

# Ministry of Health, Jordan Public Health Surveillance

April to September 2015



September 2015

Prepared by WHO Jordan

## KEY RESULTS

# 71,208

consultations recorded between  
April – September 2015

# 297

alerts generated between April –  
September 2015

## JORDAN PUBLIC HEALTH SURVEILLANCE

The Ministry of Health Jordan, with the support of WHO, implemented a national program of public health surveillance in April 2015.

The project introduced case-based, integrated disease surveillance of mental health, non-communicable and communicable disease, and is programmed using mobile technology and an online framework.

The results of the first six months of implementation are presented in this report, with conclusions and recommendations to inform future programming of public health surveillance in Jordan.

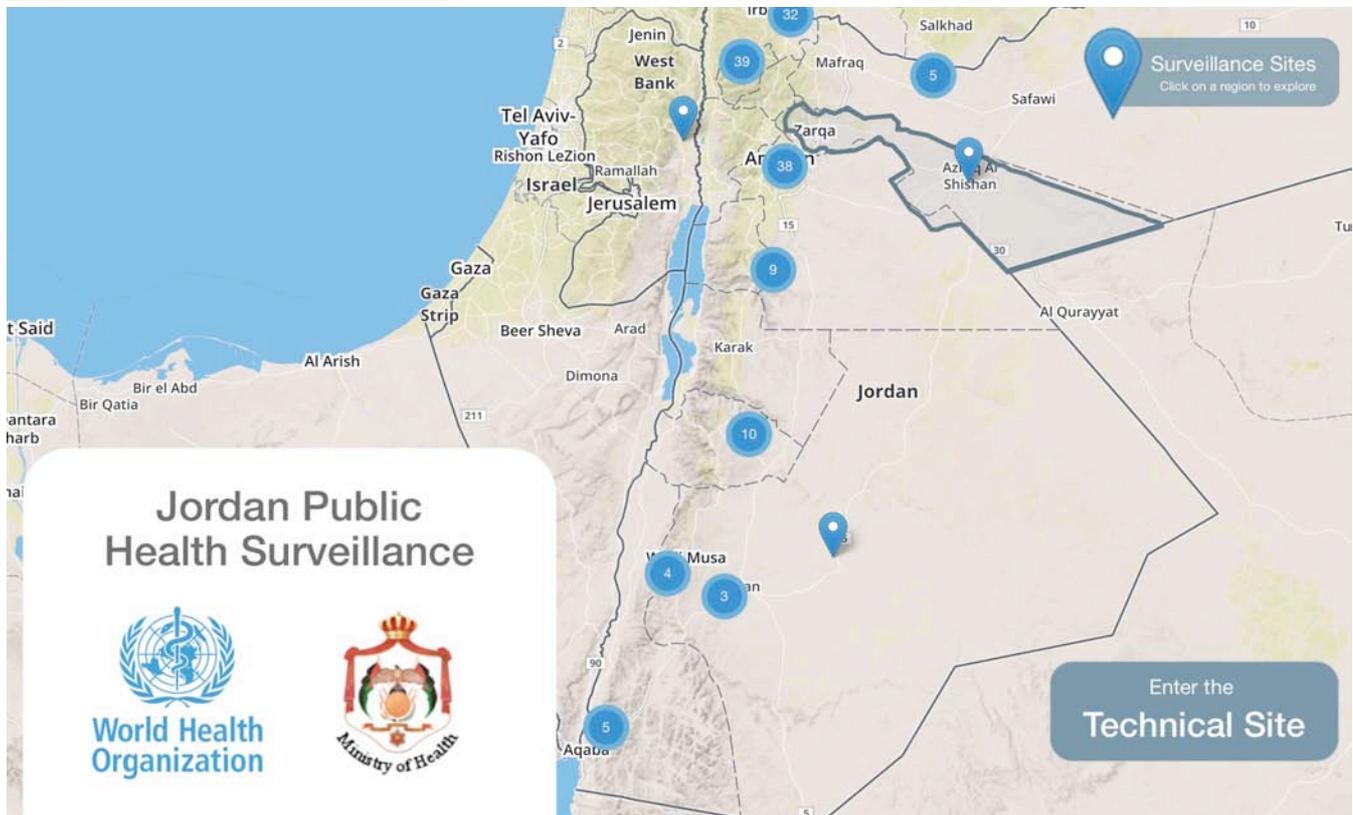


Figure 1. Map of showing location of 269 facilities (indicated by number in blue circles) that participated in the public health surveillance between April - September 2015

## SUMMARY

More than 629,266 Syrian refugees were registered in Jordan up to 6 September 2015, comprising more than 10% of the entire Jordanian population. Communicable diseases remain of public health concern in Jordan and little to no information is known of the burden of mental health and non-communicable disease among displaced populations.

There is a need to strengthen national public health surveillance in Jordan in order to monitor the epidemiology of priority public health diseases, conditions and events. A pilot public health surveillance project was initiated in Jordan between May to December 2014 that demonstrated the feasibility of collecting, analyzing and reports disease surveillance information using mobile tools in real-time.

Following the success of pilot implementation, the Ministry of Health Jordan implemented a national program of public health surveillance in April 2015. The results of the first six months of implementation, using 409 mobile devices in 269 health facilities across the country are presented in this report.

### Key Results

1. Integrated, case-based public health surveillance was implemented using 409 mobile devices across 269 health facilities in Jordan between April - September 2015.
2. A total of 1,783 health workers were trained in use of the system in 52 training workshops across the country.
3. The total cost national scale-up was USD\$ 94,089.0 with unit cost per reporting site of USD\$ 227 and maintenance cost per reporting site per year of USD\$ 96.
4. A total of 71,208 consultations and 6,002 cases were reported with 5,600 (93%) cases coded according to ICD-10.
5. A total of 297 automated real-time notifications and alerts were generated within one hour of reporting to inform outbreak investigation and response at the appropriate level of Ministry of Health decision-making.
6. Additional information is available to the clinician, including the essential medicines list for prescribing and clinical algorithms of integrated management of childhood illness (IMCI) and mental health (mhGAP)
7. Further data collection and analysis will facilitate a more detailed understanding of the burden of disease among host communities and displaced populations in Jordan, including relative disease burden among refugees, for public health and clinical decision-making.

