

MINISTRY OF HEALTH



ZANZIBAR MALARIA ELIMINATION PROGRAM

**Malaria Surveillance in Zanzibar:
Data Analysis and Interpretation**

September 2016



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List of Abbreviations

DMSO	District Malaria Surveillance Officer
FAQ	Frequently Asked Questions
MCN	Malaria MCN
MCR	Malaria Case Register
MEEDS	Malaria Epidemic Early Detection System
USSD	Unstructured Supplementary Service Data
WHO	World Health Organization
ZAMEP	Zanzibar Malaria Elimination Programme

1. Chapter 1: Introduction

1.1. Definition of Malaria Surveillance Data Analysis

Data analysis is the process of inspecting, cleaning, and transforming data to derive useful information, whereas **surveillance** is the ongoing systematic collection, analysis, and interpretation of outcome-specific data for use in the planning, implementation, and evaluation of public health practices.¹

The seventh report of the World Health Organization (WHO) Expert Committee on malaria stated that malaria surveillance is "designed to discover evidence of any continuation of transmission, to establish its nature and causes, to eliminate residual foci, to prevent or cure such residual or imported malaria infections in man as would delay the ending of transmission or threaten its resumption in a given area, and, finally, to substantiate the fact that *elimination* has been achieved".

1.2. Importance of Malaria Surveillance Data Analysis in the Elimination Phase

Increased surveillance is one of the greatest differences between malaria control and malaria elimination programs. During control, programs focus on population-wide interventions and are, therefore, interested in broad measures of morbidity that can be captured monthly or even less frequently in a (possibly) limited geographical area (sentinel sites). As programs move forward to the elimination phase, their interest eventually turns to each individual case reported via daily or weekly data reporting systems. This shift is important for disrupting ongoing transmission. The persistence of endemic malaria transmission in surrounding areas leaves the islands of Zanzibar vulnerable to sudden outbreaks of malaria and the re-establishment of perennial malaria transmission. Reliable and improved malaria surveillance and epidemic response capacity are required to maintain control and prevent malaria resurgence in Zanzibar².

1.3. Aims and Objectives

The purpose of this manual is to outline how data analysis can be performed using the malaria MCN (MCN) system implemented in Zanzibar. The details of each step involved in each system are explained to provide a malaria surveillance data analysis manual for surveillance officers, the District Malaria Response Team, and Zanzibar Malaria Elimination Programme (ZAMEP) staff. This manual also describes the features of the web portal that was designed to manage the data and perform basic analysis. This web portal enables data dissemination to stakeholders through weekly reports and facilitates identifying sudden increases in malaria cases. When such an increase is detected, an outbreak response plan is initiated by the District Malaria Response Teams, as shown in the flow diagram (**Figure 1**) on the next page.

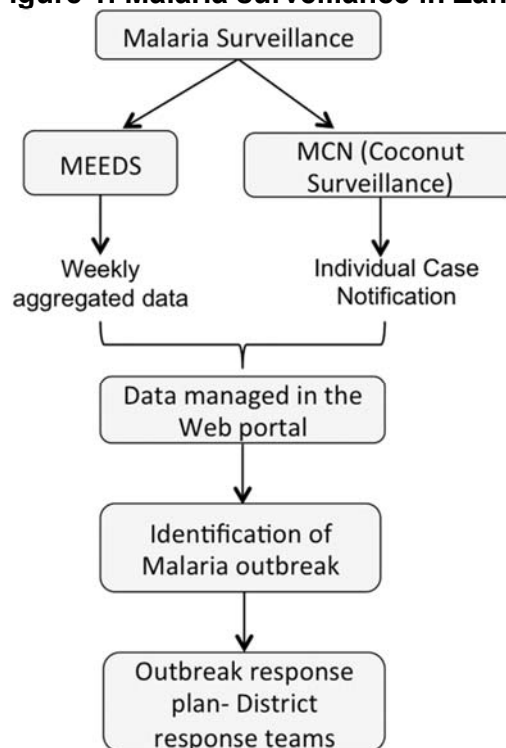
¹ Thacker, SB & Berkelman RL. Public Health Surveillance In The United States. 1988. Epidemiological reviews 10:(164-190).

² Zanzibar Malaria Elimination Programme. 2013. Malaria Strategic Plan III 2013/14-2017/18.

1.4. The Zanzibar Experience

In 2005, malaria prevalence exceeded 20% in many parts of Zanzibar. After almost 5 years of malaria intervention scale-up in Zanzibar, malaria-related illness and childhood mortality have been impacted^{3,4}. Increased malaria prevention interventions, including universal coverage with insecticide-treated bed nets and indoor residual spraying (since 2007), have resulted in a dramatic decline in malaria prevalence in Zanzibar. In 2008, the Zanzibar Malaria Elimination Programme, in collaboration with the U.S. President's Malaria Initiative, developed and implemented the Malaria Epidemic Early Detection System⁵ (MEEDS). MEEDS relies on mobile phone-based weekly reporting of malaria indicators from government primary health care units in Zanzibar. Each week, malaria surveillance data are forwarded to a secure website for review by ZAMEP. These real-time surveillance data allow ZAMEP to make data-driven decisions regarding when and where to investigate sudden increases in transmission, initiate active case detection, and provide more comprehensive coverage with malaria interventions.

Figure 1. Malaria surveillance in Zanzibar



2. Chapter 2: Overview of Malaria Surveillance in Zanzibar

Figure 1 summarizes the two main surveillance systems established in Zanzibar: MEEDS and MCN.

2.1. MEEDS

MEEDS helps to identify abnormal increases in malaria cases based on weekly reported data. Since this system was established, remarkable achievements have been made in successfully controlling malaria in Zanzibar. However, to ensure that these gains are sustained over time, proper monitoring systems should be in place.


