

Distribution water jerrycans in camps



Early Warning Alert & Response Network (EWARN) Annual Report

2020

ACU

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Acronyms

ABD	Acute Bloody Diarrhea	MR	Measles – Rubella
ACS	Area Coverage Survey		
ACU	Assistance Coordination Unit	MMR	Measles - Rubella- Mumps
AD	Acute Diarrhea	MSF	Médecins Sans Frontières
AEFI	Adverse Event Following Immunization	MUAC	Mid Upper Arm Circumference
AFP	Acute Flaccid Paralysis	NGO	Non-Governmental Organization
AJS	Acute Jaundice Syndrome	NP-AFP	Non- Polio Acute Flaccid Paralysis
AWD	Acute Watery Diarrhea	NPEV	Non- Polio Enterovirus
BCG	Bacillus Calmette–Guérin	NSS	Nutrition Surveillance System
BMGF	Bill & Melinda Gates Foundation	OAD	Other Acute Diarrhea
CBS	Community Based Surveillance		
CDC	Centers for Disease Control and Prevention	OBRA	Outbreak Risk Assessment
CI	Confidence Interval	OCHA	Office for the Coordination of Humanitarian Affairs
CLO	Central Level Officer	OCT	Outbreak Control Team
CMAM	Community Management of Acute Malnutrition	ODK	Open Data Kit
CSF	Cerebrospinal fluid	OPV	Oral Polio Vaccine
cVDPV	Circulated Vaccine Derived Poliovirus	PCR	Polymerase Chain Reaction
cVDPV2	Circulated Vaccine Derived Poliovirus Type 2	PLWs	Pregnant & Lactating Women
DLO	District Level Officer	Power BI	Power Business Intelligence

Acronyms

DNO	District Nutrition Officer	QGIS	Quantum Geographic Information System
EPI	Expanded Program on Immunizations	QRC	Qatar Red Crescent
EMRO	Eastern Mediterranean Regional Office	RDTs	Rapid Diagnostic Tests
ENA	Emergency Nutrition Assessment Software	RI	Routine Immunization
EOC	Emergency Operations Center	RRT	Rapid Response Team
ERC	Expert Review Committee	SAM	Sever Acute Malnutrition
FLO	Field Level Officer	SAMS	Syrian American Medical Society
FNO	Field Nutrition Officer	SARI	Severe Acute Respiratory Illness
GAM	Global Acute Malnutrition	SEMA	Syrian Expatriate Medical Association
GIZ	German Society for International Cooperation	SD	Standard Deviation
HAV	Hepatitis A Virus	SDF	Syrian Democratic Forces
HBsAg	Surface Antigen of the Hepatitis B virus	SIAs	Supplementary Immunization Activities
HBV	Hepatitis B Vaccine	SIG	Syrian Immunization Group
HBV	Hepatitis B Virus	SL	Sabin Like
HCV	Hepatitis C Virus	SMART	Standardized Monitoring and Assessment of Relief and Transitions
HEV	Hepatitis E Virus	SPSS	Statistical Package for the Social Sciences
HFA	Height for Age	STF	Suspected Typhoid Fever
HIV	Human Immunodeficiency Virus	TB	Tuberculosis
IDA	Independent Doctors Association	TOT	Training of Trainer
IDDKs	Interagency Diarrheal Disease Kits	UNICEF	United Nations International Children's Fund

Acronyms

IEC	Information Education Communication	UCE	Unusual Cluster of Event
IFA	Information for Action Software	UCD	Unusual Cluster of Death
IgM	Immunoglobulin M	UOSSM	Union of Medical Care and Relief Organizations
ILI	Influenza Like Illness	VCS	Vaccine Coverage Survey
IPV	Inactivated Polio Vaccine	VPDs	Vaccine Preventable Diseases
IYCF	Infant and Young Child Feeding	VDPV	Vaccine Derived Poliovirus
IWA	International Water Association	WASH	Water-Sanitation- Hygiene
Leish	Leishmaniasis	WBDs	Water Borne Diseases
MAM	Moderate Acute Malnutrition	WFA	Weight for Age
Meas	Measles	WFH	Weight for Height
Men	Meningitis	WHO	World Health Organization
mOPV	Monovalent Oral Polio Vaccine	WSP	Water Safety Plan
MNM	MOBILITY AND NEEDS MONITORING		

Section 1: Introduction

1.1 Covered areas and population

EWARN was launched on 10th June 2013 as nonprofit national health information surveillance system, its main mission is collecting epidemiological data from sentinel sites, analysis, then sharing the results with health institutes and stakeholders to guide proper decisions and needed actions for supporting and further improving health services in Syria.

- The network started in 61 sub- districts in 7 governorates
- In September 2014, the system expanded in Rural Damascus (east Ghouta) and Dar'a governorates
- In March 2015, west part of Dar'a and Quneitra, besieged rural north of Homs and northern of Al-Hasakeh.
- In 2016 many areas witnessed a switch in the controlling forces, thus a new team was trained and assigned in the field (South Al-Hasakeh–Menbij), in addition, new areas were added to the network coverage: eastern Homs (Al Badiya) and western Rural Damascus (western Ghouta).
- During 2017 the field team has been re-assigned in many areas due to switching control in multiple governorates (Ar-Raqqa and Deir ez zor). Scaling up the coverage in rural Damascus Sabe Byar sub district (Ar Rukban Camp) at the end of 2017.
- In 2018, the security landscape in Syria is likely to remain complex and dynamic. Displacement rates in 2018 remained high and broadly comparable to 2017, with some 1.6 million population movements tracked between January and December 2018. This was largely due to the escalation of hostilities in East Ghouta, northern rural Homs, Dar'a and Quneitra. Thus, EWARN lost the geographical access to those areas, and at the end of 2018 EWARN covered 238 communities in 82 sub districts, 25 districts for 6 governorates, and the total population is 32% (6,397,614).
- In 2019, more than 1.2 million people displaced from their homes in the total year, mainly from northwest of Hama and southern Idleb governorate, in addition to the north of Ar-Raqqa and Al-Hasakeh and moving further north away from the hostilities. A new team was assigned was done in Ar-Raqqa and Al-Hasakeh (Peace Fountain area), and re-distribution of EWARN displaced team from Idleb and Hama in the Euphrates shield and Afrin areas, resulting in losing the access in Hama and in many areas in southern of Idleb governorate.
- In 2020, the humanitarian situation remains dire as the additional strains related to the COVID-19 pandemic and the economic downturn in Syria continue to impact the 4.1 million people living in northwest Syria. Nearly a decade of conflict marked by multiple displacements, economic shocks, military operations, and violence is continuously eroding the resilience of the population. An estimated 2.8 million people rely on humanitarian assistance to meet their basic needs such as shelter, food, water and health. Reinforcement of EWARN activities in Tell Abiad & Ras Al-Ain districts.

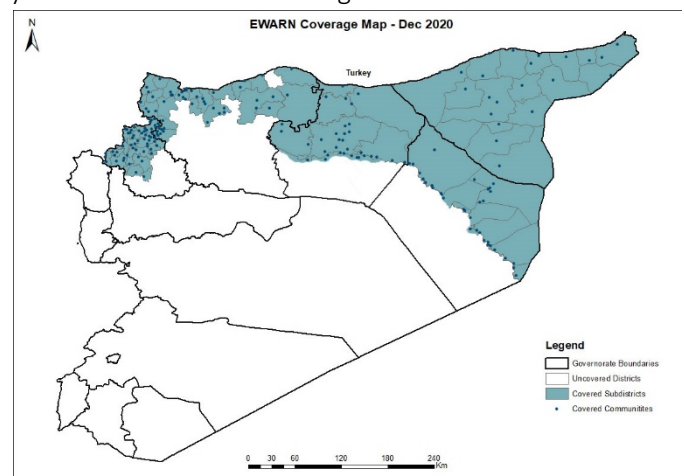


Figure 1: Coverage map for EWARN _ December 2020

Table 1. The population percentage and Area percentage that covered by EWARN -2020

GOVERNORATE	Syria Population_ MNM	EWARN Population	*Population%	^Area %
Aleppo	4,054,970	2,073,976	51%	42%
Al-Hasakeh	987,905	987,905	100%	97%
Ar-Raqqa	684,911	644,838	94%	72%
Deir-ez-Zor	767,037	417,264	54%	48%
Hama	1,329,243	150	0%	1%
Idleb	2,734,848	2,717,938	99%	78%
All of Syria	20,560,806	6,842,071	33%	36%

**The population percentage is calculated based on the census provided by MNM, July – 2019.*

^The area percentage is calculated based on the national areas of Syria sub-districts.

1.2 Review of EWARN team

Table 2: EWARN team review per year

Year	CLOs	Manager	Surveillance	Response	Data	Financial	DLOs	DNOs	Response team in field	WASH team in field	Lab team in field	FLOs	FNOs	Vaccinators	Total
2013	6	1	1	3	-	1	16	-	-	-	-	-	-	-	22
2014	7	1	1	3	1	1	22	-	-	-	-	-	-	-	29
2015	9	1	2	3	2	1	24	-	-	-	--	181	-	-	214
October 2015	13	1	3	5	3	1	29	-	4	10	2	214	-	-	272
December 2016	16	1	3	7	4	1	30	-	6	20	7	212	-	-	291
December 2017	24	1	5	9	7	2	30	11	12	24	12	211	135	84	543
December 2018	28	1	7	11	7	2	26	12	11	24	10	192	180	124	607
December 2019	28	1	6	12	7	2	27	3	8	24	14	196	40	176	516
December 2020	29	1	7	11	8	2	29	7	7	24	25	226	96	200	643

1.3 Review of diseases in Surveillance list

After EWARN and WHO have reviewed and modified both case definition and the alert threshold for the diseases during 2017, EWARN team kept that during 2018, with one exception for Measles alert threshold. Due to the large Measles outbreak in 2018, and after the discussion with WHO and SIG, alert threshold for Measles modified after April to be: Double the average of the last 3 weeks in a given location.

In 2019 & 2020, no change in case definition nor in alert threshold was done.

Table 3. Diseases / Syndromes in surveillance list review per year															
Time	*The highlighted cells refer to added diseases to the surveillance list *The highlighted codes refer to modification in case definition or / and alert threshold														
2013	ABD	AWD	AJS	AFP	Mea	Men	SARI	FUO	UCE	UXD					
2014	ABD	AWD	AJS	AFP	Mea	Men	SARI	FUO	UCE	UXD	STF	Leish			
2015	ABD	AWD	AJS	AFP	Mea	Men	SARI	FUO	UCE	UXD	STF	Leish	AD	ILI	
2016	ABD	AWD	AJS	AFP	Mea	Men	SARI	-	UCE	UCD	STF	Leish	OAD	ILI	
2017	ABD	AWD	AJS	AFP	Mea	Men	SARI	-	UCE	UCD	STF	Leish	OAD	ILI	
2018	ABD	AWD	AJS	AFP	Mea	Men	SARI	-	UCE	UCD	STF	Leish	OAD	ILI	
2019	ABD	AWD	AJS	AFP	Mea	Men	SARI	-	UCE	UCD	STF	Leish	OAD	ILI	
2020	ABD	AWD	AJS	AFP	Mea	Men	SARI	-	UCE	UCD	STF	Leish	OAD	ILI	

Section 2: Surveillance Updates in 2020

2.1 Acute Flaccid Paralysis (AFP) Surveillance

2.1.1 Executive summary

At the end of 2019 we all witnessed another milestone on the road to eradicate polio. With a historic announcement as an independent commission of experts concluded that wild poliovirus type 3 (WPV3) has been eradicated worldwide. Following the eradication of smallpox and wild poliovirus type 2, this news represents a historic achievement for humanity.

As the eradication of wild poliovirus (WPV) comes within grasp, essential activities required to interrupt transmission and maintain a polio-free world become even more critical. This is especially true of surveillance, which detects the presence of the virus wherever it persists – in the last endemic countries and in countries and regions that, due to weakened health systems or gaps in immunization, have experienced outbreaks of vaccine-derived polioviruses (VDPVs), similar to what happened in Syria in 2017 and number of African countries, Pakistan, Afghanistan and other countries. Through the time-tested gold standard of detecting and investigating cases of acute flaccid paralysis (AFP) to more recent developments testing environmental samples from sewage collection sites, surveillance is a multi-pronged tool used to surface information of paramount importance as the Global Polio Eradication Initiative (GPEI) works to close all remaining gaps and rid the world of polio.

The last mile toward eradication has been characterized by steep challenges. The primary challenge has been a lack of access in conflict-affected or security-compromised areas, in hard-to-reach geographies and the COVID-19 pandemic that affected the implementation of both surveillance and immunization activities. EWARN is working constantly in such conditions, all sorts of mitigation measures are taken in order to overcome those difficulties. The population displacement that took place at the beginning of 2020 had an impact on the program, but at the same time EWARN managed to cover the IDPs who were reallocated in northern governorates.

The efforts to dig deeper in the collected data continues and the recruitment of a data officer specialized in GIS helped in bringing the data visualization to a higher level.

EWARN modified some of the measures in response to WHO/ EMRO's recommendation or as response to COVID-19 pandemic. Contacts sampling just for inadequate and highly suspected cases, area coverage survey for selected cases and modifications to active surveillance visits, but maintained some of the enhancement measures such as presenting all AFP cases with inadequate specimens to the ERC, data segregation, monitoring the IDPs displacements' routes, recruitment and maintain the surveillance staff and deploying them in the areas of need, evaluating almost all the field level officers (FLOs) to identify any gaps and build on the capacity that they already possess. In addition to the coordination with all the partners such as WHO, UNICEF, Polio Lab in Ankara and all the NGOs.

2.1.2 AFP surveillance indicators review

The year 2019 has witnessed number of changes in the field in relation to AFP surveillance.

EWARN maintained the measures that were implemented to enhance the surveillance before, during and after cVDPV2 outbreak. Contacts' specimens were collected for all AFP cases when feasible, all AFP cases with inadequate specimens presented to ERC, data segregation, monitoring the IDPs displacements' routes, recruitment and maintain the surveillance staff and deploying them in the areas of need, evaluating almost all the field level officers (FLOs) to identify any gaps and build on the capacity that they already possess. In addition to the coordination with all the partners such as WHO, UNICEF, Polio Lab in Ankara and all the NGOs.

429 AFP cases were investigated in 2019 with an adequacy of 91%. Compared to 399 AFP cases were investigated by EWARN in 2018 with 10.8 NP-AFP rate and adequacy of 91%.

The overall surveillance indicators demonstrate the improvement over the years and EWARN managed to maintain the sensitivity and quality of the program in order to meet the global standards. Despite the challenges that face the program from security reasons to continuous population movements and changes in the controlling forces.

Despite losing access to number of governorates, namely besieged Homs, Dar'a, Quneitra and rural Damascus in 2018, followed by loss of access to northern rural Hama in the first half of 2019, but access to population did not decrease by much.

The end of 2019 was marked by an influx of IDPs from southern parts of Idleb governorate, parts of southern Aleppo and northern rural Hama due to an intensive military operation. The military offenses led to the displacement of nearly 1,4 million residents towards the camps area in Harim district in Idleb and some crossed to Afrin district in Aleppo governorate.

386 AFP cases investigated in 2020. NP-AFP rate was 10.2 and an improvement in adequacy (96%) in comparison to 2019 (91%), similar improvement was documented in early detection from 88% in 2019 to 91% in 2020.

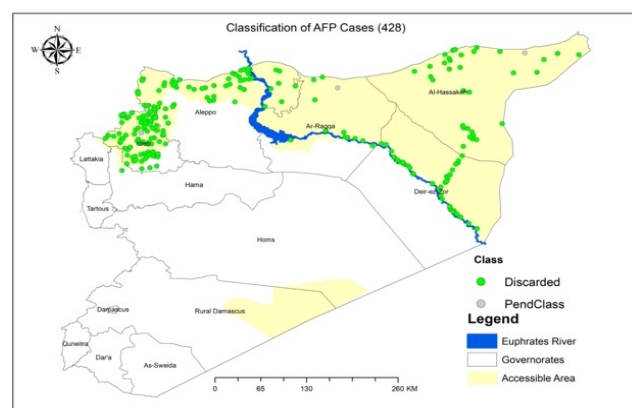


Figure 2: AFP cases distribution - 2019

The drop in NPEV% from 23% in 2019 to 21% in 2020 could be attributed to higher hygiene practices in the COVID-19 pandemic, whereas the drop in SL% from 8% in 2019 to only 2% in 2020 is a clear result of the implementation of only one OPV campaign in 2020 and the interruption of the routine immunization activities.

