



Joint Meeting of the Working Groups on Surveillance (Laboratory & Epidemiology)

EPIDEMIOLOGICAL SITUATION OF CHOLERA & HOTSPOTS IDENTIFICATION

Dr. Patrick Dely, MSPP

Dr. Elie Celestin, MSPP

Ministère de la Santé Publique et de la Population (MSPP), HAITI

15-17 April 2019 – Annecy, France



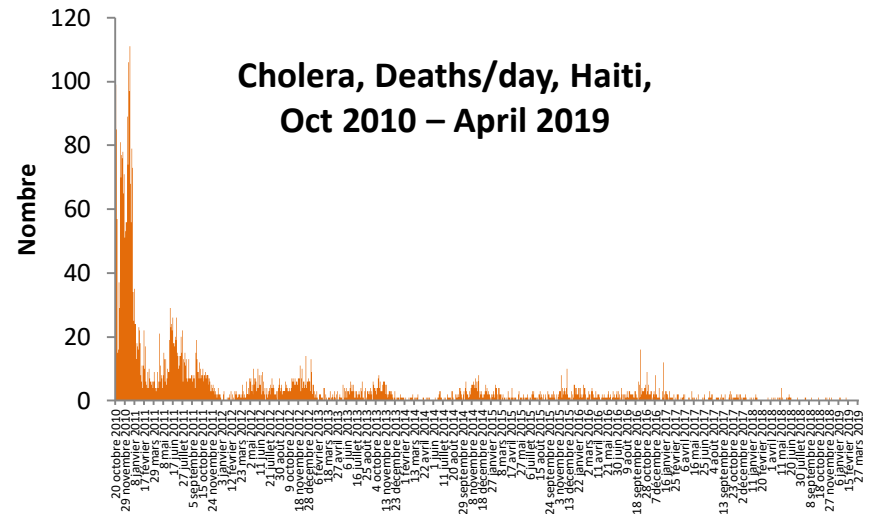
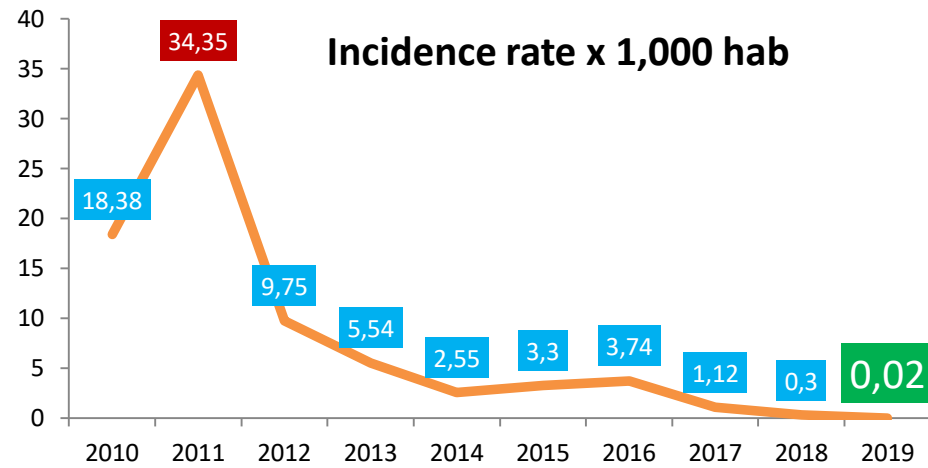
Summary of the Cholera Situation, Haiti

October 2010 to April 2019

Year	Population	Suspected cases	Deaths in healthcare settings	Community Deaths	Total Deaths	Incidence rate (x 1,000 hab)
2010	10085214	185,351	2,521	1580	4101	18.38
2011	10248306	352,033	1,950	977	2927	34.35
2012	10413211	101,503	597	311	908	9.75
2013	10579230	58,574	403	184	587	5.54
2014	10745665	27,392	209	88	297	2.55
2015	10911819	36,045	224	98	322	3.30
2016	11078033	41,421	307	140	447	3.74
2017	12201437	13,681	110	49	159	1.12
2018	12542135	3,786	20	21	41	0.30
2019	12893402	265	2	1	3	0.02