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# INTRODUCTION

The humanitarian situation in the Syrian Arab Republic (Syria) and Iraq is of increasing concern, with growing domestic, regional, and international consequences. As the conflict in Syria enters its fifth year, insecurity and violence continue to force the people to seek safety and protection elsewhere. The current Iraq crisis began in early June 2014, when the extremist group Islamic State (IS), which already controls parts of Syria, seized much of northern Iraq, including the major city of Mosul. With no immediate prospect for peace, the combination of conflict, deteriorating economic opportunities, and shrinking social services are likely to generate further levels of displacement within Syria, Iraq and the region.

More than 629,266 Syrian refugees were registered in Jordan up to 9 September 2015, with a further estimated 750,000 unregistered refugees living in non-camp settings, comprising approximately 20% of the entire Jordanian population. While health services inside the refugee camps are primarily supported by international agencies, 80% of refugees reside in non-camp settings and are placing an increasing burden on the national health infrastructure. Communicable diseases remain of public health concern and little to no information is known of the burden of mental health and non-communicable disease among displaced populations.

There is a need to strengthen national public health surveillance in Jordan in order to monitor the status and functioning of the national health system and to ensure it can provide health services to meet the basic needs of both displaced populations and host communities. There is also a need to monitor the epidemiology of priority public health diseases, conditions and events, including mental health, non-communicable disease and communicable disease.

## Project objectives

A national program of routine public health surveillance was initiated in Jordan in April 2015. The project introduced case-based, integrated disease surveillance of mental health, non-communicable disease and communicable disease, and is programmed using mobile technology and an online framework. The project has two objectives:

- to monitor the epidemiology of priority public health diseases and conditions (including mental health, non-communicable disease and communicable disease) among refugees and host communities in Jordan; and
- to monitor the status and functioning of the national health system in Jordan in response to the Syria and Iraq crises.

The clinician uses the system within the consultation, which introduces clinical-decision support as well as real-time reporting of information. This information is made available within one hour via an online framework with automated generation of SMS and email alerts, support for mapping and reporting functions, and can be accessed at all levels of MOH.

The first phase of national expansion of public health surveillance was implemented between April – September 2015 and introduced case based reporting across 269 health facilities in all twelve governorates of the country, using 409 mobile devices.

## Principles of implementation

The project has the following principles of implementation:

### 1. Routine surveillance

The project supports routine surveillance to ensure the national health system is strengthened and the capacity of the Ministry of Health is developed for long-term ownership and response.

### 2. Integrated disease surveillance

The project builds on existing WHO and international surveillance standards, guidelines and case definitions for mental health, non-communicable and communicable disease and uses the International Classification of Diseases (ICD-10) to code and classify diseases, conditions and events. The case definition and clinical algorithms of signs/symptoms, laboratory diagnostic criteria and alert thresholds specific to national guidelines are detailed in the national training manual for routine public health surveillance.

### 3. Case-based surveillance

Data is entered directly by the attending clinician during the consultation (or in some cases following the consultation by a nurse). The system uses mobile information technology to enable case-based reporting in real-time from the health facility.

### 4. Clinical-decision support

Additional information is available to the clinician, including the essential medicines list for prescribing and clinical algorithms of integrated management of childhood illness (IMCI) and mental health (mhGAP). A standardised case definition, and clinical decision support for priority diseases, including signs and symptoms, risk factors, diagnostic screening criteria and laboratory advisories is also provided.

### 5. Alerts and notifications

Automated real-time notifications and alerts are generated, by SMS and email, within one hour of reporting to inform outbreak investigation and response at the appropriate level of decision-making. A line list of alerts is automatically generated via the online framework which links subsequent alert investigation and outcomes.

### 6. Mobile data collection and management

National reporting forms are replicated in an electronic format and standardised case definitions adhered to. Data is submitted in real-time to a cloud-based server via a mobile data network connection.

### 7. Online framework

The system shares structured, anonymised data via an online framework for geospatial data visualisation, generation of alerts, and automated generation of reports. Annex 1 shows an example report that is automatically generated.

A online framework for Jordan public health surveillance can be accessed via the following link:

<https://jordan.emro.info>

## METHODS

### Project implementation

The public health surveillance system was approved for use in Jordan by the Ministry of Health and adheres to national surveillance standards and case definitions. The Ministry of Health, in co-ordination with the WHO Jordan country and regional offices, led project implementation. Several tools and cross-cutting themes supported national health system strengthening, including the adoption of a common information management framework, standardised indicators and alert thresholds, technical support and capacity building, and introduction of structured data collection, management and reporting tools.

### Budget

USD\$18,235.2 was required for Phase 1 pilot implementation between May – November 2014 and USD\$ 10,712.9 was required to support Phase 2 pilot implementation between November – December 2014 (Table 1).

The cost for Phase 3 national scale-up between April - September 2015 was USD\$94,089.0 (Table 1), using 409 tablets and covering 269 health facilities in Jordan (including primary and comprehensive care facilities, hospital, prisons and mental care facilities). Subsequent support and system costs are approximately USD\$40,000 per year.

The unit cost per reporting site (tablet) of establishment and training is around USD\$ 227 and subsequent maintenance cost per reporting site (tablet) per year is around USD\$ 96.

Item	Phase 1 pilot (USD)	Phase 2 pilot (USD)	Phase 3 national (USD)
Training	2,685.2	690.9	27,435.0
Development			17,647.0
Server			4,265.5
Tablets	12,250.0	9,065.0	30,001.4
Connection	3,300.0	957.0	14,740.0
<b>Total</b>	<b>18,235.2</b>	<b>10,712.9</b>	<b>94,089.0</b>

\* USD:JOR 1:0.708 as of 5 September 2015.

