CDC Health Information Innovation Consortium February Forum

Brian Lee, MPH

Chief Public Health Informatics Officer

Office of Public Health Scientific Services

Tuesday, February 14, 2017

2:00-3:00pm ET

Chamblee 106, Room 1B + Adobe Connect

February Presenter

Nishant is the data manager for Malaria Zero and is based in the DPDM. He is charge of the data collection, storage and pipelining coordinated between all members of the project and builds tools ranging from mHealth implementations to client-facing analytic dashboards. He holds a MPH from Emory University and is fascinated with the intersection of Public Health and Technology. Nishant began his foray into this field while implementing an SMS sexual and reproductive health education system as a Peace Corps Volunteer in Nicaragua. He is specifically interested in automated surveillance, outbreak detection using big and high-throughput data, and making technology more accessible for public health projects.

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THE ALLIANCE FOR A MALARIA-FREE HAITI

Prioritizing Pipelines in Data Management

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Tulane University
School of Public Health and Tropical Medicine

Introduction

Title: Data Manager

Responsibilities: Building data collection, analysis and visualization systems

Experience:

- 5 years designing and building mHealth systems in the US and Latin America
- ODK, CommCareHQ, Magpi, Formhub, Ona, R, Python, Django

Outline

I. Data flow in many studies
II. Pipelines: Horizontal integration of data
III. Example with census implementation
IV. Examples in active and reactive case detection
V. Plans with household survey implementation

Data Flow

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Generalized Data Flow in a Study

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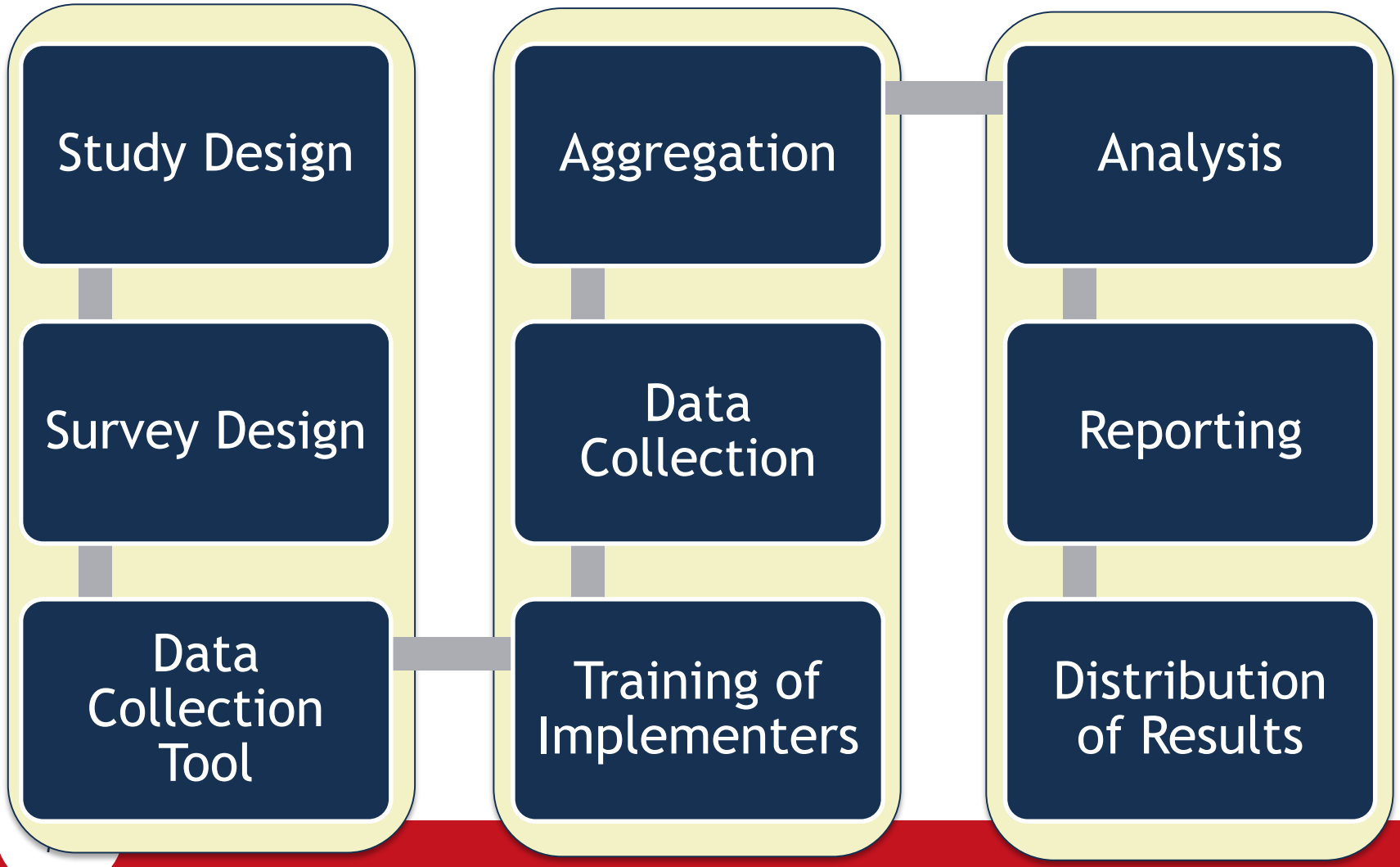