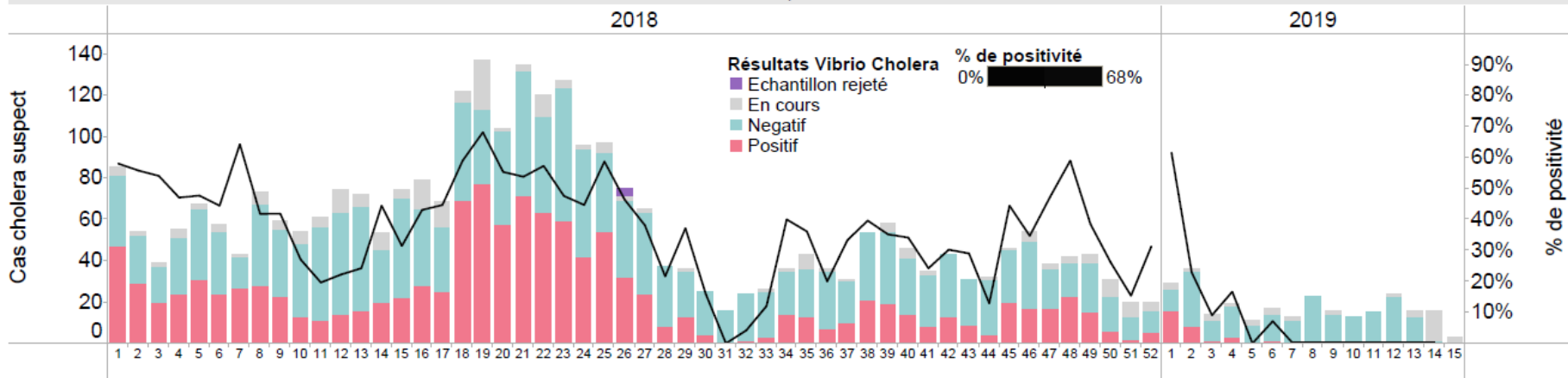
Haiti: Overview

EW 42/2010 – EW 13/2019



Cholera Laboratory Results

Resultats (n et % de positivité) des cas suspect de Cholera, dans les departements d'Ouest, d'Artibonite, du Centre, du Nord, du Nord-Est et le Nord-Ouest, 2019