Table 1. Budget for pilot and national implementation of public health surveillance

### Monitoring

Monitoring of national surveillance and response was routine and continuous. An evaluation of pilot implementation took place in December 2014 and this report forms the basis of the first six months evaluation of national scale-up.

Two categories of indicators were monitored during the project – first, the health status of the population, which include morbidity of priority public health diseases, conditions and events, including mental health, non-communicable and communicable disease and second the functioning of the health system and infrastructure.

This report focuses on the first indicator – namely, health status of the population. Functioning and status of the health system is not included in this report.

### Risk analysis and mitigation measures

The project assumed the WHO Jordan country office would provide technical, financial and administrative support to the MOH Jordan to introduce a common information management framework and innovative technologies for strengthening public health surveillance. The project timeframe assumed those displaced by conflict would remain at the same or increased numbers for more than one year and would mostly be settled in non-camp settings. The project also assumed WHO would maintain its ability to operate in a safe and secure manner in Jordan.

### Data management and security

A two-step process of data management and security was followed. In the first step, patient identifiable information was sent from mobile devices at each clinic to a secure, encrypted cloud-based server hosted. Only MOH had access to these data. In the second step, all data were anonymised and sent to a second cloud-based server instance. Patient identifiable data that were removed included name, address and any free-text fields that represent patient identifiable information. The date of birth was rounded to the beginning of the month.

Only anonymised, aggregated data on the second server instance was accessed by a password protected, online framework to generate and display information. This website was updated every hour to inform decision-making and planning and included the following functionality:

- charts, maps and tables of anonymised data, disaggregated by gender, status, nationality, disease and epidemiological week or year.
- data drilled from national to directorate to clinic level.
- individual disease information, including epidemiological curve, classification, source, alert threshold, case definition, risk factors, signs/symptoms and laboratory diagnostics.
- a line list of alerts and notifications automatically updated each hour.
- individual alert information, including clinic, reporting date, investigation date and outcome of investigation.

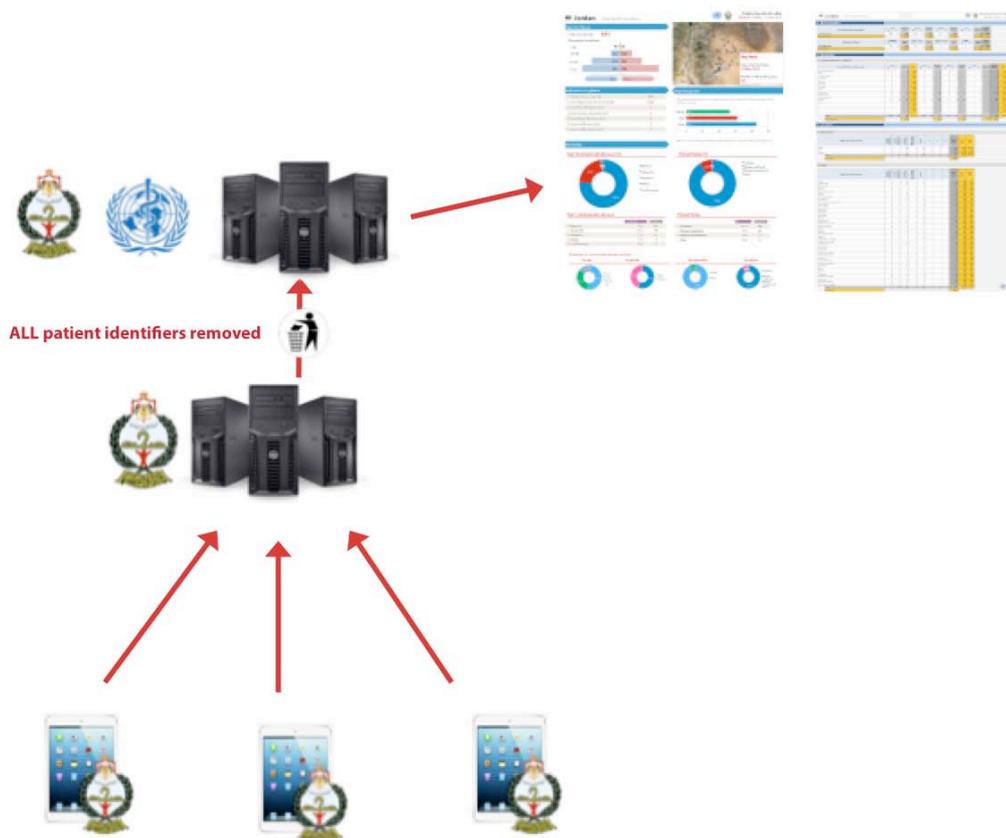


Figure 4. Two step process of data management and security.

### Outbreak confirmation

Outbreak confirmation and investigation was not implemented during the first six months of national implementation. A workflow is being developed by MOH to investigate all alerts and notifications (specific to each alert type), including:

- each alert will be responded to by the directorate within 48-72 hours and an electronic investigation form completed to assess the status of referral, case management, laboratory diagnosis and contact tracing.
- the investigation form will be completed on a mobile device and uploaded in real-time.
- the form will automatically be linked to the original case report via the online framework.
- the outcome of the alert will be automatically updated according to its status of completion (pending, ongoing, confirmed, not confirmed).
- if an alert is confirmed then formal outbreak investigation will be initiated by MOH.

## IT system specifications

The public health surveillance system was built using free, open source software and builds on common platforms and previous work. The system implemented a cloud-based model, rather than a local clinic model, which removed the need for local clinic infrastructure and enhanced data access and sharing at different levels of the health system. In using the term “cloud-based” we refer to the fact that the server and data are hosted centrally by the Ministry of Health and not by the individual clinic.