Pipelines

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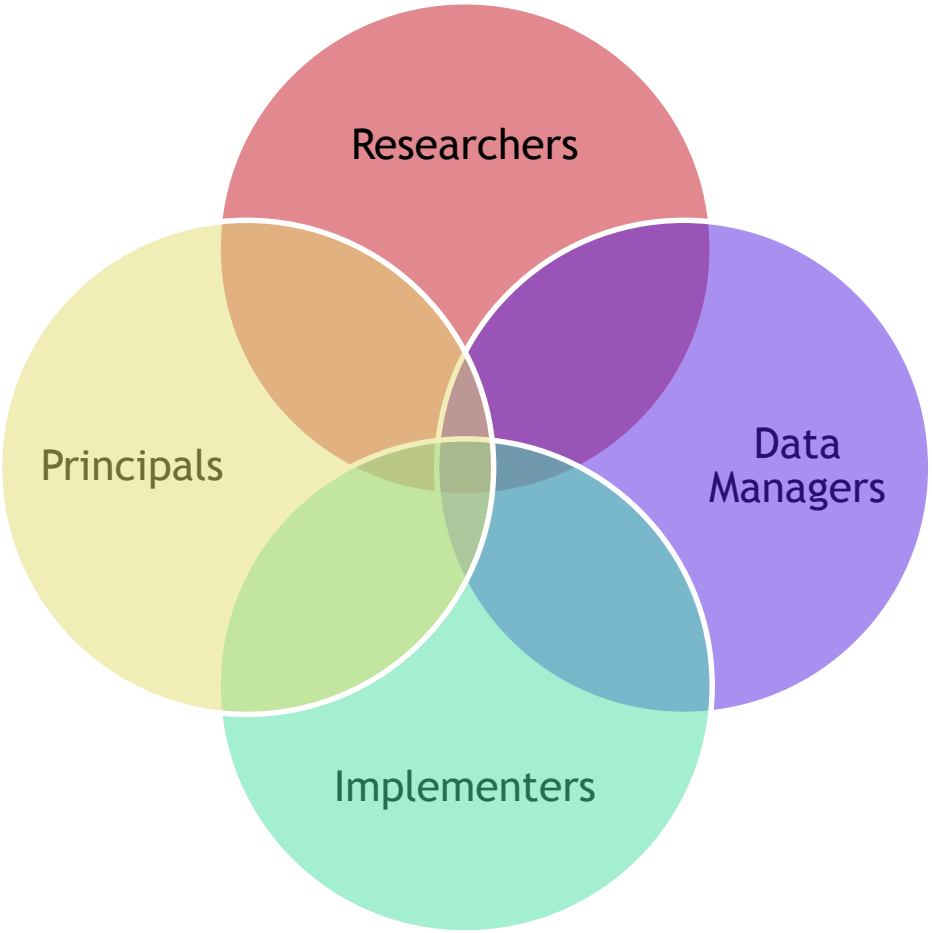
Pipelines 1



