



## Article Original

## Challenges and Lessons Learnt after Two Mass Campaigns of Oral Cholera Vaccine in Hard-to-Reach Fishermen Communities

*Défis et leçons apprises après deux campagnes de masse de vaccin oral contre le choléra dans les communautés de pêcheurs à accès difficile*

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## RÉSUMÉ

**Objective.** We aimed to report our experience of conducting the first reactive OCV campaign in hard-to-reach fishermen communities on an Archipelagic Health District in Cameroon with some challenges and lessons learnt. **Population and Methods.** A cross-sectional study was carried out using results of two rounds of reactive mass vaccination campaigns against cholera. An estimated target of 9,421 people aged 1 year and above including pregnant women. The two rounds took place from February to March 2020 using an oral bivalent killed vaccine, Shanchol™. The pre-campaign phase was comprised of extensive planning on risk analysis, social mobilization, vaccine logistics, Water Hygiene and Sanitation Devices, Case Management, and Vaccination strategies. **Results.** Of the 9,421 people target, about 6589 people were sensitized, with 4412 from Cape Cameroon and 2177 from Toube. The first round of reactive OCV campaign achieved a coverage of 62.43% while that of the second round was 59.66%. Town crier and social mobilisers were the main sources of information. A majority of the target population was covered using the door to door strategy. All cases of vaccine refusals were managed. **Conclusion.** Overall OCV was highly accepted in these Island communities. Strengthening efforts on local advocacy, community mobilization, case management, implication of health area coordination teams and motivation of vaccination teams may have a better impact on controlling an outbreak.

## ABSTRACT

**Objectif.** Nous avons voulu présenter notre expérience de la conduite de la première campagne de VCO réactive dans des communautés de pêcheurs difficiles à atteindre sur un district sanitaire archipélagique au Cameroun, avec quelques défis et leçons apprises. **Population et Méthodes.** Une étude transversale a été réalisée en utilisant les résultats de deux séries de campagnes de vaccination de masse réactive contre le choléra. Une cible estimée de 9 421 personnes âgées de 1 an et plus, y compris les femmes enceintes. Les deux séries ont eu lieu de février à mars 2020, avec un vaccin oral bivalent tué, Shanchol™. La phase de pré-campagne a consisté en une planification approfondie de l'analyse des risques, de la mobilisation sociale, de la logistique des vaccins, des dispositifs d'hygiène de l'eau et d'assainissement, de la gestion des cas et des stratégies de vaccination. **Résultats.** Sur 9 421 personnes ciblées, environ 6589 personnes ont été sensibilisées, dont 4412 au Cap Cameroun et 2177 à Toube. Le premier tour de la campagne de VCO réactive a atteint une couverture de 62,43% tandis que celle du second tour était de 59,66%. Les crieurs publics et les mobilisateurs sociaux ont été les principales sources d'information. La majorité de la population cible a été couverte par la stratégie du porte-à-porte. Tous les cas de refus de vaccins ont été pris en charge. **Conclusion.** Dans l'ensemble, le VCO a été très bien accepté dans ces communautés insulaires. Le renforcement des efforts sur le plaidoyer local, la mobilisation communautaire, la gestion des cas, l'implication des équipes de coordination des zones de santé et la motivation des équipes de vaccination peuvent avoir un meilleur impact sur le contrôle d'une épidémie.

## INTRODUCTION

Overall, in 2020, 80 countries reported data on cholera to WHO. Of these, 27 countries reported a total of 323 320 cholera cases and 857 deaths, for a case-fatality rate of 0.27%, while 53 countries reported 0 cases for the year (1). In Cameroon, cholera occurs periodically and the general trend shows an annual increase in the number of cases with a case fatality rate that greatly exceeds the

target rate recommended by the WHO which is less than 1%(2). The main epidemics were recorded in the North, Far North and Littoral regions(3).