### 1. Data is entered using XML forms and ODK mobile application

A **case-based reporting form**, available in Arabic and English, was designed in extended mark-up language (XML) and uploaded to tablets for clinic consultations. The form included individual patient information and disease specific information, including relevant clinical and laboratory findings. Each form was programmed for the **Open Data Kit** (ODK; <http://www.opendatakit.org>) application and skip logic algorithms were used. Android-based Lenovo IdeaTab 7” A3000 and A3500 tablets were used in each health facility, with built-in mobile data connection, and were locked so users could not use the device for any other function. All facilities received appropriate training in the use of tablets and appropriate data collection and interview techniques. An electronic **daily register** form was completed by each clinic to record total number of consultations recorded each day as well as zero reporting of measles and acute flaccid paralysis cases.

### 2) Data is submitted via mobile devices to a MOH hosted server

Data were uploaded in real-time from the clinic tablets to the central server and surveillance database. Only tablets using SIM cards registered by the project could access the server, which was hosted by the Ministry of Health in Amman, Jordan.

A HP ProLiant DL380 Generation 8 server with an Ubuntu operating system was installed by WHO Jordan in the Ministry of Health Jordan Data Centre. The server has a RAID array with hard drives to protect against hard drive failure and a redundant power supply. The server has fully encrypted hard drives and is set up with a firewall to allow access only for web traffic and secure shell connections (SSH). A RSA key is needed to access the server remotely, and a service to deny repeated unsuccessful log-in attempts is running. The server is connected to an Uninterruptible Power Supply (UPS).

### 3) A python script anonymises data and imports to a second WHO hosted server every hour

Data were imported, anonymised and aggregated over time and location using a custom designed application. The application was based on a **PostgreSQL** (<http://www.postgresql.org>) database, a **python** (<http://www.python.org>) application programming interface (API) and a password protected HTML/Javascript website. This website was updated with new aggregated and anonymised data every hour.

The custom-designed website displayed demographics and proportional disease morbidity at directorate, district and health centre level. Anonymised, aggregated data were displayed using tables, charts and maps. The website was based on the **Bootstrap framework** (<http://getbootstrap.com/2.3.2>) and used **NvD3** (<http://nvd3.org>) for charting and **leafletJS** (<http://leafletjs.com>) for mapping functions. The python API is based on the bottle package.

### 4) Anonymised data is hosted in a PostgreSQL database, developed using a virtual environment (Vagrant) and hosted on Ubuntu 12.04 Virtual Private Server (VPS)

The FormHub installation and online framework were hosted on virtual private servers, provided by **Linode** (<http://www.linode.com>).

### 5) The PostgreSQL database is relational and facilitates python scripted export of reports and data in other formats

The online framework automatically generated various reports and data tables. Customised PDF reports were generated automatically each week and posted on the website for download. PDF generation was handled by **DocRaptor** (<http://www.docraptor.com>). Excel based raw data and data tables were automatically generated and posted to the website each week for download.

### 6) The online framework generates automated SMS and Email alerts

Whenever certain notifiable diseases were reported to the system, alerts were sent via SMS and email to appropriate levels of MOH. Text messaging protocols were handled by **Nexmo** (<http://www.nexmo.com>) and batch emails were handled by **Postmark** (<http://www.postmark.com>).