3 Tanzania Commission for AIDS, Zanzibar AIDS Commission, National Bureau of Statistics, Office of the Chief Government Statistician, and MacroInternational Inc. 2008. *Tanzania HIV/AIDS and Malaria Indicator Survey 2007-08*. Dar es Salaam, Tanzania.

4 Bhattarai A, Ali AS, Kachur SP. Impact of artemisinin based combination therapy and insecticide-treated nets on malaria burden in Zanzibar. *Plos Med* (4 (11):e309.doi:10.1371/journal.pmed.0040309.

5 Zanzibar Malaria Control Programme. *Zanzibar Malaria Epidemic Early Detection System Biannual Report*, Year - End 2010; 2 (No.2); 2011.

2.2. MCN




The MCN system uses the Malaria Case Register (MCR) to record detailed information about confirmed malaria cases that are individually followed up by the DMSO. This register provides quick information about malaria cases when required. The following procedures detail how data from the MCR are reported to the server via the Short Message Service (SMS) system and how they are reported via the Coconut Surveillance application using tablets.


- 

NATIONAL MALARIA CASE REGISTER

District: _____

Facility: _____



- ## Malaria Surveillance in Zanzibar: Data Analysis and Interpretation

Surveillance application on the tablet, please refer to the surveillance field manual.

5. The DMSO will then visit the health facility in that *shehia* to verify the reported case and collect additional information using the tablet from the MCR booklet at the health facility.
6. After the information at the health facility has been entered into the tablet, the DMSO will visit the patient's house and collect data at the household level. The medical officer will provide additional patient information to the DMSO, such as the phone number and address where he/she can reach the patient. Each DMSO is provided with a backpack containing rapid diagnostic tests and medical supplies, such as gloves, syringes, alcohol swabs, malaria medications, net coupons, and a thermometer. The DMSO must ensure that he/she has sufficient stocks of all these supplies.
7. The DMSO will then collect individual data from all household members. Every member of the household needs to be tested for malaria infection using rapid diagnostic tests. In addition, their temperatures must be checked to determine the presence of fever. If any members test positive, the DMSO should give them medication.
8. The data are then sent to the server so that the stakeholders can access them.

3. Chapter 3: Malaria Case Detection

3.1 Using MCNMCN Data

The national-level surveillance, monitoring, and evaluation team is responsible for reviewing the data for the past week on a daily basis to detect any abrupt increase in malaria cases. *Shehias* with 10 or more cases and villages with 5 or more cases are identified, and response activities are promptly conducted. Once the *shehias*/villages are identified, the respective District Medical Officers are invited for a meeting at the ZAMEP offices where planning and logistic arrangements are discussed and finalized. The response activities are fully conducted by the district malaria response team and led by the District Medical Officer, who is supported by a team from the national level. These activities involve several interventions, such as behavior change communication/long-lasting insecticide-treated nets, entomological activities, case management, and diagnostics. The procedures for detecting malaria cases at the *shehia*/village level using MCN data are detailed below.

3.2 Access to Web Portal

Steps for accessing the web portal:

1. Double click the short-cut to the web browser installed in your computer (for example, Mozilla Firefox or Google Chrome).
2. Type the following URL into the address bar and press the '**Enter**' key or click the '**GO**' button to the right of the address bar:

<http://coconut.zmcp.org/zanzibar/design/zanzibar/index.html#>

After the webpage has loaded, it will appear as shown below.

Type your username (For example, one user was registered as hmkali)

Type your password (Note, it will appear as *****)

Press the **Login** button

Note: You will only be able to login if you have been registered and granted access to the system

3. Specify the time interval for which you are interested in viewing the data.

District	Case	Complete household visit	%	Missing Case Notification	Without complete facility visit (but with case notification)	%	Without complete facility visit within 24 hours	%	Without complete household visit (but with complete facility visit)	%	Without complete household visit within 48 hours	%
ALL	211	45	21%	104	61	29%	143	68%	165	78%	140	66%
CHAKE CHAKE	5	4	80%	1	0	0%	0	0%	1	20%	0	0%
KASKAZINI A	11	3	27%	4	4	36%	6	55%	8	73%	6	55%
KASKAZINI B	19	12	63%	7	0	0%	6	32%	7	37%	6	32%
KATI	32	13	41%	5	13	41%	14	44%	18	56%	15	47%
KUSINI	6	0	0%	6	0	0%	4	67%	6	100%	3	50%
MACHARABI	44	0	0%	31	13	30%	42	95%	44	100%	39	89%
MICHEWENI	32	6	19%	15	11	34%	22	69%	26	81%	22	69%
MUNI	4	0	0%	4	4	100%	4	100%	4	100%	4	100%

coconut.zmcp.org/zanzibar/_design/zanzibar/index.html#reports

Start Date: 2016-06-06
End Date: 2016-06-13
Select By Week
Region: ALL
Report Type: Analysis - Cases, Household, Age, Gender, Nets and Travel

Aggregation Type: ☒ District ☐ Shehia

Click on a column heading to sort.

