Evaluation of the Coordination of Cholera Outbreak response in Harare City, 2018

Alex Ingwani[1], Blessing Mushangwe[1], Rephias Shabenyanga[1], Marvellous Mhondoro[1], Kudzai Kufa[1], Tsitsi Juru[1,&], Notion Tafara Gombe[1], Gerald Shambira[1], Mufuta Tshimanga[1]

[1]Department of Community Medicine, University of Zimbabwe

KEYWORDS
Cholera, Coordination, Response

ABSTRACT

Background: Zimbabwe declared a cholera outbreak on 6th September 2018 with cases rapidly increasing during the first week of the outbreak. Despite early detection of the outbreak and various coordination activities for the outbreak response, the cases continued to rise in Harare City and by the 21st of September 2018 the city had recorded 5 802 suspected cholera cases. Poor coordination may result in avoidable morbidity and mortality. We evaluated the effectiveness of the coordination for preparedness and response during 2018 cholera outbreak in Harare City to identify gaps and make recommendations for improvement. **Methods:** We conducted a descriptive cross-sectional study. We used interviewer-administered questionnaires to collect data from key informants who were purposively recruited at Ministry of Health head office (MOHCC), City health department and West-South-Western district in Harare City and partners. Checklists were used to assess the quality of coordination meetings and Emergency Operations Centre (EOC) according to the Emergency Management British Columbia guidelines. Records review of stock cards for medicines and sundries and random physical counts were conducted to assess stock management. We analyzed data by themes and frequencies. **Results:** Coordination framework, coordination structures and clarity of roles were in place. The EOC was located at MOHCC with well-established security measures; however it was operating for only 8 hours daily, had space for only 20 personnel and no hotline. Eight meeting minutes were reviewed. They had an agenda, appropriate participants, identified action items but lacked timelines for the action items and had no action matrix for identified tasks. Stock management was conducted manually resulting in delayed resource distributions. **Conclusion:** The coordination framework and structures were well established. There are opportunities for improvement if timelines and an action matrix are added to the meeting minutes. The EOC was operating for eight hours and without a hotline. Keeping the EOC operational for 24 hours daily during outbreaks can improve the outbreak response. Delays in resources redistribution and consequent delayed response may improve with use of an electronic stock management system.

[&]CORRESPONDING AUTHOR
Tsitsi Juru, Department of Community Medicine, University of Zimbabwe Email: tsitsijuru@gmail.com

RECEIVED
30/01/19

ACCEPTED
15/04/19

PUBLISHED
23/04/19

LINK

http://www.afenet-journal.net/content/article/2/6/full/

CITATION
Alex Ingwani et al. Evaluation of the Coordination of Cholera Outbreak response in Harare City, 2018. J Interval Epidemiol Public Health. 2019 March; 2(1):5

Introduction

Disease outbreaks are characterized by overwhelming needs, competing priorities, inefficient communication channels, a lot of humanitarian assistance, aid and overwhelmed responders[**1**]. The main aim of controlling a cholera outbreak is to prevent further transmission of the infection and reduce cholera deaths in order to maintain a World Health Organisation (WHO) acceptable case fatality rate of less than 1%[**2**]. This is achieved through collaborative efforts of different partners that are properly coordinated because no single entity can address the complexity of needs associated with outbreak response.

Some of the benefits of good coordination of outbreak response include improved efficiency by sharing information which speeds up response, cost effectiveness as it avoids duplication of activities and speedy responses as decisions are made faster. It is also important to recognize and identify barriers to coordination. An example is fear by organizations that their freedom to make decisions and run programs will be reduced[**1**]. Coordination may be complicated by presence of too many players, slowing the process and losing focus and absence of consensus among participants[**1**].