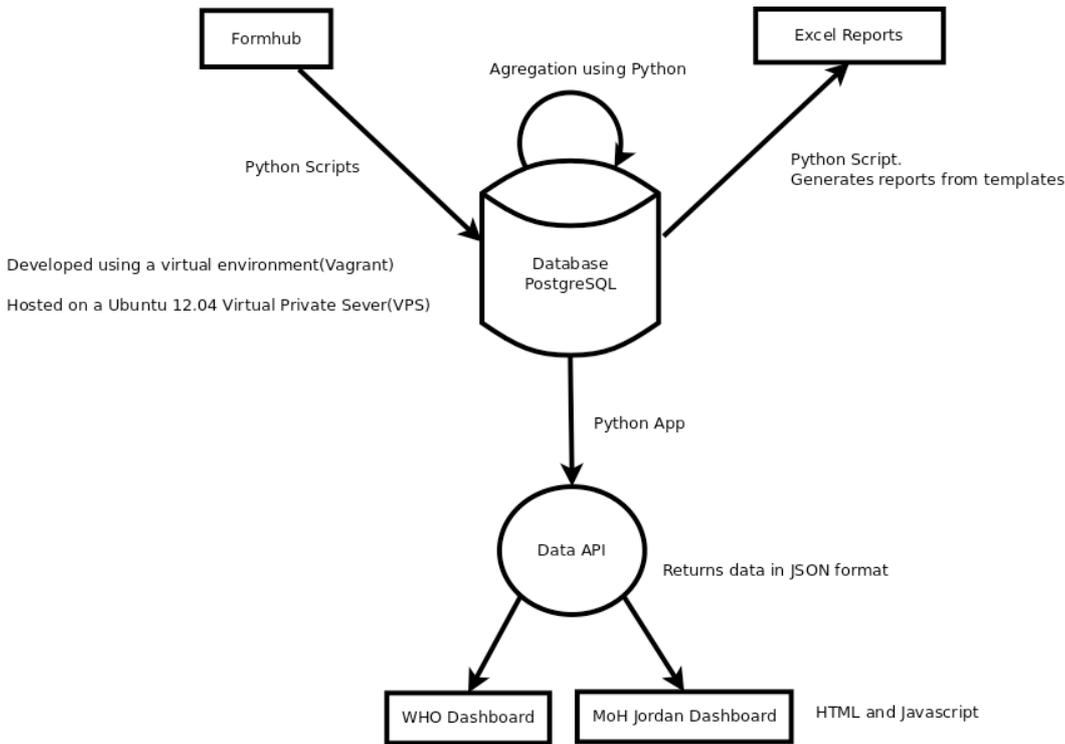


Figure 5. IT systems architecture for the public health surveillance project

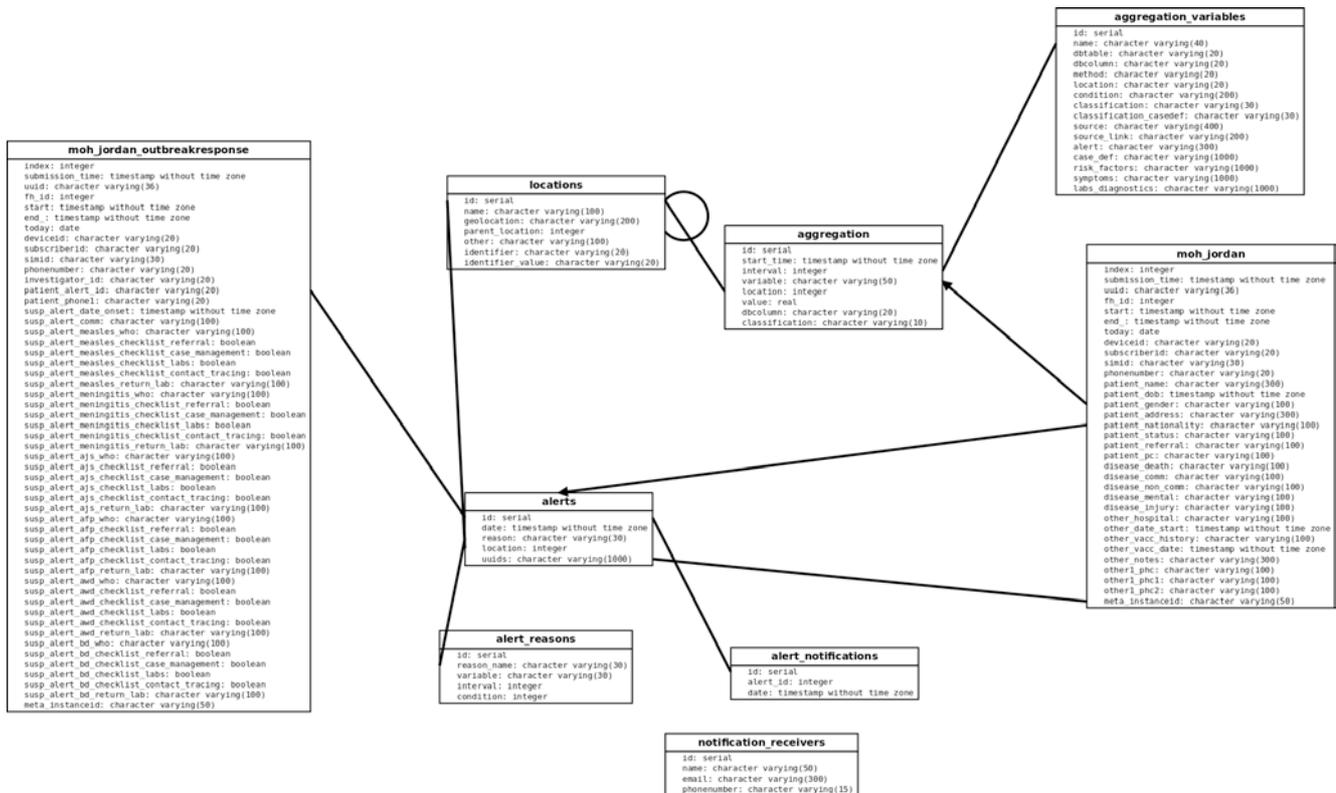


Figure 6. Database schema for the public health surveillance project (incomplete).

## Training

A total of 1,783 health workers were trained in the use of public health surveillance between April to September 2015 in 52 separate training sessions across all twelve governorates of Jordan. The total cost of this training was USD\$ 27,435 or USD\$ 15 per person.

A summary of trainings and participants by Governorate between April to September 2015 is shown in Table 2. A detailed breakdown of individual trainings by date is shown in Annex 2.

Governorates	Trainings	Participants
Ajloun	3	120
Amman	5	187
Aqaba	3	95
Balqa	5	116
Irbid	7	302
Jerash	3	120
Karak	3	91
Ma'an	3	95
Madaba	4	102
Mafrq	7	288
Ramtha	1	35
Tafleh	3	91
Zarqa	5	141
<b>Total</b>	<b>52</b>	<b>1,783</b>

Table 2. Summary of trainings and participants by Governorate between April – September 2015

# RESULTS

## Demographics

- A total of 71,208 consultations and 6,002 cases were reported between April to September 2015 from 409 tablets and 269 health facilities across Jordan.
- 1,923 (32%) of cases were reported from Irbid governorate.
- 2,796 (47%) of cases reported were female and 2,105 (35%) of cases reported were under the age of five years.
- 5,782 (96%) of cases reported were Jordanian, 128 (2%) of cases reported were refugees.

### DEMOGRAPHICS

## 6,002

cases were reported between April to September 2015

## 35%

of cases reported were aged under five years

## 2%

of cases reported were refugees

Gender	N	%
Male	3,206	53%
Female	2,796	47%
<b>Total</b>	<b>6,002</b>	<b>100%</b>

Age Group	N	%
< 5 years	2,105	35%
5-9 years	1,041	17%
10-14 years	544	9%
15-19 years	245	4%
20-59 years	1,721	29%
> 60 years	346	6%
<b>Total</b>	<b>6,002</b>	<b>100%</b>

Status	N	%
National	5,768	96%
Refugee	128	2%
Other	106	2%
<b>Total</b>	<b>6,002</b>	<b>100%</b>

Table 3. Gender, Age Group and Status of cases reported through the public health surveillance system between April - September 2015.