Cases Followed Up [Toggle Details](#)

District	Cases	Complete household visit	%	Missing Case Notification	Without complete facility visit (but with case notification)	%	Without complete facility visit within 24 hours	%	Without complete household visit (but with complete facility visit)	%	Without complete household visit within 48 hours	%
ALL	211	45	21%	104	61	29%	143	68%	165	78%	140	66%
CHAKE CHAKE	5	4	80%	1	0	0%	0	0%	1	20%	0	0%
KASKAZINI A	11	3	27%	4	4	36%	6	55%	8	73%	6	55%
KASKAZINI B	19	12	63%	7	0	0%	6	32%	7	37%	6	32%
KATI	32	13	41%	5	13	41%	14	44%	18	56%	15	47%
KUSINI	6	0	0%	6	0	0%	4	67%	6	100%	3	50%
MAGHARIBI	44	0	0%	31	13	30%	42	95%	44	100%	39	89%
MICHEWENI	32	6	19%	15	11	34%	22	69%	26	81%	22	69%
MJINI	47	3	6%	29	15	32%	39	83%	44	94%	39	83%
MKOANI	4	1	25%	2	1	25%	3	75%	3	75%	3	75%

4. Many options can be chosen from the 'Report Type' dropdown menu.

coconut.zmcp.org/zanzibar/_design/zanzibar/index.html#reports

Start Date: 2016-06-06
End Date: 2016-06-13
Select By Week
Region: ALL
Report Type: Analysis - Cases, Household, Age, Gender, Nets and Travel

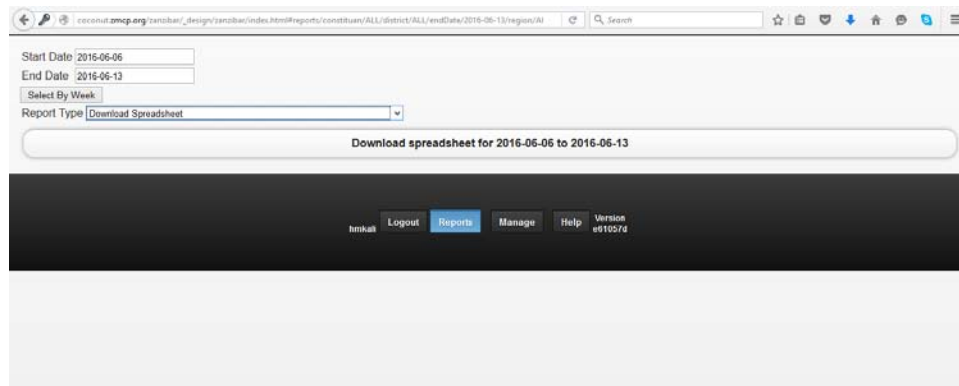
Aggregation: Case Followup Status
Compare MEEDS or iSMS Weekly Facility Reports With Case Followups

Click on a column heading to sort.

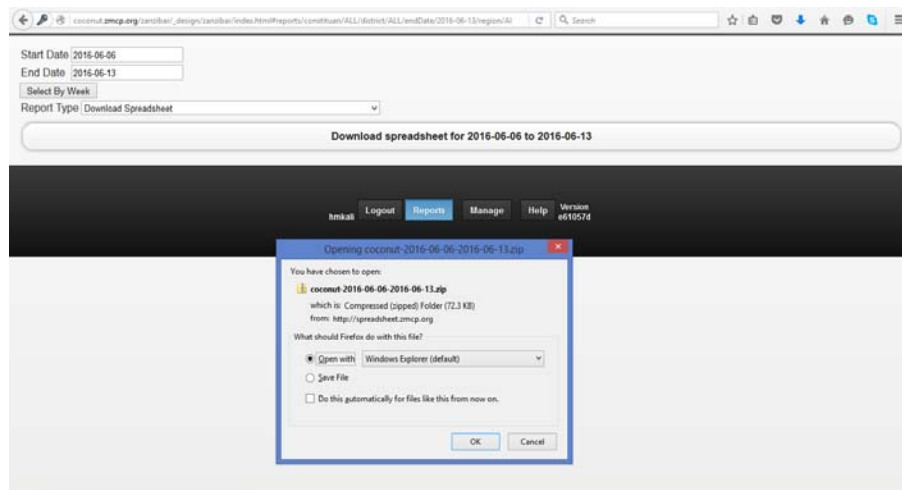
Cases Followed Up [Toggle Details](#)

District	Cases	Complete household visit	%	Missing Case Notification	Without complete facility visit (but with case notification)	%	Without complete facility visit within 24 hours	%	Without complete household visit (but with complete facility visit)	%	Without complete household visit within 48 hours	%
ALL	211	45	21%	104	61	29%	143	68%	165	78%	140	66%
CHAKE CHAKE	5	4	80%	1	0	0%	0	0%	1	20%	0	0%
KASKAZINI A	11	3	27%	4	4	36%	6	55%	8	73%	6	55%
KASKAZINI B	19	12	63%	7	0	0%	6	32%	7	37%	6	32%
KATI	32	13	41%	5	13	41%	14	44%	18	56%	15	47%
KUSINI	6	0	0%	6	0	0%	4	67%	6	100%	3	50%
MAGHARIBI	44	0	0%	31	13	30%	42	95%	44	100%	39	89%
MICHEWENI	32	6	19%	15	11	34%	22	69%	26	81%	22	69%
MJINI	47	3	6%	29	15	32%	39	83%	44	94%	39	83%
MKOANI	4	1	25%	2	1	25%	3	75%	3	75%	3	75%

