

## Displaced subscribers from violence-affected neighbourhoods, Carrefour-Feuilles and Savanes Pistache: Situation as of 19 August 2023

### Executive summary

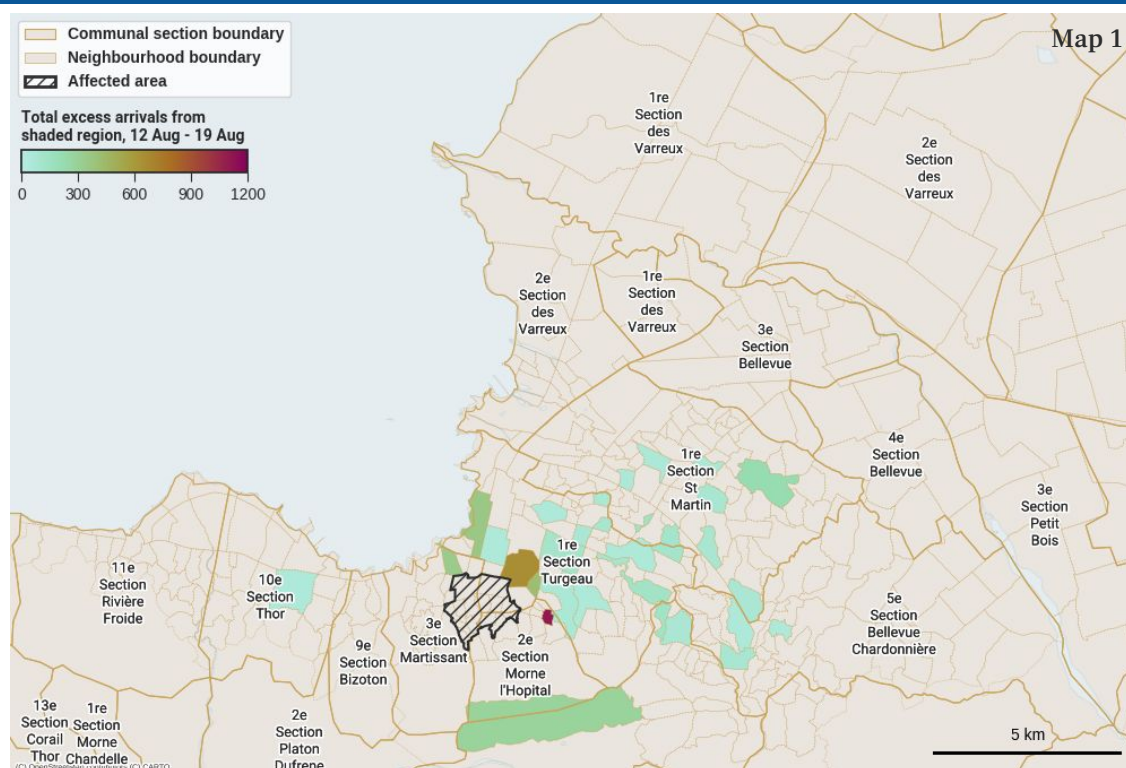
Heightened gang violence since 12 August 2023 in the neighbourhoods of Carrefour-Feuilles and Savanes Pistache in Port-au-Prince triggered significant relocations of subscriber residents from these zones and neighbouring areas. Estimates derived from Digicel Call Detail Records (CDR) data suggest that at least 5,366 Digicel subscribers may have left the affected area between 12 August 2023 and 19 August 2023 (or about 23.7% of the subscribers residing in the affected area). Most of these subscribers have sought refuge in nearby neighbourhoods within the Port-au-Prince commune. Smaller proportions have relocated to the communes of Delmas and Petion-Ville, with a minimal number shifting to Carrefour. Notably, 32 neighbourhoods experienced more than 50 displaced subscribers. Rankings are detailed in Table 1 on Page 2 of the report, showcasing the areas most impacted by this subscriber residents shift.

### Where have residents of the affected area been displaced to around Haiti?

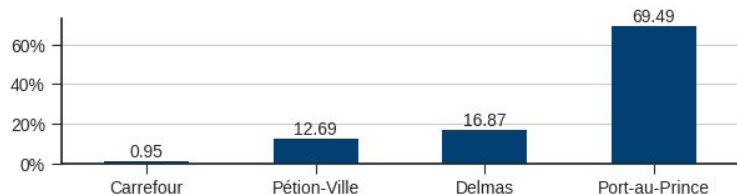
#### Displaced subscribers

The coloured regions in Map 1 (right) correspond to the **number of displaced Digicel subscribers** from the shaded area affected by violence (calculated as excess arrivals from the area affected by violence, see page 3). Estimated displacements are assumed to be mostly related to the violence but could also include subscribers not affected.

