



**EMPHNET**

The Eastern Mediterranean  
Public Health Network



# Brucellosis Surveillance Newsletter 2021



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

Issue No. 3  
May 2019-December  
2020

## Introduction

Brucellosis is a highly contagious zoonosis caused by ingestion of unpasteurized milk or undercooked meat from infected animals, or close contact with their secretions. It is also known as undulant fever, Malta fever, and Mediterranean fever. The strong seasonality of the disease indicates that climatic factors may play important roles in the transmission of the disease. However, the associations between climatic variability and human brucellosis are still poorly understood.

This newsletter is the third issue of the project's newsletter, the first issue 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, the second issue was published in June 2020 and provided more details about capacity building activities for laboratories at human and animal health facilities, which represents the project main goal. In addition, the newsletter shed the light on surveillance activities and data generated during the period of May 2019 -June 2020.

This third issue will provide more details about surveillance activities and data generated during the period of May 2019 -December 2020 for laboratories at human and animal health facilities, in addition, the newsletter will focus on achievements and challenges during Covid-19 pandemic.

In Jordan, the disease is under-diagnosed, and data related to its incidence, prevalence and main risk factors are limited, therefore, EMPHNET and U.S. Centers for Disease Control and Prevention (CDC) in collaboration with Ministry of Health (MOH), Ministry of Agriculture (MOA) and Royal Medical Services (RMS) in Jordan are implementing a project titled, "Evaluating the Impact of Enhanced Laboratory-Based Surveillance of Animal and Human Brucellosis in Jordan". This project is adopting the "One Health Approach" which is the most effective way of controlling brucellosis in the animal population, resulting in a reduction of human disease.

## Brucellosis surveillance findings since the project initiation in May 2019 through Dec 2020

Since May 2019, EMPHNET & CDC are implementing a project on sentinel laboratory-based surveillance system for brucellosis endemic regions in Jordan: East Amman, Karak and Mafraq, building capacities of laboratories at both human and animal health facilities for diagnosis of human and animal brucellosis at central and peripheral levels (115 laboratory technicians, 151 health clinicians, 51 Veterinarians were trained, 29 comprehensive health centers, 4 hospitals and 2 central labs were enrolled in the project). Provide the stakeholders with all instruments, reagents, and consumables necessary for samples collection, preservation, transportation, and testing.

Despite the negative impacts of COVID-19 and complete lockdown of the country for almost three months (Mid-March to mid-June 2020) and later the partial closing of the infected facilities (Mid-June 2020- Dec 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.

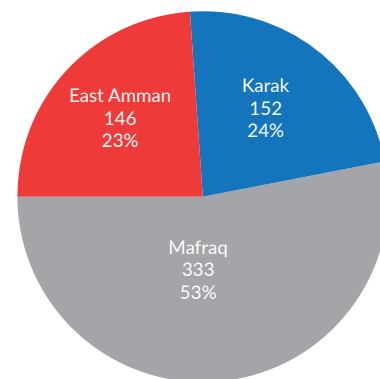


Figure 1. Enrolled human brucellosis cases in East Amman, Mafraq and Karak governorates, Jordan since May 2019 to through end of Dec 2020.

Overall, 9120 suspected cases were tested for Rose Bengal screening test, however, 631 of people who presented with brucellosis-like symptoms and tested positive for Rose Bengal test have been enrolled and entered in the study surveillance database.

Out of 631 collected blood samples from all sites, results of RBT, SAT and ELISA are available, considering that all enrolled cases are Rose-Bengal test (RBT) positive to be included in the project, it was found that only 521 (83%) cases tested positive by SAT compared to 383 (61%) cases tested positive by ELISA-IgM and 436 (69%) cases tested positive by ELISA-IgG as shown in table 1 and chart 2 below.

Site	Total confirmed human cases	Positive Results			
		RBT	SAT	IgM	IgG
East Amman	152	152	129	93	66
Al-Mafraq	333	333	291	204	285
Al-Karak	146	146	101	86	85
Total	631	631	521	383	436