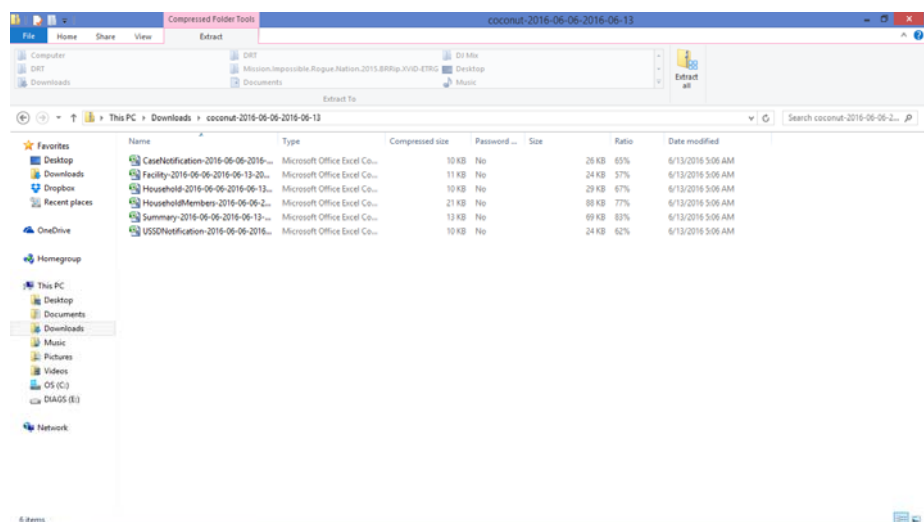
5. For practice, choose 'spreadsheet'. Once you select an item under 'Report Type', the 'download' button will automatically appear. Click on the 'download' button to download the spreadsheets for the selected period of interest.



6. After the data have been downloaded, a dialog box will open requesting you to either '**Open**' or '**Save**' the .zip folder, as shown below.



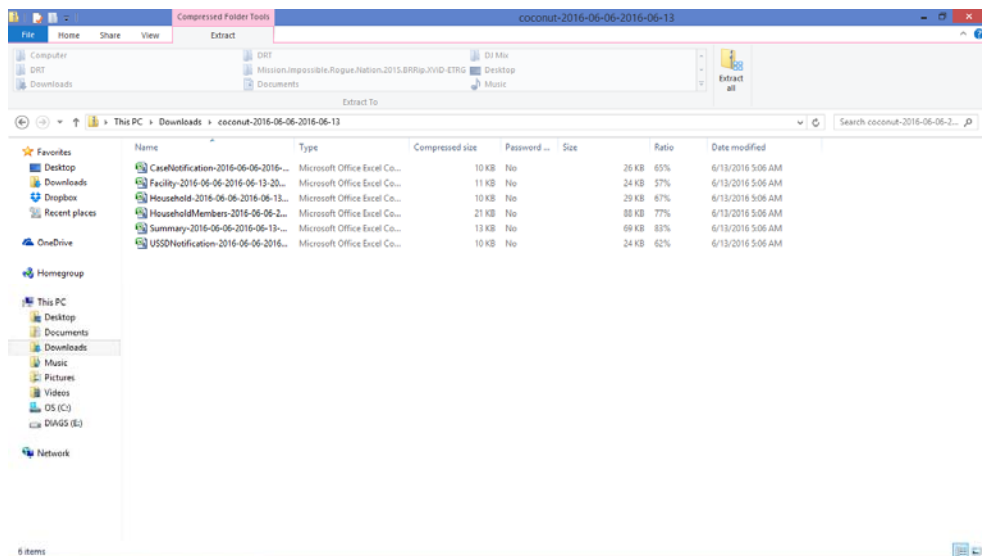
7. Once you press '**Save**', the downloaded data will automatically be saved in the '**Downloads**' folder. Copy/cut the downloaded data and paste them in your preferred location.
8. Open the zipped file and copy all the files to the selected folder, as shown below.



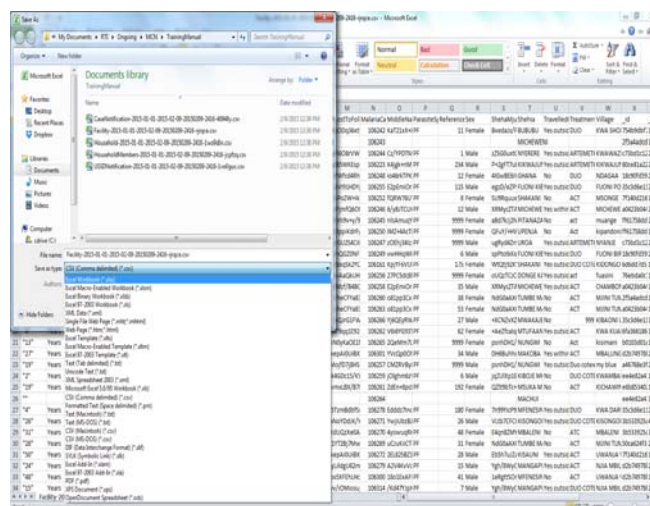
9. Six .csv files will appear. Each file contains a different level of patient information, as follows:

- The **'USSDNotification'** file contains all of the malaria cases that have been reported in the specified period.
- The **'MCN'** file includes all of the notified cases.
- The **'Facility'** file contains all the cases that have been followed-up to the facility level.
- The **'Household'** file comprises all the individual cases (index cases) that have been followed-up to the household level.
- The **'Household Members'** file contains information on all household members (secondary cases) living in the index cases' households.
- The **'Summary'** file includes information on all of the above files.

Note that all the files are compatible with Microsoft Excel.



- To detect malaria cases, we use the **'Facility'** file because it contains all of the required patient demographics and location (*shehia/village*) information. Because this file is in .csv format, it must be converted to an .xls or .xlsx file to be compatible with formulas.



3.2 Data Manipulation

The data downloaded from the system might not meet the end-user's needs or conform to his/her preferred format or arrangement. Thus, they may require some cleaning before further analysis can be done. For example, the downloaded data may not include the week number or you may want to link several data sets (e.g., Data set A might contain cases and *shehias*, whereas Data set B might contain health facilities, *shehias*, and districts). Eventually, you must have a complete data set that merges Data sets A and B. This can be achieved via data manipulation.

