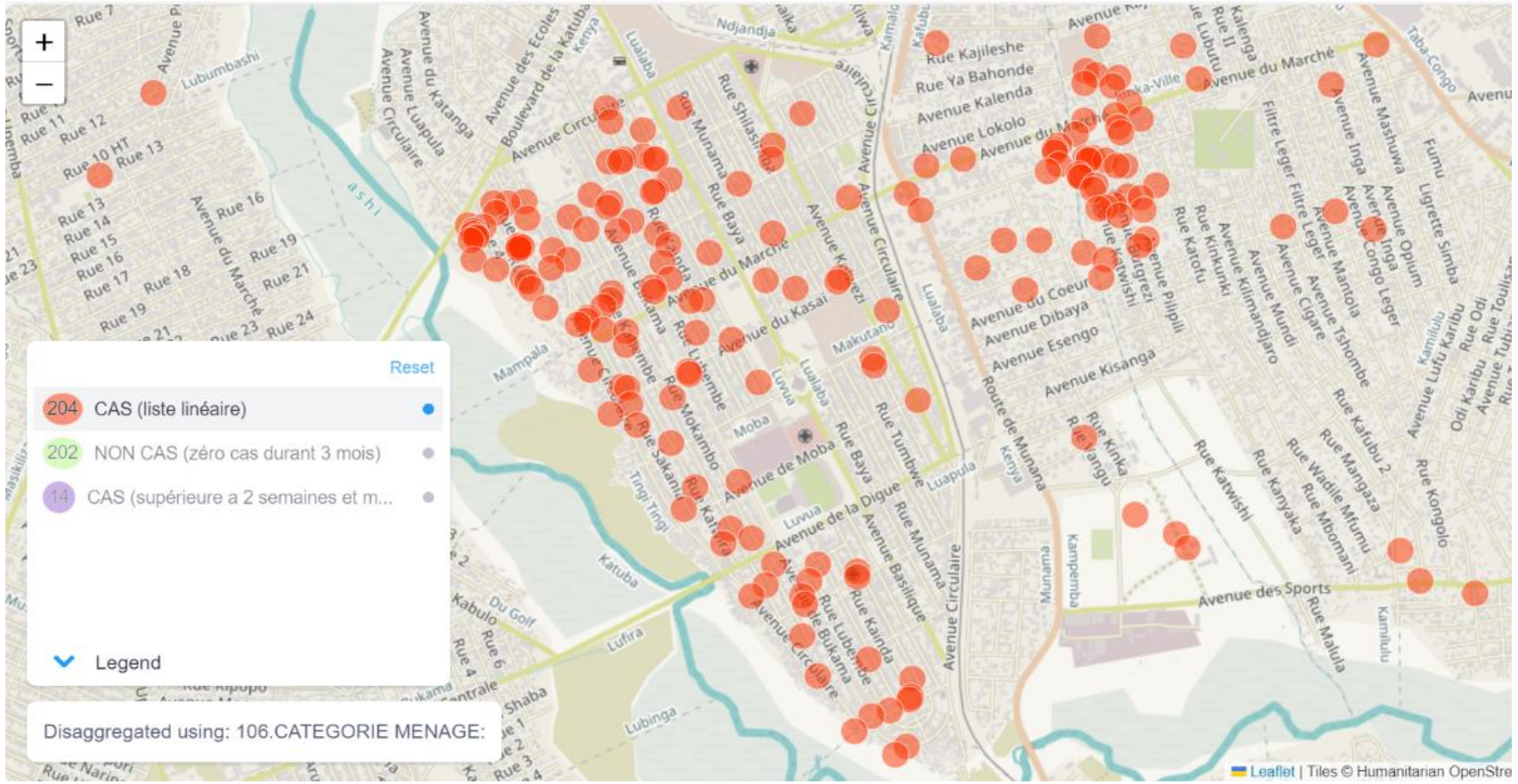




Carte 2: Site de Bulengo (Goma) avec points de ménages cas et infrastructures WASH

1. THE IMPORTANCE OF GEO-LOCATING CASES: EXAMPLES FROM HAUT KATANGA

Concentration of cases in densely populated urban areas with frequent cross-border exchanges