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

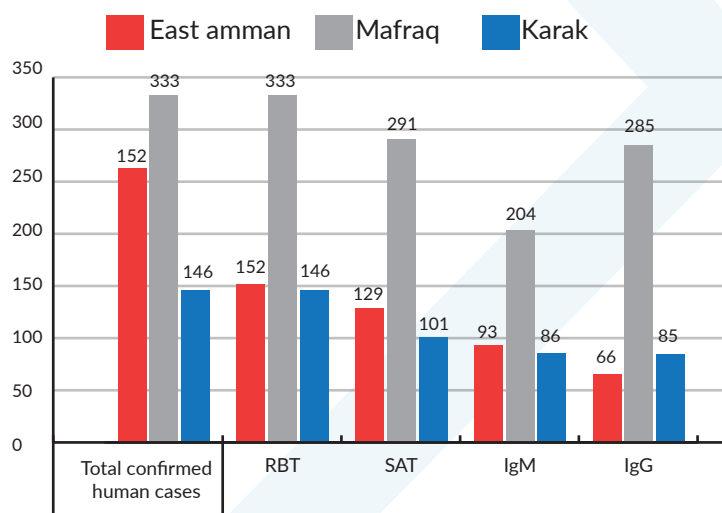


Figure 2. SAT and ELISA (IgG & IgM) positive testing results of human enrolled cases from May 2019 through end of Dec 2020 in East Amman, Mafraq and Karak.

Patients occupations were considered in data analysis as well. Out of 631 enrolled human brucellosis cases, 196 (31%) cases had occupation related to animal, 398 (63%) cases had other occupations and occupations of 37 (6%) cases were not reported. Data is shown in table 2

	Animal-related occupation	Other occupation	Not reported occupation	Total
East Amman	32 (21%)	101 (66%)	19 (13%)	152
Al-Mafraq	120 (36%)	202 (61%)	11 (3%)	333
Al-Karak	44 (30%)	95 (65%)	7 (5%)	146
Total	(196)*	398**	37	631

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

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 209 farms had been investigated, 63 farms in East Amman, 103 farms in Mafraq and 43 farms in Karak. A total of 2316 biological samples were collected to include 1644 blood and 672 milk as shown in table 3 and Figure 3

Farms Investigated

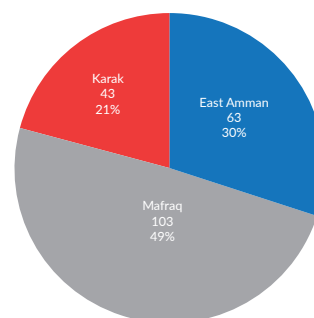


Figure 3. Investigated farms since May 2019 through Dec 2020

Table 3. Investigated farms and biologicals samples collected from animals' farms - in East Amman, Mafraq and Karak.

Governorate	Farms investigated	Samples collected	
		Blood	Milk
East Amman	63(30%)	526	407
Mafraq	103 (49%)	744	142
Karak	43 (21%)	374	123
Total farms	209	1644	672
Total number of samples		2316	

Available (to date) testing results for brucellosis at animal health facilities per governorate is shown below. Out of 2316 collected blood (1644) and milk (672) samples from the three governorates; 465 blood samples tested positive by RBT out of 1291 tested, 587 tested positive by FPA out of 1286 tested while 96 milk samples tested positive by FPA out of 405 samples tested, which means that the positivity rate of blood tested by RB is 36%, 46% blood tested by FPA and 24% for milk tested by FPA. Data is shown in table 4.

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

Governorate (samples tested)	Blood testd /1291	Blood testd/1291	Milk teste/ 405
	RBT Postive	FPA Postive	FPA Postive
East Amman	43 (9%)	87 (15%)	64 (66%)
Mafrq	282 (61%)	349 (59 %)	16 (17%)
Karak	140 (30%)	151 (26%)	16 (17%)
Total	465	587	96
Positivity Rate	(36%)	(46%)	(24%)

More analysis of data collected from investigated farms according to animal species (figure 4) and rationale for investigation are shown in figure 5 below.

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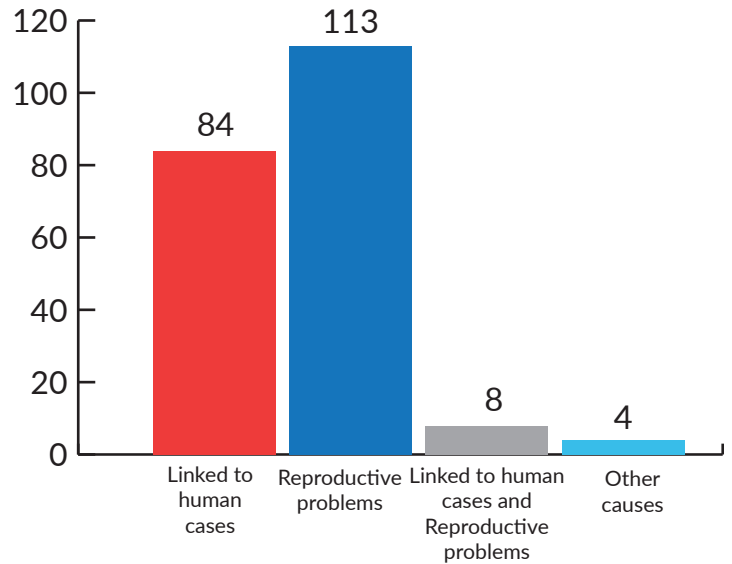


Figure 5. Data analysis based on the rationale of farm investigation in East Amman, Mafrq and Karak.

