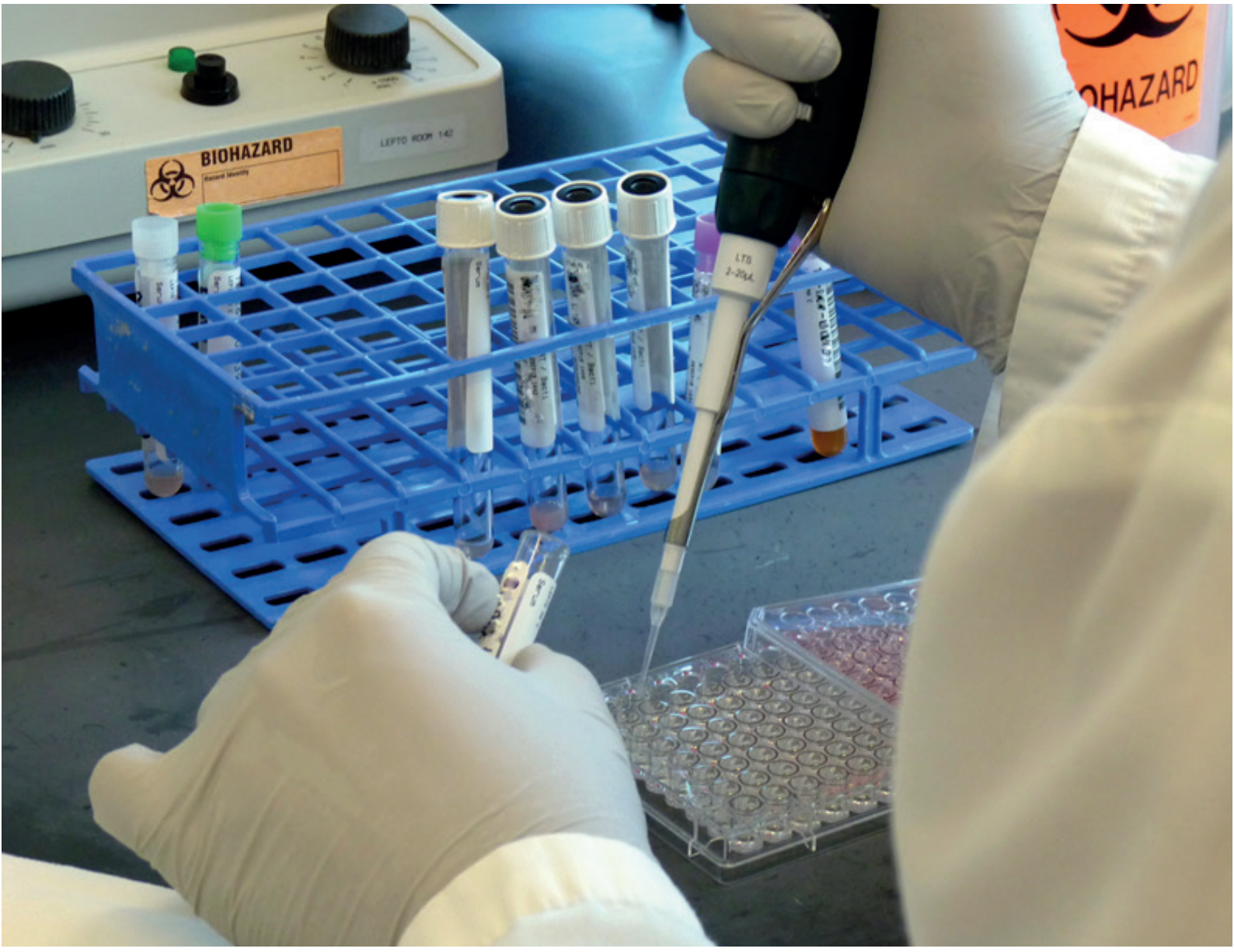
EMPHNET
The Eastern Mediterranean
Public Health Network

Ministry of Health

Brucellosis Surveillance Newsletter 2020



Evaluating the Impact of Enhanced Laboratory-Based Surveillance of Animal and Human Brucellosis in Jordan

Issue No. 2
May 2019-June 2020

Introduction

Brucellosis is a zoonotic disease and the infection is almost invariably transmitted by direct or indirect contact with infected animals or their products. It affects people of all age groups and of both sexes. Although there has been great progress in controlling the disease in many countries, still there are regions where the infection persists in domestic animals and, consequently,
transmission to the human population frequently occurs.