Pipelines 2

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Survey Design

- The database is created along with the survey and optimized for implementation, analysis and reporting

Implementation

- Worker reports and quality metrics ensure equity of labor and validity of data

Analysis

- Tight feedback loops provide information in NRT to implementers for data QA and researchers for validation of tool

Reporting

- Generated in NRT to provide mission critical metrics to principles to help in allocation of resources as needed

Pipelines 3

- All staff play key roles during the lifetime of the project
- The data structure build during the design phase has to be resilient enough to meet needs for all further stages. It should be built to:
  - Maintain a complex relational database on the backend
  - Be flexible enough to automate structured exports for smaller data groups used for feedback and quality assurance
  - Export in the simplest dataset possible to answer primary study questions
- While the graphic is linear and directional, it is better to think of it as a single process which permeates all the regular silos of project development

Example: Census

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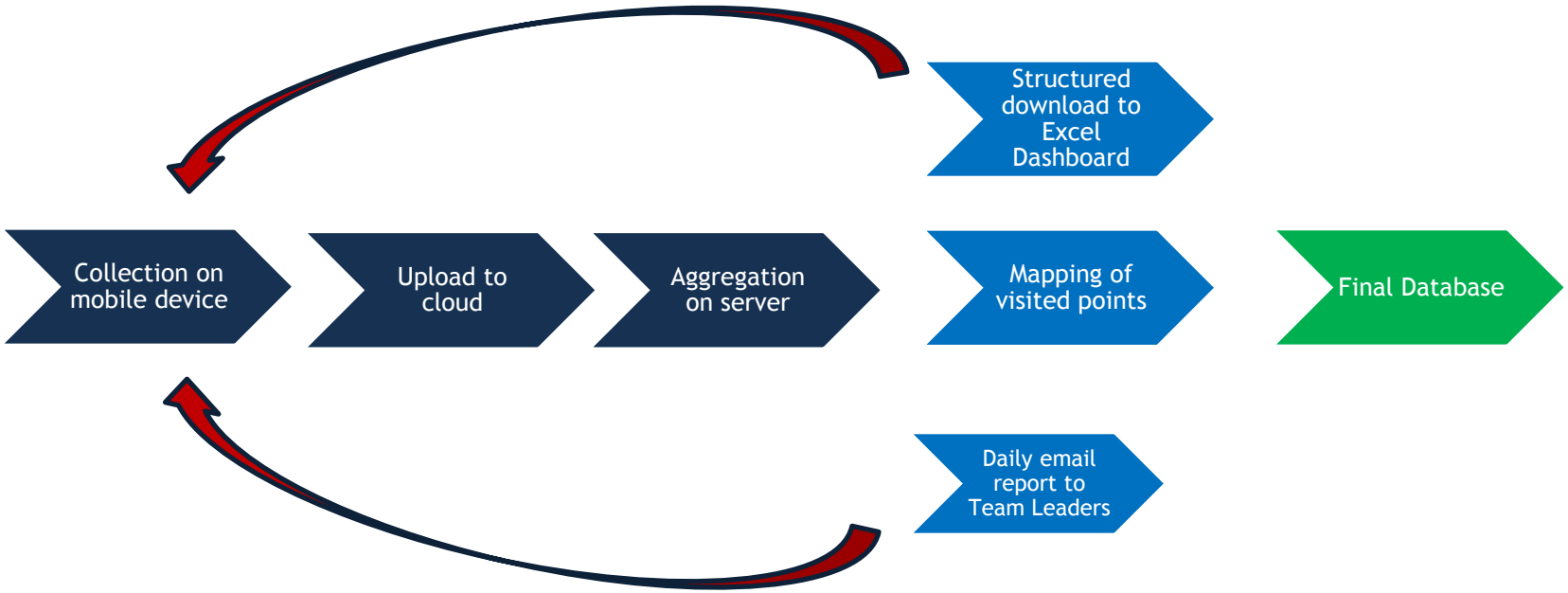
Census Data Flow



Excel Dashboard

- Initially a complex selection dashboard with a variety of inputs.
- Changed over time to be a form with a row for all units for easier comparison across teams and individuals.