We see from Graph 1 (below) that the **majority of people relocated from the affected area to a neighbourhood within the commune of Port-au-Prince (69.5%)**. The remaining relocations were split between the communes of **Delmas (16.9%)**, and **Pétion-Ville (12.7%)**, with a small number of relocations to **Carrefour (1%)**. (for a list of the most affected neighbourhoods, see the table on page 2)



Graph 1: Percentage of relocations from affected area (per commune)



Total displacements from affected area: <b>5,366 subscribers</b>	Percentage change of residents within affected area: <b>-23.7%</b>	Neighbourhoods with > 50 excess arrivals from affected area: <b>32</b>
---	---	---

**Table 1:** Ranking of neighbourhoods by displaced subscribers (number of arrivals above expected) from the affected area.

Rank	Commune	Communal Section	Neighbourhood	Displaced subscribers	Rank	Commune	Communal Section	Neighbourhood	Displaced subscribers
1	Port-au-Prince	2ème Morne l'Hopital	Tapis Rouge	1,110	17	Delmas	1ère Saint martin	Rousseau - Dupre - Village ULDECA	80
2	Port-au-Prince	1re Section Turgeau	Bas Peu de Chose	654	18	Delmas	1ère Saint martin	Jacquet Tybulle	79
3	Port-au-Prince	1re Section Turgeau	Avenue Christophe	419	19	Petion-Ville	3ème Etang du Jong	Juvenat	79
4	Port-au-Prince	1re Section Turgeau	Bicentenaire (Bord de Mer)	359	20	Port-au-Prince	1re Section Turgeau	Revine Pintade	78
5	Port-au-Prince	3ème Section Martissant	Cite de l'Eternel	335	21	Port-au-Prince	1re Section Turgeau	Pacot	72
6	Petion-Ville	3ème Etang du Jong	Desire - Boutilier	286	22	Delmas	1ère Saint martin	Peligre - Charbonnière	71
7	Delmas	1ère Saint martin	Siloe	222	23	Port-au-Prince	1re Section Turgeau	Haut Nazon	69
8	Delmas	1ère Saint martin	Delmas 32 - Lakou New York - REMY	143	24	Delmas	1ère Saint martin	Delmas 17	60
9	Petion-Ville	3ème Etang du Jong	Bremond	132	25	Delmas	1ère Saint martin	Valme	57
10	Port-au-Prince	1re Section Turgeau	Haut Canape-Vert - St-Hilaire	131	26	Port-au-Prince	1re Section Turgeau	Morne-à-Tuf	55
11	Port-au-Prince	1re Section Turgeau	Bois Verna	108	27	Port-au-Prince	1re Section Turgeau	Babiote - Debussy - Haut Turgeau	53
12	Delmas	1ère Saint martin	Delmas 40b	106	28	Port-au-Prince	1re Section Turgeau	Bourdon	52
13	Port-au-Prince	1re Section Turgeau	Canape-Vert (Lalue)	92	29	Port-au-Prince	1re Section Turgeau	Fort National	52
14	Port-au-Prince	1re Section Turgeau	Christ-Roi - Nan Moise	90	30	Petion-Ville	5ème Bellevue Chardonnière	Bobin	52
15	Delmas	1ère Saint martin	Delmas 75	87	31	Carrefour	10ème Thor	Haut Thor	51
16	Petion-Ville	5ème Bellevue Chardonnière	Centre Ville (Ouest)	81	32	Petion-Ville	5ème Bellevue Chardonnière	Morne-Hercule	51

