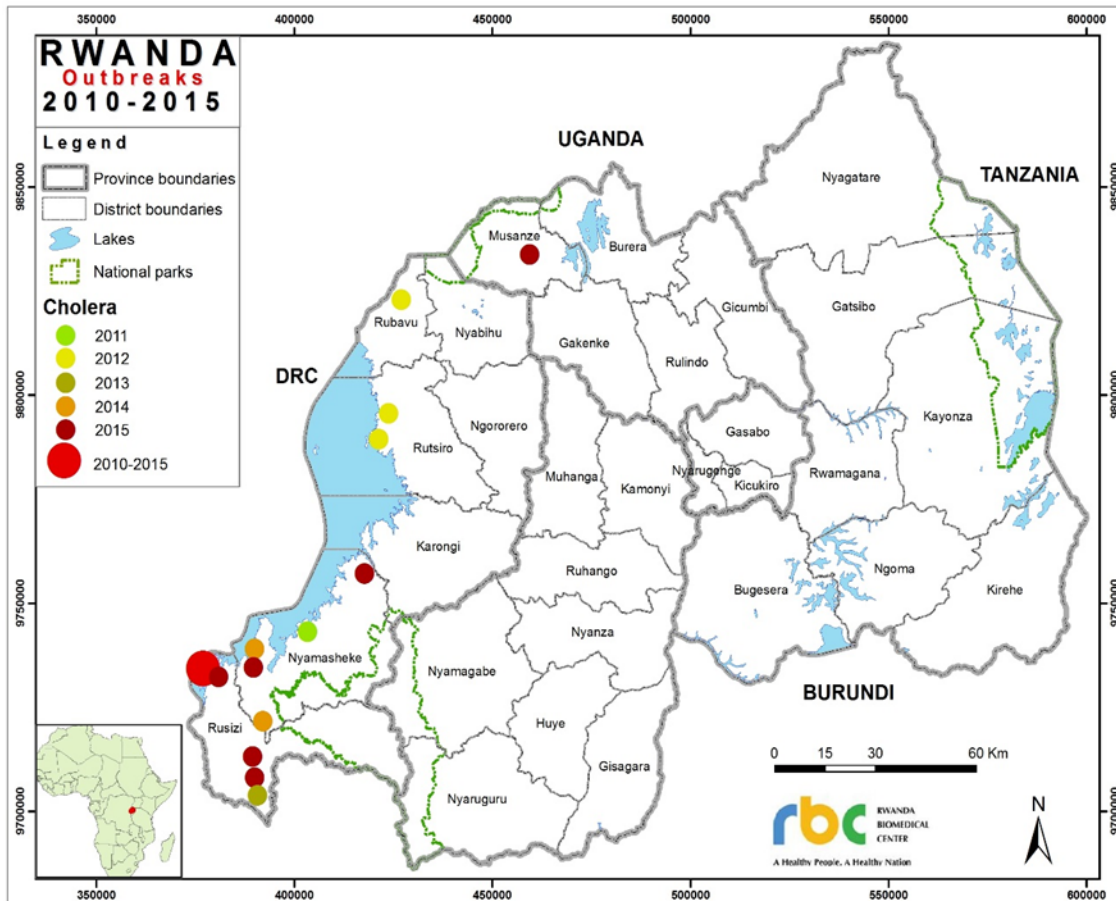


Cholera outbreak inventory, seasonality and risk factors

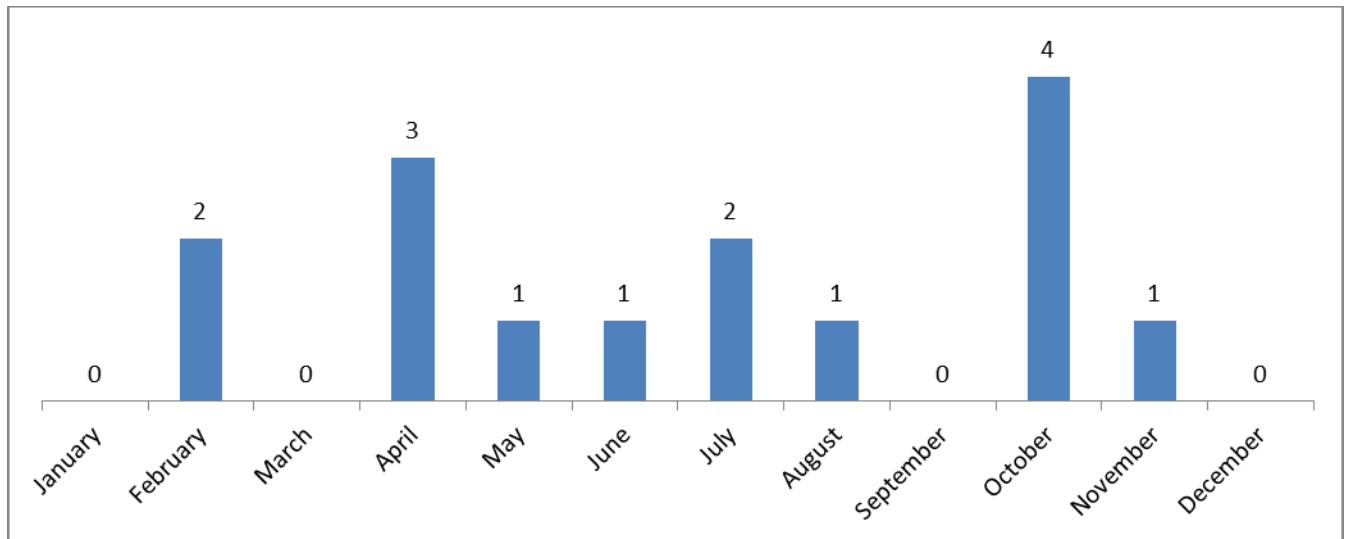
In Rwanda cholera outbreak seems to be endemic in some part of the country. Since 2010, fifteen outbreaks have been recorded with a total of 285 cases and 3 deaths recorded.