Primary Dashboard

ZEWO MALARYA

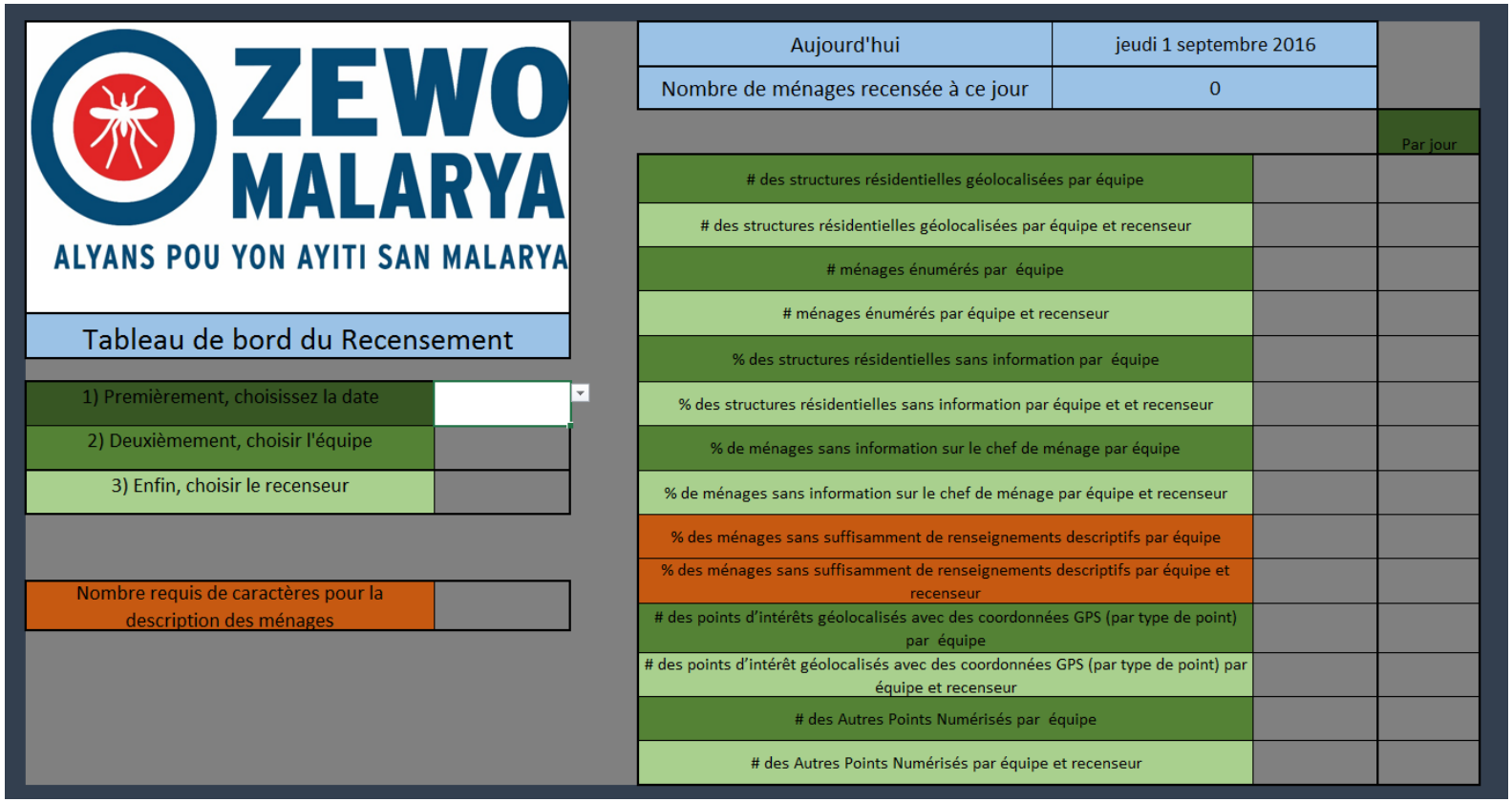
ALYANS POU YON AYITI SAN MALARYA

Résumé de recensement

Commune	Progrès	M	PdI	PN
Anse D'Hainault	0/53 - 0%	0	0	0
Chambellan	0/50 - 0%	0	0	0
Dame Marie	0/57 - 0%	0	0	0
Moron	0/46 - 0%	0	0	0