Source: Labomoto

IDENTIFICATION OF CHOLERA HOTSPOTS IN HAITI

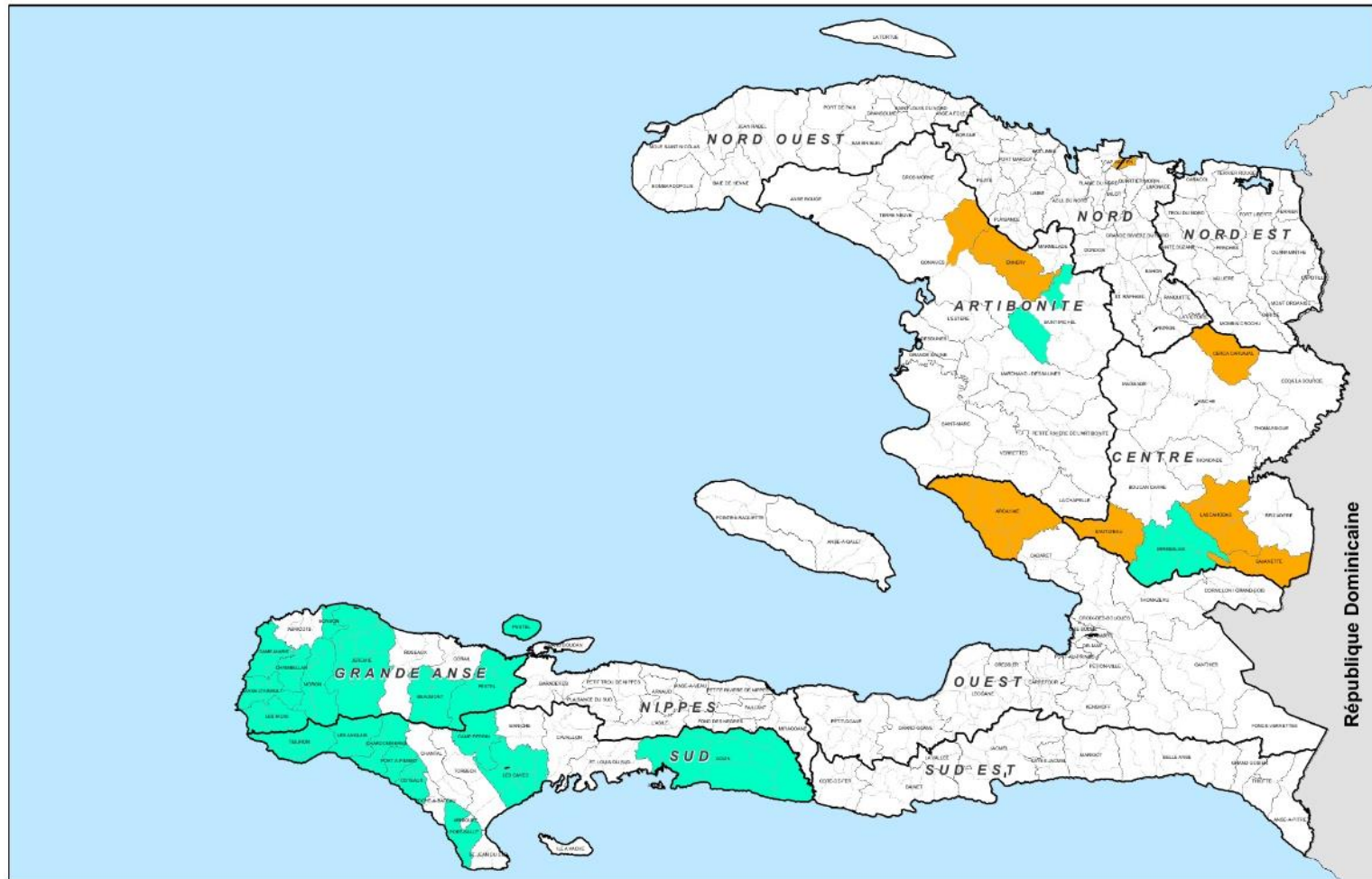
Priority Departments

Nombre de cas suspects de choléra par dépt de prise en charge, 2015-2018

Departement (group)	2015		2016		2017		2018	
	Cas suspects	Incidence dept. pour 1,000	Cas suspects	Incidence dept. pour 1,000	Cas suspects	Incidence dept. pour 1,000	Cas suspects	Incidence dept. pour 1,000
Artibonite	4,802	2.5	5,384	2.8	4,062	2.1	1,174	0.6
Centre	4,383	5.4	6,102	7.6	2,623	3.2	1,092	1.4
Grand'Anse	1,314	2.8	3,203	6.8	189	0.4	6	0.0
Nippes	434	1.4	859	2.8	253	0.8	0	0.0
Nord	4,647	4.2	5,094	4.6	852	0.8	302	0.3
Nord-Est	371	0.9	1,141	2.7	196	0.5	9	0.0
Nord-Ouest	1,963	2.4	1,665	2.0	550	0.7	328	0.4
Ouest	16,697	3.6	13,969	3.0	4,209	0.9	844	0.2
Sud	1,762	2.2	3,491	4.3	551	0.7	20	0.0
Sud-Est	1,543	1.9	842	1.0	134	0.2	14	0.0

Artibonite, Centre and Ouest have the highest and most persistent average incidence

Prior Vaccination activities in Haiti

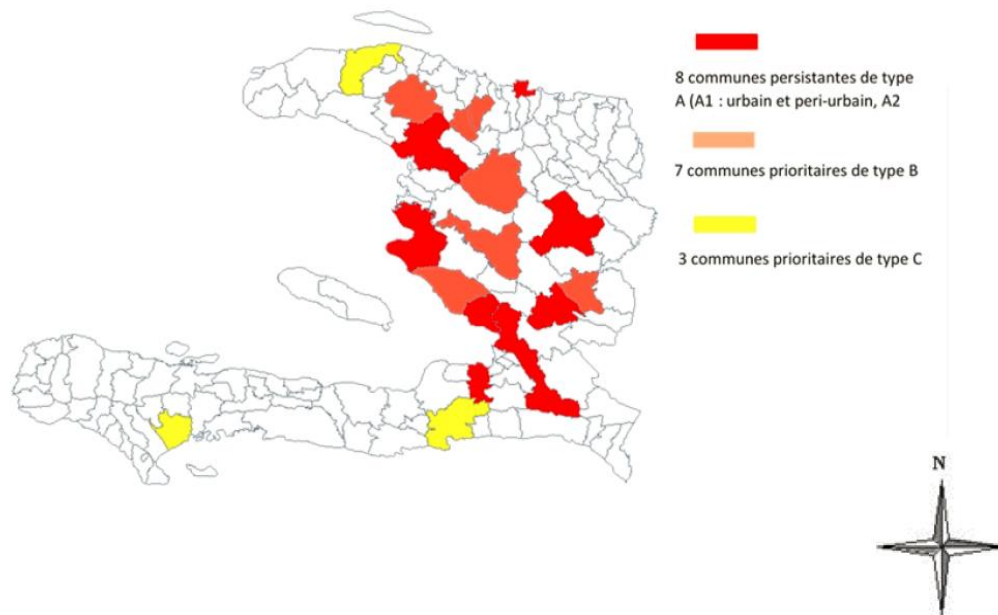


	CAMPAGNE DE VACCINATION 2012- 2018		SOURCE DE DONNEES Grid: WGS 1984 zone 18N DELR CNIGS	1:1,350,000 km 0 15 30
	CAMPAGNE DE VACCINATION ■ COURS TERME ■ MOYEN TERME	LIMITES ADMINISTRATIVES □ Limites départementales □ Limites communales □ Limites Sections communales		

