



UPDATE: 23 October, 2010

Saint-Marc Cholera Outbreak

**Analyses of ongoing population movements
from the Saint-Marc area, Haiti**

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Acknowledgement

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Ongoing population movements out of the Saint-Marc area

- **Most of the country has received a small number of travelers from the area during the last week**
- **A few areas: Gonaive, the areas south of Saint-Marc, Ile de la Gonave and Port-au-Prince, have received the vast majority of travelers from the affected area.**
- **There is no evidence that more people than usual leave the affected area**

Aim and definitions

In this updated report we have sought to assess:

- i) New areas that potentially could be at increased risk for cholera outbreaks or where isolated cholera cases could seek care,
- ii) Whether people in the cholera outbreak area are moving out from the area

We have analyzed daily average movements of Digicel mobile phones from the areas surrounding Saint Marc during the period 15 October to 9 am 23 October (Haitian time). We have also compared these movements with the average movements between 1 March to 18 June.

We have defined the cholera outbreak area as communal sections surrounding the sections with known cases around Saint Marc. This area is delineated in figure 1 (black) and the name of the communal sections in this area are listed in the appendix.

For each communal section in Haiti we have determined the daily average number of people arriving into that communal section from the affected areas surrounding Saint-Marc.

Results

The average daily movements out of the affected area are shown in figures 1 (a) to (d). Four periods are shown: 1 March to 18 June, 15 October to 21 October, 21 to 22 October and 22 October to 9:00 am 23 October.

Each communal section that has received at least one person with a Digicel mobile phone from the affected area during the period has a column placed within its borders. The blue

