Strengthening Neonatal Mortality and Stillbirths Audit in Zatari and Azraq Refugee Camps in Jordan

Mid-year/2019

Report of Neonatal Deaths and Stillbirths Audit among Syrian from Zatari and Azraq Refugee Camps, Jordan.

1st January–30th June 2019

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Background

Neonatal death is defined as any death that occurs in the first 28 days of life, currently account for approximately 44% of all deaths of children under five years of age in low-middle income countries.[1]Stillbirth is defined as Birthweight ≥1000g, or if missing, ≥24 completed weeks gestation, or if missing, body length ≥35cm.

The ICD definition of Stillbirth is birthweight ≥1000g; or if missing ≥24 completed weeks; or if missing body length ≥35cm. the WHO international comparison definition of Stillbirth is Birthweight ≥1000g, or if missing, ≥28 completed weeks gestation, or if missing, body length ≥35cm. A joint meeting between UNHCR, UNFPA and EMPHNET early Jan 2019 took place in order to agree on the used definition in Jordan context. It was agreed to use the WHO definition with the exception of GA completed 24 weeks. As the already used cut off point for abortion is 24 weeks so in order to not miss cases between 24 and 28 weeks of gestation.

Neonatal death and stillbirth audits are the process of systematically capturing information on the number and causes of all neonatal deaths and stillbirths and the potential avoidable factors linked to deaths, to affect change.[2] These are conducted in a no-blame, interdisciplinary setting to improve the care provided to all mothers and babies. Neonatal deaths and stillbirth reviews provide opportunities to examine the circumstances surrounding, as well as the immediate and contributing factors leading to a neonatal death and stillbirths and inform the delivery of health services and quality of health care for women and babies during pregnancy and delivery, and ultimately to prevent future morbidity and mortality.[3]

Neonatal mortality and stillbirth audits are particularly important as care often falls short between different providers and even between different departments or units. However, audit alone cannot improve the quality of care and outcomes; unless the recommendations contained within the audit process are effectively implemented, maternal and neonatal outcomes will not improve.[4,5]

[1]Improving newborn and neonatal care- UNHCR http://www.unhcr.org/57beb81e4.pdf

[2] Kerber et al. BMC Pregnancy and Childbirth 2015, 15(Suppl. 2): S9 Counting every stillbirth and neonatal death through mortality audit to improve quality of care for every pregnant woman and her baby. http://www.biomedcentral.com/1471-2393/15/S2/S9

[3] http://www.who.int/pmnch/knowledge/publications/summaries/ks27/en/

[4] Pattinson R1, Kerber K, et. al. Perinatal mortality audit: counting, accountability, and overcoming challenges in scaling up in low- and middle-income countries. Int J Gynecology Obstet.2009 Oct;107 Suppl 1: S113-21, S121-2.

[5] EJ Buchmann. Towards greater effectiveness of perinatal death audit in low- and middle-income countries. BJOG. Volume 121, Issue Supplement s4, pages 134–136, September 2014

Neonatal mortality rate is the number of neonatal deaths in the camp dying at age of 28 days and less, divided by the number of live births in the same camp & same period, multiplied by 1000.

Stillbirth rate is the number of stillbirths (Any fetal death after 24 weeks and/or <1000) divided by the number of total births in the camp for the same period, multiplied by 1000.

In line with UNHCR's global strategy; UNHCR Jordan established a NN death audit system in camps in collaboration with Centers for Disease Control (CDC). Since June 2016, EMPHNET was selected through a tendering process to start conducting the audits in Zatari camp and in April 2016 in Azraq camp, stillbirth audits started at July 2018. The main objective of this audit is to decrease the neonatal mortality and stillbirths, among Syrian refugees through conducting the following activities:

- Conduct periodic review meetings with stakeholders about the findings and recommendations in a manner that is acceptable to all.
- Investigate possible causes of death/ and factors affecting the coverage and quality of babies' care.
- Improve neonatal care in refugee camps and to prioritize action to save lives of babies.
- Revision of the audit forms took place in late 2017 and 2019 in order to capture more significant data; questions were added to highlight challenges in transportation for the mother in addition to the baby. More questions added to specify treatment protocols used for anemia during pregnancy.

Methodology

Neonatal mortality and stillbirth cases were reported to EMPHNET from the International Medical Corps (IMC) in Zatari and Azraq camps. Whenever EMPHNET was alerted about a new case of neonatal mortality, a team would be sent to investigate the case.

The appointed (EMPHNET) investigator and assistant are responsible to conduct a field visit within 72 hours of the reported neonatal death and stillbirth cases. During this visit, the team should fill the neonatal death and stillbirth audit form. The audit form is designed to collect data in a quantitative and qualitative manner through a questionnaire, including: Interviews with caregivers/mothers, reviewing medical files of the newborn and mother, and the mother ANC card, then completed forms should be submitted electronically to UNHCR. All the information in the audit form are confidential.

EMPHNET has done a descriptive analysis of all neonatal deaths and stillbirths occurred during the midyear 2019 by using Epi Info 7. This report reflects the findings of the following analysis, regarding neonatal deaths and Stillbirths.