Zimbabwe adopted the Integrated Disease Surveillance and Response strategy for cholera outbreak response[**3**]. The Ministry of Health and Child Care (MOHCC) recommends that coordination of a cholera outbreak response is conducted using the Cholera Command and Control Centre (C4) concept as shown in Figure 1. The coordination is divided into the following thematic areas: Surveillance/Laboratory, WASH (water sanitation and hygiene), Case Management, Social Mobilisation and Supply Forecasting. The C4 structure is composed of World Health Organisation (WHO) and MOHCC Department of Epidemiology and Disease Control (EDC). At operational level the Rapid Response Team (RRT) is part of the Emergency Preparedness Response (EPR) committee and reports to the EPR committee which in turns reports to the National Taskforce on Disease Prevention and Control as depicted in figure 2. The RRT has links with WHO, Health cluster and WASH cluster members at district and national level. The coordination of outbreak response in Zimbabwe utilizes existing MOHCC structures which are: district RRT, provincial RRT and national RRT. Information for outbreak response is relayed from district to provincial and national level. The Director of Epidemiology and Disease Control Department (at national level) reports to National Taskforce on Epidemic Prone Diseases and WHO. Implementing partners operate at district, provincial and national levels. These include Medecins Sans Frontiers, United Nations International Children's Emergency Fund (UNICEF) and OXFAM which provide technical support and commodities for control of cholera outbreaks. Harare City through its provincial and district structures implements response activities for MOHCC. The Zimbabwe Field Epidemiology Training Program assists with generation of evidence based interventions to control outbreaks through research. The emergency operations centre (EOC) is a physical space located at MOHCC facilities where the outbreak status is periodically reviewed. Efficiency of coordination also increases when the teams actively participate in deciding policies, procedures and strategies hence creating an environment of respect and goodwill[**1**]. In addition, the agencies must be impartial when assisting so as to provide relief where it is needed and not to fulfill their own objectives. In addition, it should be transparent to all participants and acceptable to affected population.

Figure 3 shows the epicurve of the cholera outbreak from the 4th to 21st September 2018. The outbreak was declared on 6 September 2018 and received overwhelming support from civil society and partners through resource mobilization. Despite early detection of the outbreak and various coordination activities for outbreak response which included stakeholder meetings, technical working group meetings, district health executive meetings and lobbying for support from the civil society, the cases continued to rise in Harare City and spread to other regions in Zimbabwe. Poor coordination may result in avoidable morbidity and mortality hence we evaluated the effectiveness of coordination of the cholera outbreak response. Our aim was to identify gaps in the coordination of the response and to make recommendations for improvement in current and future outbreaks.

Methods

Study design and setting

We conducted a descriptive cross sectional study in Harare, a city, with a population of approximately two million people basing on the 2012 census[**4**]. The study was conducted in Harare City at national (MOHCC head office), provincial (Harare City Health Department, Rowan Martin Building) and district (Glen View Polyclinic, Budiriro Polyclinic) levels and implementing partners were interviewed at their offices in Harare.

Study Population

Key informants were selected at national, provincial and district levels, at each level the head of the unit was interviewed. Personnel responsible for the coordination of the outbreak response among partners were interviewed. Fifteen key informants available to participate in interviews at the time of study were purposively recruited into the study.

Sampling of records

At the time of review the eight available minutes for coordination meetings out of the estimated 20 of the coordination meetings were conveniently reviewed of which four were for meetings at national level and four were health executive meetings at provincial level. There were no minutes for district level meetings.

Data collection

Interviewer administered questionnaires were used to collect data from key informants. Checklists were used to assess the quality of coordination meetings and Emergency Operations Centre according to the Emergency Management British Columbia Guidelines [**5**–**7**].

Variables

Data were grouped according to themes: composition of coordination teams, EOC readiness, communication channel clarity, stock availability and meeting effectiveness. Meeting effectiveness was measured by availability of the following: agenda, attendance by appropriate participants, identification of action items and their corresponding timelines.

Data management and analysis

Data were analysed manually after themes were generated from the responses of the key informants.