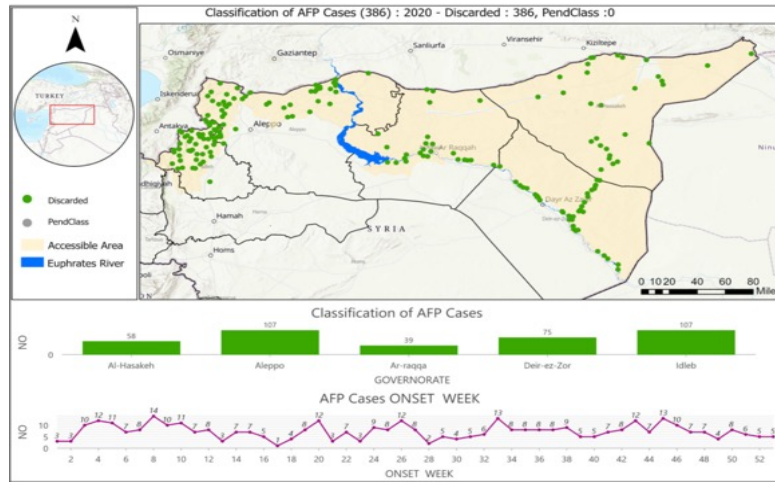


Figure 3: AFP cases distribution - 2020

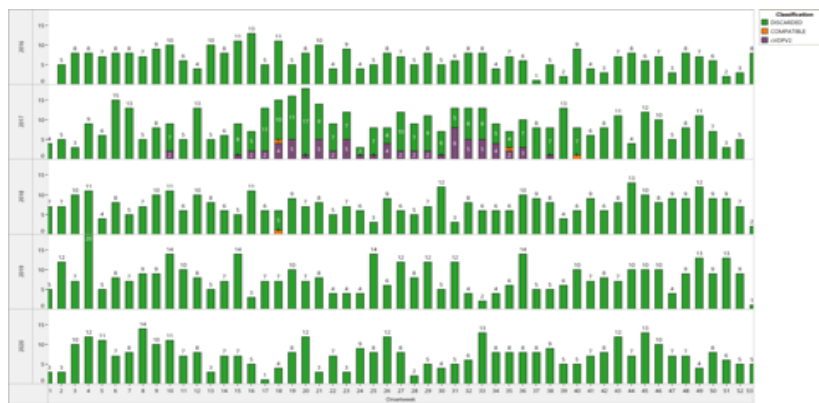


Figure 4: AFP Cases epi-curve - annual comparison

Despite losing access to number of governorates, namely besieged Homs, Dar’a, Quneitra and rural Damascus in 2018. And it was followed by loss of access to northern rural Hama in the first half of 2019, but access to population did not decrease considerably. It is reflected by the number of investigated cases and data segregation based on the displacement status of the cases among other indicators.

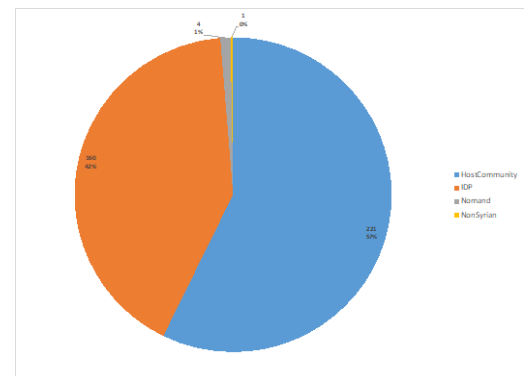


Figure 5: AFP case status (IDP vs. host) - all accessible areas

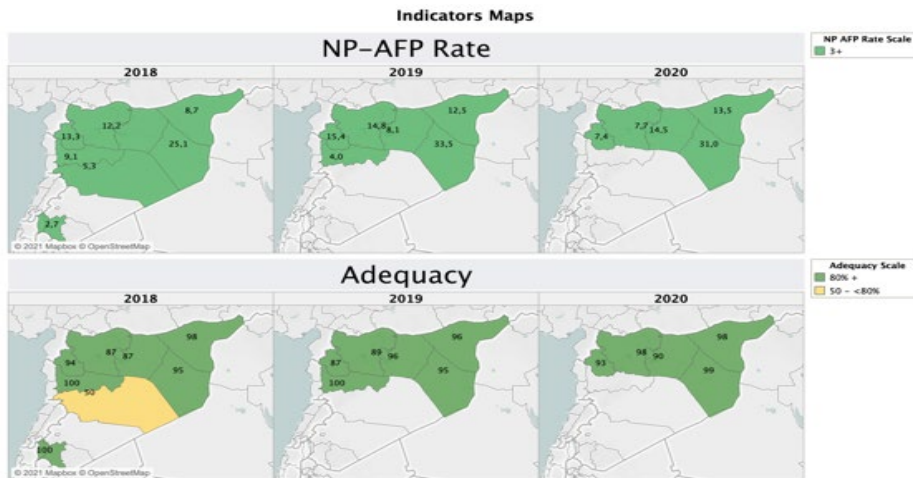


Figure 6: Basic surveillance indicators mapping by governorate (annual comparison)

The military operation targeting southern Idlib and western rural Aleppo at the end of 2019 lead to population movement from those areas towards the camps area in Harim district, but as not all the displaced population moved to accessible areas for EWARN; this contributed to the decrease in reported cases.

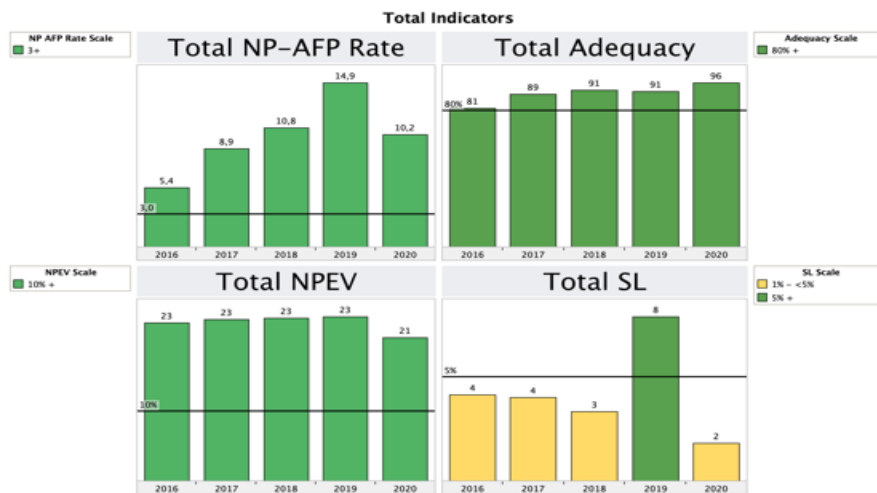


Figure 7: Basic surveillance indicators comparison - all accessible areas

221 cases (57%) were from the host communities, whereas 160 cases (42%) were IDPs in addition to 4 cases from the nomad community and one non-Syrian case.

In Idleb governorate, the picture reflects clearly the size of the displacement of the population. 79 cases (74%) come from IDPs and only 27 cases (25%) are from the host community.

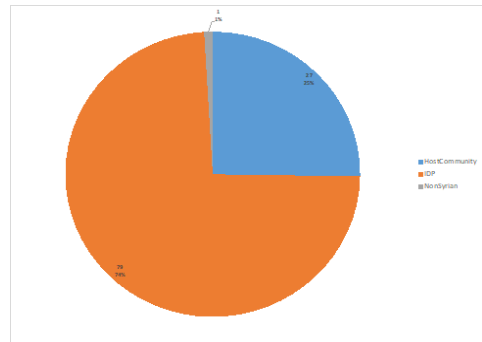


Figure 8: AFP case status (IDP vs. host) - Idleb

The overall early detection showed an improvement in 2020 in comparison to the years before. Although the early detection improved in Idleb and Aleppo, but a drop was noted in Ar-Raqqa governorate and to a lesser degree.

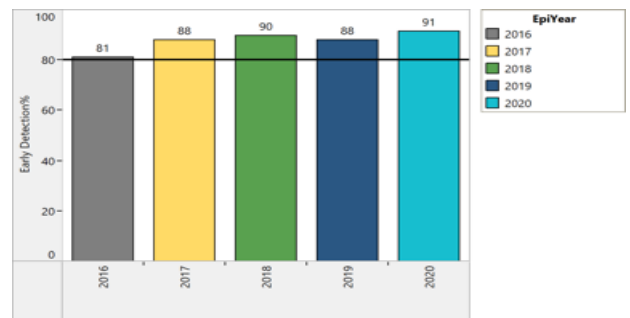


Figure 9: Early detection over the years

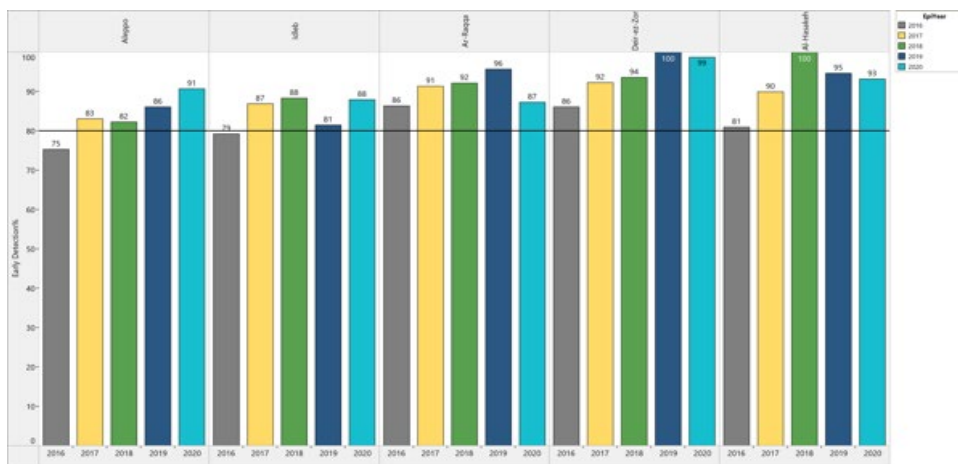


Figure10: Early detection annual comparison - governorate level

This could be a result of the movement restrictions that were imposed in NES areas, which caused a delay in seeking healthcare.

351 cases were reported by the 1st encounter, in an improvement from 359 (84%) in 2019. All accessible areas reported the majority of the cases through the first encounter in an improvement from 2019.

Table 4: Ranking of reports - 2020 Governorate Level							
GOVERNORATE	TOTAL # CASES	# CASES REPORTED BY 1ST ENCOUNTER	% CASES REPORTED BY 1ST ENCOUNTER	# CASES REPORTED BY 2ND ENCOUNTER	% CASES REPORTED BY 2ND ENCOUNTER	# CASES REPORTED BY 3+ ENCOUNTER	% CASES REPORTED BY 3+ ENCOUNTER
Al-Hasakeh	58	55	95%	3	5%	0	0%
Aleppo	107	100	93%	7	7%	0	0%
Ar-Raqqa	39	35	90%	2	5%	2	5%
Deir-ez-Zor	75	67	89%	7	9%	1	1%
Idleb	107	94	88%	8	7%	5	5%
Grand Total	386	351	91%	27	7%	8	2%

The 313 cases (81%) were reported by physicians, followed by 19 cases (5%) by nurses. The rest of the reports included community-based surveillance focal points, community health workers, family members among others.

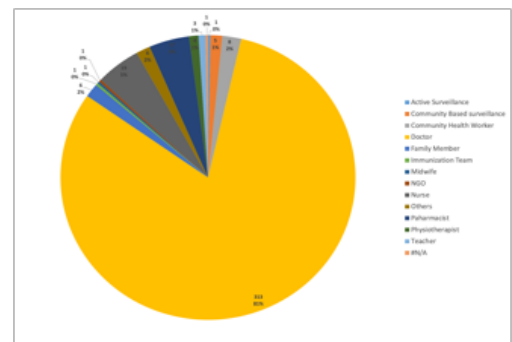


Figure 11: Reporter designation

EWARN stopped the contacts' sampling for all AFP cases and reverted back to regular sampling only for inadequate cases, and highly suspected cases. This decision was taken based on the recommendation of WHO/ EMRO office. Only 188 contacts samples were collected in 2020 in comparison to 968 samples in 2019.



Figure 12: Number of contacts per index case comparison 2019 (left) vs. 2020 (right)

Although the number of detected cases in 2020 were slightly smaller than that in 2019, but the proportions of the final clinical diagnosis of the investigated cases did not change by much. With focus on GBS, TIN, and TM cases we can see the similarity between the two years of comparison.

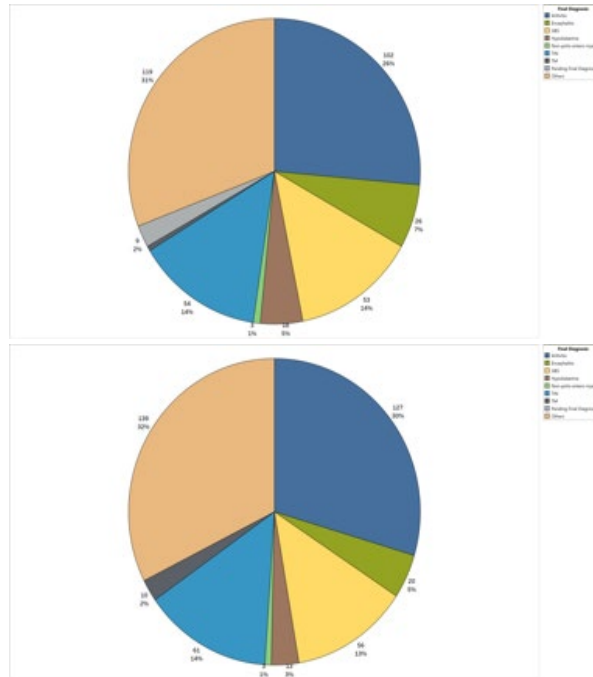


Figure 13: Final clinical diagnosis comparison- 2020 (top) vs. 2019 (below)

The lab isolates had NPEV in all the accessible areas in 2020, but same cannot be said about SL isolates. The decrease in those isolates can be due to more hygiene practices in the COVID-19 response, and the implementation of only one OPV campaign in 2020.

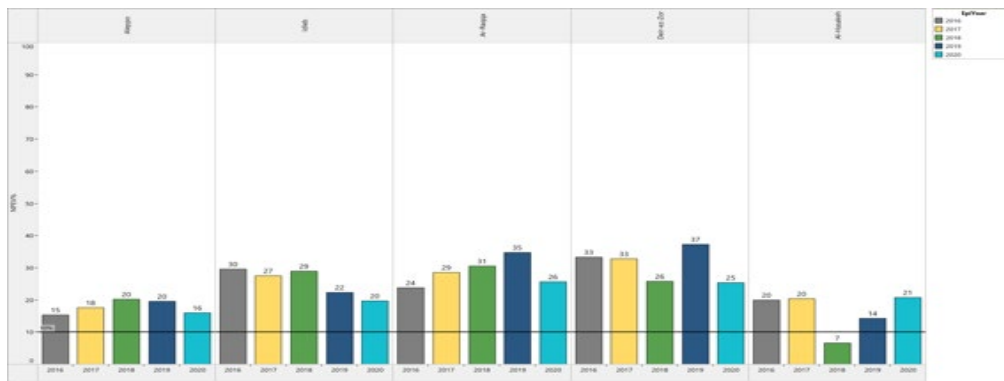


Figure 14: 1NPEV% annual comparison - gov. level

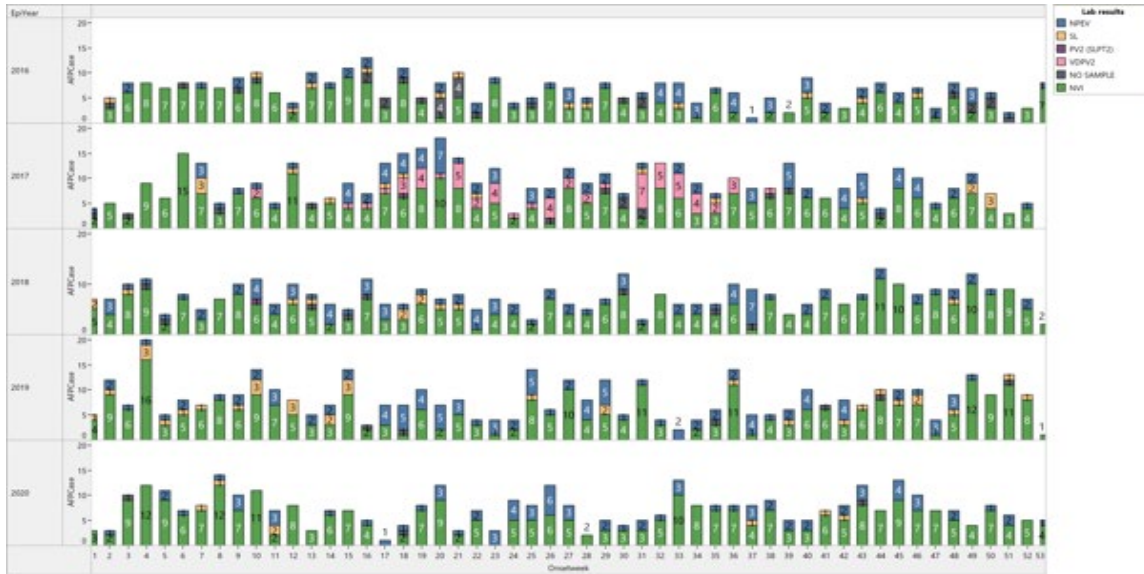


Figure 15: AFP cases epi-curve - lab results - annual comparison

The program managed to detect AFP cases from all the targeted different age group categories. In a similar manner to the previous years.