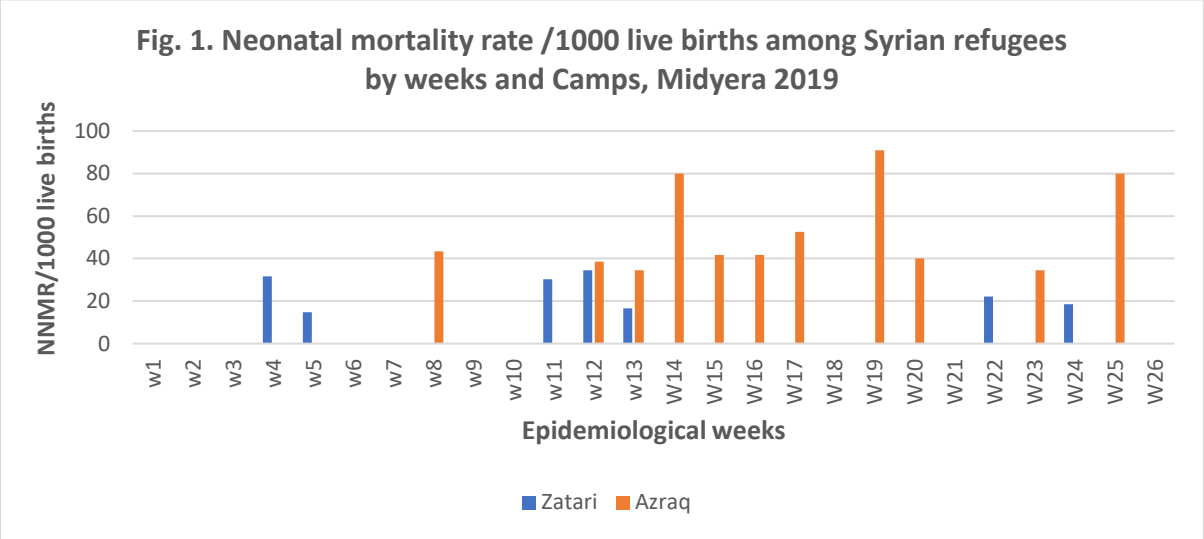
- Number of neonatal death cases were 23 neonates and 6 stillbirths, in midyear 2019 (1st January-30th June) in both camps; in terms of NN death, there was 13 in Azraq and 10 in Zatari. For stillbirths, 3 in each camp.

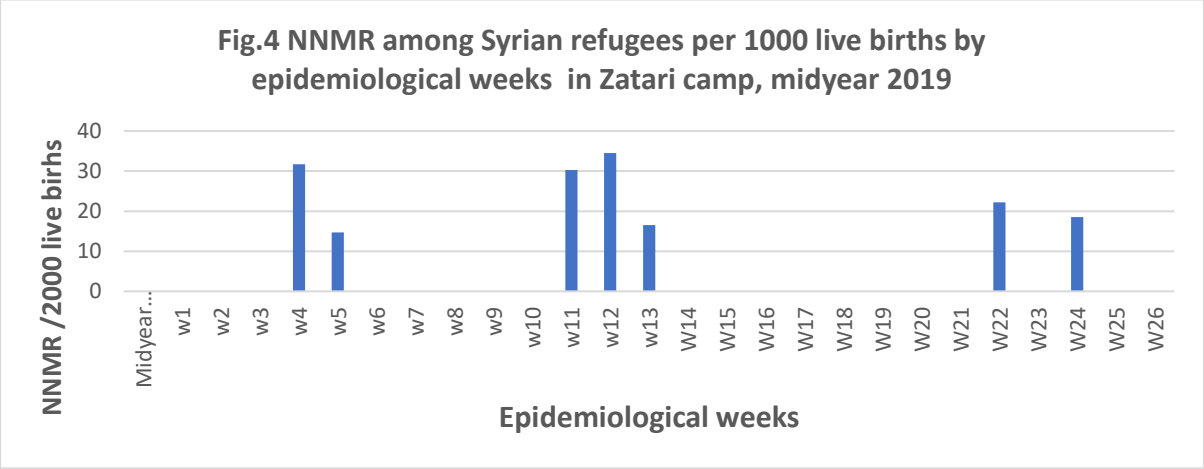
Table 1. Distribution of NN death among Syrian refuges by camps and years.

	2016	2017	2018	2019
Zatari	10	13.9	9.4	6.7
Azraq	19	11.9	12.1	20.2

Results

Midyear data of Neonatal Deaths audit among Syrian refugees in Zatari and Azraq camps