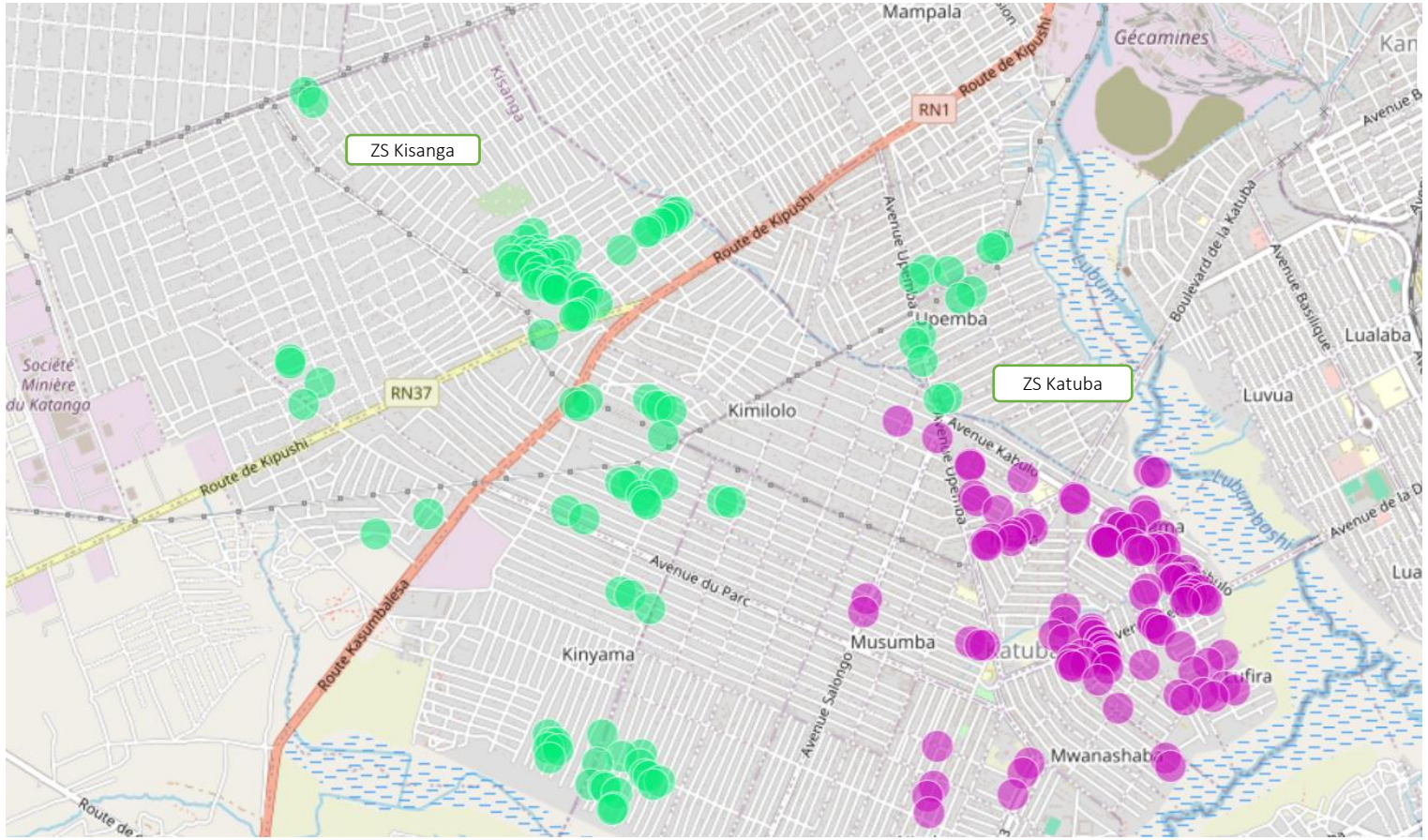


Carte 3 : représentation spatiale des cas suspects de cholera ZS Kenya et ZS Kampemba

- Kenya HZ has the largest market in the region - **constant interaction and cross-border movement**
- Zone is overcrowded with **traders from neighboring communes, the province and Zambia**
- **Unsanitary conditions, sharing of latrines with several people** (vendors and residents) and consumption of water from unprotected wells

Suspected cases in the **Kisanga** and **Katuba** HZs are also concentrated in the more densely populated urban areas, where the main activities are often linked to trade.

Carte 5 : cas suspect de cholera ZS Kisanga et ZS Katuba



In Katuba, however, cases seem to be concentrated in <u>areas bordering the Lubumbashi River.</u>

People use it to dispose of faeces, and others use the **marshes surrounding the river to defecate** in the open.