Opening a 'Facility' File

- As in step (10) above, double click the **'Facility'** file in Microsoft Excel. A window will open as shown below.

In this example, you want to see which facility did not fill in the patients' genders.

1. Click on any cell in the **'Facility'** data set. Then, click on the **'Data'** tab and click the button shown here:



2. Once you do so, an arrow will appear on the right side of each heading.

F	G	H
Sex	ShehiaMjumba	District

3. To identify those cases for which no gender was specified, go to the **'Gender'** field and click the arrow. A dropdown menu will appear, as shown below. Uncheck **'Male'** and **'Female'** but leave **'blank'** checked. This will display all the cases that are missing gender information.

NOTE:

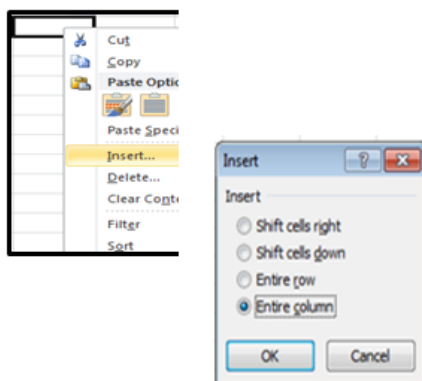
- Using the same dropdown menu, you can sort the data in ascending/descending order or by color, depending on your preference.
- Using filtering, you can review all fields to determine whether all of the rows are completely filled out.

Creating a new variable

Sometimes, a new field column that does not exist in the data downloaded from the system will be needed.

For example, you may wish to create a new variable called **'Week Number'** using the **'date of submission'** column. The details of how this can be done are provided below.

1. Depending on which side of the **'date of submission'** column you want the new variable to appear, select a cell to the right or left.
2. Right click on the cell, and a menu will appear as shown below. Click **'Insert'**. A new menu will appear. Select **'Entire column'** and then click **'OK'**.



3. A new column will appear. Type **'Week Number'** into its heading.
4. In the cell immediately below the heading, type **"=WEEKNUM()"**, clicking on a cell with a date while the cursor is between the parentheses.

- Press the 'Enter' key. A week number will appear (in this case, '36').

Date	Week Number
9/1/2015	=WEEKNUM(D2)
9/2/2015	
9/3/2015	
9/4/2015	
9/5/2015	
9/6/2015	
9/7/2015	
9/8/2015	
9/9/2015	
9/10/2015	
9/11/2015	
9/12/2015	
9/13/2015	
9/14/2015	
9/15/2015	
9/16/2015	
9/17/2015	
9/18/2015	

D	E
Date	Week Number
9/1/2015	36
9/2/2015	
9/3/2015	
9/4/2015	
9/5/2015	
9/6/2015	
9/7/2015	
9/8/2015	
9/9/2015	
9/10/2015	
9/11/2015	
9/12/2015	
9/13/2015	
9/14/2015	
9/15/2015	
9/16/2015	
9/17/2015	
9/18/2015	

D	E
Date	Week Number
9/1/2015	36
9/2/2015	
9/3/2015	
9/4/2015	
9/5/2015	
9/6/2015	
9/7/2015	
9/8/2015	
9/9/2015	
9/10/2015	
9/11/2015	
9/12/2015	
9/13/2015	
9/14/2015	
9/15/2015	
9/16/2015	
9/17/2015	
9/18/2015	

D	E
Date	Week Number
9/1/2015	36
9/2/2015	36
9/3/2015	36
9/4/2015	36
9/5/2015	36
9/6/2015	37
9/7/2015	37
9/8/2015	37
9/9/2015	37
9/10/2015	37
9/11/2015	37
9/12/2015	37
9/13/2015	38
9/14/2015	38
9/15/2015	38
9/16/2015	38
9/17/2015	38
9/18/2015	38

- Highlight the cell containing the week number (in this case, '36'). Then, point to the right, bottom corner of the cell with the cursor until it changes and appears as a cross.
- Double click the entire column to fill with week numbers according to the specified dates.

To create another new variable called 'Year'

To create a variable called 'Year' using the same variable and date of submission, apply the same steps as above.

- Instead of using the WEEKNUM function, use the YEAR function by typing "=YEAR ()" and specifying a cell containing a date within the parentheses (e.g., "=Year (D2)").
- Below is a screenshot showing an example of the formula.

D	E	F
Date	Week Number	YEAR
9/1/2015	36	=YEAR(D2)
9/2/2015	36	
9/3/2015	36	
9/4/2015	36	
9/5/2015	36	
9/6/2015	37	
9/7/2015	37	
9/8/2015	37	

[illegible]

The **'Facility'** file includes no column for the variable **'District'**. Therefore, this variable must be added to the file. The image below outlines the concept of data set merging.