Brucellosis is an important human disease in many parts of the world especially in Europe, north and East Africa, the Middle East, South and Central Asia and Central and South America. However, it is often unrecognized and frequently goes unreported. In Jordan, the disease is under-diagnosed, and data related to its incidence, prevalence and main risk factors are limited.

Since May 2019, EMPHNET & CDC are implementing a project on sentinel laboratory-based surveillance system for brucellosis in three geographical regions in Jordan: East Amman, Karak and Mafraq. The project is implemented in collaboration with MOH, MOA, Royal Medical Services (RMS) and Princess Haya Biotechnology Center (PHBC).

The first issue of the project's newsletter was published in January 2020 and contained the project introduction and highlights on surveillance methodology and data generated during the implementation period of May-December 2019. This 2nd issue will provide more details about capacity building activities for laboratories at human and animal health facilities, which represents the project main goal. In addition, the newsletter will shed light on surveillance activities and data generated during the period of May 2019 -June 2020.

As mentioned, the main goal of this project is to build capacities of laboratories at both human and animal health facilities for diagnosis of human and animal brucellosis at peripheral, central, and national levels. To achieve this goal, EMPHNET conducted several hands-on training workshops to support the project workflow. These workshops were conducted in collaboration with the MOH, MOA, RMS and CDC and tackled several topics, including biosafety and good laboratory practices, and performing Rose Bengal Test (RBT) and (SAT) Serum Aglutination tests at primary human healthcare facilities. Training also covered ELISA IgG&IgM testing at public health labs in each governorate, collection of blood and milk samples from different animal species that are linked to confirmed human brucellosis cases and testing it by RBT and fluorescence polarization assay (FPA), and PCR testing of samples from human and animal confirmed cases at CPHL and CVL Amman. As well, testing reagents and consumables for serological and molecular detection of brucellosis were provided.

Brucellosis Surveillance Findings Since project Initiation (May 2019 to June 2020)

Despite the negative impacts of COVID-19 and complete lockdown of the country for almost three months (Mid-March to mid-June 2020), including the brucellosis surveillance at both human and animal health facilities, surveillance activities were resumed and new data is being generated almost every day. Figure 1 below shows a summary of the overall enrolled human cases from East Amman, Mafraq and Karak.

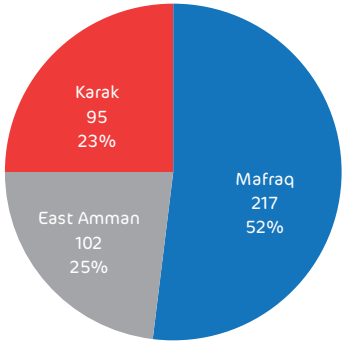


Figure 1. Enrolled human brucellosis cases in East Amman, Mafraq and Karak governorates, Jordan since May 2019 to the end of June 2020.

Laboratory Findings

Overall, 6125 suspected cases were tested for Rose Bengal screening test, however 414 of people who presented with Brucellosi s-like symptoms and tested positive for Rose Bengal test have been enrolled and entered in the study surveillance database.

Out of 414 collected blood samples from all sites, results of RBT, SAT and ELISA are available for 386 (93%) samples. Testing of the rest of samples (7%) is ongoing along with enrollment of new cases. Considering that all enrolled cases are Rose-Bengal test (RBT) positive to be included in the project, it was found that only 315 (82%) cases tested positive by SAT compared to 354 (92%) cases tested positive by ELISA as shown in table 1 and figure 2 below.

Governorate (samples tested)	RBT positive number & (%)	SAT positive number & (%)	ELISA positive number & (%)
East Amman	74(19%)	61 (82%)	69 (93%)
Al-Mafraq	217(56%)	190 (88%)	209 (96%)
Al-Karak	95(25%)	64 (67%)	76 (80%)
Total	386	315 (82%)	354 (92%)

Table 1. Testing results of brucellosis human cases at East Amman, Mafraq and Karak governorates, Jordan.