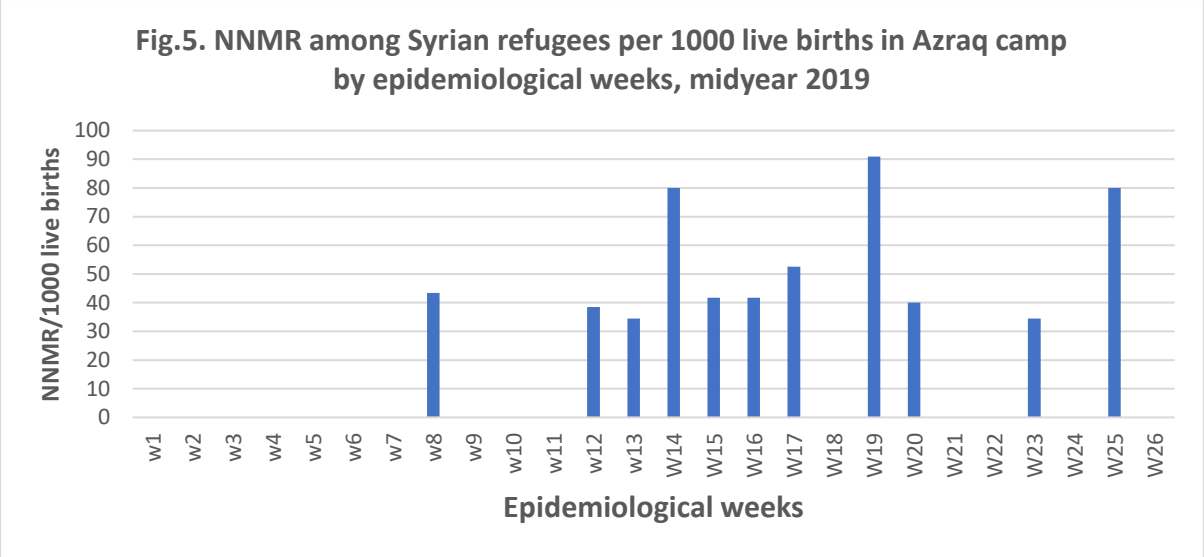


Fig.5. NNMR among Syrian refugees per 1000 live births in Azraq camp by epidemiological weeks, midyear 2019
NNMR/1000 live births
100
90
80
70
60
50
40
30
20
10
0
w1 w2 w3 w4 w5 w6 w7 w8 w9 w10 w11 w12 w13 W14 W15 W16 W17 W18 W19 W20 W21 W22 W23 W24 W25 W26
Epidemiological weeks

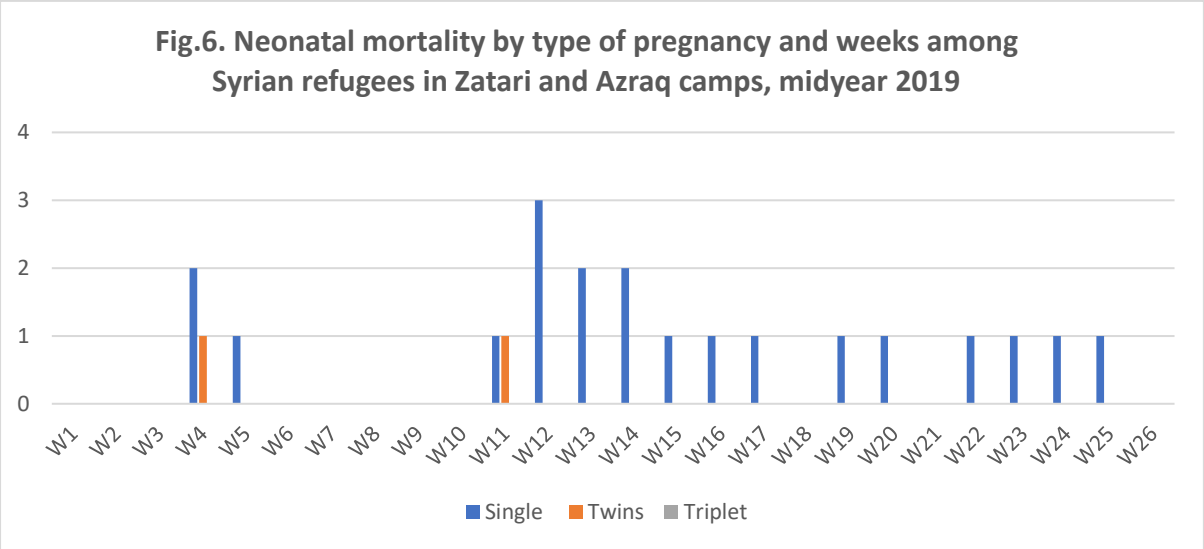


Fig.6. Neonatal mortality by type of pregnancy and weeks among Syrian refugees in Zatari and Azraq camps, midyear 2019
4
3
2
1
0
W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W14 W15 W16 W17 W18 W19 W20 W21 W22 W23 W24 W25 W26
Single
Twins
Triplet

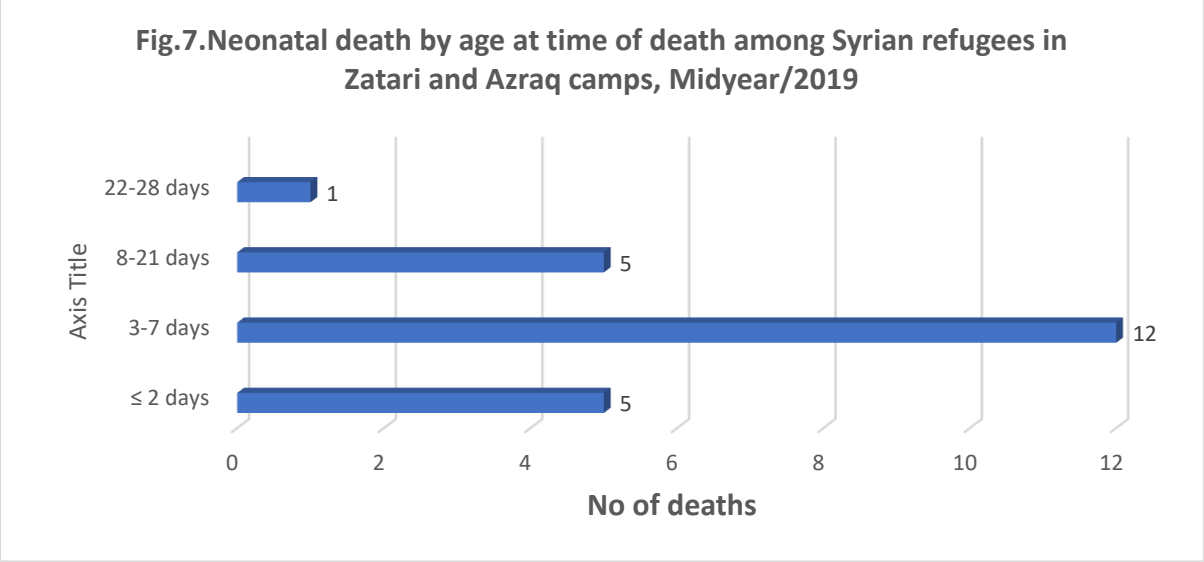


Fig.7.Neonatal death by age at time of death among Syrian refugees in Zatari and Azraq camps, Midyear/2019
Axis Title
22-28 days
8-21 days
3-7 days
≤ 2 days
1
5
12
5
0
2
4
6
8
10
12
No of deaths