Figure 16: Age group categories - annual comparison

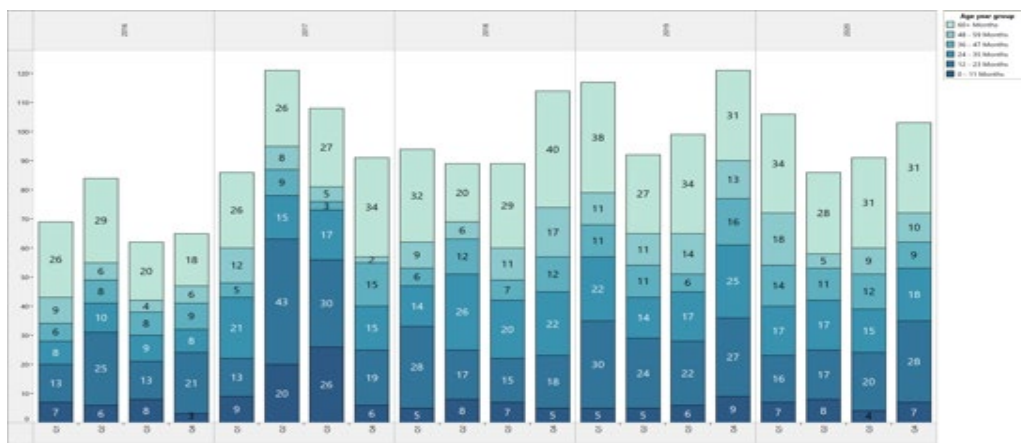


Figure 17: Age group categories comparison - by quarter

The vaccination status of the investigated AFP cases showed a drop in 2020 after the steady improvement in the previous years.

36 cases (29%) in the age group 6-59 months had less than optimal vaccination status, in addition to 11 cases (9%) at the same age group not receiving any polio vaccines.

On the governorate level in the accessible areas; Ar-Raqqa has the worst development with 16 cases (84%) aged 6-59 months with less than 4 OPV doses. And non of the cases in this age group receiving 7 or more OPV doses. Idleb also had a similar drop in the vaccination status.

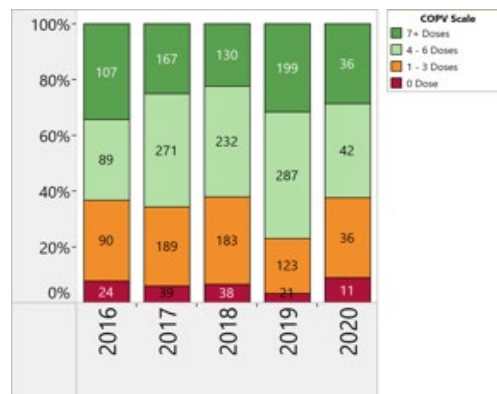


Figure 18: OPV vaccination status – 6-59 months- ANNUAL comparison

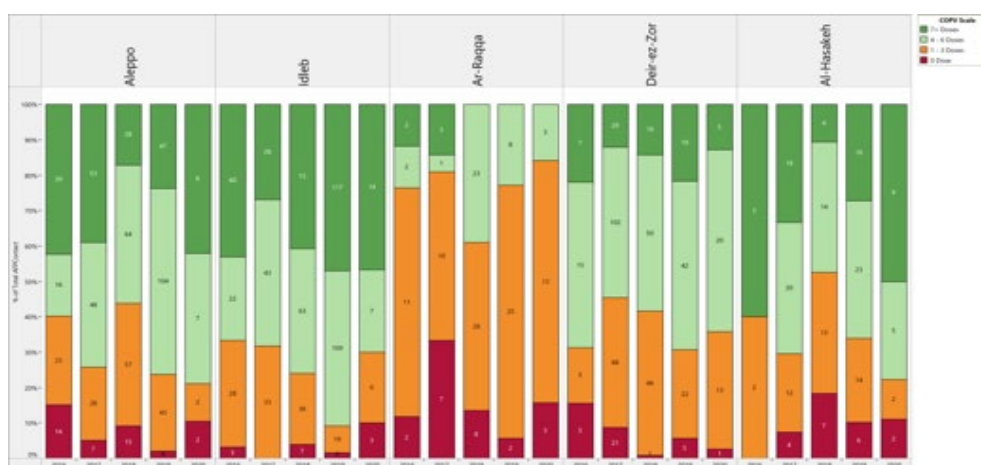


Figure 19: AFP cases PV status - 6-59 months - governorate level

2.1.3 COVID-19 Impact on AFP Surveillance Indicators:

COVID-19 related measures affected the full implementation of AFP surveillance-related activities, such as extended area coverage survey and contact sampling out of the household.

The detection of the first COVID-19 case had a direct impact on the reporting of AFP cases; and this was apparent in July with almost a drop of 50% in comparison to 2019.

Overall, the frequency of reporting did not decline much as per expectations and all accessible areas continued reporting AFP cases and the overall drop of the reported cases up to the end of 2020 was 10%.

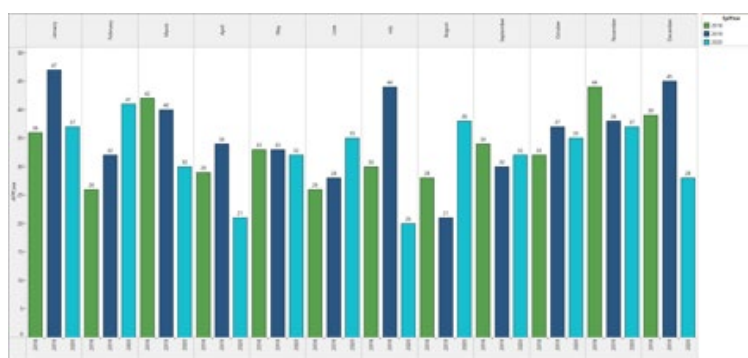


Figure 20: AFP cases reporting comparison by month

This differed between the areas as some governorates witnessed an increase in reporting frequency as clarified in the table below:

Table 5: AFP cases reporting comparison						
	Aleppo	Idleb	Ar-Raqqa	Deir-ez-Zor	Al-Hasakeh	Grand Total
AFP Cases in 2019	122	162	23	65	56	428
AFP Cases in 2020	107	107	39	75	58	386
Percentage of change	-12%	-34%	70%	15%	4%	-10%

The increase in NES governorates despite the drop in reporting at times could be attributed to the focused sensitization session targeting EWARN staff that was conducted online, the area became more settled, and more NGO supported health facilities started their activities in Ar-Raqqa, reallocating more field staff in newly accessible areas in addition to the increased activities by CBS focal points (mainly in Al-Hasakeh governorate).

The maps below show that the cases were distributed in different districts and no major reporting gaps.

The only governorate that was affected by the movement restrictions and the curfew is Al-Hasakeh during March/ April period, but the frequency of reporting and the main surveillance indicators were not affected.

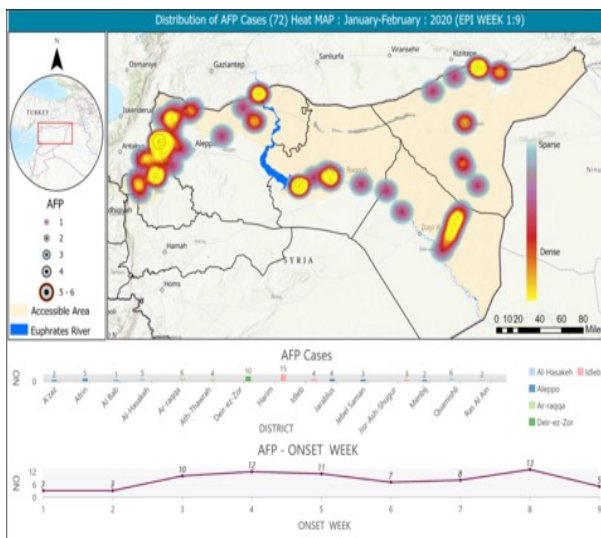


Figure 21: Heat Map of AFP cases distribution January-February 2020

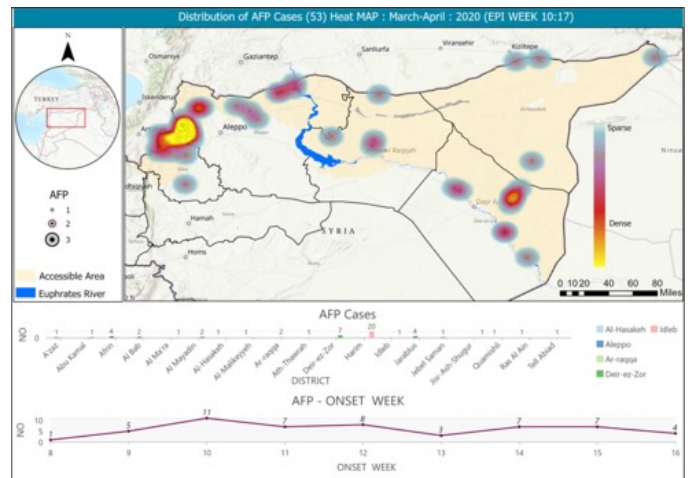


Figure 22: Heat Map of AFP cases distribution March- April 2020

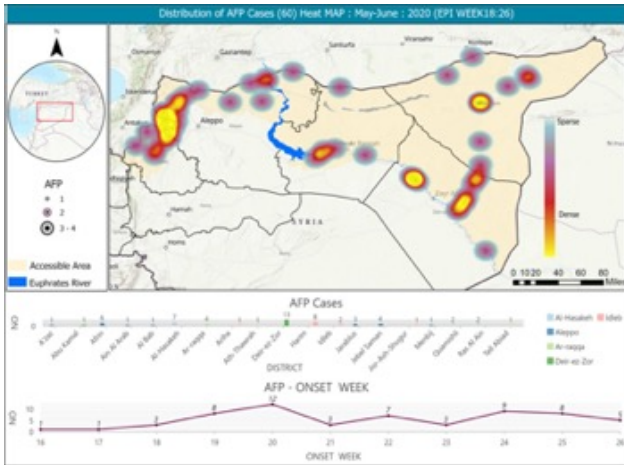


Figure 23: Heat map of AFP cases distribution May-June 2020

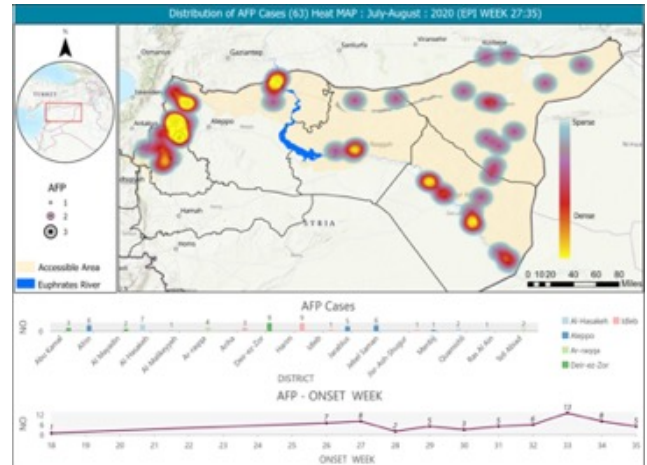


Figure 24: Heat map of AFP cases distribution July - August 2020

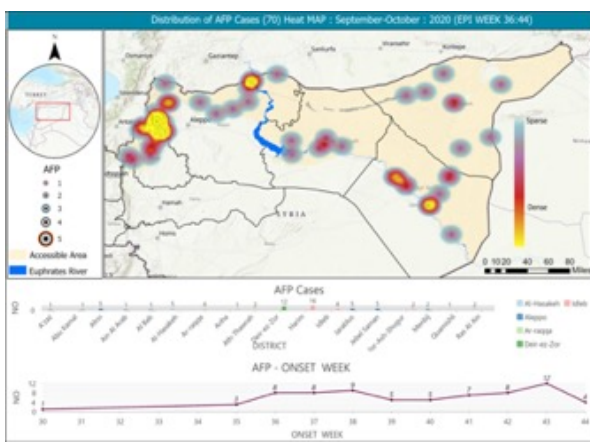


Figure 25: Heat map of AFP cases distribution September - October 2020

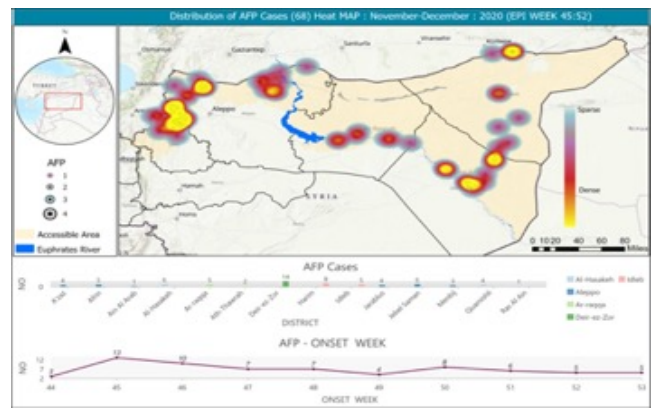


Figure 26: Heat map of AFP cases distribution November - December 2020

Transportation time did not change considerably in the field, it shows improvement in all accessible areas. This improvement could be attributed to the coordination efforts between the logistics and the surveillance teams.

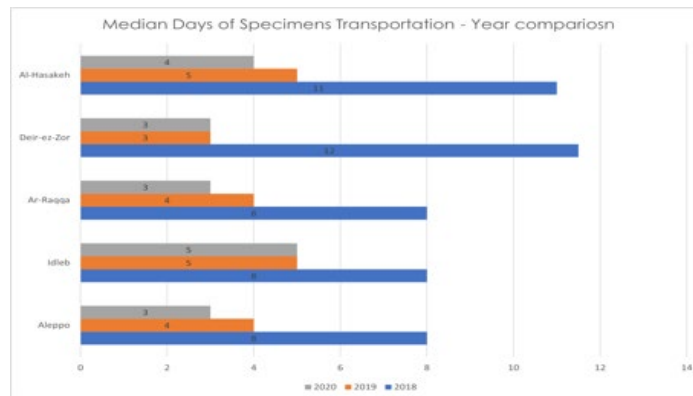


Figure 27: Median days of Specimens' transportation (Collection - Dispatch to Lab)

The investigation within 48 hours was not affected by the restrictions, but only 10 cases out of 386 were investigated after 48 hours of notification.

The main drop of the reported AFP cases happened in April, but started to improve afterward, the main drop happened in the eastern governorates during the curfew.

The epi-year 2020 is divided into three sections January/February, March/April, May/June to identify the impact of COVID-19 related measures on AFP surveillance. Each group represents different effects.

January/ February had no measures related to COVID-19 and the global spread just started at that time. AFP surveillance was affected by the IDPs movement from southern Idlib due to the military operation, but the cases from those IDPs were detected by the team in the camps area, only Ar-Raqqa had adequacy less than 80% whereas all the other governorates had adequacy more than 90%. NPEV was isolated in cases from all governorates except Ar-Raqqa, but SL was isolated only in cases Ar-Raqqa and Deir-Ez-Zor.

March/ April witnessed restrictions on movement and curfew in some areas, in addition to focusing on COVID-19 related surveillance activities. Cases from Al-Hasakeh and Aleppo had no NPEV isolates nor SL in this period and early detection dropped to less than 80% in Al-Hasakeh only (1 case out of 4 reported cases reported after 7 days of onset), but the adequacy in all the governorates was more than 95%.

In May/June the lockdowns and restrictions loosened. But the consequences of suspended vaccination activities in some areas were clear with no SL isolates in the investigated cases in this period. The low NPEV% could also be attributed to the increase in personal hygiene practices as a response to COVID-19.

2.1.4 Coordination with Partners

The weekly meetings to review AFP surveillance indicators continued virtually via Skype as a precaution measure against COVID-19.

AFP surveillance team participated in COVID-19 preparedness efforts, through translating the guidelines in a timely manner, participating effectively in the Task Force meetings, and guiding the field staff in the early stages of the outbreak.

Although the number of the visits to the reference laboratory in Ankara were minimized due to the COVID-19 situation, but the communication with the lab focal point continued to ensure the continuation of the testing and to inform them in case there is a highly suspected case that needs prioritization in testing.

The lab focal point expressed their desire to stop testing any specimens from north Syria as the beginning of 2021, due to the excess workload for SARS-CoV-2 testing. The communication with EMRO office commenced immediately to look for alternative labs.

Three laboratories were suggested at the beginning: Amman/ Jordan, Muscat/ Oman, and VACSERA in Egypt. It was agreed eventually that VACSERA is the most suitable one and the parallel negotiation with the courier company continued to assess the finance required for this operation.

At the same time a communication channel with the Turkish ministry of health was established by ACU management to look into ways of continuation. Those efforts succeeded in reaching an agreement that ensured the continuation of testing for 2021.