Nationality	N	%
Jordan	5,782	96%
Syria	103	2%
Egypt	16	0%
Palestine	25	0%
Iraq	12	1%
Other	64	0%
<b>Total</b>	<b>6,002</b>	<b>100%</b>

Governorate	N	%
Ajloun	312	5%
Amman	546	9%
Aqaba	131	2%
Balqa	1,356	23%
Irbid	1,923	32%
Jarash	314	5%
Karak	95	2%
Ma'an	135	2%
Madaba	109	2%
Mafrq	485	8%
Tafeileh	481	8%
Zarqa	115	2%
<b>Total</b>	<b>6,002</b>	<b>100%</b>

Table 4. Location and Nationality of cases reported through the public health surveillance system between April - September 2015.

## Presenting Complaint

- A total of 5,600 (93%) cases were coded according to ICD-10 between April to September 2015.
- 72% of cases reported between April to September 2015 were for communicable disease.

### PRESENTING COMPLAINT

# 93%

of cases were coded according to ICD-10

# 72%

of cases reported between April – September 2015 were for communicable disease

Presenting Complaint	N	%
Non-communicable disease	1,104	18%
Mental Health	85	1%
Communicable disease	4,347	72%
Other	403	7%
Injury	62	1%
Reproductive Health	1	0%
<b>Total</b>	<b>6,002</b>	<b>100%</b>

Table 5. Table of presenting complaints between April - September 2015.

ICD-10 code	N	%
01. Certain infectious and parasitic diseases	4,342	72%
02. Neoplasms	2	0%
03. Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	42	1%
04. Endocrine, nutritional and metabolic diseases	440	7%
05. Mental and behavioural disorders	85	1%
06. Diseases of the nervous system	6	0%
07. Diseases of the eye and adnexa	1	0%
09. Diseases of the circulatory system	404	7%
10. Diseases of the respiratory system	63	1%
11. Diseases of the digestive system	145	2%
15. Pregnancy, childbirth and the puerperium	1	0%
18. Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	6	0%
19. Injury, poisoning and certain other consequences of external causes	62	1%
21. Factors influencing health status and contact with health services	1	0%
23. Other (Not ICD-10 coded)	402	7%
<b>Total</b>	<b>6,002</b>	<b>100%</b>

Table 6. Table of presenting complaints, by ICD-10 code, generated between April - September 2015.

## Alerts and notifications

- 297 alerts were generated between April – September 2015.
- The most common alerts generated were for suspected bloody diarrhoea (24%), rubella (19%) and Hepatitis B (16%).
- 28 cases of suspected measles and 2 cases of suspected acute flaccid paralysis were reported through the public health surveillance system.

## ALERTS AND NOTIFICATIONS

**297**

alerts were generated between April - September 2015

**24%**

of alerts generated between April – September 2015 were for suspected bloody diarrhoea

**19%**

of alerts generated between April – September 2015 were for suspected rubella

Alerts	N	%
Bloody diarrhoea	71	24%
German measles (Rubella)	57	19%
Hepatitis B	48	16%
Measles	28	9%
Mumps	21	7%
Brucellosis	18	6%
Hepatitis A	18	6%
Food Poisoning	15	5%
Viral meningitis	5	2%
Scarlet fever	4	1%
Meningococcal meningitis	3	1%
Acute Flaccid Paralysis	2	1%
Cholera	2	1%
Pertussis	1	0%
Syphilis	1	0%
Echinococcosis	1	0%
Hepatitis C	1	0%
Typhoid fever	1	0%
<b>Total</b>	<b>297</b>	<b>100%</b>

Table 7. Table of alerts generated between April - September 2015.

Alert ID	Alert	Directorate	Clinic	Date Reported	Date Investigated	Central Review	Status
e99a8b	Measles	Ramtha	Al-Tatweer Al-Hadari	2015-09-03	-	-	Pending
de117c	Brucellosis	North Badia	Al-Badiyah Al-Shamali	2015-09-03	-	-	Pending
66ef38	Measles	Amman	Al-Nasser	2015-09-03	-	-	Pending
25e0ee	Measles	Irbid	Deir Abi Se'eid	2015-09-03	-	-	Pending
566327	Hepatitis A	Mafrq	Gynecology & Obstetrics and Children Hospital	2015-09-02	-	-	Pending
00e28	Bloody diarrhoea	Karak	Talal	2015-09-02	-	-	Pending
e5030f	German measles (rubella)	Koura	Samou'e	2015-09-02	-	-	Pending
531f3c	Brucellosis	Mafrq	Gynecology & Obstetrics and Children Hospital	2015-09-01	-	-	Pending
04dc4c	Brucellosis	Balqa	Al-Rawdah	2015-09-01	-	-	Pending
8f18ae	Mumps	Balqa	Ain Al-Basha	2015-09-01	-	-	Pending
60cae5	Bloody diarrhoea	Balqa	Ain Al-Basha	2015-08-31	-	-	Pending
59bd1c	Hepatitis C	Amman	National Addiction Center	2015-08-31	-	-	Pending
e4e2b9	Mumps	Zarqa	Isskan Al-Amir Talal	2015-08-30	-	-	Pending
8a01a8	Hepatitis B	Ma'an	Queen Rania Hospital	2015-08-30	-	-	Pending
1fa766	Hepatitis A	Ma'an	Queen Rania Hospital	2015-08-30	-	-	Pending
cd9a5d	German measles (rubella)	Ramtha	Al-Shajrah	2015-08-26	-	-	Pending
9cd161	Hepatitis A	Tafelieh	Al-Qadissiah	2015-08-26	-	-	Pending
4fb0e6	Typhoid fever	Zarqa	Al-Rousifeh Al-Shamali	2015-08-26	-	-	Pending
11ad90	Measles	Ramtha	Sahel_Houran	2015-08-26	-	-	Pending
9d4ba1	Hepatitis A	Mafrq	Fa'a	2015-08-25	-	-	Pending
b3978e	Measles	Balqa	Mahess	2015-08-25	-	-	Pending
2766d9	Measles	Mafrq	Gynecology & Obstetrics and Children Hospital	2015-08-23	-	-	Pending
970d9d	Poliomyelitis	Zarqa	Al-Rousifeh Al-Shamali	2015-08-23	-	-	Pending
86129d	German measles (rubella)	Zarqa	Al-Dieil	2015-08-21	-	-	Pending
541c79	Bloody diarrhoea	Mafrq	Gynecology & Obstetrics and Children Hospital	2015-08-15	-	-	Pending
06f541	Bloody diarrhoea	Mafrq	Gynecology & Obstetrics and Children Hospital	2015-08-12	-	-	Pending
995636	Bloody diarrhoea	Irbid	Rahmah Hospital	2015-08-12	-	-	Pending
efdd0a	Scarlet fever	Ramtha	Sahel_Houran	2015-08-10	-	-	Pending
2f39bf	Brucellosis	Amman	Prince Hamza Hospital	2015-08-10	-	-	Pending
4cc59a	Bloody diarrhoea	Karak	Talal	2015-08-09	-	-	Pending