Table 2: Characteristics of the neonatal deaths among Syrian refugees in Zatari and Azraq camps, midyear 2019

Characteristics	Azraq		Zatari		Total	
Parameter	**Number**	**Percent**	**Number**	**Percent**	**Number**	**percent**
Deliveries						
Single	**12**	**92.3**	**9**	**87.5**	**21**	**91.3**
Multiple pregnancies	**1**	**7.7**	**1**	**12.5**	**2**	**8.7**
Gender						
Male	**6**	**46.4**	**7**	**62.5**	**13**	**56.5**
Female	**7**	**53.8**	**3**	**37.5.**	**10**	**43.5**
Place of Birth						
Referral Hospital	**5**	**38.5**	**7**	**75**	**12**	**52.2**
Camp Hospital	**8**	**61.5**	**3**	**25**	**11**	**47.8**
Home	**0**	**0**	**0**	**0**	**0**	**0**
Age Group at time of death						
≤ 2 days	**4**	**30.8**	**1**	**12.5**	**5**	**21.7**
3-7 days	**6**	**46.2**	**6**	**50**	**12**	**52.2**
8-14days	**1**	**7.7**	**2**	**25**	**3**	**13**
15-21 day	**1**	**7.7**	**1**	**12.5**	**2**	**8.7**
22-28 days	**1**	**7.7**	**0**	**0**	**1**	**4.35**
Birth Weight						
Low birth weight	**9**	**69.2**	**4**	**50**	**13**	**56.5**
Normal birth weight	**4**	**30.8**	**6**	**50.5**	**10**	**43.5**
Birth weight per classification						
Extremely Low Birth weight<1000 gm	**2**	**15.4**	**1**	**12.5**	**3**	**13**
Very low Birth weight 1001-1500 gm	**5**	**38.5**	**2**	**12.5**	**7**	**30.4**
Moderate low birth weight 1500-<2500 gm	**2**	**15.4**	**3**	**25**	**5**	**21.7**
Normal birth weight	**4**	**30.1**	**4**	**50**	**8**	**34.8**
Resuscitation needed at time of delivery						
Yes	**11**	**84.6**	**6**	**62.5**	**17**	**73.9**
No	**2**	**15.4**	**4**	**37.5**	**6**	**26.1**
Place of death						
Referral Hospital	**12**	**92.3**	**9**	**87.5**	**21**	**91.3**
Camp hospital	**1**	**7.7**	**0**	**0**	**1**	**4.35**
Home	**0**	**0**	**1**	**12.5**	**1**	**4.35**
Total	**13**	**100**	**10**	**100**	**23**	**100**

Table 3: Distribution of neonatal deaths among Syrian refugees by place of death in Zatari & Azraq camps (Midyear. 2019)

	Azraq		Zatari		Total	
Name of referral hospital	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Sarah Specialty Private/ Mafraq	1	7.7	4	40	5	21.74
Al-Khansa'a Private / Amman	1	7.7	0	0	1	4.35
Zarqa Gov. hospital	2	15.4	0	0	2	8.7
Al-Hanan private/ Amman	7	53.8	2	20	9	39.2
Marka Islamic / Amman	1	7.7	0	0	1	4.35
Camp hospital	1	7.7	0	0	1	4.35
Irbid Specialty	0	0	1	10	1	4.35
Home	0	0	1	10	1	4.35
Al-Maqased Private / Amman	0	0	1	10	1	4.35
Princess Badeea Government/ Irbid	0	0	1	10	1	4.35
TOTAL	13	100	10	100	23	100

Three newborns were found 32-37 weeks gestational age , 2 of them were from Zatari camp and their birth weights were 2000 gm, referred to Sarah private hospital at Mafraq governorate due to prematurity , congenital abnormalities and neonatal Jaundice and only

one case was from Azraq camp and with birth weight was more than 1800 gm and referred to Zarqa governmental hospital due to dyspnea , all the three cases were in critical conditions.

Table 4: Distribution of reasons for hospital admissions of the neonates of Syrian refugees in Zatari and Azraq camps (Midyear. 2019)

	Azraq		Zatari		Total	
Reason for Admission	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
respiratory system disorder*	10	76.9	6	60	16	69.6
Low birth weight	7	53.8	6	60	13	56.5
Prematurity	8	61.5	3	30	11	47.8
Congenital anomalies	3	23.1	6	60	9	39.1
Jaundice	0	0	2	20	2	8.7
fever	0	0	1	10	1	4.35
Cyanosis	1	7.7	0	0	1	4.35
Neonatal Sepsis	**2**	15.4	0	0	2	8.7

*****Dyspnea 12, Tachypnea 3 and Asphyxia 1

Table 5. Distribution of Maternal characteristics of Syrian refugees in Zatari and Azraq camps, midyear / 2019

Location	**Zatari**		**Azraq**		**Total**	
Characteristics	**Number**	**Percent**	**Number**	**Percent**	**Number**	**percent**
Age (years)						
Mean	28.1 years		28.67 years		28	
Range	25-44 years		18-35 years		18-44	
Gestational age						
Mean	35.5 weeks		35. weeks		34.47	
Range	29-40 week		26-42week		26-42	
Preterm level						
Extremely preterm (< 28 wks)	0	0	1	7.7	1	4.35
Very preterm (28- < 32 wks)	2	20	5	38.5	7	30.4
Moderate preterm (32- <37 wks)	2	20	3	23.1	5	21.7
Full Term (37-42 wks)	6	60	4	30.8	10	43.5
Gravida						
Mean	5		4.3		4.78	
Range	3-10		1 -7		1-10	
Parity						
Mean	4.62		4.3			