Permission and ethical considerations

The Ministry of Health and Child Care requested for and approved this evaluation. We sought permission to carry out the evaluation from the Director Health Services (DHS) Harare City and the Health Studies office (HSO). Strict confidentiality was ensured at all times when handling data during all processes of data capturing and analysis. Informed written consent was obtained from all study participants. Informants' names or identifying information were not recorded on questionnaires. IRB was not sought given that we were in an outbreak situation and the evaluation was to primarily inform control efforts.

Results

Out of 15 respondents, three were from national level, four from provincial level, five from district level and three were from partner organizations (table 1). One respondent said "The experience of the 2008 cholera outbreak made us more prepared this time around." Another respondent was very appreciative of the support and said "We received overwhelming support and aid from the society in this outbreak."

Composition of the coordination teams of the cholera outbreak response in Harare City, 2018

The composition of the coordination teams were as expected according to Zimbabwe cholera treatment guidelines [**3**]. The rapid response teams were present at all levels; that is at district, provincial and national levels. The team members from the rapid response teams belonged to different thematic areas. Thematic areas included case management, water sanitation and hygiene, social mobilization, logistics, laboratory and surveillance; hence the rapid response teams included clinicians, administrators, laboratory scientists, health

environmental personnel, health promoters and pharmacists. All thematic groups conducted separate meetings as well as combined meetings and reported to the team leaders District Medical Officer (DMO), Director of Health Services (DHS) and Director Epidemiology and Disease Control (DEDC) for reporting to the next level. The Inter-Agency Coordinating Committee on Health was the platform where the partners were engaged for support with the Directorate of Epidemiology and Disease Control.

Assessment of the Emergency Operation Centre of the cholera outbreak response in Harare City, 2018

The EOC is located within MOHCC building and had the required security measures in place to restrict access. The EOC was operating for 8 hours during day time whereas it is expected to operate 24 hours daily during outbreaks and could only house 20 out of 60 expected personnel. There was no active hotline during the outbreak whilst a functional hotline is necessary. The EOC uses the Incident Command System, the information they received from districts via the provincial level was not in real time. Each morning the EOC received updates from the previous day and this helped in planning. A monitoring and evaluation framework for monitoring the outbreak was not in place as expected (Table 2).

Stock management

The sources of stock were: City of Harare (pharmacy, stores), National Pharmaceuticals (NATPHAM), MOHCC and Partners. The stock management was conducted manually using stock cards; one out of the three facilities had updated stock cards for commodities used for cholera control. Variances between quantities on stock cards and physical counts were observed in two out of three facilities. One out of three facilities had stock outs of aqua tablets and doxycycline whilst these were overstocked in the other facilities.

One key informant said, "… some partners who were not familiar with the donation process delivered their donations directly to the specific health facilities, which created overstocking of commodities. Moreover, some partners had specific preferences on facilities where to donate and others donated what they had and not what was needed. "

Another respondent also said, "The level of support from the civil society and partners for this outbreak was overwhelming and unanticipated which affected accountability initially."

Table 3 shows stock management of medicines and commodities in the cholera outbreak response per facility.

Communication Channel

The WHO and MOHCC circulated a weekly situational report through emails to all the stakeholders. This helped to evaluate how well the response to the outbreak was doing. The daily updates that were done at all levels covering the thematic areas helped for personnel to identify gaps within their respective thematic areas and action them. However, the district level personnel highlighted inadequate feedback from higher levels.

Review of minutes for meetings

Eight minutes for coordination meetings were reviewed. All meetings had agenda, relevant stakeholder participation and tasks were appropriately assigned as expected. However, there were no timelines for tasks assigned and no action matrix to show if the action plans were done by the next meeting. Table 4 shows quality of the coordination meetings minutes.