Figure 7. Alert line list from the online framework for Jordan Public Health Surveillance system (dated 4 September 2015).

## Communicable disease

- Table 8 and Table 9 lists the cases of suspected communicable disease reported through the public health surveillance system between April - September 2015 across 269 sites in Jordan.
- Acute diarrhoea had the highest reported proportional morbidity (70%), followed by chicken pox (16%) and animal bite (4%).

Communicable Disease	N	%
Diarrhoea	2,963	70%
Chicken pox	690	16%
Animal Bite	182	4%
Bloody diarrhoea	91	2%
German measles (Rubella)	66	2%
Hepatitis B	57	1%
Food Poisoning	52	1%
Measles	31	1%
Scabies	24	1%
Brucellosis	22	1%
Mumps	21	0%
Hepatitis A	20	0%
Viral meningitis	6	0%
Scarlet fever	4	0%
Meningococcal meningitis	3	0%
Cholera	2	0%
Acute Flaccid Paralysis	2	0%
Typhoid fever	1	0%
Syphilis	1	0%
Pertussis	1	0%
Hepatitis C	1	0%
Echinococcosis	1	0%
<b>Total</b>	<b>4,241</b>	<b>100%</b>

Table 8. Table of communicable diseases reported through the public health surveillance system between April - September 2015.

### COMMUNICABLE DISEASE

# 4,241

cases of communicable diseases were reported between April - September 2015

# 70%

of cases reported between April - September 2015 were acute diarrhoea

# 16%

of cases reported between April - September 2015 were chicken pox

Communicable Disease (ICD-10)	N	%
Intestinal infectious diseases	3,110	71.40%
Viral infections characterized by skin and mucous membrane lesions	788	18.10%
Viral infections of the central nervous system	258	5.90%
Viral hepatitis	94	2.20%
Certain zoonotic bacterial diseases	50	1.10%

Table 9. Table of top five communicable diseases, coded by ICD-10, reported through the public health surveillance system between April - September 2015.

## Non-communicable disease

- Table 10 lists the top five cases of suspected non-communicable disease reported through the public health surveillance system between April - September 2015 across 269 sites in Jordan.
- In-situ Neoplasms had the highest reported proportional morbidity (39%), followed by hypertensive diseases (22%) and diabetes mellitus (20%).

Non-communicable disease (ICD-10)	N	%
In situ neoplasms	692	39%
Hypertensive diseases	403	22%
Diabetes mellitus	350	20%
Other diseases of intestines	139	8%
Obesity and other hyperalimantation	89	5%

Table 10. Table of top five non-communicable diseases, coded by ICD-10, reported through the public health surveillance system between April - September 2015.

## Mental health

- Table 11 lists the top five cases of suspected mental reported through the public health surveillance system between April - September 2015 across 269 sites in Jordan.
- In-situ Neoplasms had the highest reported proportional morbidity (39%), followed by hypertensive diseases (22%) and diabetes mellitus (20%).

Mental Health (ICD-10)	N	%
Mood [affective] disorders	53	62%
Schizophrenia, schizotypal and delusional disorders	11	13%
Neurotic, stress-related and somatoform disorders	10	12%
Mental retardation	4	5%
Mental and behavioural disorders due to psychoactive substance use	3	4%

Table 11. Table of top five mental health conditions, coded by ICD-10, reported through the public health surveillance system between April - September 2015

### NON-COMMUNICABLE DISEASE

# 1,673

cases of communicable diseases were reported between April - September 2015

# 39%

of cases reported between April - September 2015 were in-situ neoplasms

# 22%

of cases reported between April - September 2015 were hypertensive diseases

### MENTAL HEALTH

# 1,673

cases of communicable diseases were reported between April - September 2015

# 39%

of cases reported between April - September 2015 were in-situ neoplasms

# 22%

of cases reported between April - September 2015 were hypertensive diseases

## CONCLUSIONS

1. Integrated, case-based public health surveillance was implemented using 409 mobile devices across 269 health facilities in Jordan between April - September 2015.
2. A total of 1,783 health workers were trained in use of the system in 52 training workshops across the country.
3. The total cost national scale-up was USD\$ 94,089.0 with unit cost per reporting site of USD\$ 227 and maintenance cost per reporting site per year of USD\$ 96.
4. A total of 71,208 consultations and 6,002 cases were reported with 5,600 (93%) cases coded according to ICD-10.
5. A total of 297 automated real-time notifications and alerts were generated within one hour of reporting to inform outbreak investigation and response at the appropriate level of Ministry of Health decision-making.
6. Additional information is available to the clinician, including the essential medicines list for prescribing and clinical algorithms of integrated management of childhood illness (IMCI) and mental health (mhGAP)
7. Further data collection and analysis will facilitate a more detailed understanding of the burden of disease among host communities and displaced populations in Jordan, including relative disease burden among refugees, for public health and clinical decision-making.