On January 13, 2020 (Epidemiologic Week 3), the Manoka Health District (HD) notified 02 suspected cases of cholera in Cape Cameroon Health Area (HA), including 01 who died. On January 14, 2020, the Regional

Delegation of Public Health for the Littoral Region (RDPHL) was notified of 05 new suspected cases in the same health area, and on January 15, 2020, the stool analyzes of the two cases collected on January 13 returned positive in the laboratory of Douala Laquintine Hospital (vibrio strain O1 serotype Inaba). Confirmation of samples sent to the Centre Pasteur Cameroon was not effective until January 27, 2020, making possible the official declaration of the epidemic in the Littoral Region.

In order to help prevent epidemics and reduce morbidity and mortality linked to cholera, a reactive vaccination campaign was organized in the Manoka Health District (HD) (Cape Cameroon and Toube health areas). It is part of an integrated approach, complementary to all other cholera control interventions implemented by the Ministry of Public Health, in collaboration with technical and financial partners. In February 2020, Oral Cholera Vaccine (OCV) was used reactively for the first time as an adjunct tool to fight a cholera outbreak in hard-to-reach Fishermen communities in Manoka.

Manoka is an archipelagic Health District in the littoral region of Cameroon, with 47 Islands and the population mostly made up of Nigerians. Implementing timely oral cholera vaccine campaigns in response to outbreaks remains challenging(7,9). Several reactive campaigns, with good coverage and acceptability, have been documented in recent years(7,10–12) Our experience revealed some challenges and lessons learnt. The main objective of this vaccination campaign was to protect the population in Manoka against cholera. We aimed to present our experience of conducting the first reactive OCV campaign in hard-to-reach fishermen communities on an Archipelagic Health District in Cameroon with some challenges and lessons learnt.

## POPULATION AND METHODS

### Study design

A cross-sectional study was carried out using results of the two rounds of reactive mass vaccination campaigns against cholera.

### Setting

The first round of reactive OCV campaign took place from the 23<sup>rd</sup> to 25<sup>th</sup> of February 2020. The second round took place from the 15<sup>th</sup> to 17<sup>th</sup> of March 2020.

Health-area centered risk analysis identified two high risk Islands (Cape Cameroon and Toube) with an estimated target of 9,421 people aged 1 year and above including pregnant women.

Bivalent Killed Oral Vaccine, Shanchol was used. Vaccines were transported from the central cold room to the regional cold room. From the regional cold room, they were supplied daily during the campaign to the target islands which did not have an adequate cold chain system. Arrangements were made for adequate storage of vaccines at the local level between +2°C to +8°C until they were administered as recommended by the manufacturers.

### Participants

This study was conducted among people of both sexes, aged one year and above, including pregnant women. The health area target population was drawn from the

Cameroon Ministry of Public Health 2020 population denominator.

### Data source and measurement

Upon arrival at the household, a list of all members was created, and one individual was randomly selected for interview. After obtaining oral consent, data were collected on vaccination tally sheets during face-to-face interviews in English or French depending on the preference of the respondents.

### Study size

The study being implemented during a mass campaign vaccination, the size of the sample included 9421 people aged of one year and more in the Manoka HD.

### Data analysis

The treatment and analysis of data was done using MS Excel version 2010. Confidence interval of proportion was computed at 95% level of confidence.

### Leadership and planning

The pre-campaign phase was comprised of extensive planning on risk analysis, social mobilization, vaccine logistics, Water Hygiene and Sanitation Devices, Case Management, and Vaccination strategies.

### Organization of the campaign

Encourage the support of at least 95% of opinion leaders, administrative and traditional authorities, as well as the population of health areas affected by the campaign. Disseminate national guidelines on preventive and curative measures for Cholera. Administer doses of cholera vaccine to at least 95% of target subjects. Take proper charge of cases in health facilities and in the community. Ensure the safe destruction of 100% of the material used during the campaign. Ensure the notification of 100% of AEFI cases during the campaign. Strengthen epidemiological surveillance in the health district concerned by the activity;

### Before the campaign

Implementation meetings were organized between various actors, at the central and regional levels. Correspondence followed to announce the activity to the competent administrative and religious authorities of the different communities. Training of field workers, vaccinators and mobilizers and their predispositions at vaccination sites.