Table summarizing cholera outbreaks occurrence

Cholera outbreaks inventory from 2010 - November 2015							
No	Periode	Health center	District hospital	District	Number of Cases	Number of deaths	Etiology Identified
1	21/4/2010	Nkombo	Gihundwe	Rusizi	48	0	Not recorded
2	24/10/2011	Shyara	Kibogora	Nyamasheke	14	0	Not recorded
3	13/2/2012	Busasamana	Gisenyi	Rubavu	13	0	Vibrio cholerae Inaba
4	29/05/2012	Nkamira refugee transit center	Gisenyi	Rubavu	8	0	Vibrio cholerae Inaba
5	10/10/2012	Kinunu and Biruyi Hcs	Murunda	Rutsiro	52	0	Vibrio cholerae Inaba
6	29/11/2012	Nkombo	Gihundwe	Rusizi	11	0	Vibrio cholerae Inaba
7	16/6/2013	Nkombo	Gihundwe	Rusizi	5	0	Vibrio cholerae Inaba
8	20/8/2013	Nkombo	Gihundwe	Rusizi	39	0	Vibrio cholerae Inaba
9	4/10/2013	Bugarama Islamic	Mibilizi	Rusizi	8	0	Vibrio cholerae Inaba
10	2/2/2014	Mukoma	Bushenge	Nyamasheke	10	0	Vibrio cholerae Inaba
11	3/4/2014	Mwezi	Bushenge	Nyamasheke	12	0	Vibrio cholerae Inaba
12	4/4/2015	Ruhengeri DH	Ruhengeri	Musanze	9	1	Vibrio cholerae Ogawa
13	25/7/2015	Mashesha	Mibilizi	Rusizi	1	0	Vibrio cholerae Inaba
14	25/7/2015	Kibingo	Kibogora	Nyamasheke	34	1	Vibrio cholerae Inaba
15	23/10/2015	Gihombo, Kinanira	Kibogora	Nyamasheke	20 ongoing	1	Vibrio cholerae Inaba