Classification of communes according to the period of time in “red alert” over a period of 24 months and according to the alert criteria. 2014-2016

- 8 communes are considered as persistent and priority **type A** (source zones which at least 50% of the weeks on red alert since 2014 and disseminate the disease in common areas): Hinche, Mirebalais, Gonaïves, Saint-Marc, Le Cap, Cabaret, Croix des Bouquets, Carrefour. Areas A1 (urban and peri-urban) and A2 (rural) will be differentiated.
- 7 persistent communes of second priority **type B** (communes in red alert of 25 to 50%, considered as relays that can play an amplifier role): Saint-Michel de l'Attalaye, Petite Rivière de l'Artibonite, Gros Morne, Limbe, Plaisance, Lascahobas, Arcahaie
- 3 recurring communes of third priority of **type C** (commune in red alert from 25 to 50% but playing a smaller role because of their geographical position "at the end of the line"): Jacmel, Les Cayes, Port de Paix.

Communes prioritaires en Haiti – Persistances d’avril 2014 à mars 2016



Choice Criteria: **Cholera Hotspots**

Identification of cholera Hotspots

Limited geographical area (eg city, municipalities, communal section):

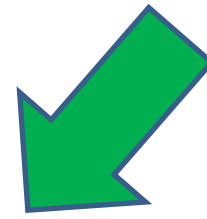
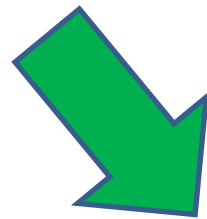
- where **environmental, cultural and / or socio-economic conditions facilitate the transmission of the disease** and
- where **cholera persists or reappears** regularly.

Hotspots play a central role in spreading the disease to other areas.

Methodology

Qualitative
Analysis

Quantitative
analysis



Identification of the
communes to target
(WASH, OCV,
surveillance...)

1- Qualitative Analysis

- Water and sanitation access
- Population and migration
- Difficulty of access
- Border area Yes/No
- Others

2- Quantitative analysis

Incidence versus Coefficient de variation (Variance)

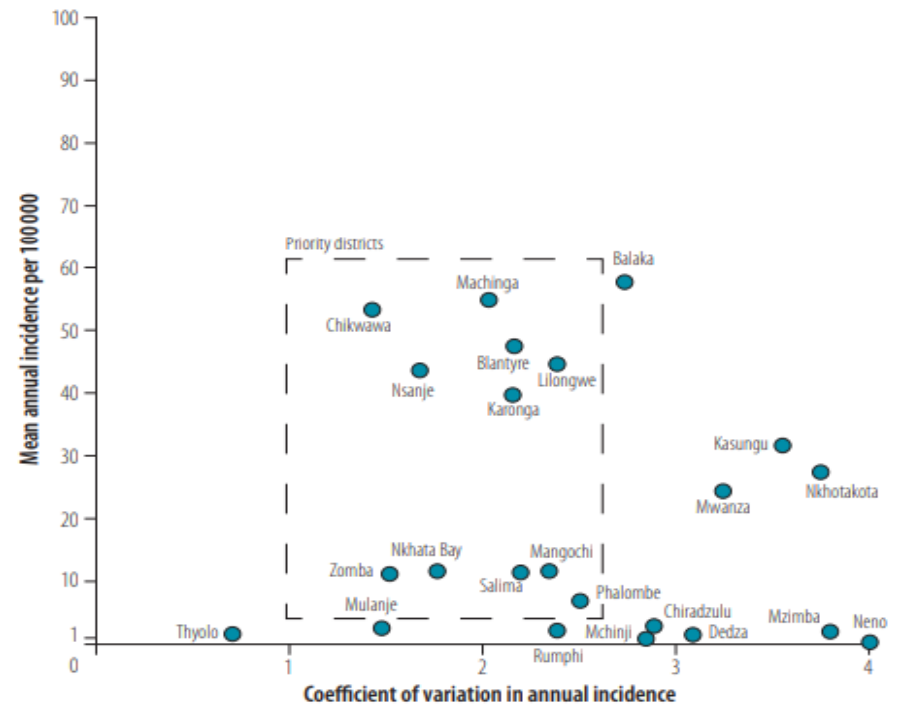
Data sources:

- DELR Cholera Surveillance Database (2013-2018)
- Labo-Moto Database (2018)
Commune of origin Laboratory results

Oral cholera vaccine in cholera prevention and control, Malawi

Maurice M'bangombe,^a Lorenzo Pezzoli,^b Bruce Reeder,^c Storn Kabuluzi,^a Kelias Msyamboza,^e Humphreys Masuku,^e Bagrey Ngwira,^f Philippe Cavailler,^d Francesco Grandesso,^g Adriana Palomares,^h Namseon Beck,ⁱ Allison Shaffer,^j Emily MacDonald,^k Mesfin Senbete,^l Justin Lessler,^m Sean M Mooreⁿ & Andrew S Azman^m

Fig. 3. District-level annual incidence of suspected cholera versus coefficient of variation in annual incidence in Malawi, 2001–2016



Example

Example: variance vs incidence

	Annual Incidence by 10,000 hab						Mean of annual incidence by 10,000 hab (2013-2018)	Variance
	2013	2014	2015	2016	2017	2018		
L'Estere	41.1	20.9	15.6	37.3	17.8	20.7	25.6	0.4
Cerca Carvajal	112.8	40.9	9.1	0.4	0.4		32.7	1.5



Incidence stable

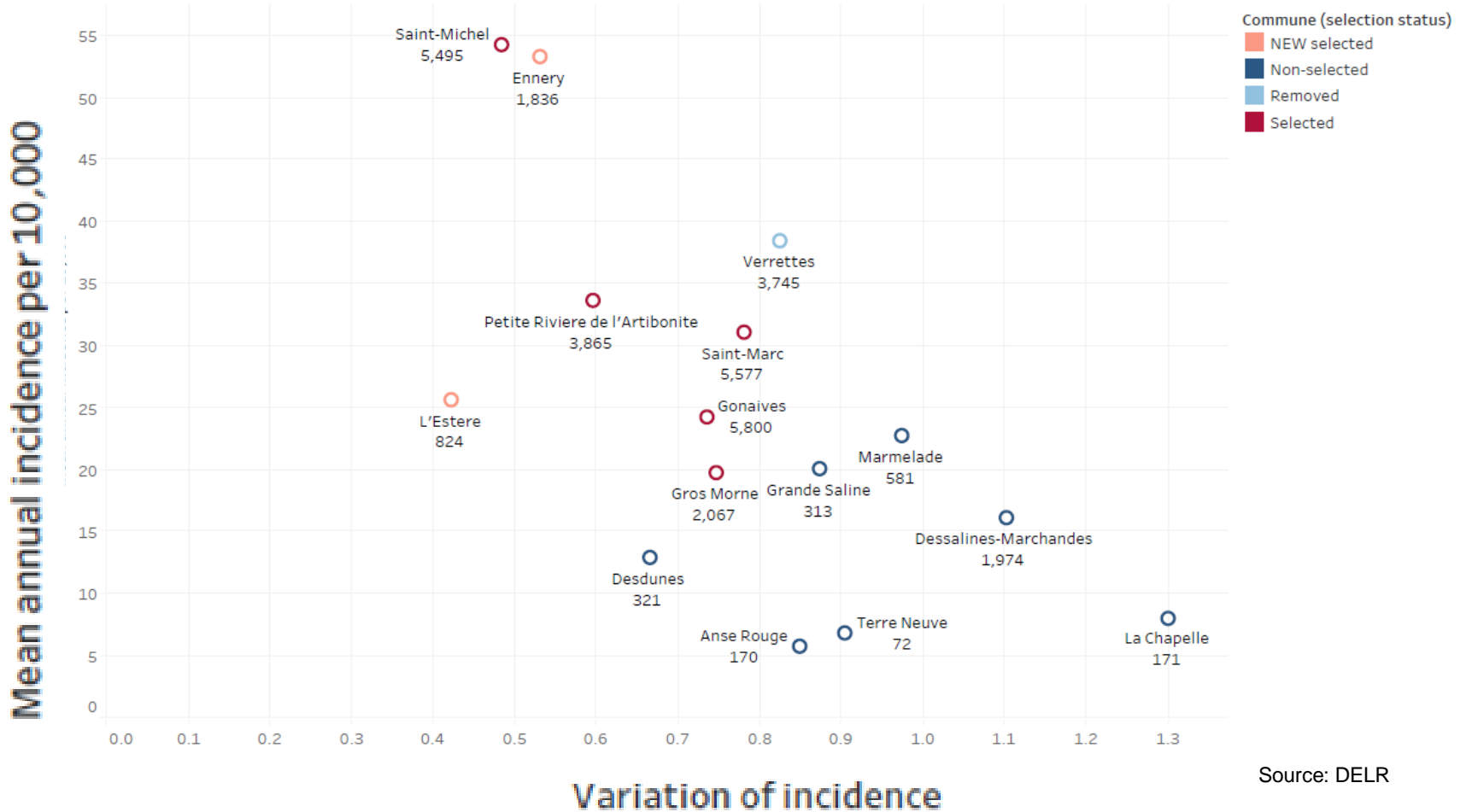


Incidence instable

Quantitative analysis

Artibonite

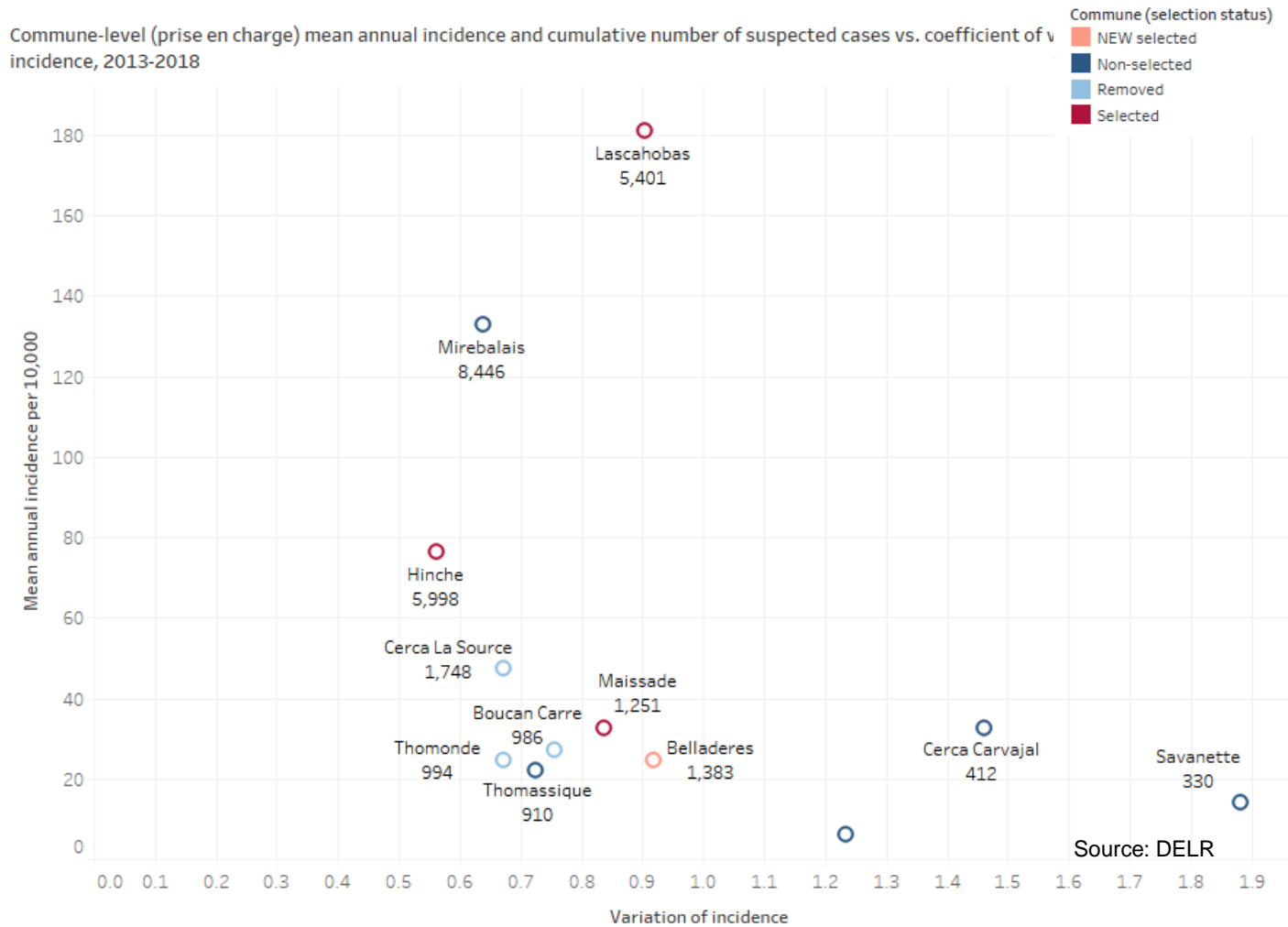
Commune-level (prise en charge) mean annual incidence and cumulative number of suspected cases vs. coefficient of variation in mean annual incidence, 2013-2018