In the event of flooding, this creates a considerable risk of contamination by cholera and other fecal-oral diseases.

The same river flows through the Katuba, Kenya and Kisanga health zones.

2: GENDER & SOCIAL DYNAMICS/GENDER: Evidence from North Kivu

Cholera risk higher in men than in women at the IDP sites

Even when women represent a higher proportion of the displaced population, men run a higher relative risk of contracting cholera than women.

	GOMA		NYIRAGONGO		KARISIMBI	
Sexe	Cas suspect	Population dans le site	Cas suspect	Population dans le site	Cas suspect	Population dans le site
H	120	15,982	178	48707	57	22377
F	127	24,048	154	73064	59	73064

Some factors associated with increased cholera infection in men :

- Absence of men from households during awareness campaigns
- Family hygiene is considered a woman's responsibility.
- Men rather than women are employed to empty filled latrines, a job often carried out without protection.
- Men are more likely to spend money on food around the sites (bistros, doughnuts, corn, etc.) without washing their hands properly before consumption.

BULENGO (ZS Goma)

Proportion of women in the sites is higher (24,048) than men (15,982)

- 0.75% of men were suspected of having cholera vs. 0.53% of women

Chi2 Pearson test:

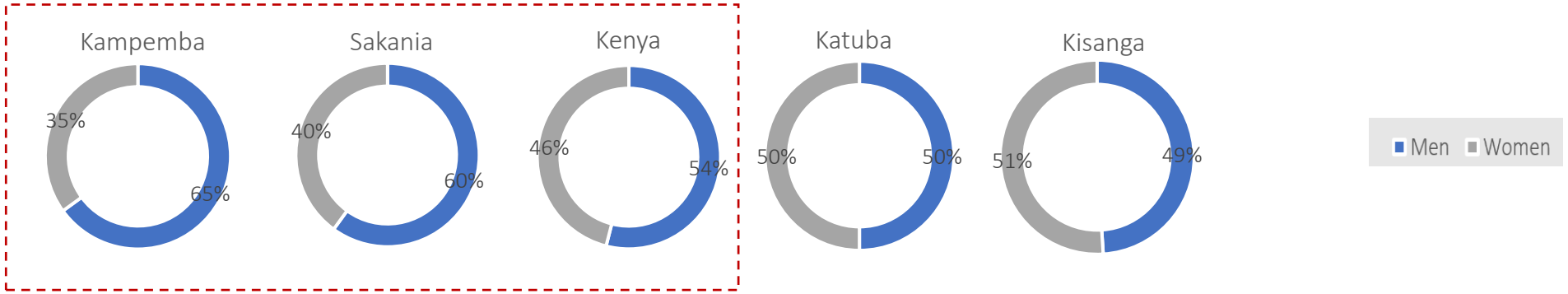
- Observed statistic is 7.77
- P-value: 0.0056

There is therefore a significant link between being a man and contracting cholera.

- The relative risk calculated here is **RR=1.42** (CI 95%: [1.100 ; 1.837]).

2: GENDER & SOCIAL DYNAMICS/GENDER: Evidence from Haut Katanga

In 3 of the 5 health zones, the proportion of suspected cases is higher among men and boys than among women.



Factors associated with increased cholera infection among men and boys:

- Absence of men in households during awareness campaigns (less informed about prevention of cholera or other diarrhoeal diseases).
- Men work as traders (Sakania HZ), encountering a greater number of people, risking exposure to the disease, and subsequently contaminating the family.
- Boys are more at risk of infection in schools than girls - girls tend to avoid WASH facilities to prevent urinary tract and other infections, while boys tend to use them regardless of hygiene conditions.