Range	2-10		1-7		1-10	
Number of antenatal visits						
Mean	6.8		7		4.43	
Rang	2-9		4-8		2-9	
Presentation						
Cephalic	9	90	8	61.5	17	73.9
Breech	0	0	4	30.8	4	17.4
Transverse lie	0	0	1	7.7	1	4.35
N. D	1	10	0	0	1	4.35
Mode of delivery						
Cesarean Section	5	50	5	38.5	10	43.5
Spontaneous Vaginal delivery (skilled attendant).	5	50	8	61.5	13	56.5

Table 6: Distribution of danger signs of pregnant women during their antenatal visits, midyear /2019

Characteristics	**Number**	**Percent**
Signs diagnosed during antenatal period		
Vaginal bleeding	**2**	8.7
Elevated blood pressure	**3**	13
UTI	**2**	8.7
Abdominal pain	**1**	4.35
Preterm rupture of membranes	**1**	4.35
No danger sign	**15**	65.2

Table 7: Distribution of anemia among pregnant Syrian refuges women in both camps, midyear / 2019

HB Test	Number
<11*	**8**
>11	**8**
Not documented	**7**
Total	**23**

*****Blood Hb below 11 gm/l was treated as anemia

Table 8. Distribution of Hb test results among Syrian refugees of NN death mothers in Zatari and Azraq camps, midyear 2019

Camp	Hb not documented	Hb doc, no def, dose correct	Hb doc, anemic, Rx correct	Hb Doc, anemic, Rx does not correct	Hb doc, no def, not correct
Azraq	5	3	0	4	1
Zatari	2	2	2	2	2

Table 9: Distribution of Syrian Neonatal deaths in both camps by place of delivery and prophylaxis given post-delivery, midyear /2019

Place of delivery	Number	Prophylaxis
Al Hanan hospital / Amman	**4**	VK
Sarah hospital/ Mafraq	**3**	VK
Al-Maqased hospital/Amman	**1**	VK
Princess Bade'a hospital/Irbid	**1**	VK
Zarqa Goven. hospital/Zarqa	**1**	VK
AL-Khansa'a hospital / Amman	**1**	VK
Camp hospitals	**12**	All were given VK and Eyes Ointment
Total	**23**	

Table 10: Distribution of immediate causes of neonatal deaths of Syrian refugees' in Zatari and Azraq camp (Midyear / 2019)

Location	Zatari		Azraq		Total	
Immediate causes of death	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
RDS	**4**	**40**	**8**	**61.5**	**12**	**52.2**
Pulmonary edema	**1**	**10**	**0**	**0**	**1**	**4.35**
Pneumonia	**2**	**20**	**0**	**0**	**2**	**8.7**
Transient Tachypnea of Newborn (TTN)	**1**	**10**	**0**	**0**	**1**	**4.35**
Suffocation	**1**	**10**	**0**	**0**	**1**	**4.35**
Liver failure	**1**	**10**	**0**	**0**	**1**	**4.35**
Pulmonary hemorrhage	**0**	**0**	**2**	**15.4**	**2**	**8.7**
Congenital anomalies	**0**	**0**	**1**	**7.7**	**1**	**4.35**
Pneumothorax	**0**	**0**	**1**	**7.7**	**1**	**4.35**
Sepsis	**0**	**0**	**1**	**7.7**	**1**	**4.35**
Total	**10**	**100**	**13**	**100**	**23**	**100**

Major findings and recommendations on the Mid-Year findings for both camps in 2019

- During the first half of 2019, there were no NN deaths reported for women under 18 years of age, but still old age pregnancy is a significant finding. Thus, awareness raising activities on the risks of old and young age pregnancies should continue.
- The lack of postpartum family planning is still a major finding during 2019. Awareness raising about the importance of birth spacing efforts should continue.

- Poor Antenatal Care with proper adherence for RH treatment protocols including identification of low and high-risk pregnancies with planning of the number of ANC visits accordingly, the measurements of vital signs including blood pressure, blood sugar, and MUAC screening. Proper management of anemia during pregnancy and gestational HTN. A Major recommendation is the continuous follow up efforts through the reproductive health working groups forums to ensure quality services are provided with regular monitoring and supervising for RH activities implemented in the clinics by implementing and operating partners.

- Poor management of Neonatal cases at the level of referral facilities outside the camps was a major concern during the first quarter of 2019 from Za'atri camp. The referral unit within the public health unit in UNHCR are following up closely with these affiliated hospitals to ensure quality of health care services provided.

- One case of sudden infant death syndrome (SIDS) was identified in one of the camps. This is still not a major issue with public health importance, however, awareness raising efforts on the risks of SIDS should be explained to families and avoided.

- Safe referrals for urgent cases identified with labor signs at the level of one of the clinics should be done

- Respiratory System disorders constitute a major reason for hospital admissions with prematurity and low birth weight. RDS is a major cause of death as well. There is a big opportunity for cases identified with high risk pregnancy and increased risk of premature delivery to receive dexamethasone injections according to RH treatment protocols. Dexamethasone is a cheap and cost-effective product that decreases risk of RDS by 40% and Neonatal deaths by 30%.