Discussion

There was an established coordination framework; coordination structures had clear roles and coordination was divided into thematic areas namely: WASH, case management, logistics and surveillance/lab. Dividing coordination into thematic areas is useful in ensuring that different processes take place simultaneously to address the challenges of the cholera outbreak. This might explain why the spread of disease and case fatality rate of the current outbreak was less than that of 200**8**.According to Cuneo et al, the cholera outbreak in 200**8** was poorly coordinated resulting in a prolonged outbreak, which spread throughout the country and had high case fatality[**8**]. However, even though the coordination for the 2008 outbreak was poor, lessons learnt might have positively

contributed to the improvement in coordination in this outbreak where preparedness as well as effectiveness of coordination was evident.

The presence of a functional EOC is very positive as it ensured efficiency or continuity of operations during the outbreak. But the fact that it was operating for 8 hours out of the expected 24 hours, there was loss of opportunities for capturing real time events occurring outside working hours. The EOC must be able to function on a 24 hours 7days a week basis until de-activation as required to support the emergency response [**6**]. In addition, it could house 20 out of 60 expected personnel which meant staff could get overwhelmed with work at any given point. Having no active hotline during the outbreak was a limitation and disadvantaged people who needed information or assistance.

The WHO and MOHCC circulated a weekly situational report through emails to all the stakeholders. This helped to evaluate how well the response to the outbreak was doing. The daily updates that were done at all levels covering the thematic areas helped personnel to identify gaps within their respective thematic areas and action them. Olushayo et al found that different information was conveyed resulting in disagreement between partners and duplication of response efforts [**9**]. However, in our study there were established communication channels, which ensured uniform information was conveyed possibly by utilizing the available Health Information System. Inadequate feedback from higher levels to district level as reported by one personnel may result in the district making wrong decisions which are not aligned with expectations. In a study done in Kenya by Oyugi et al in 2015, it was shown that lack of coordination and communication of response roles leads to confusion which subsequently result in delays and also inefficiencies in outbreak control[**10**].

The coordination meetings minutes had no timelines for tasks assigned and there was no action matrix to show if the action plans were done by the next meeting. The lack of timelines on action items might have led to delays in implementation of action plans. According to Olushayo et al poor coordination meetings resulted in delayed implementation of actions points, poor attendances and repeated discussions of the same issues[**9**].

Manual Stock management is cumbersome and may lead to delays in distribution of stocks[**11**]. Cuneo et al revealed that the 2008-2009 Zimbabwe cholera outbreak response was characterized by poor coordination which was highlighted by the politicization of health care, aid, water and information[**8**]. This was also apparent in our study since some partners preferred to support certain areas leading to overstocking, or with resources which might not have been essential at that particular time.

Limitations

We were not able to review all the minutes of coordination meetings held during the outbreak as only eight out of the possible 20 were availed to the study team. This could have affected our findings because the unavailable minutes might have been of different quality from what we reviewed.

Conclusion

Coordination was fairly effective with an established coordination framework, structures and mechanisms. However, the EOC was operating sub-optimally as it was operating during the day as opposed to 24 hourly. Besides the coordination being done, there were deficiencies in stock management, which could have been avoided. Adding a hotline and use the electronic stock management system will improve outbreak response in future. The experience from previous outbreaks contributed to the improved coordination in the current outbreak. There was better preparedness as well as effectiveness of coordination during the current cholera outbreak.

Coordination meetings were effective and provided an opportunity for sharing information of activities and future plans among different organisations that were participating in the outbreak so as to avoid overlapping assistance. However, the lack of timelines might have led to delays in implementation of action plans. Since EOC's function is to monitor events using various sources of data it is surprising that it only operated for 8 hours and had no functional hotline.

Recommendations

We recommend that timelines and an action matrix are routinely included in the minutes of the meetings at all levels. We also recommend that the - EDC director makes the EOC operational for 24 hours per day during outbreaks and adds a hotline. In addition, City Health department should consider using the electronic stock management system to improve stock management.

Declarations

Ethics approval and consent to participate

Strict confidentiality was assured and ensured at all times when handling data during all processes of data collection, capturing, analysis and storage. Permission to conduct the study was obtained from Director Epidemiology and Disease Control (Ministry of Health and Child Care), Director of Health Services (Harare City) and Health Studies Office.