Source: DELR

Quantitative analysis

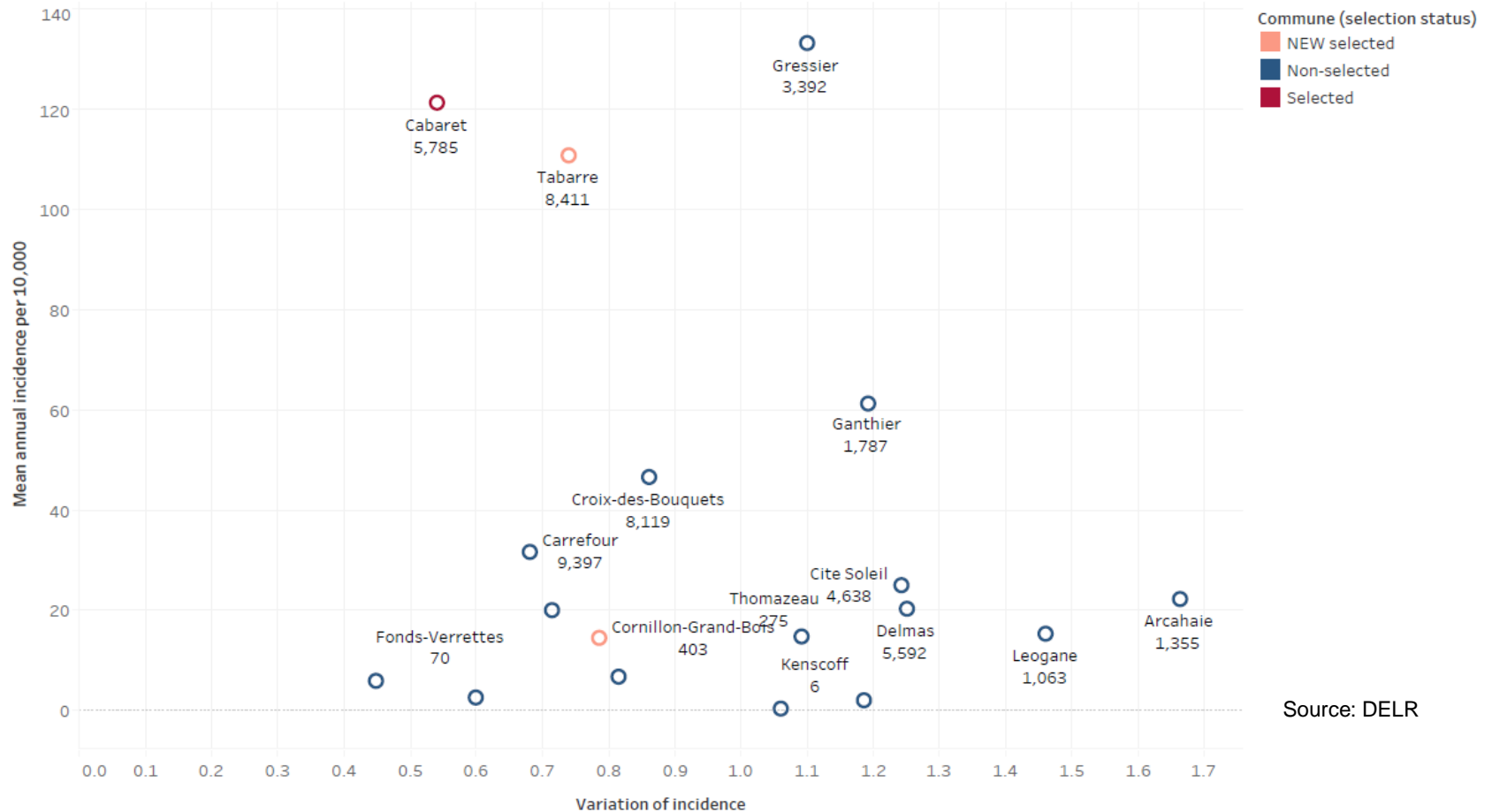
Centre



Quantitative analysis

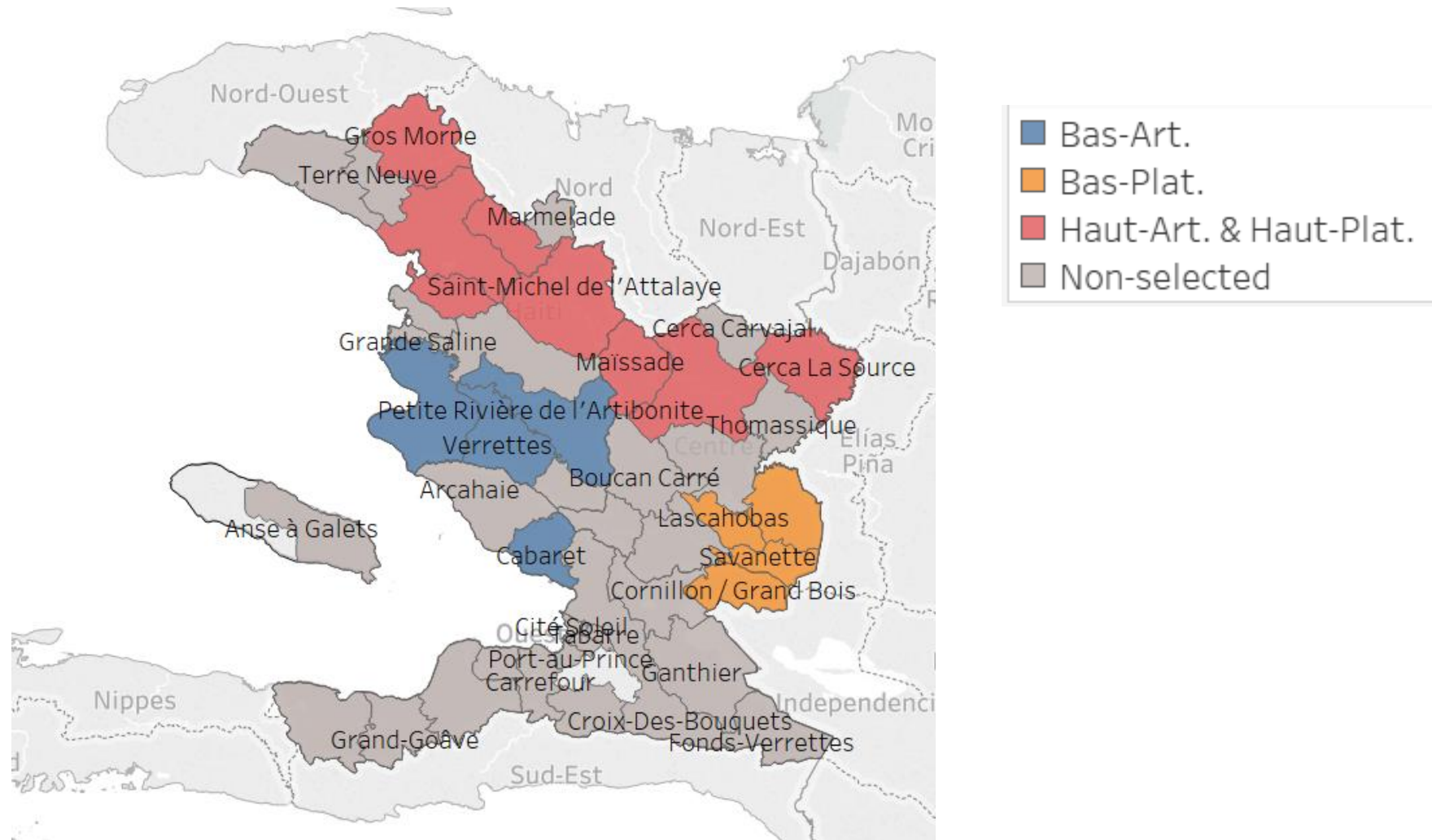
Ouest

Commune-level (prise en charge) mean annual incidence and cumulative number of suspected cases vs. coefficient of variation in mean annual incidence, 2013-2018



Source: DELR

Hotspots/Hot zones: Communes proposed to be targeted



According to a qualitative analysis, three geographical areas were identified as **persistent areas of cholera.**

1. Haut Artibonite - Haut plateau.
2. Bas plateau + Cornillon
3. Bas Artibonite + Cabaret

Targeted Population

Commune	Population (2019)	< 1 year (2.6%)	Targeted population
Bas-Art.	603,157	15,682	587,475
Bas-Plat.	265,321	6,898	258,423
Haut-Art. & Haut-Plat.	1,103,066	28,680	1,074,386

Total targeted population

1,920,284

Summary

- In 2019, lowest incidence level. Low mortality.
- No positive cases
- Hotspots have been identified, using surveillance data from 2013-2018

Cholera Elimination is possible only if:

- *Reinforcement of the alert and response system*
- *Strengthening laboratory surveillance: testing cases of diarrhea beyond suspicion*
- *WASH capacity building (water +++)*
- *Adequate vaccination strategy: hotspots*
- *Accentuation of research*

Thank you for your attention!

For more information, please visit

<http://mspp.gouv.ht/newsite/documentation.php>