Début du recensement	vendredi 2 septembre 2016
Aujourd'hui	jeudi 1 septembre 2016
% des zones de dénombrement recensée	0.00%
Nombre de ménages recensée à ce jour	0
Nombre de points d'intérêt recensée à ce jour	0
Nombre de points numérisés recensée à ce jour	0
Estimation du nombre de personnes recensée à ce jour	0
# moyen de personnes par ménage	0

Initial Dashboard



ZEWO MALARYA

ALYANS POU YON AYITI SAN MALARYA

Tableau de bord du Recensement

1) Premièrement, choisissez la date	
2) Deuxièmement, choisir l'équipe	
3) Enfin, choisir le recenseur	
Nombre requis de caractères pour la description des ménages	

Aujourd'hui	jeudi 1 septembre 2016	
Nombre de ménages recensée à ce jour	0	

		Par jour
# des structures résidentielles géolocalisées par équipe		
# des structures résidentielles géolocalisées par équipe et recenseur		
# ménages énumérés par équipe		
# ménages énumérés par équipe et recenseur		
% des structures résidentielles sans information par équipe		
% des structures résidentielles sans information par équipe et et recenseur		
% de ménages sans information sur le chef de ménage par équipe		
% de ménages sans information sur le chef de ménage par équipe et recenseur		
% des ménages sans suffisamment de renseignements descriptifs par équipe		
% des ménages sans suffisamment de renseignements descriptifs par équipe et recenseur		
# des points d'intérêts géolocalisés avec des coordonnées GPS (par type de point) par équipe		
# des points d'intérêt géolocalisés avec des coordonnées GPS (par type de point) par équipe et recenseur		
# des Autres Points Numérisés par équipe		
# des Autres Points Numérisés par équipe et recenseur		

Dashboard after tweaking

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Statistiques journalières par équipe et recenseur										
	CommCare	Nom	Prenom-s	Équipe	Struc Res	Menage	% SR san Info	% desc inadéquate	P de I	PN
1	**fpeti**	***PETIT-HOMME***	***France Marie Bernadette***	**1**	0	0	0.00%	0.00%	0	0
2	scler	CLERMONT	Sherley	1	0	0	0.00%	0.00%	0	0
3	sdesa	DESARMES	Socaina	1	0	0	0.00%	0.00%	0	0
4	fjasm	JASMIN	Fanise	1	0	0	0.00%	0.00%	0	0
5	kjean1	JEAN LOUIS	Katia	1	0	0	0.00%	0.00%	0	0
6	jjeud	JEUDY	Judith	1	0	0	0.00%	0.00%	0	0
7	flala	LALANNE	Francion	1	0	0	0.00%	0.00%	0	0
8	mloui	LOUIS	Marie Sofonie	1	0	0	0.00%	0.00%	0	0
9	rporc	PORCENA	Ruthza	1	0	0	0.00%	0.00%	0	0
10	rseid	SEIDE	Regine	1	0	0	0.00%	0.00%	0	0
11	jvend	VENDREDI	Jean Bernard	1	0	0	0.00%	0.00%	0	0
			totale de l'équipe 1		0	0	0.00%	0.00%	0	0
12	**jnoel**	***NOEL***	***Jean Herby***	**2**	0	0	0.00%	0.00%	0	0
13	carma	ARMAND	Cliford	2	0	0	0.00%	0.00%	0	0
14	adori	DORIUS	Alexandrine	2	0	0	0.00%	0.00%	0	0
15	cjean	JEAN LOUIS	Clausenie	2	0	0	0.00%	0.00%	0	0
16	mnico	NICOLAS	Magarette	2	0	0	0.00%	0.00%	0	0
17	knoe	NOE	Kerlyne	2	0	0	0.00%	0.00%	0	0
18	anorz	NORZIL	Anderson	2	0	0	0.00%	0.00%	0	0
19	jpeti	PETION	Josue	2	0	0	0.00%	0.00%	0	0
20	nrely	RELY	Nirva	2	0	0	0.00%	0.00%	0	0
21	ssain	SAINT VIL	Sarra Presca	2	0	0	0.00%	0.00%	0	0
22	wsigu	SIGUINEAU	Widine	2	0	0	0.00%	0.00%	0	0
			totale de l'équipe 2		0	0	0.00%	0.00%	0	0