Consent for publication

Not applicable

Availability of data and materials

The data that support the findings of this study are available from Director Health Services (DHS) Harare City, Ministry of Health and Child Care (MOHCC) and Health Studies office (HSO). Data are however available from the authors upon reasonable request.

Competing interests

The authors declare no competing interest.

Funding

This study was funded by AFENET through their support for ACoDD activities.

Authors´ contributions

RS, AI, MM, BM, DB, KK: conception and design of study, analysis and interpretation of data, drafting the manuscript.

GS, NG, TJ, MT: conception and design of study and critically reviewing the manuscript for important intellectual content.

All authors read and approved the final manuscript for publication.

Acknowledgments

We would like to express our sincere gratitude to all the key informants, our Master in Public Health colleagues, Department of Community Medicine, University of Zimbabwe, the Health Studies Office, Zimbabwe and AFENET for all their support.

Tables and figures

Table 1: Distribution of key informants at different levels
Table 2: Assessment of the Emergency Operation Centre of the cholera outbreak response in Harare City, 2018
Table 3: Minimum stock status of commodities per affected facility.
Table 4: Quality of the coordination meetings minutes
Figure 1: The Epi-curve of the Harare Cholera Outbreak, 2018
Figure 2: Coordination mechanism and framework in cholera outbreak response

References

1.Improving coordination: Disaster Preparedness Training Programme [Internet]. International Federation of Red Cross and Red Crescent Societies; 2000 [cited 2018 Oct 3]. Available from: https://www.ifrc.org/Global/Impcoor.pdf

2.WHO | Prevention and control of cholera outbreaks: WHO policy and recommendations [Internet]. WHO. [cited 2018 Sep 11]. Available from: http://www.who.int/cholera/technical/prevention/control/en/

3.Zimbabwe Cholera Control Guidelines Third edition [Internet]. World Health Organisation; 2009 [cited 2019 Apr 13]. Available from: http://apps.who.int/medicinedocs/documents/s20993en/s20993en.pdf

4.Zimbabwe National Statistics Agency. Zimbabwe Population Census 2012: National Report [Internet]. Harare, Zimbabwe: Zimbabwe National Statistics Agency; 2013 Oct [cited 2019 Apr 15] p. 126. Available from: http://www.zimstat.co.zw/sites/default/files/img/publications/Population/National_Report.pdf

5.WHO | Public Health Emergency Operations Centre Network (EOC-NET) [Internet]. WHO. [cited 2019 Mar 18]. Available from: http://www.who.int/ihr/eoc_net/en/

6.Emergency Operations Center Assessment Checklist | FEMA.gov [Internet]. [cited 2019 Mar 18]. Available from: https://www.fema.gov/emergency-operations-center-assessment-checklist

7.Emergency Operations Centre Operational Guidelines 2nd Edition [Internet]. Emergency Management Division, Justice Institute of British Columbia; [cited 2019 Mar 18]. Available from: https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/local-government/eoc_operational_guidelines.pdf

8.Cuneo CN, Sollom R, Beyrer C. The Cholera Epidemic in Zimbabwe, 2008-2009. Health Hum Rights. 2017 Dec;19(2):249-64.

9.Olu OO, Lamunu M, Chimbaru A, Adegboyega A, Conteh I, Nsenga N, et al. Incident Management Systems Are Essential for Effective Coordination of Large Disease Outbreaks: Perspectives from the Coordination of the Ebola Outbreak Response in Sierra Leone. Front Public Health. 2016;4:254. https://doi.org/10.3389/fpubh.2016.00254 PMid:27917377 PMCid:PMC5117105

10.Oyugi B. Potential Impact of devolution on motivation and job satisfaction of healthcare workers in Kenya: Lessons from early implementation in Kenya and experiences of other Sub-Saharan African Countries. The Journal of Global Health Care Systems [Internet]. 2015 Jan 13 [cited 2018 Oct 26];5. Available from: http://jghcs.info/index.php/j/article/view/390