### During the campaign

The cholera response vaccination campaign was carried out at the same time as the sensitization of the populations on respect for hygiene and sanitation rules. It was carried out simultaneously, in door-to-door and fixed leadership strategies. The campaign had run for three days and the catching up took place in villages where targets were not reached or where vaccination went poorly. Social mobilization was required to ensure awareness.

### Ethical considerations

This survey was conducted as part of the public health response to the cholera outbreak. A formal agreement was obtained from the Ministry of Public Health. Approval from an ethical review committee was not required. Verbal consent was obtained from all adults, while parents or care givers of eligible children gave permission. Consent was obtained before interviews were conducted.

All data were collected and analyzed anonymously and no identifiable information was collected.

The supervision of the campaign was ensured by the Ministry of Public Health (from the central level to the district level) and the partners (WHO and Médecin Sans Frontière). During the 3 days, the supervision team was deployed every morning to support the field teams to achieve the objectives of this campaign and in addition to orient the strategies for more success.

**RESULTS**

**Socio-demographic characteristics**

Manoka Health District include two health areas: Cape Cameroon and Toube health areas. According to 2020 National data, Manoka Health District has a total population of 9703 inhabitants, Cape Cameroon being the most populated

6 127(63.15%) estimated residents. People aged of one year and more or

9 412(97%) individuals where eligible for that mass campaign against cholera with

5 943 in Cape Cameroon and 3469 in Toube. (Table I)

**Table I. Population distribution by health area, Manoka HD, Cameroon, 2020.**

Cape Cameroon health area		
Islets	Population	Target (97%)
Cape Cameroun	4318	4188
Kalabot	57	55
Tende	201	195
Bescool	501	486
Moppi	406	394
Accra	612	594
Triconer	32	31

<b>Total</b>	6127	5943
<b>Toube health area</b>		
<b>Toube 1 and 2</b>	2496	2421
<b>Nkangue french</b>	1080	1048
<b>Total</b>	3576	3469

**Social mobilization**

Before the three days of vaccination, social mobilization activities were carried out in the whole District. Population was informed and counted in their household by social mobilization workers. Town crier and social mobilisers were the main sources of information. Sensitization about vaccination against cholera during the two campaign rounds showed the following results (Table II):

**Table II. Sensitization data of the two-health areas, Manoka HD, Cameroon, 2020.**

	Households visited	People sensitized	Target people counted (%)	CI (95%)
Cape Cameroon	1220	2442	4412 (73.32)	72.2-74.43
Toube	461	434	2177 (61.99)	60.37-63.58
<b>Total</b>	1681	2876	6589 (67.65)	60.21-70.07

**Technical results**

A majority of the target population was covered using the door-to-door strategy. All cases of vaccine refusals were managed. Synthesis of technical vaccination results during the first round of campaign is presented in the table III

**Table III. Distribution by age of first round vaccinated individuals, Feb 2020, Manoka HD, Cameroon**

	Deployed teams	Age				Total	Vaccination coverage zone* (%)	by CI (95%)
		1 – 4 years	5 – 9 years	10 – 19 years	> 20 years			
Cape Cameroon	11	335	329	367	1 671	2 702	63.73	62.27-65.16
Toube	2	266	270	366	596	1 498	61.12	59.17-53.03
<b>Total</b>	13	601	599	733	2 267	4 200	62.43	61.61-63.92
<b>Percent</b>		<b>14.31</b>	<b>14.26</b>	<b>17.45</b>	<b>53.98</b>			

*\*Estimation of zone coverage: denominator Cape Cameroon: 4240, Toube: 2451*

During this round, majority of participant 70.99% where aged more than 20 years and the overall first round campaign coverage was estimated at 4200 (62.43%). This result was lower than the target set at 95%. The vaccinal coverage was higher in Cape Cameroon than Toube and the difference was statistically significant. On the other hand, for the second round, majority of people (53.81%) who received the vaccine was aged from 10 to 19 years. The zone coverage was higher in Cape Cameroon but not statistically different from Toube. Table IV and figure 1.