Mapping Interface 1/3

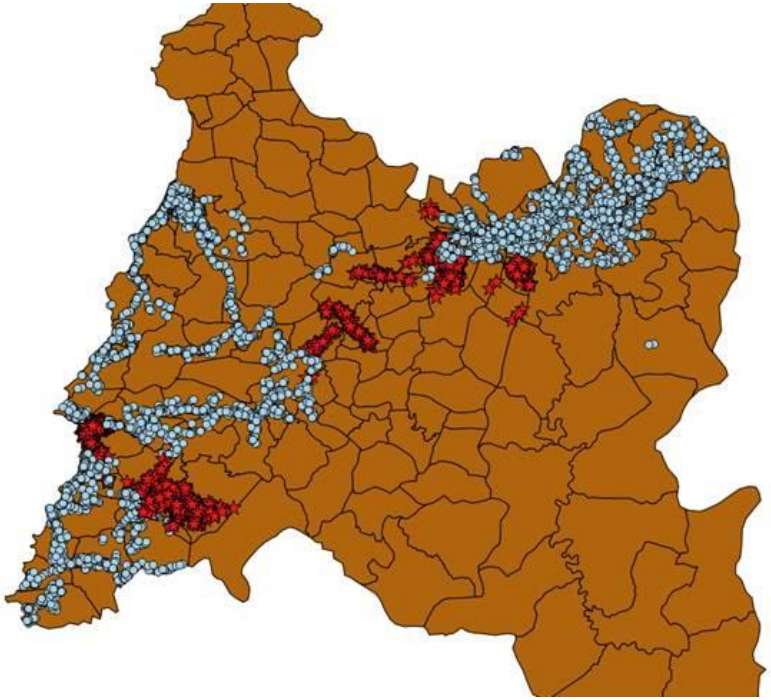
- Keeping track of spatial coverage
- Looking at strange spatial data
- Monitoring teams that are in remote regions

Keeping track of spatial coverage

Mapping Interface 2/3

- Keeping track of spatial coverage
- Looking at strange spatial data
- Monitoring teams that are in remote regions

Identifying anomalies



Mapping Interface 3/3

- Keeping track of spatial coverage
- Looking at strange spatial data
- Monitoring teams that are in remote regions

Looking at coverage in remote areas

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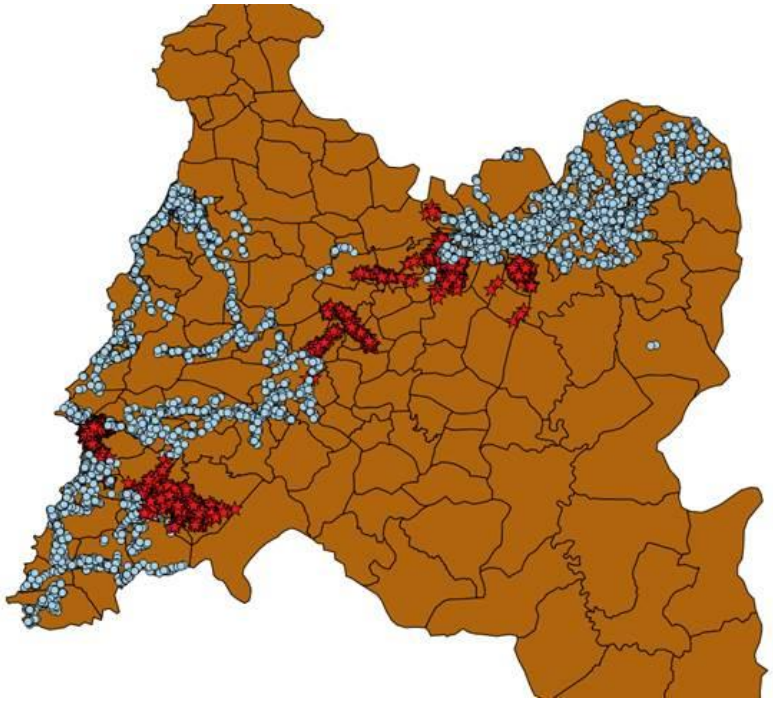