11.Chris Joseph. Advantages & Disadvantages to a Manual Inventory Control System [Internet]. HoustonChronicle.com. Hearst Newspapers, LLC; [cited 2019 Jan 27]. Available from: https://smallbusiness.chron.com/advantages-disadvantages-manual-inventory-control-system-22693.html

Table 1: Distribution of key informants at different levels

National (n=3)	Provincial (n=4)	District (n=5)	Partners (n=3)
Director Epidemiology and Disease Control Deputy director Non Communicable Disease	Director Health Services Health Services Manager Environmental Health Manager Nursing manager	District Medical Officer District Nursing Officer District Health Services Administrator District Environmental Health Officer Stores officer	MSF UNICEF WHO

Table 2: Assessment of the Emergency Operation Centre of the cholera outbreak response in Harare City, 2018

Features	Available	Expected
Operating hours	8 hours	24 hours
Location	Within government offices	Within or near government offices
Sitting capacity	20 participants	At least 60 participants
Security	Access restricted to authorized staff	Access restricted to authorized staff
Hotline	No	Yes
M and E framework	No	Yes

Table 3: Minimum stock status of commodities per affected facility.			
Item	**Glen View**	**Budiriro**	**Beatrice Road Infectious Hospital**
Intravenous fluids	Yes	Yes	Yes
Medicines	Yes	Yes	Yes
Aqua tablets	Yes	No	Yes
PPEs	No	Yes	Yes

Table 4: Quality of the coordination meetings minutes	
	Frequency
Agenda present	8/8
Agenda covered	8/8
Action points identified	8/8
Action points assigned to appropriate persons	8/8
Follow up of action points	8/8
Appropriate participants	8/8
Timelines specified	0/8