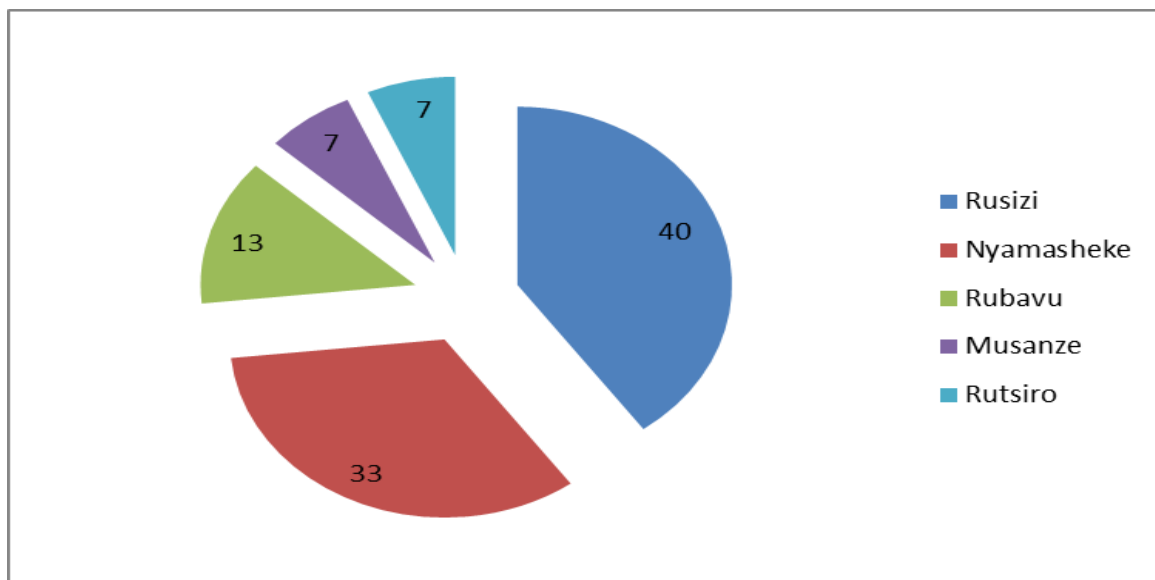


Seasonality of cholera outbreak in Rwanda from 2010 to date



Most of the outbreaks 11/15 happened during the rainy season from February to May, October and November.

Geographical repartition of cholera outbreaks (percentage) from 2010-Nov.2015



The graph shows that 73% of outbreaks are located in Rusizi and Nyamashe district respectively with 40% and 33%. This can be partially explained by three major's vulnerabilities (assumption) of the region to cholera:

1. Environmental vulnerabilities, this zone is characterized by polluted waters (wait lands, rivers and Lac Kivu)

2. Geographical vulnerabilities: cross border transmission via trades and exchanges
3. Local community hygiene habits

Summary of cholera outbreak risk factors

Location and period	Identified risk factors
Risuzi ,Nkombo, 2010	Having use Kivu Lake water as source of drinking water Having an occupation at the Kivu Lake (fisherman) Having been contact with a case of diarrheal Poor hygiene (latrine, home,...)
Nyamasheke, Kagano, Oct 2011	Drink Kivu Lake water due to the broken and damaged water taps
Rutsiro, Kinunu, Oct. 2012	living in poor hygienic conditions, Lack of clean running water(Use Kivu Lake water) Using of unboiled and untreated water. Lack of latrine (Many HH shared 1 latrines) Substandard latrine that can Kivu Lake during torrential rain.
Rusizi, Nkombo,Dec.2012	Lack of latrine Fishermen use Lake Kivu as latrine Poor hygiene habits Unfunction water taps
Rusizi, Nkomba,Dec 2012	Use of non-chlorinated water Poor hygiene around the house Inappropriate latrine
Rusizi, Nkombo, Aug 2013	Use of non-chlorinated water Poor hygiene around the house Inappropriate latrine
Rusizi, Nkombo, Sep 2013	POOR hygienic condition of communities Improper pit latrines Using untreated water from lake Kivu for drinking and washing utensils
Nyamasheke, Mwezi, March 2014	All visited households don't have standard pit latrines; Drink untreated/ non boiled water and Lack of the basic measures of hygiene including hand washing before and after using toilets
Rusizi, Gihundwe, Feb. 2014	Lack of clean water,(Absence d'eau de Rwiyekezamirimo il ya 2semaines Drink Lake Kivu water Water is expensive even when available (20RwF a jerrican)
Nyamasheke, Mwezi, April 2014	Lack of latrines Poor hygiene
Musanze, April 2015	Imported Cholera form DRC(Congolese visitors to a Rwandan family)
Nyamasheke, Gihombo, July 2015	Lack of drinking water supply (from March 2015) Lack of latrines and adequate latrines (some don't have ,others have inadequate latrines: no roof, no pit cover, none s) Use of unboiled and untrated water (Lake kivu and Gaseke river) Lack of washed hands habit Presence of human excrements around the house, pathway and in the

	lake and river. Poor socio-economic condition
Rusizi, Mibilizi, July 2015	<ul style="list-style-type: none"> • Rusizi District has 18 sectors, 3 of them have been subject of diarrhea cases in the past due to ecological and geographical parameters (wetland and Kivu lake polluted water) • There are 36 adductions of water in Rusizi including 3 for WASAC. Almost all adductions of the district are not maintained adequately which leads to frequent shortage of water in the area • There is insufficiency of clean water in the 4 sectors affected by acute watery diarrhea • Most of people are using polluted water from rivers • In the area where clean water is available, the population prefer to use river water since public tap water is no longer free of charge (WASAC recommended price is 10 RwF per 1 Jerican at a public tap water) • Some of Public tap water points of Ubudehe were closed by WASAC because of non-payment of the bill
Rusizi . Mururu, March 2015	Poor hygiene Use of unclean water
Nyamasheke, Kinanira, Nov, 2015	Lack of clean water, lake Kivu is the only source of water Total lack absence of latrine

Long term prevention measure

Cholera prevention being a multi-sectoral intervention, there is a need for a long term intervention. The reason why we conducted an “community assessment on water, sanitation and hygiene in response to cholera outbreak in Rusizi and Nyamasheke districts, Rwanda, 2015” to guide intervention decision.

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