The average zone coverage was 61.05%. This vaccination coverage was significantly higher during round one than in round two in the Manoka Health District. Though a few minor stomach aches were observed (minor AEFI), no serious AEFI were observed

**Achievements**

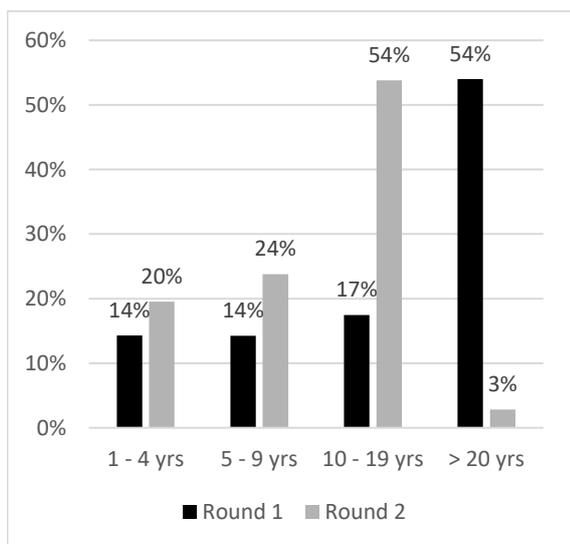
MSF had distributed Non-Food Items (NFIs) to help improve water and hands hygiene. Each household was given a kit consisting of 2 cups, 1 bottle of 20 liters, Aquatab tablets and 2 soaps. During this distribution, the community was made aware of the drinking water treatment by Aquatab.

A total of 18 handwashing points was deployed in the island of Cape Cameroon to encourage communities to wash their hands. The construction of a Cholera Treatment Unit (CTU) for cholera patients with staff made available by the District.

**Table IV. Distribution by age of first round vaccinated individuals in health area, March 2020, Manoka HD, Cameroon.**

	Deployed teams	Age				Total	Vaccination coverage by zone* (%)	CI (95%)
		1 - 4 years	5 - 9 years	10 - 19 years	> 20 years			
<b>Cape Cameroon</b>	7	453	481	1 578	60	2 572	60.64%	59.18-62.12
<b>Toube</b>	3	328	469	570	53	1 420	57.94%	55.97-59.88
<b>Total</b>	10	781	950	2 148	113	3 992	59.66%	58.48-60.83
<b>Percent</b>		19.56	23.80	53.81	2.83			

\*Estimation of zone coverage: denominator Cape Cameroon: 4240, Toube: 2451



**Figure 1.** Vaccinated people distributed according to age, February-March 2020, Manoka HD, Cameroon

**Challenges**

The last population census in this district dates from 2005 with an extrapolation of this figure by following the demographic curve of the national level.

The population of this set of islets is an overwhelming majority of nomadic fishermen who usually leave their homes for several months in the sandstone of seasonal fishing areas. Tidal movements limit the time for vaccination and supervision activities as the population is essentially nomadic, with movement according to the frequency of fishing.

These sand islands are hit hard by soil erosion due to climate change. (The radio antenna, formerly in the center of the island is now more than 500 meters from the shore in the open sea. We also note the presence of remains of pilings at the level of the beach and in the water at low tide, piles were the foundations of the houses on the seafront) According to the statements of the local population, some houses were moved further inside the island when others were destroyed and saw their population migrate.

Several houses are empty or closed and local testimonies corroborate the fact that numerous families of fishermen are absent for several months. During the rapid coverage survey, almost half of the homes visited were empty or closed.

Some local social actors speak of an informal estimate of the population of Cape Cameroon at around 3000 people. (Not verified) These points tend to show that the population figures presented originally do not take into account the fact that these populations migrate according to the erosion of the islands and the fishing seasons. As is the over-representation of children under 5 who stay on the island when adults are at sea.