Activities of the brucellosis surveillance project were resumed (June- August) after being severely affected by the country's complete lockdown at the second quarter of 2020 and partial lockdown in the third and fourth quarter of the same year due to COVID-19, therefore we lost the chance to calculate the seasonality of the disease in animals. In addition, the case notification has decreased again regarding the second wave of COVID-19 in Jordan (Sep- Dec), Figure 6.

### Animal Species

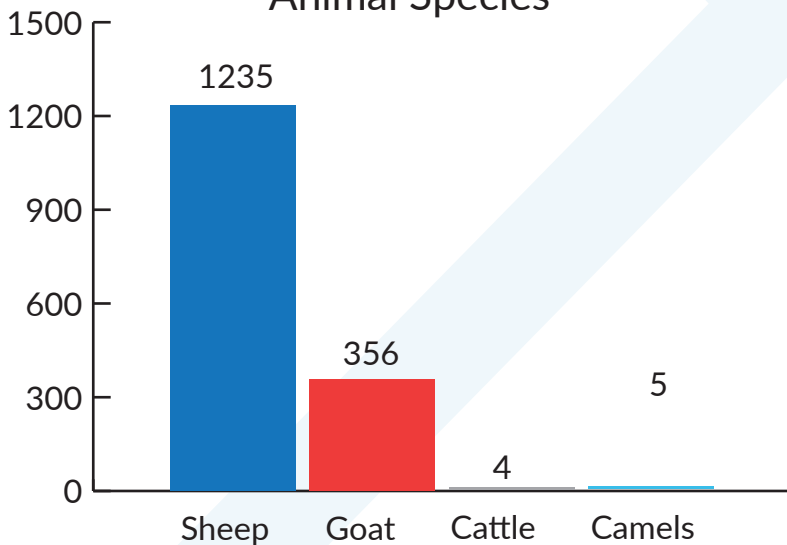


Figure 4. Species classification of collected animal samples from East Amman, Mafrq and Karak.

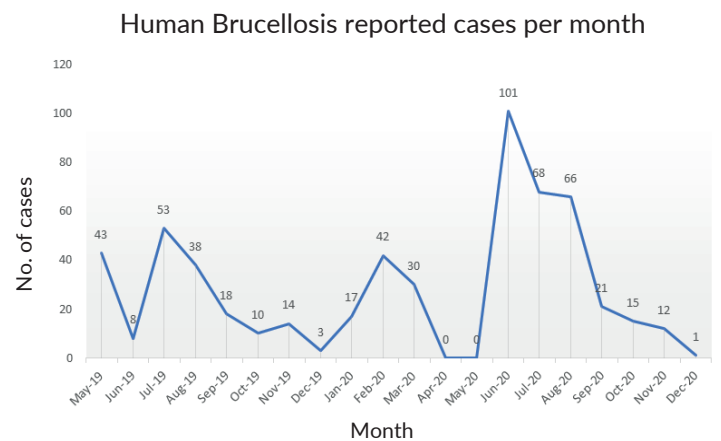


Figure 6. brucellosis reported cases by month in East Amman, Mafrq and Karak and COVID-19 impact on data collection.



## Conclusion

During the second year of the study data collection, the synergy between both ministries MOH and MOA was remarkably improved and noticed. The effective collaboration and efficient networking resulted in concrete enhancement of brucellosis notification and diagnostic testing in all project targeted sites. Furthermore, the study will reveal the brucella species prevalence among animals in Jordan, which may help in making decisions regarding vaccination strategy.

On the other hand, the data collection and testing were severely affected by the COVID-19 pandemic during both waves; the first and the second. It is worth to mention here that brucellosis is a seasonal disease and during last year within the same period interval, the study noticed decreasing in reporting data. However, despite all challenges, GHD is continuously conducting field visits to project sites and support in providing required laboratory supplies to assigned focal points.

An increase of reporting number is expected as Jordan nowadays is reporting a smaller number of COVID-19 cases compared with last months and the Government of Jordan is looking to ease the restrictions across the kingdom starting gradually in critical sectors.