Despite the success in keeping the lab testing in Ankara, but a pilot shipment to VACSERA was agreed by all the involved partners as an alternative and a preparedness for any urgent situation.

Challenges

The main challenges facing the implementation of AFP surveillance activities in 2020 was the COVID-19 pandemic (Delayed reporting, delayed investigation, delayed stool shipment, ...) some of the related challenges and the undertaken mitigation measures could be summarized as follows:

#	Challenge	Mitigation
1	The partial closure of a considerable number of private physicians.	<ol style="list-style-type: none"> 1. Communicating with the private sector and informing them that the program's AFP activities are not suspended and that they can contact the focal points if they encounter AFP cases from the close community. 2. Communicating with the CBS focal points on regular basis to ensure the immediate notification of any possible AFP case. 3. Planning with the DLOs to conduct virtual sensitization sessions with the private sector before the end of 2020.
2	Inability to conduct the supplementary AFP surveillance activities such as Area Coverage survey and out-of-household contact sampling.	<p>Recommendation to stop contact specimens' collection out of the household level, and temporarily suspending the ACS.</p> <p>Each inadequate case situation is discussed bilaterally with the field staff, to evaluate the situation</p>
3	Delay in lab results; the referral laboratory in Ankara is the central virology laboratory in Turkey and they are running the diagnostic tests for a high number of samples every day	<ol style="list-style-type: none"> 1. Maintaining the communication channels with the reference lab to ensure timely feedback of the lab results once possible.

	and the polio team is involved now in the COVID-19 testing.	<ol style="list-style-type: none"> 2. Looking into alternative laboratories to run the needed tests. 3. Reviewing the reverse cold chain and transportation routes and time, no gaps were identified. 4. Agreeing with the referral lab to prioritize the testing of highly suspected cases and inadequate cases, to ensure timely response if required.
4	The lack of PPEs with the field staff, this endangers the staff and the community as the team moves between different areas to conduct the investigation.	<ol style="list-style-type: none"> 1- Training the field staff about COVID-19 as they are the ones conducting the surveillance activities for it which include the required personal protection measures. 2- Purchasing PPEs and distributing it to the field staff.
5	Inability to conduct in-person ERC sessions as a precaution measure against COVID-19.	The ERC is conducted virtually.

The reference laboratory in Ankara informed officially that as of the beginning of 2021 they will not accept AFP specimens from northern Syria, as they are overwhelmed with SARS-CoV-2 testing and that they have deployed all human resources as a part of COVID-19 response.

The communication with WHO commenced immediately to look for alternative labs and other solutions. The agreement was finally on VACSERA lab in Egypt as the most suitable lab to test the specimens from northern Syria. Eventually, the reference laboratory in Ankara agreed to continue testing the specimens in 2021.

Future Plans

AFP surveillance team works always to maintain the level of performance that meets the global standards.

Benefiting from the implemented risk management and mitigation measures against COVID-19; the program will expand the experiment with conducting remote training targeting EWARN staff (DLOs, and FLOs) to include healthcare providers in some areas.

All investigated AFP cases are located at the community level, one of the objectives for 2021 is to have the household level geo-location of at least 80% of the investigated cases. This will enable better and faster detection of any possible clustering.

In collaboration with the WASH team, an assessment of the sewage system will be conducted in location with more than 150,000 residents in accessible areas and communicate with WHO office about the possibility of having environmental surveillance in EWARN accessible areas.

2.2 Vaccine preventable diseases (VPDs) surveillance

2.2.1 Introduction

Early Warning and Response Network (EWARN) was established in mid-2013 to cover the diseases that cause epidemics, at the top of this list is vaccine-preventable diseases (VPD), which is one of the cornerstones of the program of the network of early warning and response to epidemics. Where this surveillance has serious tasks and was the first to announce the measles outbreak in Syria during the past few years and there is working on follow-up to the epidemiological surveillance and vaccine-preventable diseases during the year 2020 in accordance with the plans and concepts outlined in the end of the year 2019, taking into account the developments and changes in all levels and areas for epidemiological, and managed through hard work and constructive effort to discover the biggest measles outbreak occurred in northern Syria over the past few decades. Also, to increase the number of routine vaccine centers (EPI) to 93 routine vaccine centers contain high-efficiency medical staff.

The importance of VPD surveillance:

The essential role of the vaccine-preventable disease surveillance is to detect and report epidemic outbreaks besides rapid response. In addition to cooperate with Syria vaccination group (SIG) and all partners increasing the activation of vaccination activities including routine expanded vaccination program. The outcome of that cooperation is reducing the proportion of morbidity and mortality.

In view of the above efforts, the measles outbreak has been receded, and the risk has been reduced by the end of 2020 as a result of effective routine vaccine program and epidemiological surveillance in its various components.

The surveillance program also monitors the following diseases in addition to measles; rubella, pertussis, mumps, neonatal tetanus, meningococcal meningitis and diphtheria.

In fact, surveillance of the adverse events following immunization (AEFI) is another backbone of the epidemiological surveillance of vaccine-preventable diseases. EWARN collaborates with the Syrian vaccination group and all health partners to work to optimize the surveillance of these effects.

2.2.2 Measles

Since mid-2016, EWARN has shifted from measles-aggregated surveillance to case-based surveillance, where the cases reported in 2020 have been investigated in two ways: the first, the investigation form, and the second, the line list form. Due to many suspected measles 2020 in the context of the massive outbreak, 64% of the total number of suspected cases have been investigated as public health methodology criteria and EWARN guidelines. Nearly 59% of the investigated cases have been confirmed by laboratory tests carried out in various laboratories of EWARN. The rest of the measles cases have been linked to epidemics and others by clinically diagnosis matching the case definition of measles as EWARN guidelines. While some cases have been discarded by the labs.

The District Level Officer (DLO) monitors various types of surveillance for measles cases and responds to coming reporting from health centers,

private medical clinics and other standard reporting methods, He investigates these cases through the frequently updated written line list and through the official investigation form adopted by the EWARN program sometimes, following the global academic surveillance standards methodologies that are being trained at quarter meetings held every 3 months together with the Central Monitoring Officers (CLO) District Level Officer).

The measles investigation surveillance form includes detailed data about the center, and suspected cases information such as: personal data, symptoms, clinical signs, complications, epidemiological, vaccination status and laboratory investigations, as well as the preventive and curative procedures followed with the recommendations provided to the patient and the contacts. EWARN staff make close follow-up of complications the measles cases.

In the 2020 work plan, measles cases have been monitored up to 30 days after the onset of the skin rash to determine the fate of the cases, especially those that have a risk factors and complications, that monitor is an attempt to enhance measles mortality surveillance.

EWARN presents and identify a weekly measles report covering the latest updates including epidemiological developments through the high quality advanced technical implementation of Microsoft Power BI, which is shared with all Syrian partners, besides WHO, UNICEF, SIG, and all medical organizations in the health cluster in Gaziantep hub.

More than 288 cases of suspected measles have been registered from the five governorates where the EWARN program is active.

The measles outbreak has spread to all Syrian governorates, with the highest number of cases of measles (136) recorded in Idleb Governorate. The laboratory positive percentage is 49% for the specific IgM antibodies by ELISA (Enzyme-linked Immunosorbent Assay) of the investigated cases.

In Aleppo, there are 100 cases of suspected measles, and the laboratory positive percentage is 65% for the specific IgM antibodies of the investigated cases.

There are 30 suspected cases of measles in the Al-Raqqqa, and the laboratory positive percentage for them is 64% for the specific IgM antibodies of the investigated cases.

21 cases of suspected measles have been recorded in Al-Hasakeh, and the laboratory positive percentage is 76% for the specific IgM antibodies of the investigated cases.

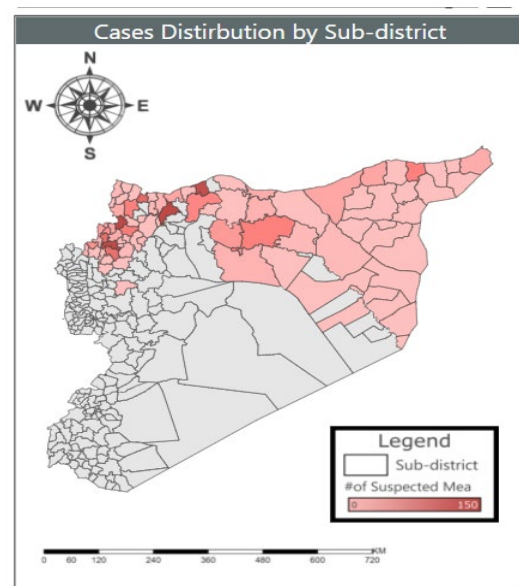


Figure 28: Suspected measles cases distribution 2020

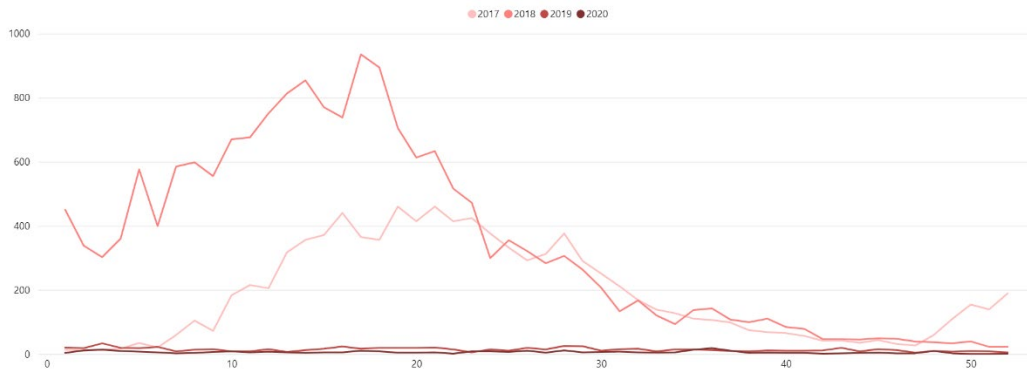


Figure 29: Comparison of measles outbreak between 2017-2018- 2019-2020

4071 cases of suspected measles have been recorded in Deir El-Zor, and the laboratory positive percentage is 79% for the specific IgM antibodies of the investigated cases.

Table 6: Suspected cases of Measles per governorate & district_2020

Cases Distribution by District			
Governorate	District	#Population	#Cases
Idleb	Harim	1535166	77
Idleb	Idleb	654799	37
Aleppo	al bab	318772	29
Aleppo	Jarablus	101035	19
Aleppo	A'zaz	627194	17
Aleppo	Afrin	431267	14
Ar-Raqqa	Ath-Thawrah	157132	14
Idleb	Ariha	172607	13
Aleppo	Jebel Saman	1886315	12
Ar-Raqqa	Ar-Raqqa	437589	11
Al-Hasakeh	Quamishli	344089	10
Idleb	Jisr-Ash-Shugur	306150	9
Aleppo	Menbij	410326	9
Al-Hasakeh	Ras Al Ain	56853	8
Ar-Raqqa	Tell Abiad	91478	5
Al-Hasakeh	Al-Malikeyyeh	140363	3
Deir-ez-Zor	Deir-ez-Zor	454063	1
Total		8125198	288

There are 188 investigated measles cases, and the percentage of investigated measles cases is 65%. most of investigated measles cases come from Harim district.

Table 7: Investigated cases of Measles per governorate & district 2020

Cases Distribution by District			
Governorate	District	#Population	#of Cases
Idleb	Harim	1535166	49
Idleb	Idleb	654799	27
Aleppo	Jarablus	101035	18
Aleppo	Al Bab	318772	14
Aleppo	Afrin	431267	13
Ar-Raqqa	Ar-Raqqa	437589	12
Aleppo	Menbij	410326	11
Al-Hasakeh	Quamishli	344089	10
Al-Hasakeh	Ras Al Ain	56853	9
Idleb	Ariha	172607	9
Aleppo	Jebel Saman	1886315	7
Aleppo	A'zaz	627194	6
Al-Hasakeh	Al-Malikeyyeh	140363	1
Ar-Raqqa	Ath-Thawrah	157132	1
Idleb	Jisr-Ash-Shugur	306150	1
Total		9076248	188

The age distribution of measles cases with the vaccination status. while the percentage of cases unvaccinated with the MR vaccine was 62% of all investigated cases.

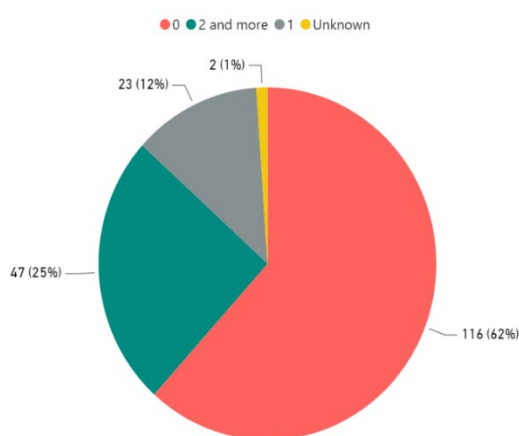


Figure 30: Investigated measles cases with the vaccination status_2020

Most cases are belonging to age group under 5 years. 71% of suspected cases and 82% of investigated cases.

While the final classification of measles cases 44% of the investigated cases are positive for IgM-specific antibodies and about 25% of the cases are clinically confirmed and about 10% of the cases have been excluded by the lab.

Three confirmed cases of rubella have been confirmed by the lab and there is no registered congenital rubella syndrome.

It seems that only 39% of the total number of investigated measles cases have been received one dose at least of the MR vaccine.

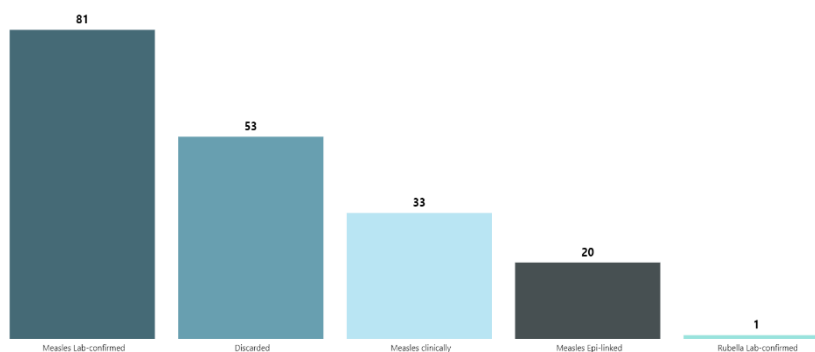


Figure 31: Final classification of investigated measles cases during 2020

The epidemiological indicators of measles surveillance for investigated cases. 188 cases of measles have been investigated out of 288 suspected measles cases and the percentage is approximately 65%. Worthy to note that has done according to the principles and policies of public health by proving the outbreak for each district or catchment area laboratory. So, the surveillance team were preparing the approved investigation forms and the line list.

Table 8: Measles Surveillance Indicators in 2020_I

Governorate	Population	# of sus Measles cases (Zero Report)	Investigated cases	Investigated cases %	Sampled Cases	Lab tested samples	No. Laboratory measles confirmed (IgM) positive	No. Laboratory measles confirmed (IgM) positive %	Non measles and non rubella cases(IgM) Negative	Incidence rate for confirmed Measles per 1.000.000 pop	Non measles and non rubella rate per 100.000
	number	number	number	%	number	number	number	number	number	Rate (target<1)	target<2
Aleppo	3,920,505	100	69	69%	48	48	31	65%	17	7.9	0.4
Idleb	2,683,550	136	86	63%	60	60	31	52%	28	11.6	1.0
Ar-Raqqa	686,199	30	13	43%	12	12	8	67%	4	11.7	0.6
Deir-ez-Zor	762,354	1	0	0%	0	0	0	-	0	0.0	0.0
Al-Hasakeh	981,507	21	20	95%	15	15	11	73%	4	11.2	0.4
Total	9034115	288	188	65%	135	135	81	60%	53	9.0	0.59

Table 9: Measles Surveillance Indicators in 2020 _II

Governorate	Investigated cases	Notified within 7 days form rash date target≥80%		Investigated within 48 h from notification date target≥80%		Sampled Cases	Sampled within 4-28 days from rash date target≥80%		Samples sent to lab	Samples sent to lab within 3 days (maximum 7 days) target=> 80%		Lab results sent	Lab result within 7 days (target≥80%)	
	number	number	%	number	%	number	number	%	number	number	%	number	number	%
Aleppo	69	55	80%	65	94%	48	42	88%	48	47	98%	48	45	94%
Idleb	86	83	97%	59	69%	60	50	83%	60	60	100%	60	59	98%
Ar-Raqqa	13	11	85%	12	92%	12	11	92%	12	12	100%	12	12	100%
Deir-ez-Zor	0	0	-	0	-	0	0	-	0	0	-	0	0	-
Al-Hasakeh	20	20	100%	20	100%	15	12	80%	15	13	87%	15	14	93%
Total	188	169	90%	156	83%	135	115	85%	135	132	98%	135	130	96%

There is no death related to measles during 2020. There are 6 cases as pneumonia related to measles. Fortunately, all of them have been managed appropriately and covered completely.