**DISCUSSION**

This study shows an average coverage by zone of 61.05% which is not far from result of a 2016 study in hard-to-reach communities in Malawi [79.5%], in south region of Cameroon [64.43%] and in Nigeria [73%], and in Zambia [73.4%] in 2020 (3,13–15). A study done in India showed similar result (61%)(16). A post campaign assessment in Haiti in 2016, shows a coverage ranging from 50 to 57%(17) based on vaccination cards which is closed to result of this study. The target coverage of at least 85%

was not reach probably because of the insufficient mobilization especially during the second round during which population were not informed in time. Moreover this objective has been exceeded in Somalia with a coverage ranging from 92-94%(6). The mains source of information was town crier and social mobilisers which is different from result found in Mozambique that showed the use of the neighborhood's main leader (31.3%) compared to social mobilizers (19.9%)(18) with similar result reported in Nigeria(14). Some participants dropped out from the first to the second round of our study leading to decrease in vaccination coverage from 62.43 % to 59.66% and the same tendency was noted in many other mass campaigns against cholera throughout the world(6,13–16,18,19). This could be explained by fear of adverse events of the first round.

It was noted that the "door to door" technique has been shown to be more effective than fixed vaccination points(17).

A few minor stomach aches were observed during this study. Different ascertainment were obtained in Mozambique(18) with abdominal pain being the most common, in Haiti with weakness/fatigue and headache(17) and in Nigeria with fever being the commonest adverse events(14).

However, refusals were noted, most of the refractories were finally convinced after a few minutes of explanations. The fact of having used local social actors and doctors who were known to the population helped to gain acceptance for the vaccine. On the other hand, a similar campaign in other regions of Cameroon, in 2020 revealed high level of unmanaged refusals due to various reasons.

### Lessons learnt

#### Social mobilization

The mobilization of the population must be done earlier for the second round to be sure to reach as many people as possible. The dates of the second round should be quickly fixed and the partner on the spot (MSF CH) as well as the local authorities (Chiefdom) should immediately inform the population. The use of a single crier with a megaphone should be extended as the method that has been shown to be very effective.

#### Technic of vaccination:

In the event of an outbreak of cholera in such context as described in this paper, "door to door" strategy should be prioritized as our experience showed it to be more effective than fixed-point strategies.

#### Partner involvement

MSF CH present in Cape Cameroon is setting up latrines with a collection and storage tank for stools for treatment with lime and / or chlorine before spreading them. This is to reduce and stop the spread of diarrheal-type diseases including cholera. Without subsidies, it will not be possible to extend this system to families in view of the cost of inputs.

#### Recommendation during cholera epidemic episodes

Drinking water is not present in Cape Cameroon and the water is transported by canoe. Chlorination points should be set up for drinking water from Tiko and Toube and the

sources of supply checked. Establishment of chlorine solution spray points for all canoes that dock or leave the islands. Systematic establishment of an IEC program concerning the use of surface water in epidemics (decant, boil water, use Aquatabs and / or chlorine). Local authorities should be involved with a view to ban dishes and cutlery in restaurants during the epidemic episode (customers should come with their own cutlery and plates). Support for the Cape Cameroon health center and training on care. Establishment of a secure and low-cost drinking water supply system to prevent inappropriate use of surface water.

### CONCLUSION

Overall OCV was highly accepted in these Island communities. Strengthening efforts on local advocacy, community mobilization, case management, implication of health area coordination teams and motivation of vaccination teams may have a better impact on controlling an outbreak. In a case like this, the vaccine is probably the only feasible medium-term solution. Any "classic" WASH project implemented would have an extremely limited lifespan due to the daily submersion of the island due to the tides.

#### Limitation

Data of this study was collected by trained community health agents and not from an independent monitoring so as to assure the validity of all data. The study was not extended to all neighborhoods using the same methodology for all teams.

#### Conflict of interest statement

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results

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#### Author Contributions

(I) Conception and design: A. Amani, (II) Administrative support: A. Amani; (III) Collection and analysis of data: Fabrice Zobel Cheuyem; (IV) Data interpretation and discussion: Fabrice Zobel Cheuyem; (V) Manuscript writing: All authors; (VI) Final approval of manuscript: A. Amani.

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