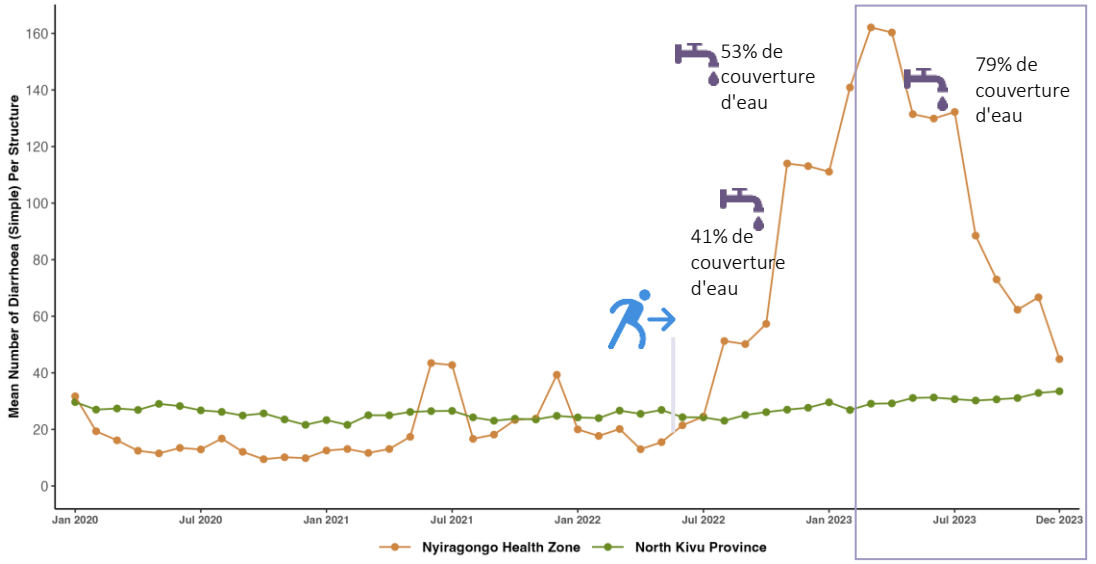
3: INTEGRATED HEALTH RISK MONITORING

Increase in diarrhoea cases in Nyragongo (orange line) associated with mass displacement (from July 2022).

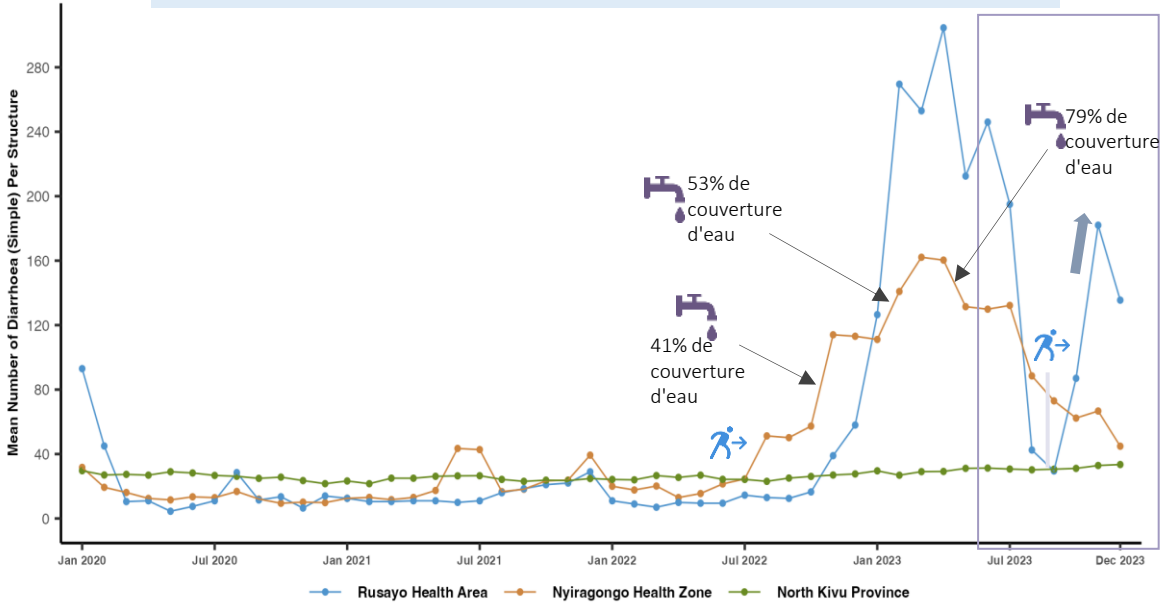
→ As water coverage at Nyiragongo sites improves, reported diarrhea rates decrease.

Diarrhea has similar risk factors to cholera, reflecting an environment favorable to cholera transmission.