[illegible]

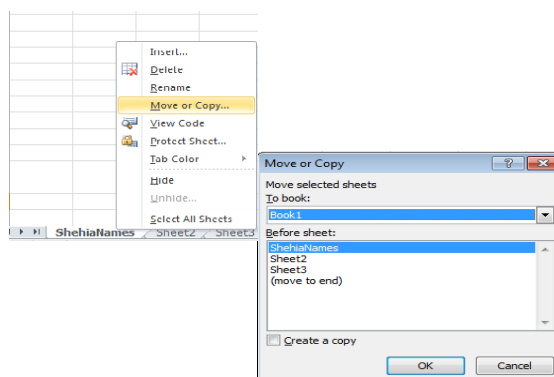
13

1. Update the file containing the *shehia* names whenever you have downloaded

SHEHIA NAME AS IS	CORRECT SHEHIA NAME (ABDISTRICT)
MWAACHALALE	KUSINI
JAMISANI	KATI
MWAACHALALE	KATI
KIBONDE MAJI	MAGHARBI
CHUNGA	MUNI
AMANI	MUNI
ETUYWE	MUNI
ZIWATUE	MUNI
ZIWATUE	MUNI
KUMHEWIA	MUNI
AMANI	MUNI
AMANI	MUNI
AMANI	MUNI
BAMBI	KATI
BAMBI YA BONDENI	KATI
BAMBI	KATI
B. BONDENI	KATI
B. BONDENI	KATI
BAMBI BONDENI	KATI
BAMBI	KATI
BANDAMAJI	KASKAZINI A
BANDAMAJI	KASKAZINI A
BANDAMAJI	KASKAZINI A
BINGUNI	KATI
BINGUNI	KATI
BOPWE	WETE
BOPWE	WETE
BUBUBU	MAGHARBI
KUJOHI	MAGHARBI
KUJOHI	MAGHARBI
BUBUBU	MAGHARBI
BUMWASUDI	MAGHARBI
BUMWASUDI	MAGHARBI
BUMWASUDI	MAGHARBI
BUMWASUDI	MAGHARBI
BUSUDI	MAGHARBI
B. BONDENI	MAGHARBI

the data.

2. Move/copy the worksheet above to the '**Facility**' file and right click the sheet name. A menu will appear. Click '**Move**' or '**Copy**'. Another box will appear. From the list of books, select the file name where you want to copy the data ('**ShehiaNames**'). Then select '**Facility**' and click '**OK**'.



3. Note that the '**ShehiaNames**' worksheet will appear in the '**Facility**' workbook.
4. Click on the '**Facility**' worksheet, which will appear as below. Insert a new column to the right of the '**Shehia**' column and name it '**District**'.

- To insert the **'District'** column into the **'Facility'** worksheet from the **'ShehiaNames'** worksheet, we will use a function called **'VLOOKUP()'**. This function allows searching for a specific district in the **'ShehiaNames'** worksheet and matching it with a *shehia* in the **'Facility'** worksheet.
- In the **'District'** column, type an equals (=) sign followed by **'VLOOKUP()'**. Click the first *shehia* name in the **'Shehia'** column while your cursor is between the parentheses.

D	E	F	G	H	I	J	K	L	M	N
Parasite	Referral	Sex	ShehiamJumbe	Shehia	district					
				KIKWAJUNI	=VLOOKUP(H2,					
				NYERERE	VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])					
				BUBUBU						
				GHANA						
				SHAKANI						
				BWEJUJ						
				UPENJA						

- Type a comma and then click on the **'ShehiaNames'** sheet on the worksheet tab.



- Highlight all of the data in the worksheet, as shown below.

Facility-2015-01-01-2015-02-09-20150209-2405-ggpc.xls - Microsoft Excel

U2 =VLOOKUP(T2,shehianames!A:C,3,FALSE)

	A	B	C
1	SHEHIA NAME AS IS	CORRECT SHEHIA NAME (AB DISTRICT)	
2	AMACHALE	KOSBA	
3	AMACHALE	KATI	
4	AMACHALE	KATI	
5	AMACHALE	KATI	
6	AMACHALE	KATI	
7	AMACHALE	KATI	
8	AMACHALE	KATI	
9	AMACHALE	KATI	
10	AMACHALE	KATI	
11	AMACHALE	KATI	
12	AMACHALE	KATI	
13	AMACHALE	KATI	
14	AMACHALE	KATI	
15	AMACHALE	KATI	
16	AMACHALE	KATI	
17	AMACHALE	KATI	
18	AMACHALE	KATI	
19	AMACHALE	KATI	
20	AMACHALE	KATI	
21	AMACHALE	KATI	
22	AMACHALE	KATI	
23	AMACHALE	KATI	
24	AMACHALE	KATI	
25	AMACHALE	KATI	
26	AMACHALE	KATI	
27	AMACHALE	KATI	
28	AMACHALE	KATI	
29	AMACHALE	KATI	
30	AMACHALE	KATI	

- Then, press F4 on the keyboard. A dollar sign will appear on the selected ranges. Type a comma.
- Type '3' to specify the 'District' column, which is the third column from the left, as shown in the screenshot above.
- Type another comma. Then, you type either '0' or 'FALSE' and a parenthesis to close the formula. **(Note: Typing 'FALSE' or '0' will match the exact district name for each shehia.)**
- Press the 'Enter' key. The result will appear as below.

Facility-2015-01-01-2015-02-09-20150209-2405-ggpc.xls - Microsoft Excel

U2 =VLOOKUP(T2,shehianames!A:C,3,FALSE)

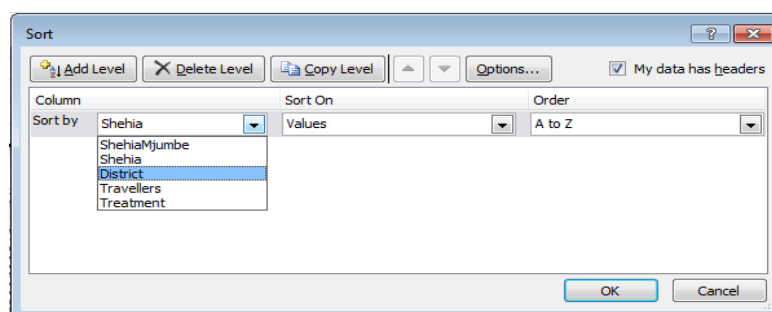
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
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2	No	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf
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23	No	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf
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25	No	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf
26	No	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf
27	No	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf
28	No	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf
29	No	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf
30	No	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf	fyabdf

13. Then, highlight the cell as above and place the cursor over the bottom, right corner of the cell; the cursor will become a cross. Double click to fill the entire 'District' column. The results will be displayed as shown below.