Mid-Year results of Stillbirth 2019:

Midyear data of Stillbirths audit among Syrian refugees in Zatari and Azraq camps

This section provides major findings during the first six months of 2019 (1st January – 30th June 2019). It is worth mentioning that the findings are based on a revised stillbirths audit form, which was adopted from the stillbirth and Neonatal Death Case review form from Making Every Baby Count Audit and review of stillbirths and neonatal deaths

Overall Demographics

In our audits during the reporting period of Mid-year 2019), a total of 6 stillbirth cases were reported and audited in two camps (Zatari and Azraq). Thus, the numerator used for most of the analysis was 6 stillbirth cases. Half (50%) of the cases (3 cases) happened in each of the camps. On the other hand, the total number of livebirths during the same reporting period was 2,125 (total number of births=2,131) in both camps. The number of live births in Zatari Camp were 1,457 (total number of births=1,460) and in Azraq Camp were 668 (total number of births=671).

To estimate the stillbirth rate in 1000 total births for the reporting period, the number of babies born during the past six months with no signs of life weighing equal to or < 1000 g and after 24 completed weeks of gestation was divided by the total (live and stillborn) births and then multiplied by 1000. It is worth mentioning that, to obtain the stillbirth rate for the year 2019, the same calculations will be done for all four quarters of the year.

The stillbirth rate for both camps was 2.82 per 1000 total births. However, the stillbirth rate for Azraq was 4.47 per 1000 total births, while the same indicator for Zatari was 2.05 per 1000 total births. Thus, when looking at the same indicator for each camp, Azraq had almost twice stillbirth rate as compared to Zatari. It is also important to mention that due to low number of the cases these findings may largely change over the coming reporting periods. Details of the stillbirth rates are summarized in the table below.

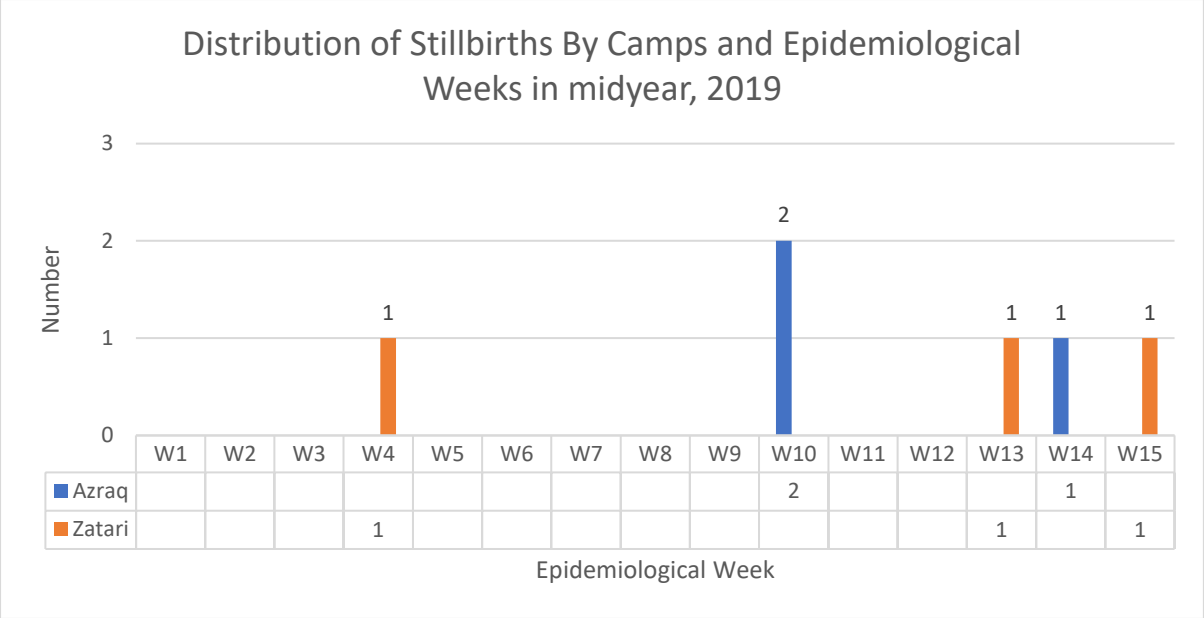
Table 1. Stillbirth rates among Syrian refugees by camps, midyear 2019

	Stillbirths	**Total births**	**Stillbirth rate per 1000 total births**
Azraq	3	671	4.47
Zatari	3	1460	2.05
Both camps	6	2125	2.82

Location and Dates of Stillbirth Cases:

Out of the 6 cases, 3 happened in in Zatari Camp and 3 in Azraq Camp.

These cases happened in weeks 4, 10, 13, 14, and 15, with week 10 having 2 stillbirth cases. It is worth mentioning that all 6 death cases happened till Week 15 of the reporting period. From week 16 to 26 of the past six months (i.e. for 11 consecutive weeks), no stillbirth cases were recorded in any of the two camps. The graph below provides details on the distribution of stillbirths by epidemiological week and camp during Quarter 1 and Quarter 2 for the year 2019.



Maternal Characteristics:

Results of analysis show that the age of mothers ranged from 19 to 35 years with the mean age of 26.2 years, while the median was 24.5 years. No woman was less than 18 Y/O or above 35 Y/O in this study.

5 out of 6 mothers had primary and secondary educational level and one mother was illiterate.

All pregnancies were singleton. Furthermore, women who delivered by normal vaginal delivery and Cesarean section were half (50%) of the cases in each category.

All 6 cases had ANC visits with an average of 4.5 ANC visits and median of 4 visits. However, the number of ANC visits ranged from 1 to 8 visits with one mother had only one ANC visit. Five of them had their first ANC visit in the first trimester while only one case started her first ANC after the second trimester.