Diarrhea (simple) in Nyiragongo health zone (14 facilities) vs. North Kivu province (949 facilities)



Diarrhea (simple) in Rusayo health area (2 facilities) vs. Nyiragongo health area (13 facilities) vs. province of North Kivu

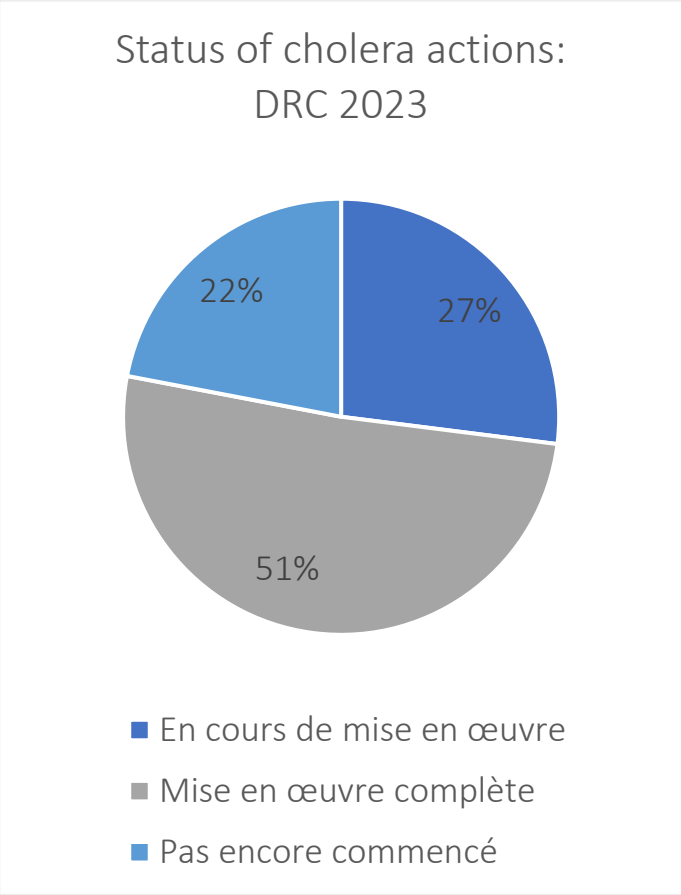


Increase in diarrhoea in Rusayo health area (blue line) from October 2023, corresponding to a new wave of displaced people arriving although cases in the zone are falling (orange line).

With programmes data, health information systems data and population/ events data we can have a better integrated earlier warning for cholera outbreaks.

Codeveloped actions

Following the in-depth cholera analysis, evidence, including key findings and risk factors contributing to cholera, is presented and discussed with all WASH, health and cholera stakeholders operating in North Kivu and Haut Katanga, with actions co-developed to address the issues raised.



So far in 2024 :

Haut Katanga:

- 35 actions codeveloped
- 77 % implemented* (100% completely)
- 23% not yet started

Nord Kivu:

- 69 actions codeveloped
- 55% implemented* (10% completely)
- 35% not yet started

Examples of codeveloped actions

	KEY RESULT	CONTRIBUTING FACTOR	ACTION	PARTNER
Haut Katanga	No action is taken after a suspected case of cholera in some health facilities, due to a lack of disinfection materials and equipment.	Some health structures do not have disinfection teams or equipment, and lack training for hygienists.	Equip the Kisanga and Sakania health zones with sprayers so that they can be distributed to health facilities for further disinfection after the passage of a suspected cholera case.	Organisation mondiale de la Santé
Haut Katanga	Lack of information on the existence of ORS points in the community.	Cholera treatment facilities are far away and information on free treatment is not widely known - Households with cases of diarrhea decide to take a mixture of ash and water to treat and prevent the disease.	When MSF ceases to manage the ORS sites, BCZ Kampemba will continue ORS site activities using community relays in the health zone, using a rotation system to ensure site continuity.	MINISTÈRE DE LA SANTÉ PUBLIQUE, HYGIÈNE ET PRÉVENTION *BCZ Kampemba*
North Kivu	Households in the site reported having observed changes in the availability of water in the household, risking recourse to non-viable sources.	Reduced water replenishment frequency and shorter drawing hours	Reinforce the Bulengo pumping station with a new motor-driven pump to facilitate availability and access to water in the site.	CONCERN worldwide
North Kivu	Over 50% of all households have RCL of 0.1, compared with 38% who have a CRL at the appropriate rate.	79% of households (cases & non-cases) consider their water to be potable. However, only 38% use chlorinated water that complies with standards. Less than 15% treat their water, because 90% think it's treated.	Carry out water quality control by testing free chlorine residual at the outlet, pumping station and ramps before distributing to the displaced, then document the RCL found in the follow-up sheets.	me Grand Lacs

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