Daily Email Reports to Principals and Team Leaders

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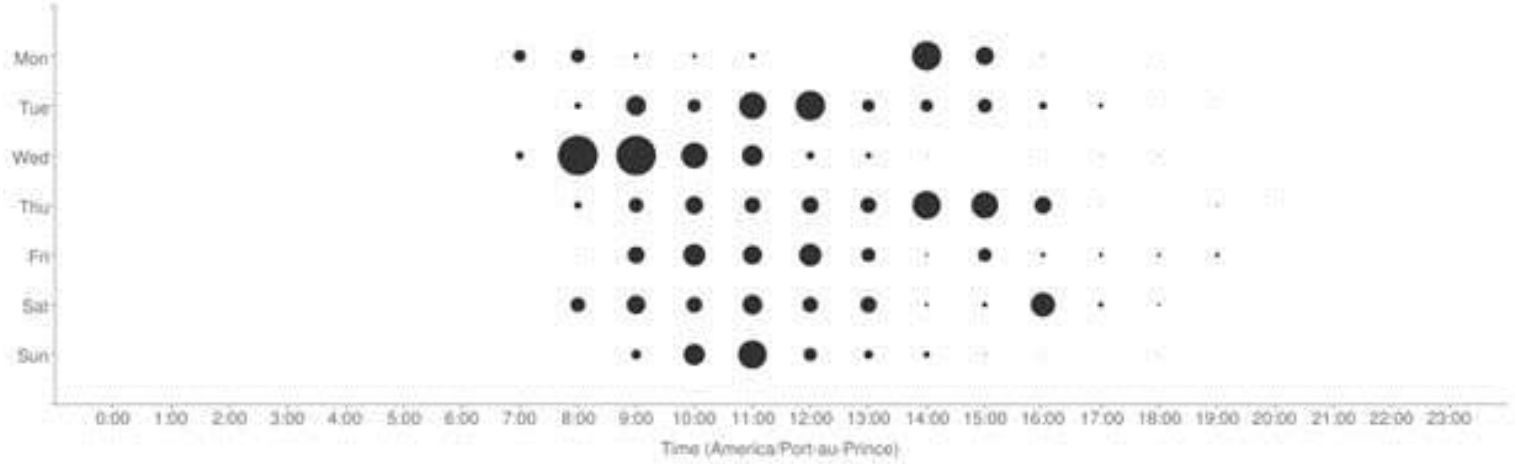
- Team Leaders

- Some technical issues
- Not all team leaders were able to have access
- Those who did, responded very well and engaged

- Principals

- Daily worker time reports
- Daily feedback and fine-tuning of the system

Tracking workers daily activity



Example: Active & Reactive Case Detection

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Output into standard forms

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MINISTERE DE LA SANTE PUBLIQUE ET DE LA POPULATION
PROGRAMME NATIONAL DE CONTROLE DE LA MALARIA
RAPPORT HEBDOMADAIRE DU COORDONATRICE

PNCM- 5

COMMUNE: Ouanaminthe DATE DE LA SEMAINE : 08/01/2017 a 18/01/2017

Nom de l'agent	Nombre de maisons visitées pour			Nombre des occupants		Nombre tests positifs			Nombre de personnes absentes		Nombre de maisons sautées
	Depist. De fievre	Cas passif	Dépistage 500m	Fébriles	Non-fébriles	Cas fébriles	Cas non-fébriles	Cas Passifs (Institution)	Fébriles	Non-fébriles	
Bazile Gabriel	1	1	26	34	112	1	0	1	0	0	0
Borgella Mathieu	1	0	34	6	168	0	0	1	0	0	0
Jerome Millerand	1	0	20	4	72	0	0	0	0	2	0
Joseph Ganel	0	0	21	0	101	0	0	0	0	34	0
Ladonysse Phidamas	0	0	23	2	113	0	0	0	0	3	0
Mompremier Jonel	0	0	38	2	198	0	0	0	0	8	1
Pierre Jackson	0	0	17	3	79	0	0	0	0	0	0
Pierre Richardnes	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	1	179	51	843	1	0	2	0	47	1