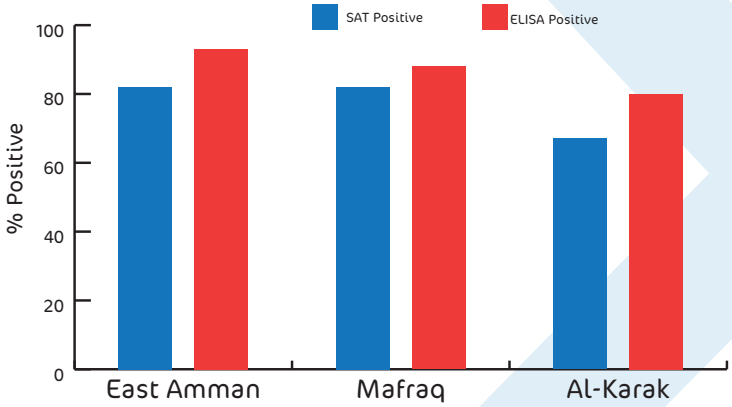


Figure 2. SAT and ELISA testing results of human enrolled cases from May 2019 to the end of June 2020 in East Amman, Mafraq and Karak.

Patients occupations were considered in data analysis as well. Out of 414 -enrolled human brucellosis cases, 153 (37%) cases had occupation related to animal, 229 (55%) cases had other occupations and occupations of 32 (8%) cases were not reported. Data is shown in table 2 and figure 3 below.

	Animal-related occupation	Other occupation	Not reported occupation	Total
East Amman	24 (16 %)	57 (25%)	14 (43%)	95
Al -Mafraq	91 (60%)	115 (50%)	11 (34%)	217
Al -Karak	38 (25%)	57 (25%)	7 (21%)	102
Total	153*	229**	32	

Table 2. Occupations of enrolled human cases since May 2019 to the end of June 2020
* Live-stock owner, veterinarian, butcher, farm laborer, etc
** Student, military person, housewife, child, etc

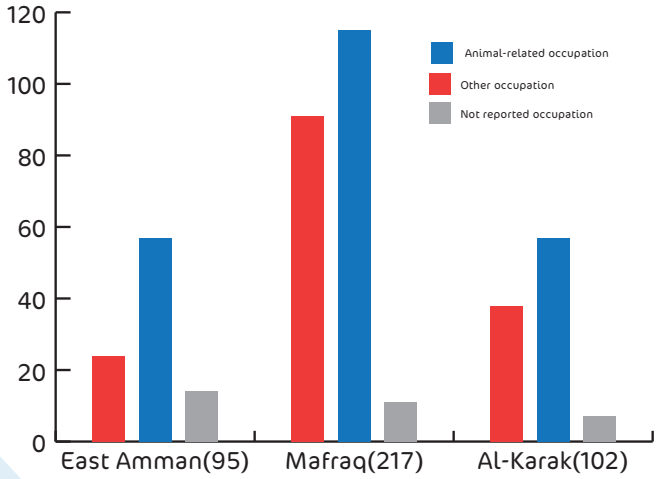


Figure 3: Occupations of enrolled human cases per governorate

Animal Farms Investigation Findings

As per the project design, whenever the patient has contact with animals, a veterinarian team visits the farm and collects different samples from farm animals. To date, a total of 116 farms had been investigated, 30 farms in East Amman, 65 farms in Mafraq and 21 farms in Karak. A total of 1090 biological samples were collected to include 766 blood and 324 milk as shown in table 3 and Figure 4.

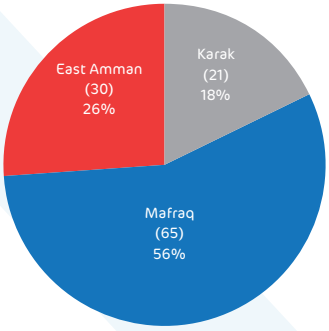


Figure 4. Investigated farms since May 2019 to June 2020

Governate	Farms visited	Samples collected	
		Blood	Milk
East Amman	30 (26%)	190	184
Al -Mafraq	65 (56%)	459	63
Al -Karak	21 (18%)	117	77
Total	116	766	324
Grand total samples	1090		

Table 3. Investigated farms and biologicals samples collected from animals related to human cases in East Amman, Mafraq and Karak.