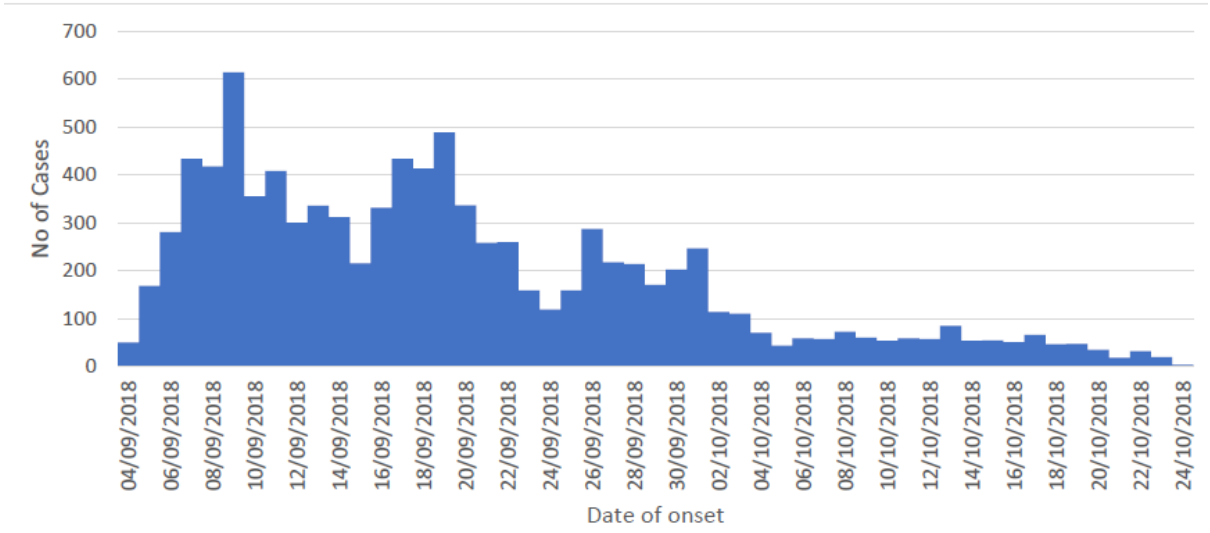

Figure 1: The Epi-curve of the Harare Cholera Outbreak, 2018

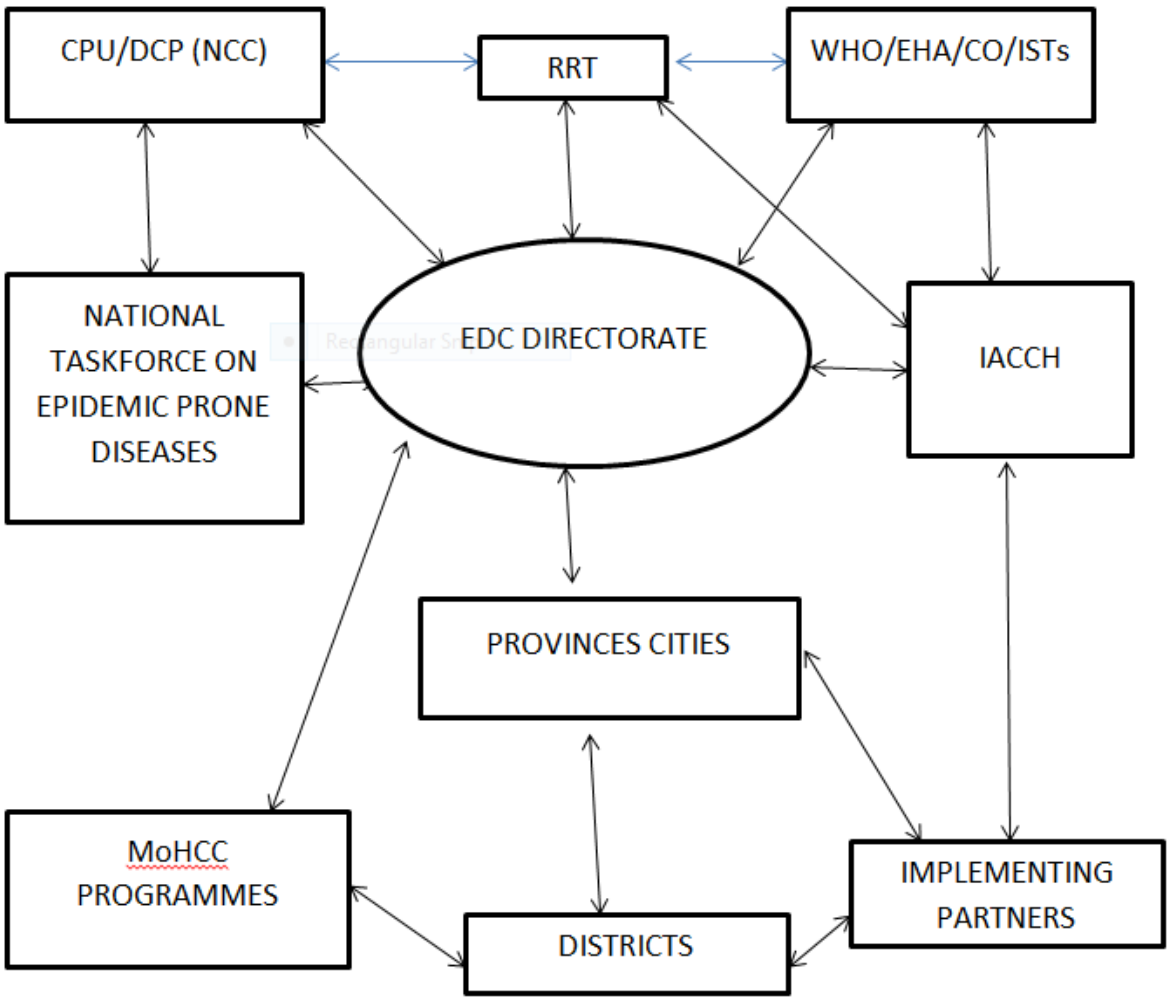

Figure 2: Coordination mechanism and framework in cholera outbreak response