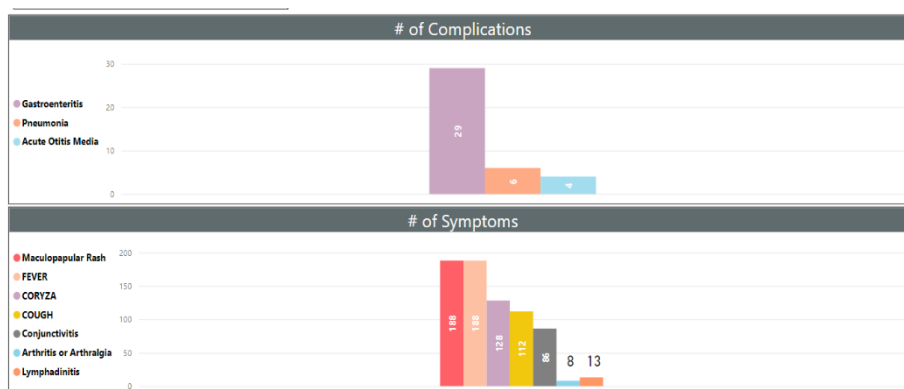


Figure 32: Complication and symptoms of investigated measles cases

For more details about measles report, please click on this link : [Measles Surveillance Report- EW 52 2020-NS-EWARN -ACU](#)

Other VPDs

- There is a confirmed rubella case in Harim district in male infant 7 – month – old age ago, he is covered totally.
- There is no registered death as complication of pertussis, mumps during 2020

VPD	Count
Measles	288
Rubella	1
Mumps	2221
Tetanus	0
Neonatal tetanus	0
Tuberculosis	449
Probable Diphtheria	0
Pertussis	3283

2.2.3 Adverse Event Following Immunization (AEFI) Surveillance

EWARN has made a great collaboration with world health organization (WHO), Syria immunization group (SIG) and with all activation health partners to increase the achievement of vaccination activities including routine expanded vaccination programs. Subsequently, morbidity and mortality of vaccine-preventable diseases will have decreased. In fact, surveillance of the adverse events following immunization (AEFI) is a collimated system of the epidemiological surveillance of vaccine-preventable diseases.

EWARN has monitored AEFI for each of the 93-routine vaccination centres in 2020. The mechanism of surveillance is to communicate with the centre supervisors, district’s supervisors, together with side effect doctors by EWARN response team, in addition to DLOs

(District Level Officer), which in turn have been sending a monthly zero- report to the central level. Central level officers (CLO) have been studying, analyzing, and processing all those reports. It is worth notably that the monthly report on routine vaccine centres is received for mild and moderate side effects of AEFIs, while dangerous, sever or cluster AEFIs have been reported urgently to CLO.

- EWARN record 350 AEFI cases in 2020.
- Age group distribution of AEFIs: there are two age groups, and there are 180 cases of AEFI in the age group under 12 months which consists 51% of total AEFI cases.
- Sex distribution of AEFIs: Males consists about 61% (214 out of 350) from the total percentage of AEFI.

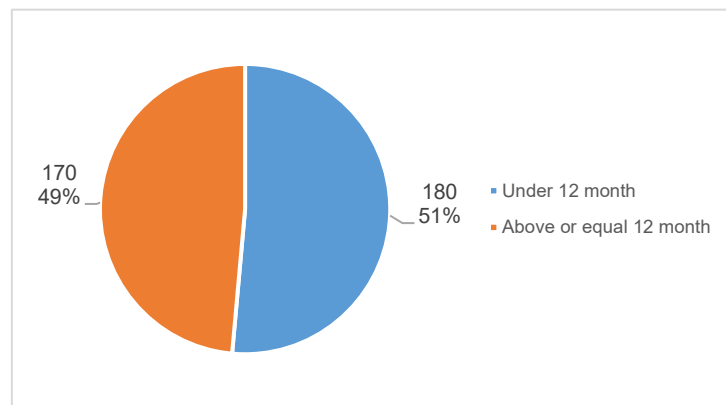


Figure 33: Age groups distribution of AEFI of 2020

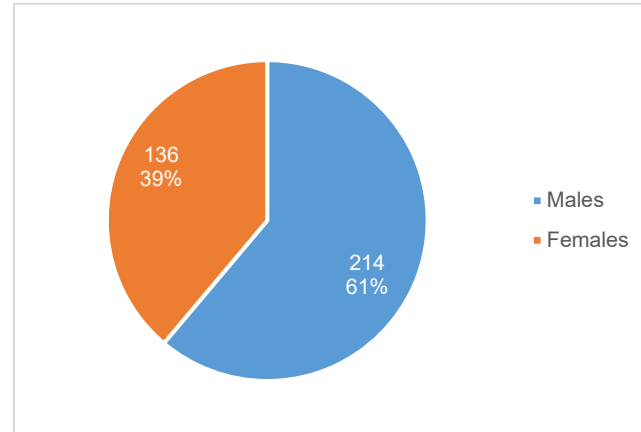


Figure 34: Sex distribution of AEFI of 2020

AEFI surveillance of routine vaccination centres (EPI) - 2020

1. Monthly reports have been received from operating routine vaccine centres. The number of these centres has reached 93 vaccine centres in Idleb and countryside of Aleppo in 2020.
2. The average percentage of monthly timeliness of AEFIs reporting has reached 98% (91 out of 93) centres have sent zero reports on time.

3. Timeliness of reporting is to send the AEFI zero report up to the end of the first week of every next month.
4. The average percentage of monthly completeness of AEFIs reporting has reached 99% (92 out of 93) centres have sent zero reports.
5. Completeness of reporting is to send the AEFI zero report at any time of next month.

Table 11: Timeliness & Completeness of AEFIs reporting from EPI in - 2020

AEFI Surveillance	# Of the sent reports	# All reports to be sent	Percentage
Timeliness	91	93	98%
Completeness	92	93	99%

Classification of AEFI according to severity

There are 3 types of AEFI:

Mild: It doesn't need treatment or doctor's intervention.

Moderate: It needs some observation by the doctor.

Sever: It needs hospital admission for management and treatment.

- The recorded number of all AEFI cases is 350.
- The recorded number of mild AEFI cases is 313.
- The recorded number of moderate AEFI cases is 30.
- There are 7 severe cases of AEFI.

Expert review committee

Expert review committee (ERC) for the AEFI Index is an independent body composed of national experts from various relevant backgrounds. The committee reviews the methodology for the Index before approval by the Supervisory Board. ERC able to detect the cause of the severe AEFI.

ERC has conducted during December 2020 and has discarded the responsibility of PENTA vaccines of death. The cause of death of first case from Aghtarin subdistrict was severe pneumonia and multi organ dysfunction. While the second case was from A'zaz district, and the cause of death was sudden death syndrome. (ERC) has classified the two mortality cases as coincident events with vaccination. There are a separate detailed reports of mentioned mortality cases.

It is considerable to note that most cases of fever or Localized swelling and redness have not been referred to the health facilities. Parents have given paracetamol to their children based on the recommendations of pediatricians and doctors of Side effects.

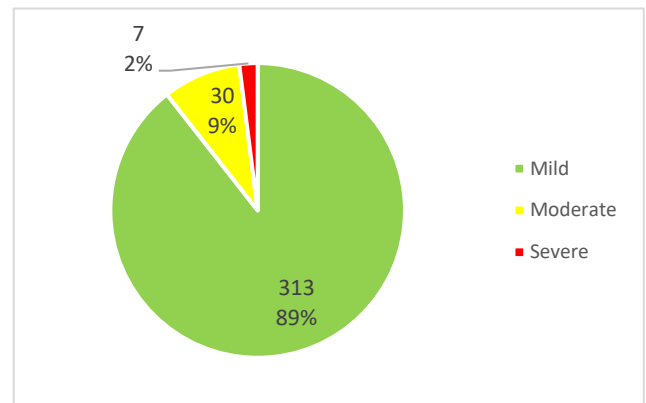


Figure 35: Classification of AEFI from EPI centres 2020

The PENTA vaccine has associated with most of reported AEFIs.

Monthly zero report

It has information on the status of the amount and date of reporting, as well as epidemiological information on the status of AEFI, detailed information on the vaccine and the mechanism of side effect.

Figure 36: AEFI cases referral form

Figure 37: Zero monthly report of AEFI from EPI centers_2020

Challenges

- The reluctance of some doctors to send AEFIs notifications.
- COVID-19 outbreak burden.
- The absence of the normal health system in Syria and increasing health workload due to inadequate health staff.
- Lack of governance for the health sector.
- Security concerns in some areas that lead to field staff collecting basic data without collecting -sometimes- the necessary samples.
- Many staffs still sending the zero report by WhatsApp and other unofficial methods for reporting.

Future Plan

- Continue to collaborate with SIG to achieve the best ways of AEFI surveillance at the level of routine vaccination centres (EPI).
- Increase the capacity of medical staff and raise their awareness by conducting more training, introducing modern electronic techniques, and enhancing electronic surveillance, especially Tableau, Epi Info, and Power BI.
- To make more efforts to hold the necessary training inside Syria, where the team of VPD entered the north of Syria and conducted supervisory and training visits and

supply technical and logistical support. Also, the team is still spare no effort to increase the efficiency of health personnel in the north of Syria.

2.3 Water Borne Diseases (WBDs)

2.3.1 Introduction

The importance of the impact of water-related diseases on human health has been recognized as a major threat to sustainable health system reconstruction.

Waterborne diseases with high potential for developing into epidemics, such as cholera, were brought under the surveillance since the launch of EWARN in 2013, three water borne diseases were included in the list (AJS – ABD and AWD), then AD was added to the surveillance list in 2015. Those diseases are highly morbidity diseases and have epidemic potential. This group of diseases strongly reflects the quality of WASH services provided.

Therefore, EWARN are at the forefront of reducing the endemic disease burden related to water and sanitation, preparing for outbreaks and make contingency plans, including keeping abreast of new epidemiological insights, resource mapping including logistics, supplies, and human resources, especially for cholera.



Figure 38: Distribution Jerrycans in camps

The challenges are particularly great in north of Syria, where the primary health care is a priority.

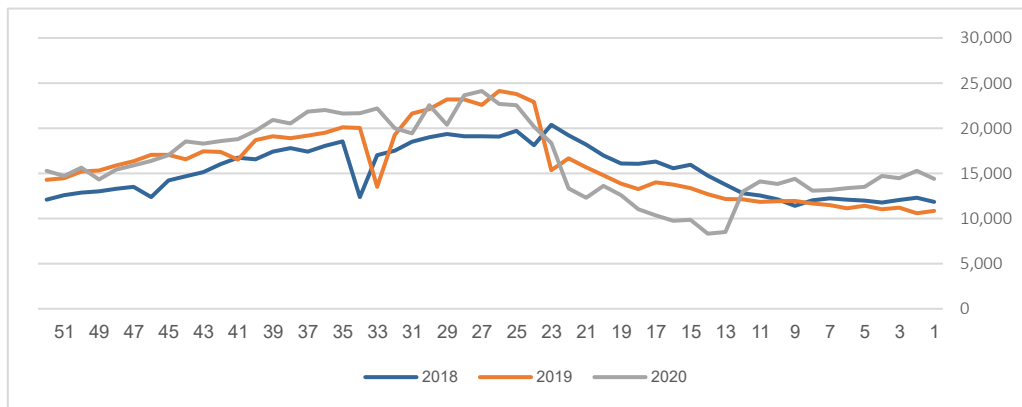


Figure 39: Cases No. for WBDs 2018, 2019, & 2020

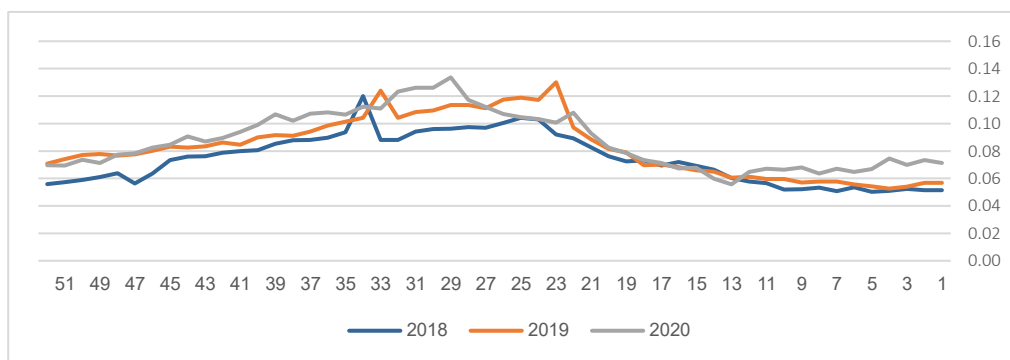


Figure 40: Proportional Morbidity for WBDs 2018, 2019, & 2020

2.3.2 Activities of 2020

- 1- Verified and investigated more than 44 WBDs alerts in 5 governorates (Aleppo, Idleb, Ar Raqqa, Deir-Ez-Zor, and Al Hasakeh), with the adequate sampling (stool or blood culture, serum), testing of water sources and disseminating IEC materials. The details of the response actions are mentioned in the logistic and response activities.
- 2- Generate the Cholera risk map in northern of Syria, and [water borne diseases dashboard](#) , share it with both Health and WASH clusters, in addition to cholera technical group. A Scale Score (0-6) (based on acute diarrhoea incidence, population density and WASH conditions) has been used to rank risk and to identify priority areas for intervention.

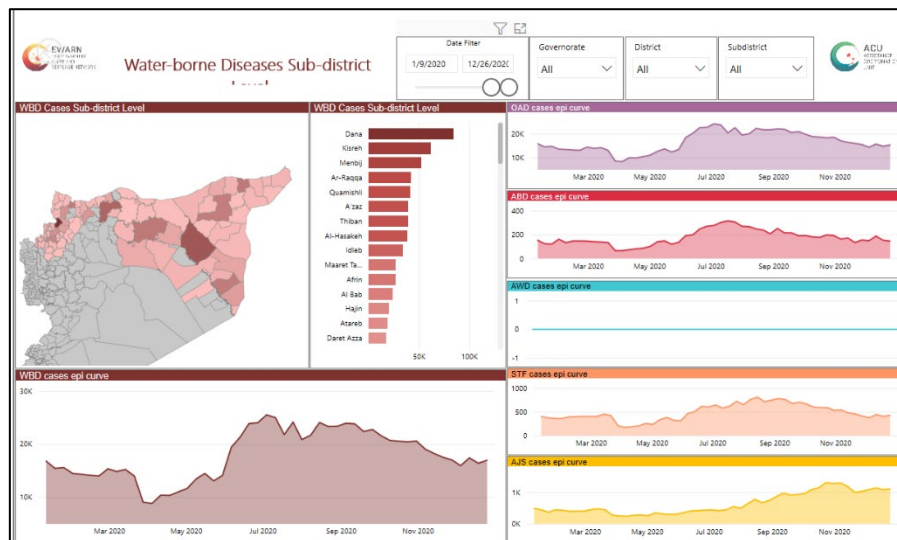


Figure 41: WBDs dashboard_2020

- 3- Fortunately, no suspected cases of cholera were notified or detected during 2020.
- 4- Currently, WBDs surveillance has a strong and high-level coordination with: Lab team, WASH team and health workers in order to monitor the trends and evaluate the implemented activities.

Table 12: WBDS cases No. per governorate_ 2020					
Governorate	ABD	AWD	OAD	AJS	STF
Aleppo	1,256	0	241,378	5,401	2,678
Idleb	481	0	236,469	9,484	4,532
Deir ez zor	2,796	0	142,746	7,035	12,483
Ar Raqqa	851	0	93,902	5,526	3,010
Al Hasakeh	3,680	0	145,637	5,582	2,553
Grand Total	9,064	0	860,132	33,028	25,256

Challenges

- 1- The COVID-19 pandemic has had a substantial impact on the other activities of infectious diseases, for that reason the cholera contingency plan of 2020 was not issued as the technical group has temporary suspended.
- 2- Uncertainty in prioritizing the risks due to lack of availability of data from the other sectors, poor knowledge of activities within the water supply chain.
- 3- Lack of human resources, including technical expertise, to plan and implement needed upgrades.

- 4- WBD are endemic in Syria. Control procedures need a strong and multiple resources to coordinate between all partners and sectors, which is very challenging and high cost implications.

Future Plan

- Building the capacity of the surveillance team about the analytical studies (cohort and case- control).
- Developing a prioritized upgrade/improvement plan for each significant uncontrolled risk related to WBDs.
- Include the community component in WBDs surveillance to increase the sensitivity of disease detection.
- A communication plan to alert and inform users and stockholders in case of WBDs epidemics.

2.4 Covid-19 Surveillance & Laboratory Pillars

2.4.1 COVID-19 outbreak and its evolution in NWS

On 9th July 2020, EWARN announced the confirmation of the first COVID-19 case from Harim district of Idleb governorate of Northwest Syria. The index case was a healthcare worker (a physician) at Bab Al Hawa (BAH) hospital, located in Harim district. He had mild manifestations and was investigated in a hospital near Syrian-Turkish borders on 7th July. Once he was confirmed as a positive case, he immediately started the self-isolation. The case had a travel history in the Al-Bab district of Aleppo for a family visit which was 14 days before his date of symptom onset. There was no travel history outside Northwest Syria while some of his contacts had continues to travel to Turkey and some of them developed symptoms.