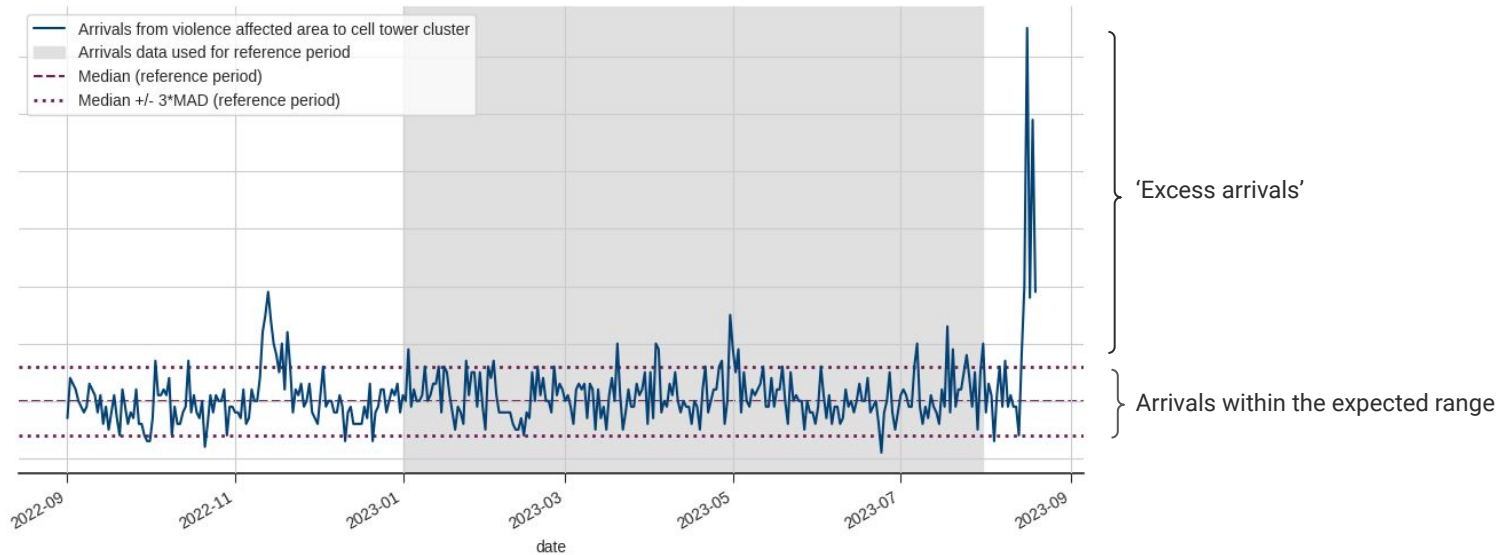
*This report and its contents may only be shared with attribution to the Flowminder Foundation and Digicel Haiti. Adaptation is permitted as long as the changes are indicated and the Flowminder Foundation and Digicel Haiti are cited. Use of the report and its contents is limited to humanitarian and development purposes.*

**Disclaimer of Warranties and Limitation of Liability:** *To the extent possible, Flowminder and Digicel offer this report and its contents as-is and as-available, and make no representations or warranties of any kind concerning this report and its contents, whether express, implied, statutory, or other. This includes, without limitation, warranties of title, merchantability, fitness for a particular purpose, non-infringement, absence of latent or other defects, accuracy, or the presence or absence of errors, whether or not known or discoverable.*

*To the extent possible, in no event will Flowminder or Digicel be liable on any legal theory (including, without limitation, negligence) or otherwise for any direct, special, indirect, incidental, consequential, punitive, exemplary, or other losses, costs, expenses, or damages arising out of the use of the report or its contents, even if Flowminder or Digicel have been advised of the possibility of such losses, costs, expenses, or damages. The disclaimer of warranties and limitation of liability provided above shall be interpreted in a manner that, to the extent possible, most closely approximates an absolute disclaimer and waiver of all liability.*

# Methodology: Excess Arrivals

**Graph 2:** Computation of excess arrivals. Dotted lines show the 'normal range' of arrivals, anything outside this range is considered as 'above normal'.



- 1) We first **sum relocations from the affected area** to locations across Haiti, inferred from changes in the most frequent call location over the last seven days, to **Digicel cell tower clusters** across Haiti.
- 2) We compute excess arrivals **by comparing the number of relocations from the 12th of August 2023 onwards** from the affected area, to **relocations from the affected area during a reference period** (1 January 2023 to 31st July 2023):
  - a) We compute the range [**median(reference period) - 3 \* MAD(reference period), median(reference period) + 3 \* MAD(reference period)**], where **MAD(reference period)** is the **median absolute deviation of the reference period**. This defines the **normal range of arrivals that we expect to see from the affected area to a given location**.
  - b) **'Excess arrivals'** are the **total number of arrivals above this range** (i.e. **arrivals - median(reference period) + 3 \* MAD(reference period)**).

An example is shown in **Graph 2** above. The **excess arrivals** are the arrivals that are **above the top dotted line**. **'Normal behaviour'** is defined as the arrivals **between the top and bottom dotted line**.

## About this report

### Data

The analyses in this report use Call Detail Records (CDRs) provided by Digicel Haiti.

### Data considerations

The estimates shown are our best current assessment of movements. However, there are a number of uncertainties. The information should be interpreted together with other available evidence.

## We welcome feedback to help us improve future reports and requests for specific types of analysis

Please email [info@flowminder.org](mailto:info@flowminder.org) with any feedback and suggestions, or if you have any specific analytical requirements we can support.

**Acknowledgements:** This study was made possible thanks to the anonymised (aggregated) Call Detail Records provided by Digicel Haiti.

This work has also been possible thanks to funding by the Agence Française de Développement, the William and Flora Hewlett Foundation and the Swiss Federal Department of Foreign Affairs (FDFA) that support current Flowminder's activities in Haiti, where Flowminder focuses on enabling the increased access to and use of mobile operator data in ways that are ethically sound, financially viable, and sustainable