All mothers received Iron supplement and folic acid during their antenatal visits. Blood pressure measurements and determining blood group and Rh factor were done for all 5 cases except one case that had no vital records due to legal issue and she had only one ANC visit cases. However, MUAC was not done, except for one case. Even for that case, MUAC was not documented, the mother explained verbally that the health care provider measured MUAC for her. Fasting Blood sugar was tested for 4 cases.

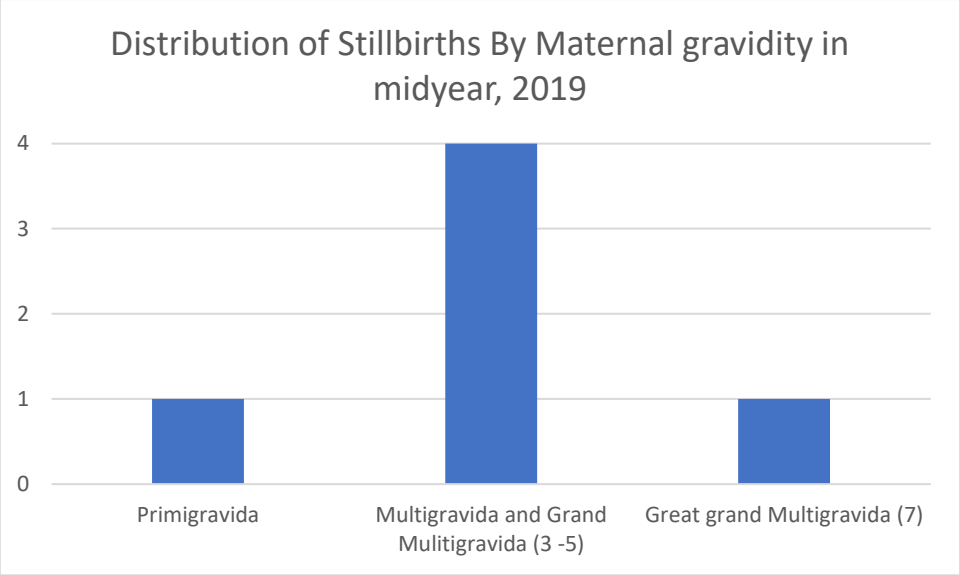
Among six mothers, one of them stated that she got pregnant while using a traditional family planning method, which is lactational amenorrhea.

There was predisposing factors in almost all stillbirth cases such as grand and great grand multi gravida, feeling decreased fetal movements, post-date pregnancy with transvers lie. Two mothers complained of previous history of stillbirths.

More details on maternal characteristics are provided in the Table below.

Table 2: Characteristics of the Mothers in Stillbirths in midyear. 2019

Characteristics	Number	percent
Age of the Mothers (years)		
Mean	26.2	
Median	24.5	
Range	16 (19-35)	
Women less than 18	0	% (0)
Women above 35	0	% (0)
Pregnancy term level		
Full term	4	67%
Preterm	2	33%
Gravidity		
Mean	4	
Median	4	
Range	6 (1-7)	
Parity		
Mean	3	
Median	3.5	
Range	3 (1-4)	
Number of antenatal care visit		
Mean	4.5	
Median	4	
Range	7 (1-8)	
Mode of delivery		
Cesarean Section	3	50%
Spontaneous Vaginal Delivery (skilled attendant)	3	50%
Predisposing factors for Stillbirth		
Grand and Great grand Multi gravidity	4	67%
Post-date pregnancy (Transvers lie)	1	17%
Un-Known	1	17%



Fetal Characteristics:

Gestational age of the baby ranged from 28 to 40 weeks with the mean gestational age of 35.83 weeks and median gestational age of 37.5 weeks. Looking into the term of pregnancy, findings showed that 4 stillbirths were at full term, while 2 were preterm. Also, in terms of dead fetal condition at the time of delivery, 4 cases were fresh stillbirths, while 2 of them were macerated. Also, 2 stillbirth cases happened as intrapartum cases, while 4 happened during antepartum period. More details on fetal characteristics are provided in the Table below.

Table 3: Characteristics of the Stillbirths in Midyear, 2019

Characteristics	Number	percent
Gestational age (weeks)		
Mean	35.83	
Median	37.5	
Range	12 (28-40)	
Terms of Pregnancy		
Full term	4	67%
Preterm	2	33%
Fetal Weight (grams)		
Mean	2966.7	
Median	3000	
Range	2000 (2000-4000)	
Condition at the time of delivery		
Fresh stillbirth	4	67%
Macerated stillbirth	2	33%
Type of Stillbirths		
Intrapartum	2	33%

Antepartum	4	67%
Causes of Stillbirths		
Post-date pregnancy	1	16.67%
Abruptio placenta	2	33.33%
Umbilical Cord Accident	1	16.67%
Obstetric complication (delay in receiving care)	1	16.67%
Un-known (No ANC)	1	16.67%

Camp	Hb not documented	Hb doc, no def, dose correct	Hb doc, anemic, Rx correct	Hb Doc, anemic, Rx not correct	Hb doc, no def, not correct
Azraq	2	1	0	0	0
Zatari	1	1	0	1	0

Analysis of Causes and Contributing Factors

A large proportion of stillbirths may happen in healthy babies, and the reason often cannot be explained. However, stillbirths are mostly linked to placental complications like abruptio placenta, problem with the umbilical cord (cord prolapse, wrapped around the baby neck and become knotted), bleeding, hypertensive disorders in pregnancy, maternal diabetes, genetic abnormalities, and various infections. Risk of stillbirth also increase in case of twins or multiple pregnancies, IUGR, early-age (<18) or over-age mothers (>35 years old), smoking and drug abuse during pregnancy, maternal obesity (BMI>30), multigravidity etc. [6]

. Almost all mothers were grand and great grand multigravida. The first major underlying cause of stillbirth (in 2 out 6 cases) was abruptio placenta due to trauma: falling of the mother (1 case), severe pre-eclampsia (1 case) and nuchal cord—umbilical cord around fetus neck (1 case). The other cause accompanied by stillbirth was post-date pregnancy (1 case), and Unknown cause based on No Antenatal Care received and major contributing factor would be emotional stress. 1 case had the incident due to delay in receiving care during labor by the health care provider.