The contact tracing started on the same day the lab result was declared. EWARN made an announcement targeting all the patients and their escorts who visited the health facility where the index case was working. The announcement encouraged the patients and their escorts to follow the quarantine protocols as per standard guidelines. The aim was to contain the spread of the virus and enhance the contact tracing process and additional case notification.

Many contacts of the index case were confirmed as they were considered the first cluster of cases, and consequently, most of them were identified as health care providers. The virus demonstrated rapid transmission from one cluster to another when a case was detected in Al-Bab district of Aleppo Governorate, on 19th of July (after 10 days of detection of the 1st case), followed by detection of another case from Sarmin city in Idleb Governorate who had a travel history to the Syrian government regime area of Aleppo city. The circulation of the virus reached up to the level of community transmission by 1st of August (after 21 days of the 1st cases), where the situation met the definition of 4th category of transmission pattern as per WHO guidelines (multiple unrelated clusters in several areas of the country/territory/area).

Till 31 December 2020, Total 20,270 laboratory-confirmed cases and 340 COVID-19 associated deaths were recorded from NWS.

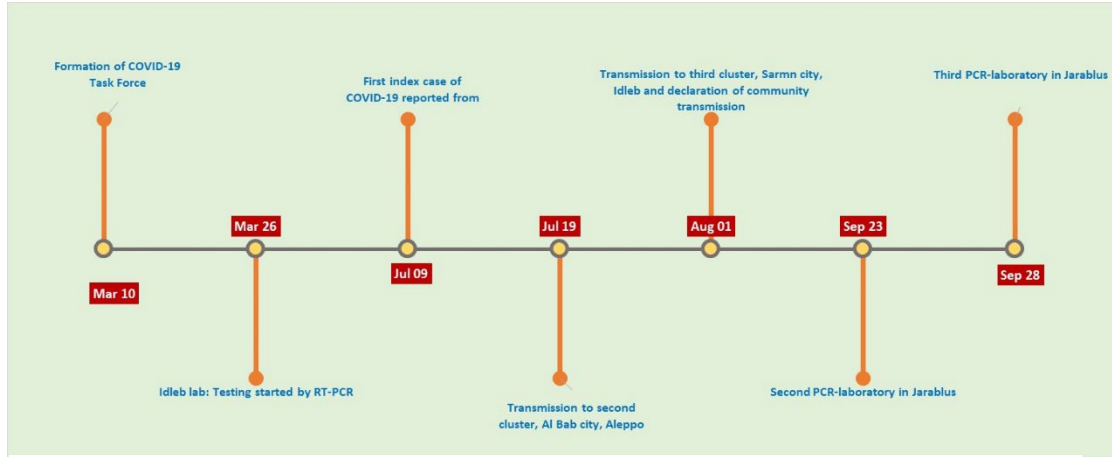


Figure 42: Timeline showing important transmission milestones for COVID-19 in NWS in 2020

The establishment of two new PCR-equipped laboratories, demonstrates how the rapid transmission of COVID-19 necessitated the increase in diagnostic capacity that facilitated the speed of establishing two additional laboratories in NWS by ACU with financial and technical assistance from the partners.



Figure 43: PCR Lab in NWS

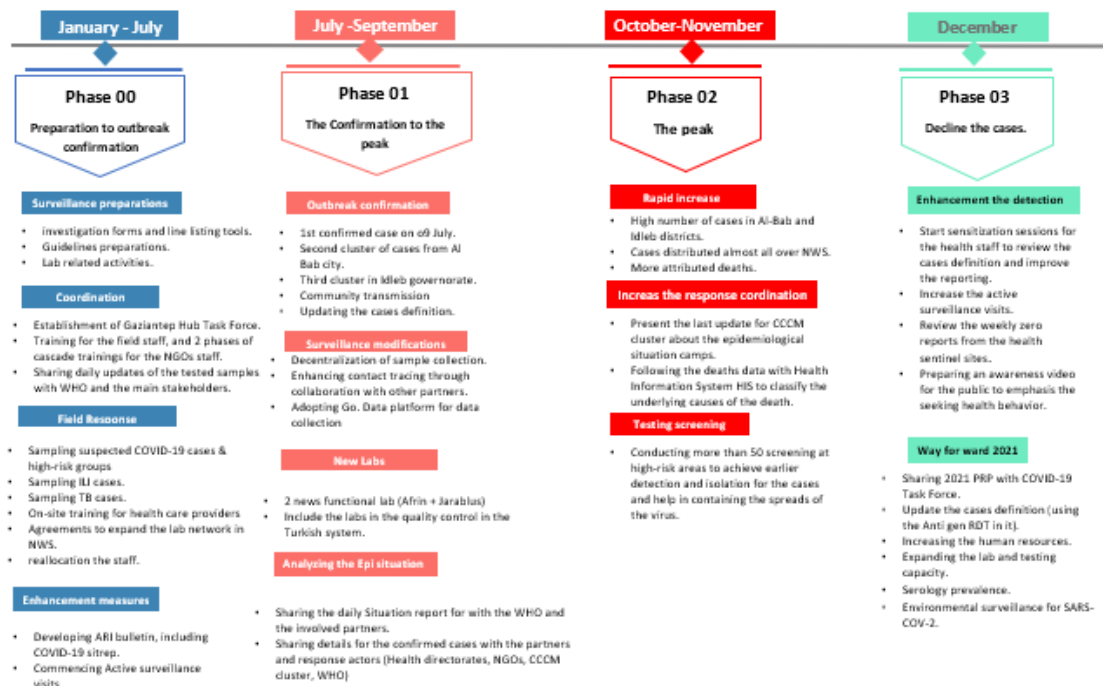


Figure 44: Timeline showing EWARN's key response milestones for COVID-19 in NWS in 2020

2.4.2 EWARN response to COVID-19 in surveillance and laboratory activities

EWARN commenced the response activities to COVID-19, without delay, from the beginning of the epidemic which started with translating the global surveillance guidelines from WHO into Arabic and disseminating them with the field staff coupled with conducting some awareness sessions in selected high-risk areas in northern Syria. Till the end of July, the number of active sentinel sites in NWS was increased from 9 during the pre-COVID situation to 113 after NWS was hit by COVID-19.

The role of EWARN in the COVID-19 Task Force response plan is to lead and implement activities under the surveillance and laboratory pillars as well as participating in activities and training with relevant teams for risk communications. Since the onset of the outbreak, EWARN has been conducting analysis for the epidemiological situation, preparing daily and weekly reports and disseminating the findings with all partners through emails, dashboards and during the weekly meetings.

One of the Enhancement measures that have been conducted to expand the testing in stage 0 is sampling the high-risk groups, a protocol for sampling the TB patients in Idleb TB clinic was developed through the COVID-19 Task Force. Another high-risk group of transmission of the virus is the health care providers, EWARN developed a protocol for regular screening of health care providers for Covid-19 in April, but it could not be commenced until additional lab capacity was ensured in September last year.

WHO EMRO has supported the EWARN/ACU team by providing training and establishing GoData as a one-stop web-based platform to manage the entire outbreak data esp for Covid-19. Implementing the GoData application facilitated EWARN in data collection, case

investigation, line-listing, and contact tracing. The data stored in the GoData platform also helped the COVID-19 data make available online, offline, and on mobile devices.

The risk mapping: before the confirmation of the outbreak in NWS, EWARN developed a risk scale for Covid19 for the severity of the pandemic if it reaches the area, it was mapped at the sub-district level in the north of Syria. The map was developed by a collaboration between the surveillance and data team in ACU/EWARN, in consultation with some CDC and WHO experts. The following are the details of the risk scale for Covid19. It was calculated depending on 6 variables, then aggregate the six variables for each sub-district, where the higher value indicates a high-risk area. Estimated population provided from HNAP, Population for camps provided from CCCM.

The variables to calculate the risk scale in NWS:

The prevalence rate for ILI cases	The prevalence rate for SARI cases
Population density	Camps population density
The number of health facilities for 10,000 persons	Proportional Morbidity of water-borne diseases

The risk scale at the sub-district level, in May 2020 shows that 2 sub-districts got the 10 grades in the risk scale (Dana sub-district in northwest and Hajin sub-district in the northeast of Syria, the first confirmation of the COVID-19 outbreak was in these subdistricts and EWARN recorded high number of the confirmed cases from there.

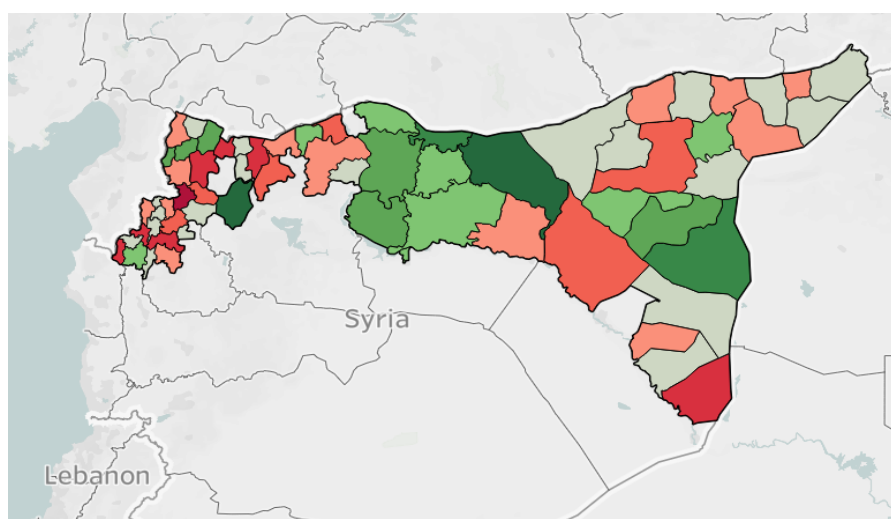


Figure 45: Risk-mapping for COVID-19 for NWS showing risk scales at sub-district

2.4.3 Laboratories and the testing strategies

The EWARN first started the testing for COVID-19 in Idleb laboratory on 26 March 2020. By September that year, two additional laboratories were established in NWS (one in Afrin and another in Jarablus district). All three laboratories were equipped with PCR machines and dedicated to testing samples for COVID-19. All laboratory physicians and technicians were trained on the methods for testing using the RT-PCR. The laboratories were capacitated to

test up to 1,500 samples per day and run around the clock. The following table (Table 5) shows the staffing of the labs and their testing capacity.

Table 13: Staff and testing capacity of the laboratories in NWS

Lab name	No. and types of staff	#PCR	Testing capacity	Future plan
Idleb	1 doctor, 4 technicians, 1 data entry	2	800 tests per day	Add 1 PCR
Afrin	1 doctor, 2 technicians, 1 data entry	1	500 tests per day	Add 1 PCR
Jarablus	1 doctor, 2 technicians, 1 data entry	1	500 tests per day	

Based on the available capacity of the laboratories, EWARN made a flexible testing strategy for NWS. The main category of the tested samples was from the patients who met the case definition of the COVID-19 suspected cases. The surveillance team would collect nasopharyngeal swabs from all the suspected cases regardless of their clinical condition, and the lab tested the samples using the RT-PCR technique to detect the SARS-COV-2. The active case search and the screening activities were very limited due to the low lab capacity. The following table (Table 6) shows the locations and types of places where EWARN conducted the screening tests for COVID-19 and the number who came out as confirmed cases:

Table 14: COVID-19 screening in NWS in 2020

Type of screened place	# Total screened	# positive
Bakery	25	2
CCTCs	96	14
Civil defense	96	16
court	66	21
Governmental offices	168	25
Hospital	499	117
Markets	95	8
NGO Office	10	4
PHC	585	62
Police center	874	128
prison	160	7
Referral System	17	2
camps	223	67
Total	2914	473

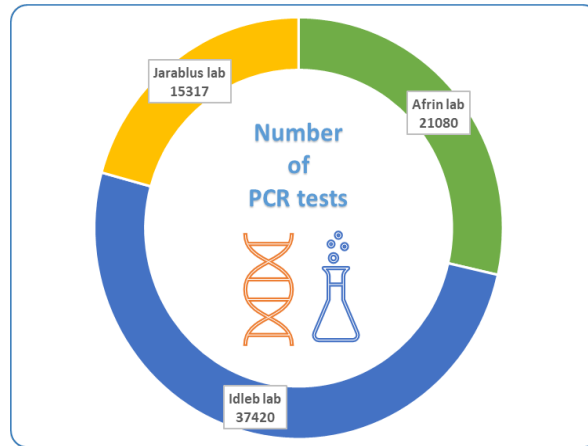


Figure 46: Number of COVID-19 samples tested in three laboratories in NWS in 2020

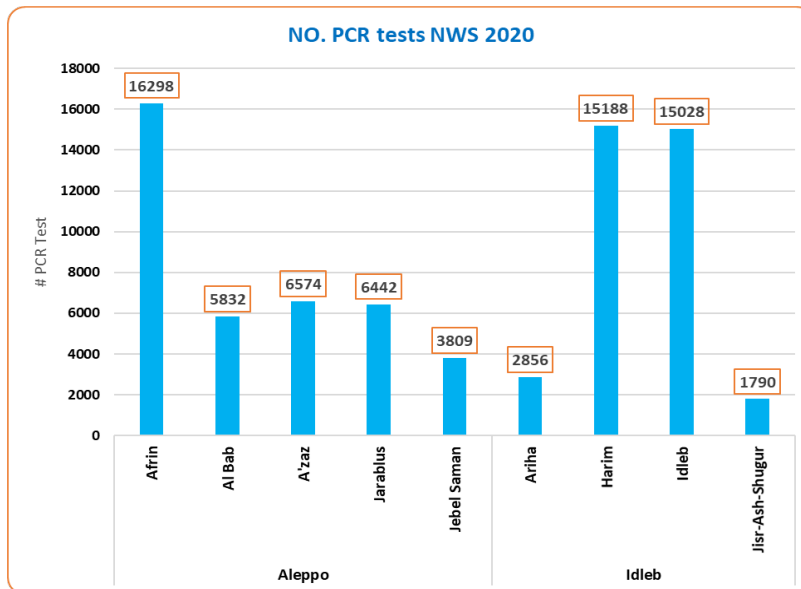


Figure 47: Number of COVID-19 samples tested in each district in NWS in 2020

Since testing for COVID-19 started in March 2020 in Idleb, the first confirmed case of SARS-COV-2 was detected on 9th July 2020. Although the number of daily tests was slow initially, it gradually went up and reached up to 1400 tests per day and by the end of December, a total 73,817 samples were tested of which 71,809 samples were tested since the first case detected on 9th July 2020. Since then, the average test positivity rate was 27.5% as of 31 December 2020.

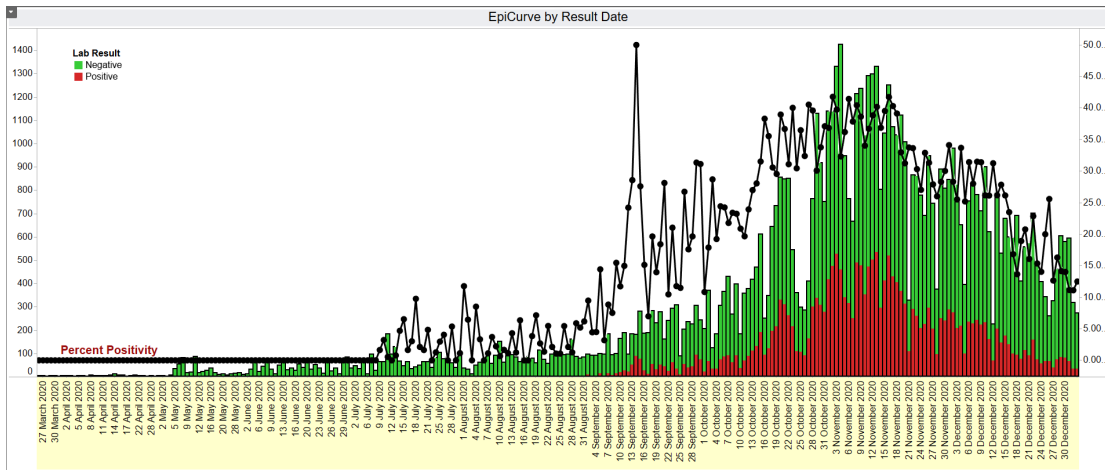


Figure 48: Laboratory-confirmed cases of COVID-19 and test positivity rate in NWS, December 2020

Since reporting of the first case, there was a gradual rise in the daily number of lab-confirmed cases in NWS and the peak reached by 13 November 2020, when EWARN recorded 525 new cases in one day. However, since then, i.e. from mid-November 2020, the number of new cases started to decline which continued till the end of 2020.