Available (to date) testing results for brucellosis at animal health facilities per governorate is shown below. Out of 1090 collected blood (766) and milk (324) samples from the three governates, 249 blood samples tested positive by RBT, 349 tested positive by FPA while 46 milk samples tested positive by FPA. Data is shown in table 4.

Governorate	Blood(766)		Milk
	RBT positive	FPA positive	FPA positive
East Amman	61(32%)	89 (46%)	22(12%)
Al -Mafraq	154 (33%)	215 (47%)	10(16%)
Al -Karak	34(29%)	25 (21%)	14(18%)
Total	249(32%)	329 (43%)	46(14%)

Table 4. RBT and FPA testing results of blood and milk samples collected from the investigated farm animals in East Amman, Mafraq and Karak.

More analysis of the investigated farms data according to animal species (figure 5) and reason for investigation is shown below (figure 6).

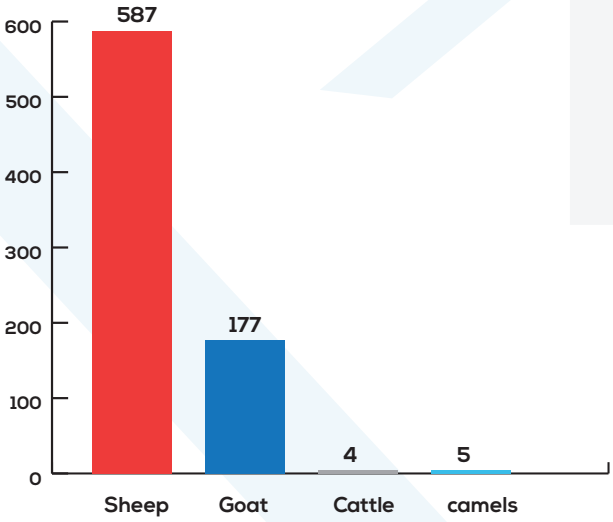


Figure 5. Species classification of collected animal samples from East Amman, Mafraq and Karak.

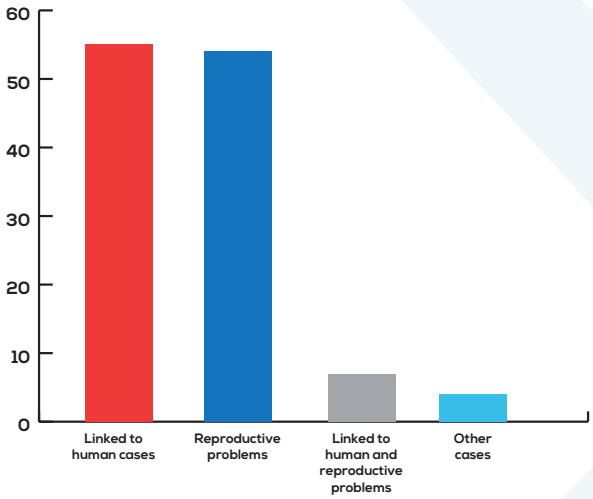


Figure 6. Data analysis based on the reason of farm investigation in East Amman, Mafraq and Karak.

Conclusion

In conclusion, human diagnostic testing for brucellosis has improved dramatically in the study areas. In addition, new laboratory methodologies for the detection and subtyping of Brucella species in human and animal populations (Fluorescence Polarization Assay, Brucella ELISA testing and PCR subtyping) were introduced a capacity that has never been available in Jordan.

Activities of brucellosis surveillance project were resumed after being severely affected by the country's complete lockdown for almost three months (Mid-March till mid-June 2020) due to COVID-19. The trained teams at each location are becoming more familiar with the project methodologies at both human and animal health facilities. EMPHNET continued the coordination with stakeholders. As well, data collection and testing of samples were resumed as of early June 2020.

EMPHNET
The Eastern Mediterranean Public Health Network

Ministry of Health

وزارة الزراعة

الخدمات الطبية الملكية

PHBC

Abdallah Ben Abbas Street 42 Shmeisani, Amman, Jordan Tel: +962-6-5519962 Fax: +962-6-5519963
www.emphnet.net jphf@emphnet.net