# ANNEXES

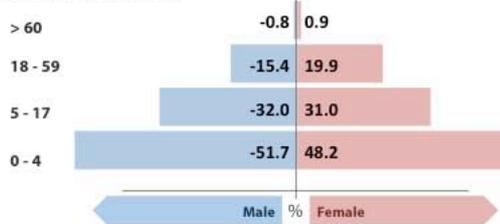
## Annex 1. Example Public Health Profile

### Jordan | Public Health Surveillance

#### Reported Cases

Total cases reported: **3,423**

Demographic breakdown:

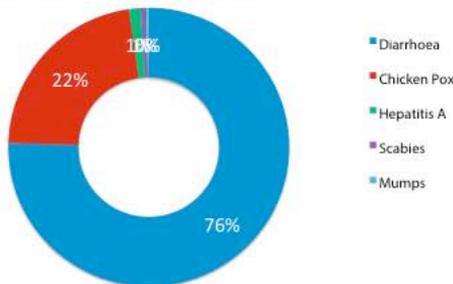


#### Indicators at a glance

1 Number of cases reported	<b>3,423</b>
2 Syria refugee proportional morbidity	<b>6.2%</b>
3 Acute Flaccid Paralysis alerts	<b>1</b>
4 Acute Jaundice Syndrome alerts	<b>0</b>
5 Acute Watery Diarrhoea alerts	<b>0</b>
6 Suspected Measles alerts	<b>3</b>
7 Suspected Meningitis alerts	<b>11</b>

#### Morbidity

##### Top 5 Communicable Diseases (%)

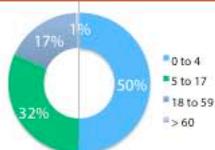


##### Top 5 communicable diseases

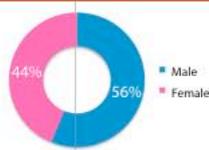
Disease	% morbidity	# of cases
1 Diarrhoea	74.1%	2,537
2 Chicken Pox	21.9%	748
3 Hepatitis A	1.3%	45
4 Scabies	0.6%	22
5 Mumps	0.3%	11

##### Breakdown of communicable disease conditions

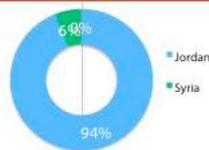
###### by age



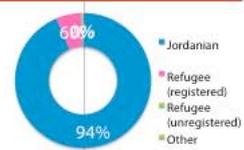
###### by gender



###### by nationality



###### by status

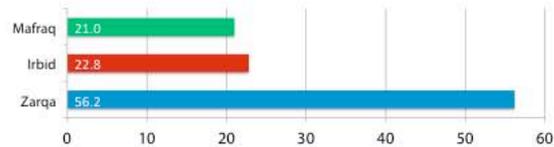


### Public Health Profile Week 38 | 28 May - 24 Sept 2014



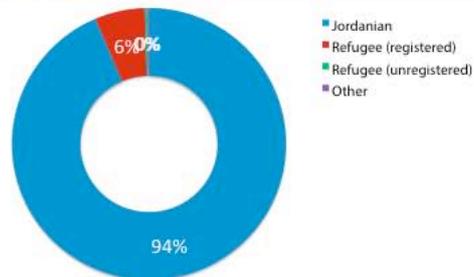
#### Reporting Sites

This public health profile is compiled from 50 Ministry of Health reporting sites in northern Jordan.



Data is collected using standardised mobile data collection and reporting tools.

##### Patient Status (%)



##### Patient Status

Status	%	# of cases
1 Jordanian	93.6%	3,204
2 Refugee (registered)	5.9%	202
3 Refugee (unregistered)	0.3%	9
4 Other	0.2%	8

## Annex 2. Dates and Locations of Training between April – September 2015

Day	Date	Location	Participants
Wednesday	01-Apr	Amman	32
Thursday	02-Apr	Zarqa	32
Sunday	05-Apr	Zarqa	32
Monday	06-Apr	Zarqa	32
Tuesday	07-Apr	Irbid	32
Wednesday	08-Apr	Irbid	32
Thursday	09-Apr	Irbid	32
Tuesday	05-May	Amman	35
Wednesday	06-May	Amman	35
Thursday	07-May	Amman	35
Sunday	10-May	Aqaba	30
Monday	11-May	Ma'an	30
Tuesday	12-May	Irbid	42
Wednesday	13-May	Irbid	42
Thursday	14-May	Irbid	42
Sunday	17-May	Aqaba	30
Monday	18-May	Ma'an	30
Tuesday	19-May	Karak	28
Wednesday	20-May	Karak	28
Thursday	21-May	Tafleh	28
Sunday	24-May	Tafleh	28
Monday	25-May	Balqa	25
Tuesday	26-May	Balqa	25
Wednesday	27-May	Balqa	26
Thursday	28-May	Mafraq	35
Sunday	31-May	Mafraq	35
Monday	01-Jun	Mafraq	35
Tuesday	02-Jun	Mafraq	35
Wednesday	03-Jun	Mafraq	34
Thursday	04-Jun	Mafraq	34
Sunday	07-Jun	Madaba	34
Monday	08-Jun	Madaba	33
Tuesday	09-Jun	Ajloun	40
Wednesday	10-Jun	Ajloun	40
Saturday	13-Jun	Jerash	40
Sunday	14-Jun	Jerash	40
Tuesday	18-Aug	Amman	50
Wednesday	19-Aug	Madaba	17
Thursday	20-Aug	Madaba	18
Sunday	23-Aug	Balqa	20
Monday	24-Aug	Balqa	20
Tuesday	25-Aug	Zarqa	20
Wednesday	26-Aug	Zarqa	25
Thursday	27-Aug	Mafraq	80
Sunday	30-Aug	Jarash	40
Monday	31-Aug	Ramtha	35
Tuesday	01-Sep	Tafleh	35

## Jordan Public Health Surveillance | September 2015

Wednesday	02-Sep	Ma'an	35
Thursday	03-Sep	Aqaba	35
Sunday	06-Sep	Ajloun	40
Monday	07-Sep	Irbid	80
Tuesday	08-Sep	Karak	35