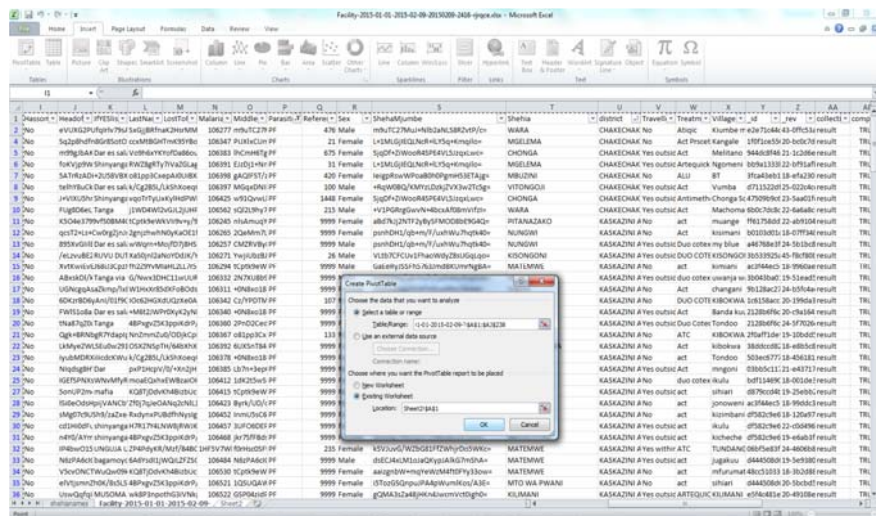
ID	Name	Sex	Age	District	Other Attributes
1	ShehiaMjumba	Female	675	ShehiaMjumba	...
2	ShehiaMjumba	Female	675	ShehiaMjumba	...
3	ShehiaMjumba	Female	675	ShehiaMjumba	...
4	ShehiaMjumba	Female	675	ShehiaMjumba	...
5	ShehiaMjumba	Female	675	ShehiaMjumba	...
6	ShehiaMjumba	Female	675	ShehiaMjumba	...
7	ShehiaMjumba	Female	675	ShehiaMjumba	...
8	ShehiaMjumba	Female	675	ShehiaMjumba	...
9	ShehiaMjumba	Female	675	ShehiaMjumba	...
10	ShehiaMjumba	Female	675	ShehiaMjumba	...
11	ShehiaMjumba	Female	675	ShehiaMjumba	...
12	ShehiaMjumba	Female	675	ShehiaMjumba	...
13	ShehiaMjumba	Female	675	ShehiaMjumba	...
14	ShehiaMjumba	Female	675	ShehiaMjumba	...
15	ShehiaMjumba	Female	675	ShehiaMjumba	...
16	ShehiaMjumba	Female	675	ShehiaMjumba	...
17	ShehiaMjumba	Female	675	ShehiaMjumba	...
18	ShehiaMjumba	Female	675	ShehiaMjumba	...
19	ShehiaMjumba	Female	675	ShehiaMjumba	...
20	ShehiaMjumba	Female	675	ShehiaMjumba	...
21	ShehiaMjumba	Female	675	ShehiaMjumba	...
22	ShehiaMjumba	Female	675	ShehiaMjumba	...
23	ShehiaMjumba	Female	675	ShehiaMjumba	...
24	ShehiaMjumba	Female	675	ShehiaMjumba	...
25	ShehiaMjumba	Female	675	ShehiaMjumba	...
26	ShehiaMjumba	Female	675	ShehiaMjumba	...
27	ShehiaMjumba	Female	675	ShehiaMjumba	...
28	ShehiaMjumba	Female	675	ShehiaMjumba	...
29	ShehiaMjumba	Female	675	ShehiaMjumba	...
30	ShehiaMjumba	Female	675	ShehiaMjumba	...
31	ShehiaMjumba	Female	675	ShehiaMjumba	...
32	ShehiaMjumba	Female	675	ShehiaMjumba	...
33	ShehiaMjumba	Female	675	ShehiaMjumba	...
34	ShehiaMjumba	Female	675	ShehiaMjumba	...
35	ShehiaMjumba	Female	675	ShehiaMjumba	...
36	ShehiaMjumba	Female	675	ShehiaMjumba	...
37	ShehiaMjumba	Female	675	ShehiaMjumba	...
38	ShehiaMjumba	Female	675	ShehiaMjumba	...
39	ShehiaMjumba	Female	675	ShehiaMjumba	...
40	ShehiaMjumba	Female	675	ShehiaMjumba	...

14. To cross check any *shehias* that do not match with districts, highlight the entire sheet above, sort it by clicking on the 'Data' tab, and then click the icon shown here:

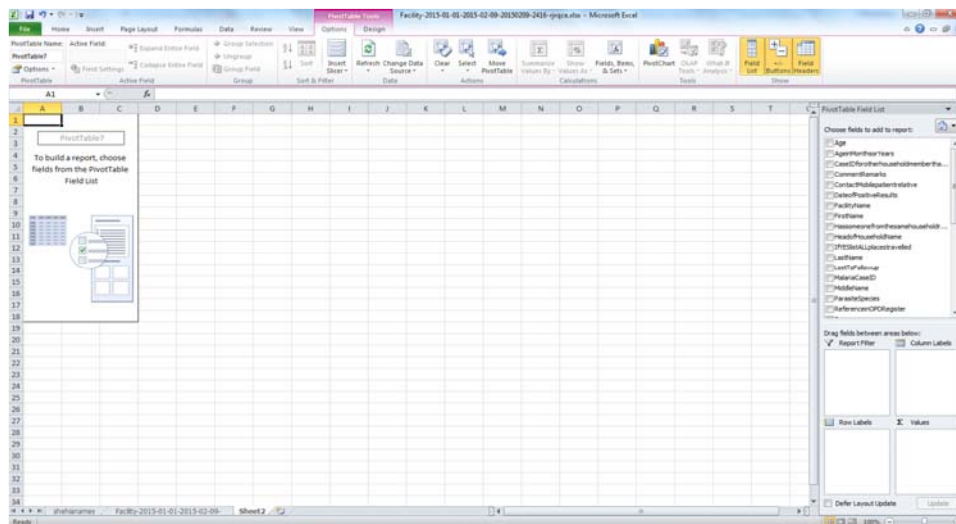
15. A dialog box corresponding to 'Sort by' will appear. Choose 'District', and for the 'Order', select 'A to Z'. Then, click 'OK'.



16. If some entries do not match, you will observe that some districts are marked as '#N/A'. If this occurs, check the correct names of the *shehias* by reviewing the spelling. If you make a revision and the district marked '#N/A' is matched, it will change to the corresponding district. The screenshot below shows four *shehias* with incorrect names.



5. The 'Pivot Table Field List' will appear on the right side of the window. The top part of this list comprises all the variables in the 'Facility' sheet, and the bottom part consists of four components: 'Report Filter' (enables selecting specific categorical features), 'Column Labels' (arranges variables vertically), 'Row Labels' (arranges variables horizontally), and 'Values' (enables the user to specify any numerical value).



6. To detect cases, drag the variable 'year' to the 'Report Filter' component.
7. Then, drag the variable 'week' to the 'Column Labels' component. This will vertically list the week numbers in that particular year.
8. Drag the variable 'shehia' to the 'Row Labels' component. This will list all the shehias horizontally.
9. Drag the variable 'village' to the 'Row Labels' component. This variable should be under the 'shehia' level. In other words, this section will show all the villages that are in a specific shehia that has reported malaria cases.

- Drag the variable '**_id**' to the '**Values**' component. This section will display the number of malaria cases reported in a certain village/*shehia* in a certain week of the year.

After completing all of the steps listed above (6–10), your window will look like that shown below.

The screenshot shows a Microsoft Excel window with a PivotTable. The PivotTable is located in the range A1:K14. The PivotTable has 'year' as the filter, 'Count of _id' as the value, and 'shehia' and 'village' as row labels. The PivotTable Field List on the right shows 'shehia' and 'village' in the Row Labels area and 'Count of _id' in the Values area.

year	Count of _id
2015	1
2016	1
2017	1
2018	1
2019	1
2020	1
2021	1
2022	1
2023	1
2024	1
2025	1
2026	1
2027	1
2028	1
2029	1
2030	1
2031	1
2032	1
2033	1
2034	1
2035	1
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2486	1
2487	1
2488	1
2489	1
2490	1
2491	1
2492	1
2493	1
2494	1
2495	1
2496	1
2497	1
2498	1
2499	1
2500	1
2501	1
2502	1
2503	1
2504	1
2505	1
2506	1
2507	1
2508	1
2509	1
2510	1
2511	1
2512	1
2513	1

Count of _id	1	2	3	4	5	6	7	53 (blank)	Grand Total
BINGUNI					2				2
KWA SHEHA				1					1
MAWENI				1					1
BUBUBU		1	1	1					3
BUBUBU		1							1
KIRINANI ZANTEL				1					1
KWA SHOMBE		1							1
BUMBWI SUDI						1			1
(blank)							1		1
BUMBWISURU			1	1					2
KIRUNDUNDA			1	1					2
CHAANI KUBWA			1						1
kibokwa			1						1
MISUFINI			2	1					3
MIAWILI			1						1
MWISHO WA NIA			1						1
UWANDANI			1						1
MIWANI		1	4	4				1	10
BRANCHI			1	2	3				6
KIRUNDUNDA			1						1
KITEMBWENI			1	2					3
KWA BONDU			1						1
MANZESE						1			1
MAKLE			1						1
MAKLE			1						1
MIKOKOTONI			2	1	2	1			6
ikulu			1	1					2
kicheche				1					1
Tondoo			2	1					3
MOMBASA									1

For example, in the screenshot above, the row highlighted in red shows the total number of malaria cases reported in Miwani *Shehia* in different weeks in 2015; the highest number of cases was reported in week 4. Similarly, the row highlighted in yellow shows the number of cases reported in Kitembweni village in Miwani *Shehia*, with 1 and 2 cases been reported in weeks 3 and 4, respectively. Note that the threshold for malaria cases at the *shehia* level is 10 or more cases, and that at the village level is 5 or more cases. Hence, none of the above exceeds the specified limit. Note: This type of analysis is performed on a weekly basis to ensure that outbreaks are detected in a timely manner.

4. Chapter 4: Frequently Asked Questions (FAQ) and Exercise

4.1 FAQ

- **Q:** Is the threshold value the same for all districts, *shehias*, and health facilities?
- **A:** No, each level has its own threshold value.
- **Q:** What is the threshold value?
- **A:** The threshold value is the level that must be reached for an effect to be produced.

Exercise

1. Download the MCN data for the period of May 1–August 31, 2014, and identify all the villages and *shehias* exceeding their respective thresholds.

2. As a team, describe how you would conduct the response activities from the planning stage to the reporting stage.
3. Present your results and describe all the challenges you encountered during the exercise.