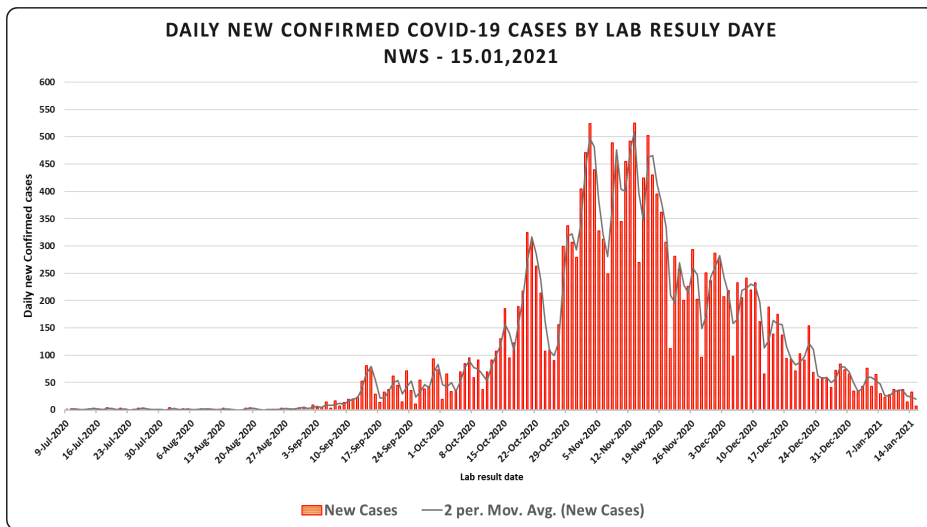


Figure 49: Daily number of laboratory-confirmed new cases of COVID-19 and 2-day moving average in NWS, till 15 January 2021

The lab quality assurance

Also last year, the WHO Turkey country Office facilitated a collaborative initiative between the EWARN and the MoH Turkey for Laboratory Quality Assurance program for COVID-19. Under this initiative, all three laboratories were included in an external quality control program that provided an opportunity to evaluate the reliability and testing capacity of each lab in NWS. Till December 2020, EWARN received 3 batches of the control samples from the MoH Turkey, tested them in those three laboratories, and sent the results to the relevant focal point in Turkey.

2.4.4 Epidemiologic profile of confirmed cases of COVID-19 in NWS

In 2020, since the first PCR-confirmed COVID-19 case was reported from NWS, a total of 20,270 cases were recorded till 31st December. Among them, 9197 cases were from the Aleppo governorate and 11,073 cases from Idlib governorate. Total 382 deaths (... from Aleppo and ... From Idlib) were recorded which were categorized as COVID-associated deaths, with the resulting case fatality rate of 1.9%.

There were 12,664 (62.5%) males, and 2,002 (9.9%) of cases were aged 60 years and above. During the year, 2,090 (10.3%) cases were identified from IDP camps. A total of 1,706 (8.4%) were clinical healthcare workers, and 948 (4.7%) were auxiliary workers working for different healthcare facilities and community health workers. By the end of 2020, total 12,822 (63.3%) cases had recovered.

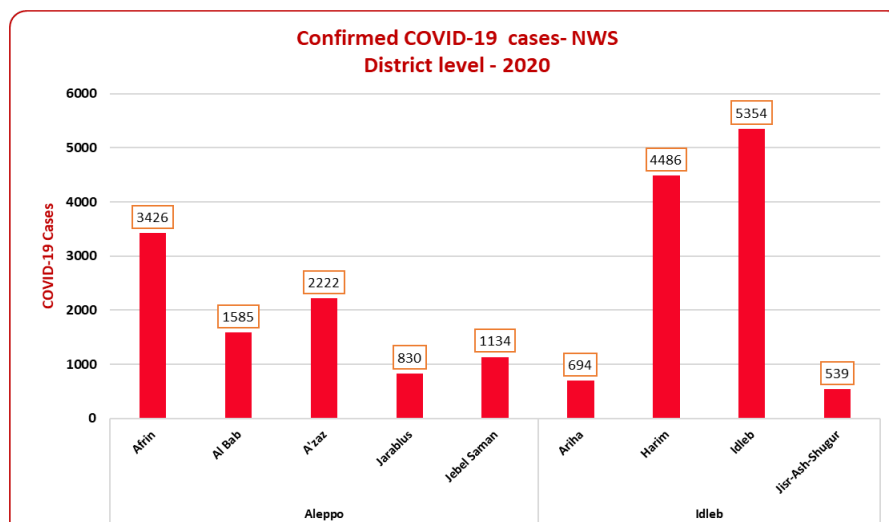


Figure 50: The number of lab-confirmed COVID-19 cases by districts in Northwest Syria, 2020

In the above map, 5 districts reported record number of cases which were Idleb, Dana, Afrin, Al- Bab and Azaz. Idleb district recorded the highest incidence rate (140 per 100,000 in Epi week 45), followed by Afrin with 120 per 100,000 for Epi weeks 45,46,47. At an earlier stage, the Al-Bab district recorded a higher incidence rate than any other district starting from Epi-week 38, while Jisr-Ash-shugur district recorded a late increase in caseloads as of Epi week 45.

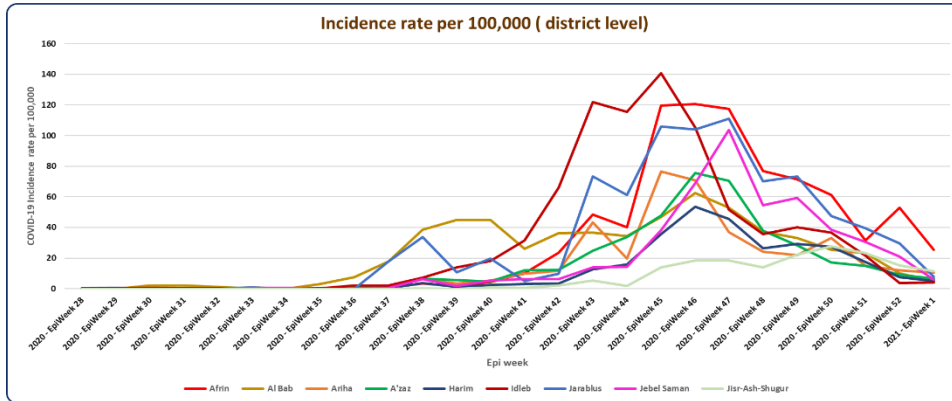


Figure 51: Trend of weekly incidence of COVID-19 cases in NWS, 2020

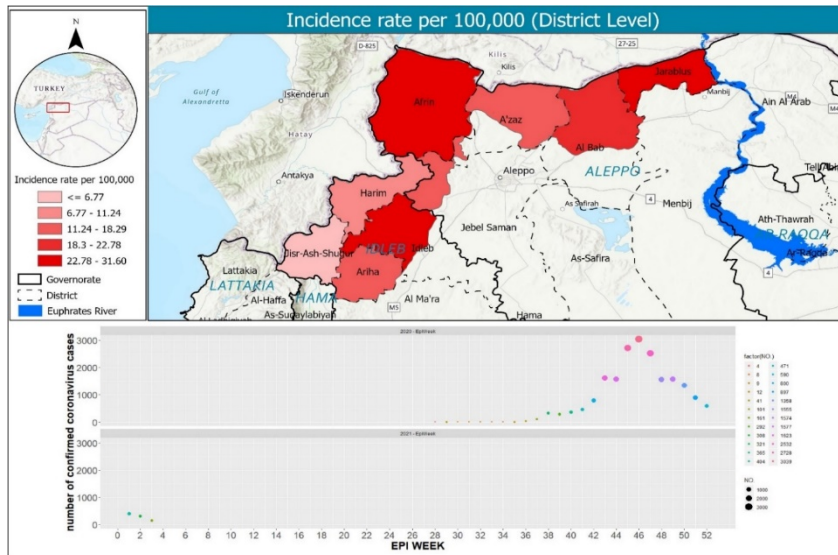


Figure 52: Distribution map of confirmed cases of COVID-19 in 2020

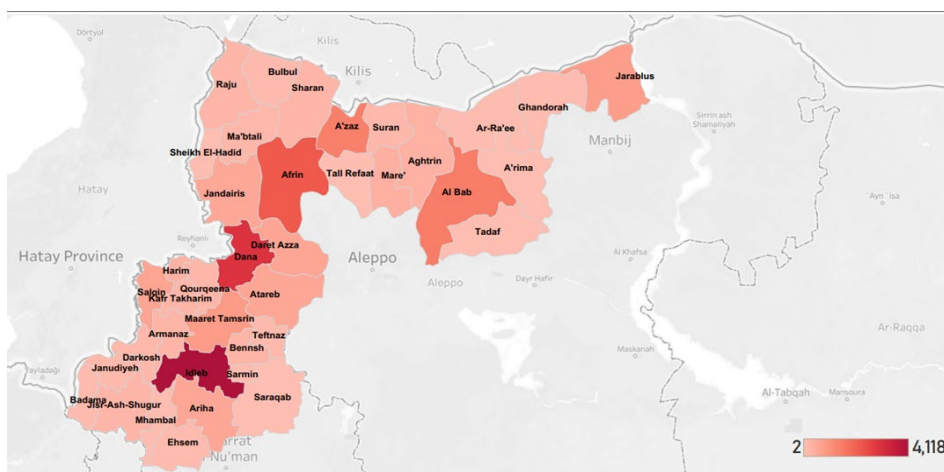


Figure 53: Map of NWS showing the sub-districts of Aleppo and Idlib governorate affected by COVID-19 in 2020

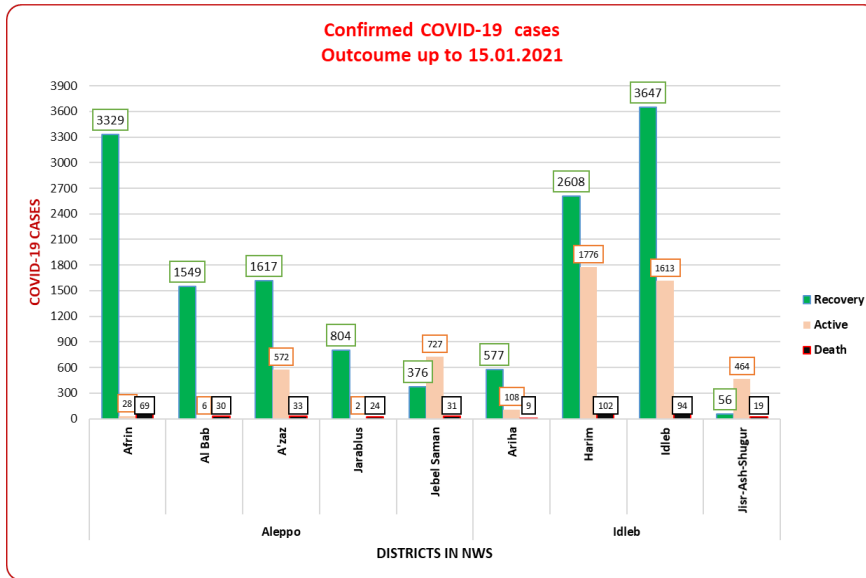


Figure 54: the number of active, recovered and death cases in NWS, 2020

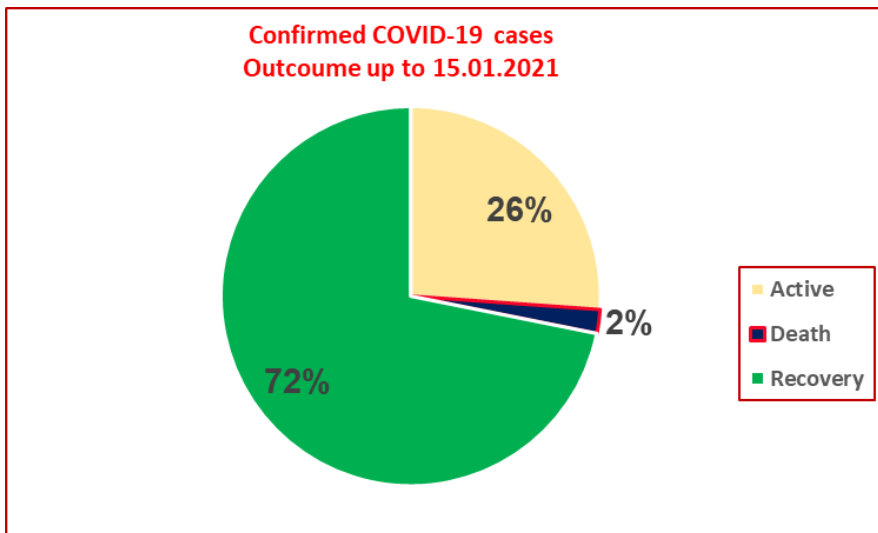


Figure 55: Distribution of confirmed COVID-19 cases by outcomes, NWS, 2020

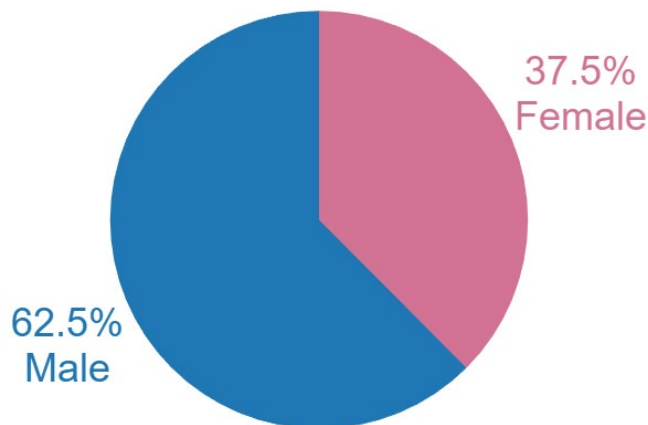


Figure 56: Distribution of confirmed COVID-19 cases by gender, NWS, 2020

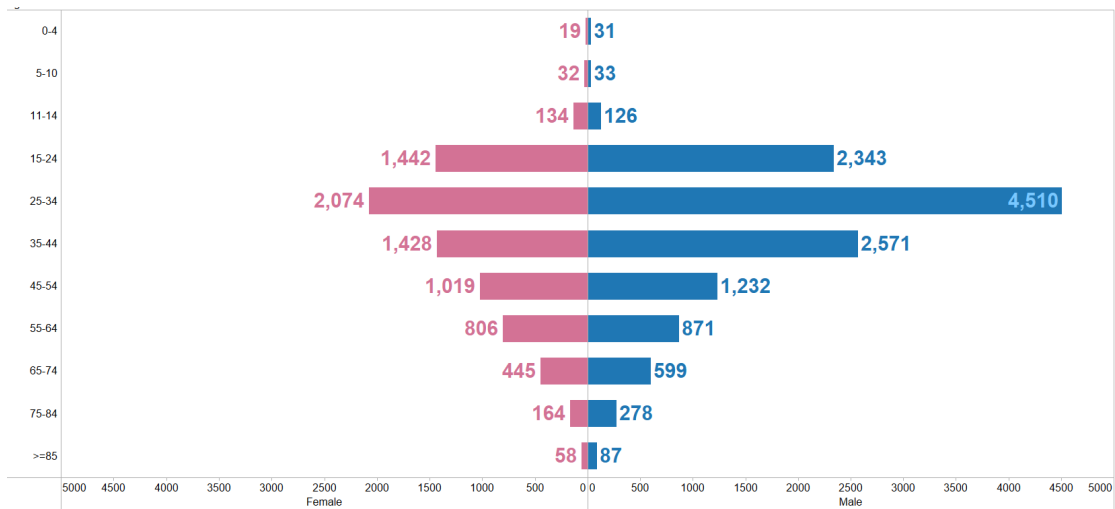


Figure 57: Age pyramids showing the distribution of confirmed COVID-19 cases by age-groups, NWS, 2020

70.8 % of confirmed cases of COVID-19 were in the age group from 15 to 44 years. The reason for higher infection among this group can be explained by their non-adherence to the preventive measures, low-risk perception (as most cases exert mild symptoms), income generation, young age.

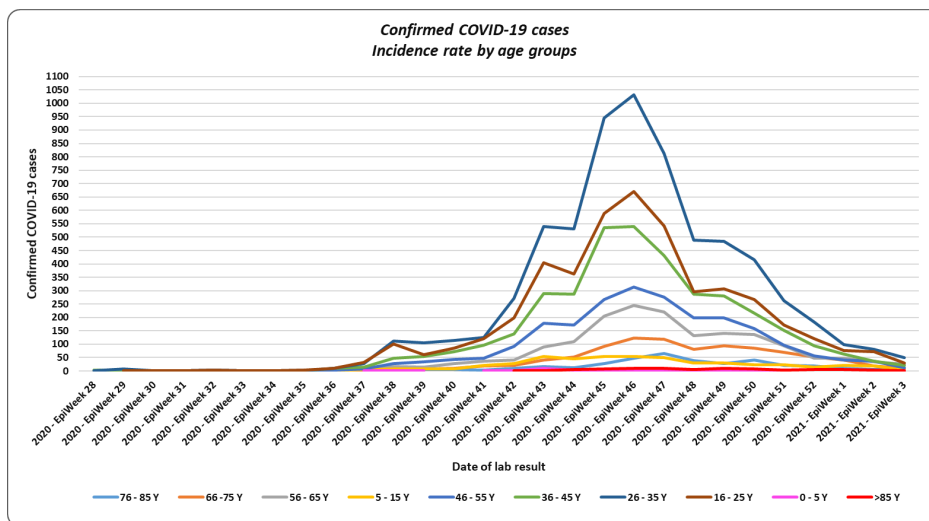


Figure 58: Line graph showing the incidence of confirmed COVID-19 cases by age-groups, NWS, 2020

2.4.5 COVID-19 mortality

EWARN follows the WHO guidelines in the COVID-19 case definition including the COVID-19 attributed death, A COVID-19 death is defined for surveillance purposes as a death resulting from a clinically compatible illness in a probable or confirmed COVID-19 case unless there is a clear alternative cause of death that cannot be related to COVID-19 disease (e.g., trauma). There should be no period of complete recovery between the illness and death.