Discussion:

Based on the qualitative analysis of the 6 stillbirth cases, we found that there was medical negligence in most of the cases. Two cases are presented as example case scenarios below:

[6] NHS. Causes of Stillbirth. Available at https://www.nhs.uk/conditions/stillbirth/causes/

First Case scenario:

A 24 Y/O, multigravida woman went to the hospital for 6 regular ANCs. Her last ANC visit was at 40-week pregnancy, she felt decrease of fetal movement, while she visited health care provider, she found that presentation is transvers lie and she told her everything is normal go back to home and came back 5 days later.

When she started labor pain at almost 41-week pregnancy and she was admitted to the hospital, doctor found, that the fetus is dead, and the presentation was transvers lie.

Technical Note regarding this case: In transvers lie case a health care provider should have extra care in the final weeks of pregnancy even an external cephalic version (ECV) can be attempted in such cases but due to many underlying complications, nowadays selective C/Section is indicated at completed 37 or at 38 week-pregnancy.

In this case, there was no issue with mother's awareness about the importance of ANC visits or danger signs of pregnancy and when she felt decrease of the fetal movement, she went to the health clinic. However, in the clinic, the doctor reassured her and advised her to come next week, despite a transverse lie, woman's complaint of the decreased fetal movement which was a significant danger sign for fetus, but health care provider did not care about this live threatening issue for the fetus and she was discharged from the clinic.

Second Case Scenario:

A 25 Y/O, PG woman with secondary educational level at 28-week pregnancy came to the hospital with chief complain of labor pain and vaginal bleeding. BP was 135/95; proteinuria was +2; and edema was present. She had 4 ANC visits at the camp Hospital, and she received tetanus toxoid, Iron supplement, Folic Acid; and she had blood sugar measurement, checking of fetal heart, Blood group and RH factor exam and blood Pressure measurement during ANC visits, HB level was 7,3 grams. However, no danger signs were identified by the health care provider.

In this case, again there was no issue with mother's attendance of 4 ANC visits till 28 weeks of pregnancy Several danger signs were present in the mother. However, the health care provider failed to take necessary measurements for the management of severe pre-eclampsia. This case scenario can again reflect medical negligence.

Third Case Scenario:

There were 2 intrapartum stillbirth cases in the reporting period, one of those is describe below for lessons learned:

She had strong uterine contractions and was referred to hospital in camp. She arrived to the hospital with full dilatation of the cervix. By doppler, doctor did not find any FHR; then she was examined by U/S and the doctor diagnosed IUFD due to umbilical cord around the neck

of fetus and abruptio placenta based on tight umbilical cord around the neck. Then she was admitted for NVD.

Technical note: During uterine contractions the blood flow through the nuchal cord is decreased. This can cause the baby's heart rate to fall during contractions (variable deceleration in CTG). As we said, she arrived almost in the second stage of labor or the end of active phase of labor (full dilatation of cervix). Therefore, it means that she spent all first stage of labor at home and blood flow was continuously decreased to the fetus during that time. The intra uterine fetal death happened during labor pain (Intrapartum stillbirth after the onset of labor (uterine contraction), and before birth).

If fetal heart rate was absent during admission, it does not mean that the death occurred before the labor contractions. The main point here is that the amniotic fluid color was green, indicating fetal asphyxia during uterine contractions.

Conclusions:

Although descriptive statistics cannot be appropriately provided for a small number of cases, the above 6 stillbirth cases can still reflect the main causes that affect pregnancy outcomes among mothers. These underlying causes and contributing factors include frequent pregnancies, lack of regular ANC visits (in one case), and more importantly medical malpractice clearly identified in these audits (only in three of the cases) Actually in 6 cases, this is greatly high number for medical negligence and we will provide you more examples.

Recommendations:

Based on the findings of our audits during the reporting period, the following recommendations must be taken into action.

- Raising awareness about their highly important responsibility of the clinical staff toward mothers' and babies' well-being and their knowledge update is of utmost importance. Even if the mothers are well aware about the importance of their compliance with medical advice and they actively seek health care and reach to the health facility at a time when it is not too late, their health and their babies health will still face increased dangers if health care providers do not take necessary actions at the right time.
- Building the capacity of staff will have positive effect in early diagnosis and proper medical decision making for the timely management of such cases.
- Raising awareness about the dangers of frequent pregnancies must be stressed during counseling sessions, specifically for those women who are grand and great grand multigravida.
- Importance of early booking visits to determine GA and clear management protocols for postdate pregnancies

- Protection cases including (Domestic violence?? Falling down) more attention to them as they pass through emotional stress and immediate of reporting and immediate action
- Adherence to RH treatment protocols and identifying risk factors and danger signs
- Raising awareness of the women about the importance of onset of labor (onset of uterine contractions) to reach to the health care center at early stage in addition to providing physical and psychological support. Observing the woman and baby is necessary to offer specific interventions in case of possible urgent complications during the onset of labor (onset of uterine contractions).
- The agreement on the health authority that is responsible on providing Antenatal Care for protection cases settled in specific protection areas in the camps