Near-Real-time worker feedback

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	Date:	11/01/2017		
INSTITUTION	PERSONNE RESPONSABLE	Téléphone	Section Communale	Agent
Dispensaire Gens de Nantes	Miss Bernadin keutelie	3280-2283	Gens de nantes	Bazile Gabriel
Dispensaire de Savane Longue	Edie	4236-8956	Savane Longue	Bazile Gabriel
Clinique Shalom	Dr Henry Aniol	4020-5534	Centre ville	Borgella Mathieu
Clinique Alliance Chrétienne	Dr Pierre	41751167	Centre ville	Borgella Mathieu
Clinique Eben Ezer	Mme Emacien	4277-6465	Centre ville	Borgella Mathieu
Clinique Agape	Dr Gener Pierre	3325-6422	Centre ville	Borgella Mathieu
Clinique allergiste	Dr Guimy Dorssainvil	4760-2248	Centre ville	Borgella Mathieu
Centre Medico Social de Ouanaminthe (CMSO)	Georges Roselyn	33265369	Centre ville	Borgella Mathieu
Clinique Dr Jeanty	Dr Jeanty	4263-5628	Centre ville	Borgella Mathieu
Clinique Dieu tout Puissant	Dr Lamah	4251-9502	Dilaire	Jérôme Millerand
Clinique Espoir de Depe	Miss Franciese	4705-3588	dilaire	Jérôme Millerand
Dispensaire Dilaire	Miss Mathurin Maguy	3366-7307	Dilaire	Jérôme Millerand
Dispensaire Acul des Pins	Dr Auguste	4832-9910	Acul des pins	Ladonysse Phydamas
Dispensaire de Savane au lait	Miss Jean Jeantilia	3368-4714	Savane au lait	Mompremier Jonel
Clinique Snerrose	Dr Presner Louis	3657-1788	Haut Maribahoux (centre ville)	Mompremier Jonel
Clinique Hope de Baja	Dr Daniest Adrien	4168- 6595	section Communale (Savane longue , Baja	Pierre Jackson
Clinique sante plus	Dr Abner Jean Baptiste	4334-4231	Sance (Savane longue)	Pierre Jackson
Clinique l'union	Mme Milou	33946228	Haut Maribahoux (centre ville)	Pierre Richardnes
Fraternité clinique	Dr Hugo Jean	3738-8888/ 4270-2735	Haut Maribahoux (centre ville)	Pierre Richardnes
La Dignite pharmaclinique	Dr Jules	3354-4589	Haut Maribahoux (centre ville)	Pierre Richardnes
Lune pharmaclinique	Dr Previlus Wiline	4307-0576	Haut Maribahoux (centre ville)	Pierre Richardnes
Mussamed Pharma	Mr Colas	3229-7575	Haut Maribahoux (centre ville)	Pierre Richardnes
clinique Dr Lavaud	Dr Jose	3290-0534	Centre ville	Pierre Richardnes
Institution Univers	Dr Lamah Azoro	4251-9502	Haut Maribahoux (centre ville)	Pierre Richardnes
Clinique Sonolab	Dumorne Ronel	43187635	Haut Maribahoux (centre ville)	Pierre Richardnes
Polyclinique la Paix	Ton-Aime Onex	42312828	Haut Maribahoux (centre ville)	Pierre Richardnes
Danita's Children	Dr Elisabeth	48453660	Centre ville	Pierre Richardnes

Future plans

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Questions?

Thank you!

NISHANT KISHORE
YNM2@CDC.GOV

Items of interest

- Next Forum – Tuesday, May 2 10am-11am ET
- Feb 22, Technology Association of Georgia Connected Robotics Event – http://bit.ly/ccrobotics
- CDC Office of Technology and Innovation (OTI) Roadshow – 3 sessions between March 3 – March 24 oti@cdc.gov
- OHSU Healthcare Data Analytics Online Course – 2017 https://dmice.ohsu.edu/onc-course/
- Please take 90 seconds to share your feedback, http://go.usa.gov/x9b2G . We'd love to hear from you on improving the quarterly forums.

Thank You & Questions

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
Visit: www.cdc.gov | Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.