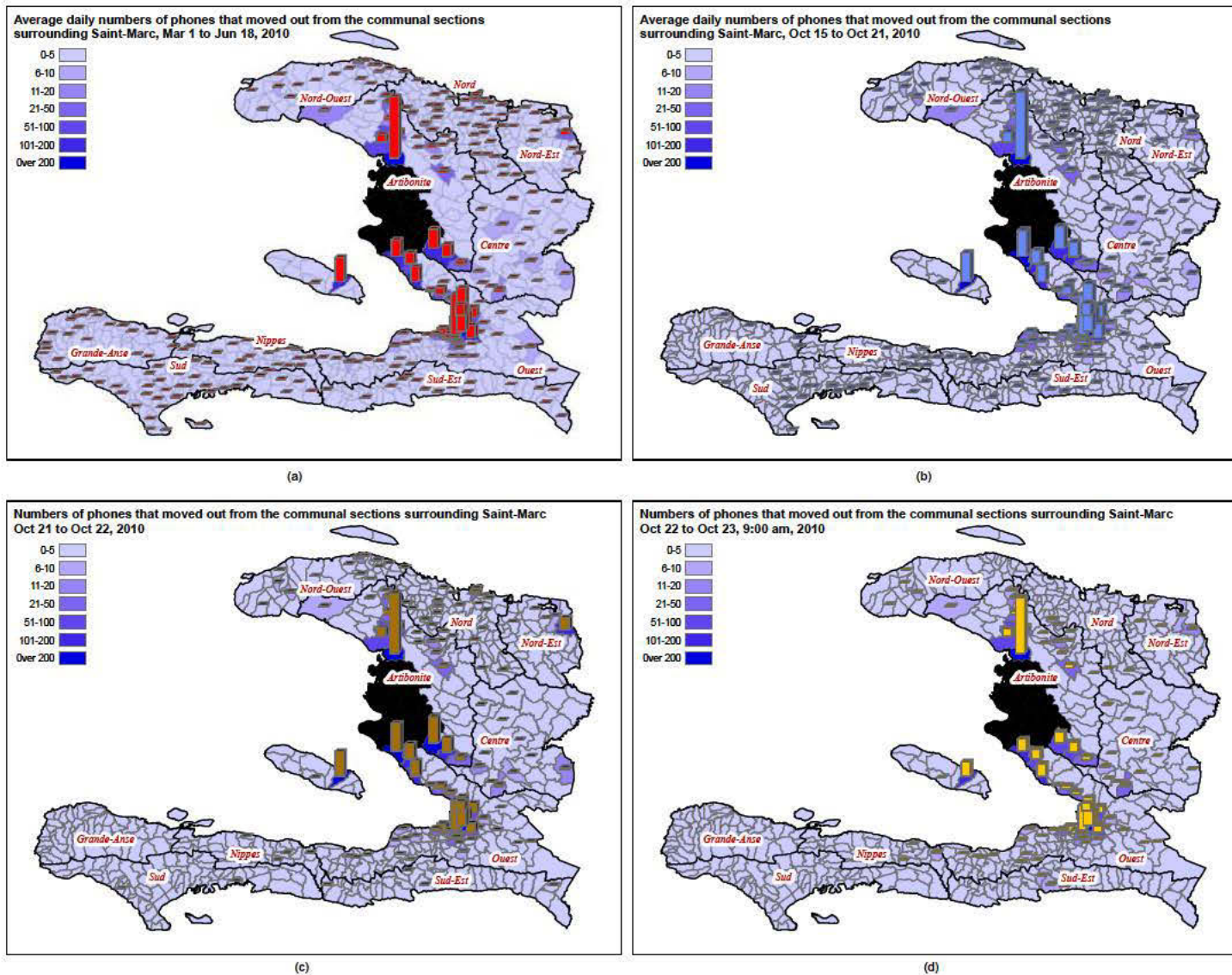


Figure 1 (a) to (d): The blue shading of the sections indicated the average daily number of Digicel mobile phones coming from the communal sections surrounding Saint Marc (black) and moving into the section. The height of the column represents the same data but shows more clearly the relative differences between the areas.

shading represents the daily average number of Digicel mobile phone using travelers arriving from the area surrounding Saint Marc. The height of the column represents the same data but shows more clearly the relative differences between the areas. An area without a column within its border is generally a low population density area with no mobile phone towers or an area that has not received any person from the area surrounding Saint Marc.

The results show that the traveling patterns out of Saint Marc during the last 7 days mimics closely the movement patterns of the spring that we described in our first report. The destinations of people moving out of the area have remained the same also at the end of the week, Thursday to Saturday (although only data until 9 am Saturday was available at the time of this report).

A few areas, Gonaive, the areas south of Saint-Marc, Ile de la Gonave and Port-au-Prince, have received the vast amount of travelers from the affected area. On Friday there was a slightly higher inflow than before also to Cap Haitien (Nord) and Quanamithe (Nord-Est).

A small number of people from the affected area travel widely throughout the country. Few people have however traveled to Nippes, Grand-Anse and Sud during the last week.

Figure 2 show the daily movement out of the affected area during 15 October to 23 October. There is no evidence of increasing population outflows towards the end of the week. A larger outflow can be seen on Monday. This is consistent with normal weekly changes and is likely due to weekly commuting to urban centers.

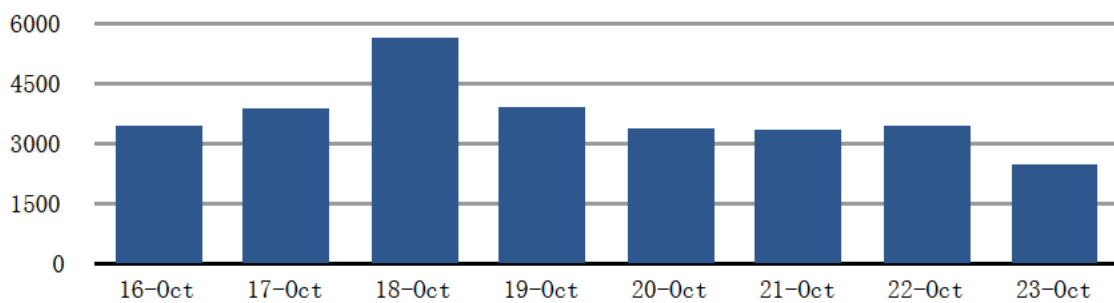


Figure 2: Daily number of Digicel mobile phones leaving the affected area.



Discussion and interpretation

This study has captured traveling patterns for all people with Digicel Sim cards during the last week. The destinations of travelers remain very similar to what we have reported before. There is no evidence of large population outflows from the affected area.

The mobile phone users that travelled out of the affected area during the last week are concentrated to a few places. These places could face higher risks of outbreaks or could have a higher risk of seeing isolated cases that have traveled from the affected area. It is important to remember that the risk of cholera epidemics involve a number of other factors beside human movements, such as contaminated water and bad sanitation.

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G. Additional acknowledgements

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Appendix

Definition of the “affected area”

The following communal sections are included in the “affected area” (black in fig. 1):

2ème Bas Coursin	5ème Bocozelle
2ème Fossé Naboth	1ère Bas Coursin
6ème Terre Natte	4ème Lalouère
3ème Goyavier	3ème Labady
6ème Charrette	2ème Bélanger
1ère Liancourt	2ème Bois Neuf
1ère Villars	5ème Bastien
2ème Desdunes	1ère Délugé
3ème Ogé	2ème Petites Desdunes
1ère Poteneau	1ère Lacroix Perisse