Calculating CFR

EWARN followed the below formula to calculate the case fatality rate for COVID-19 in NWS:

$$\text{Case Fatality ratio (CFR, in\%)} = \frac{\text{Number of deaths from disease}}{\text{Number of deaths from disease} + \text{Number of recovered from disease}} \times 100$$

[Ref: <https://www.who.int/news-room/commentaries/detail/estimating-mortality-from-covid-19>, WHO, 4 August 2020]

Using this formula, EWARN calculated 1.9% case fatality rate as COVID-19 associated deaths from NWS in 2020. However, there were some more deaths till 31st December 2020, for which the cause of death was still pending for final decision and hence they were not included in this calculation.

In NWS, the linkage between the confirmed cases of COVID-19 and death is assessed and reviewed by the **Health Information System (HIS)** unit of NWS. After careful review and through investigations, the HIS unit makes the final classification of the deaths of COVID-19 patients and declares whether the deaths resulted from COVID or from non-COVID causes. For this review, they match the names and the case ID with the HIS database and assess whether or not the deaths follow the WHO definition of COVID-19-associated death. The HIS unit also collaborates with the local authorities (such as the civil defense) who deal with the dead bodies and transfer them from hospitals to the burial places, this coordination aimed to help the identification of the outcome and not lose possible deaths. However, it is unlikely that all deaths were detected and correctly assigned, some COVID-19 deaths occurring in the community may be undetected.

This chart shows that as of 15 January 2021, 43 SARS-COV-2 deaths were not classified whether these were attributed to COVID-19 or not.

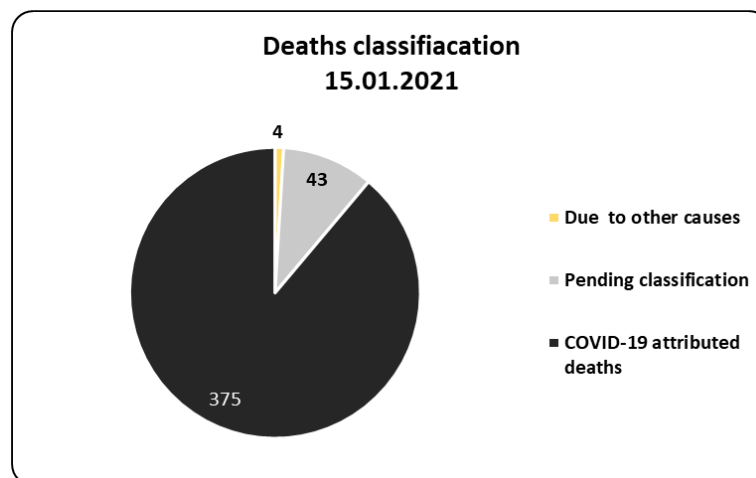


Figure 59: Classification of deaths for confirmed cases of COVID-19 in NWS, 2020

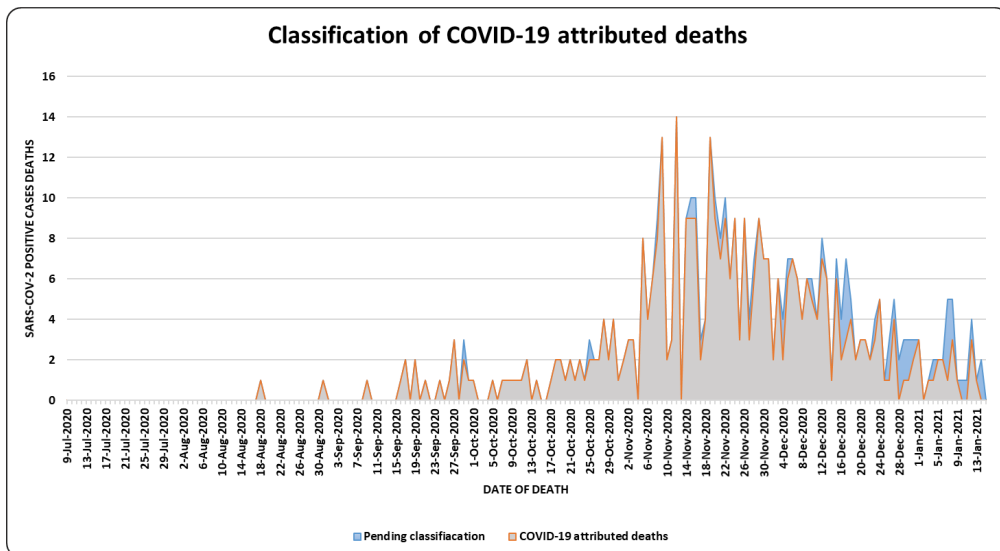


Figure 60: confirmed COVID-associated deaths and the deaths which were pending for classification in NWS till mid-January 2021

This Epi-curve shows all the deaths of SARS-COV-2 positive cases as per the COVID-19 line list, as of 15 Jan 2020. The gray-colored area represents COVID-19 attributed deaths for which EWARN received confirmation from the (HIS) Unit, a body responsible for the classification of deaths for all PCR-confirmed cases in NW. In this curve, the blue-colored area shows the deaths which were still pending for classification by the HIS unit. The majority of these deaths mainly occurred at the home or in health facilities and till that time, there was inadequate clinical information available about the deceased which did not allow to conclude about the cause of those deaths.

The below epi-curve shows the new daily cases and deaths. The peak of the deaths was observed during the second half of November 2020, which essentially represented that the peak of the deaths appeared about one week after the peak of new cases in NWS last year.

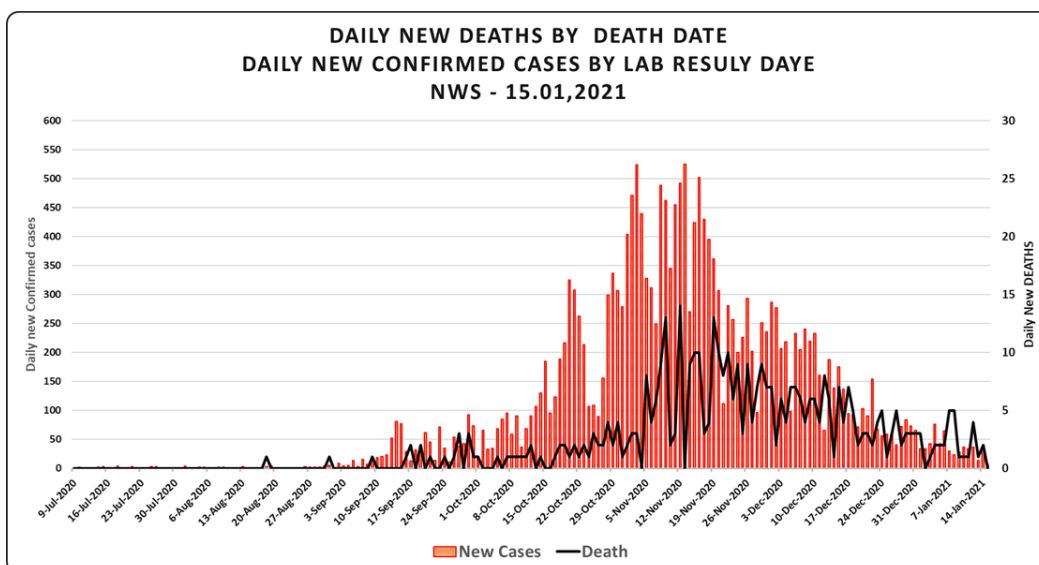


Figure 61: daily new cases and deaths of confirmed COVID-19 cases in NWS till mid-January 2021

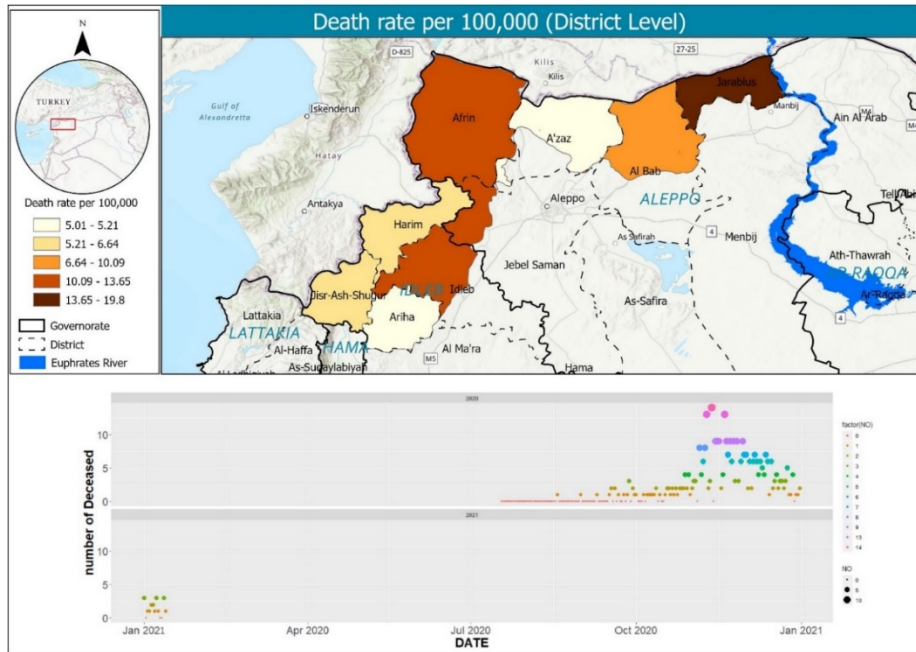


Figure 62: COVID-associated deaths per 100,000 population in districts of NWS in 2020

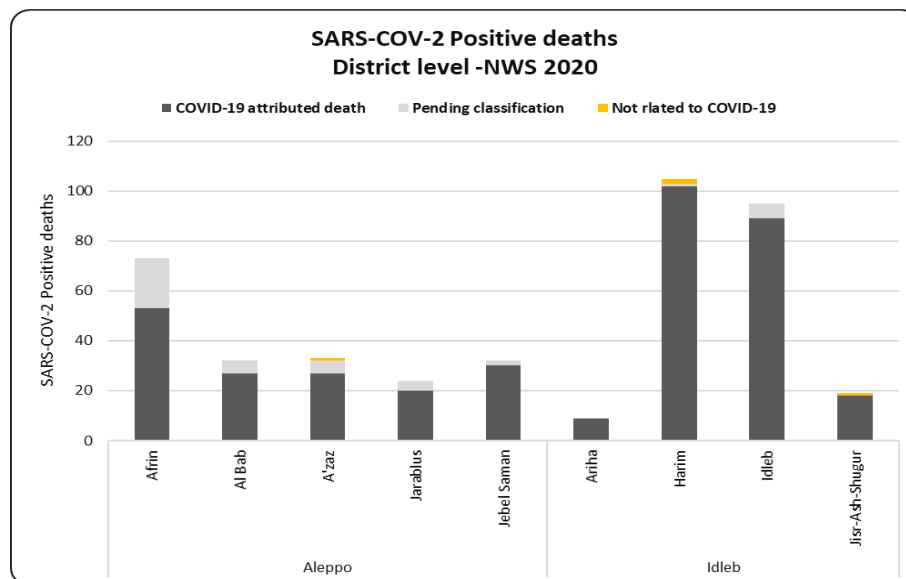


Figure 63: classification / pending classification of confirmed COVID-associated deaths in NWS by districts in 2020

2.4.6 Contact tracing

As similar to the other parts of the surveillance system, EWARN followed the WHO guidelines for the definition of contacts and the recommendation for contact tracing. The contact tracing started immediately after receiving the positive result for the case, identifying the contacts differs according to the area. The FLOs in Idlib identified the contacts and shared the names and contact details with the responsible NGOs working in Idlib to conduct daily follow-ups. While there were teams for contact tracing, supported by Turkish authorities, who were engaged in identifying the contacts in Aleppo after EWARN

shared the name and address of the confirmed cases. Due to various reasons, EWARN did not have full access to the data for the identified contacts and nor they could conduct the daily follow-up in Aleppo.

In the early stage of the outbreak, EWARN was able to identify contacts for almost all the confirmed cases. However, after the continued upsurge of the cases was observed, EWARN prioritized the contact tracing for those cases which were reported from areas having lesser caseloads.

The main challenge in the contact tracing for EWARN was the lack of human resources and the inadequate centers quarantine for the contacts (CCTCs, quarantine centers, etc).

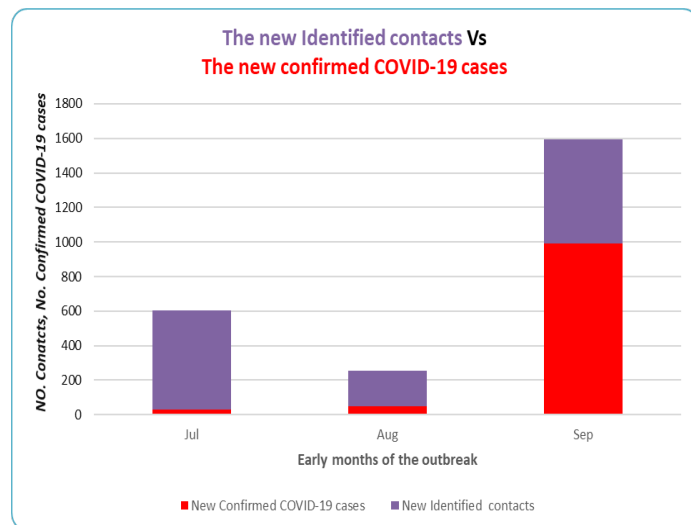


Figure 64: new cases and new contacts identified during the initial months of COVID-19 outbreak in NWS in 2020

Moreover, EWARN did not have any dedicated teams for contact tracing. The field level officers who were in charge of doing the contact tracing were already overwhelmed with investigating the cases, collection and shipment of specimens, ensuring reverse cold chain mechanism and sharing the results in time. The effect of the absence of dedicated teams of contact tracers appeared at the peak when the staff at all levels became overly busy with following a huge number of daily caseloads which made it very difficult for them to able to conduct the contact tracing with optimal performance.

Besides, because the majority of the contacts were asymptomatic, most of them were found reluctant to complete the quarantine period or follow the recommended quarantine measures. Additionally, the inability of using electronic applications (GoData, etc) in northwest Syria made contact tracing even more difficult for EWARN teams.

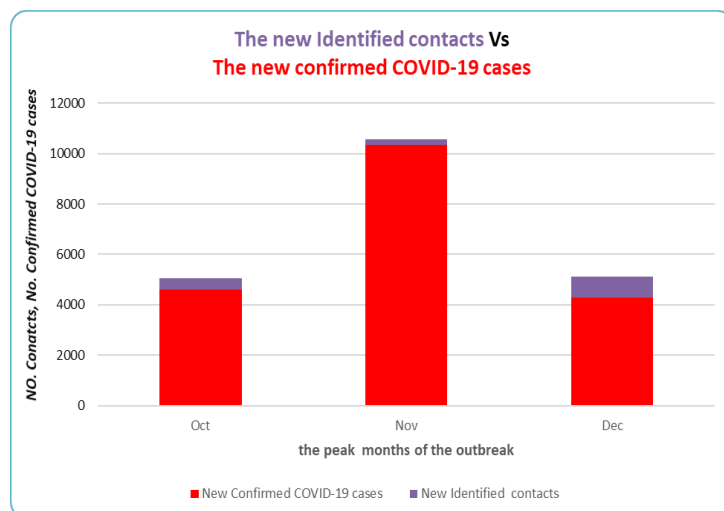


Figure 65: new cases and new contacts identified during the peak months of COVID-19 outbreak in NWS in 2020

2.4.7 COVID-19 infection among the health care workers (HCWs) in NWS

As mentioned earlier, the first confirmed case of COVID-19 from NWS was a physician who worked in a hospital in Idleb. Consequently, the first cluster of the confirmed cases were mostly the health care workers, and EWARN recorded a high percentage of the HCWs who were infected with COVID-19 in the early stage of the community transmission of the disease. The following chart shows the percentage of the confirmed COVID-19 among the health care workers out of the total confirmed cases:

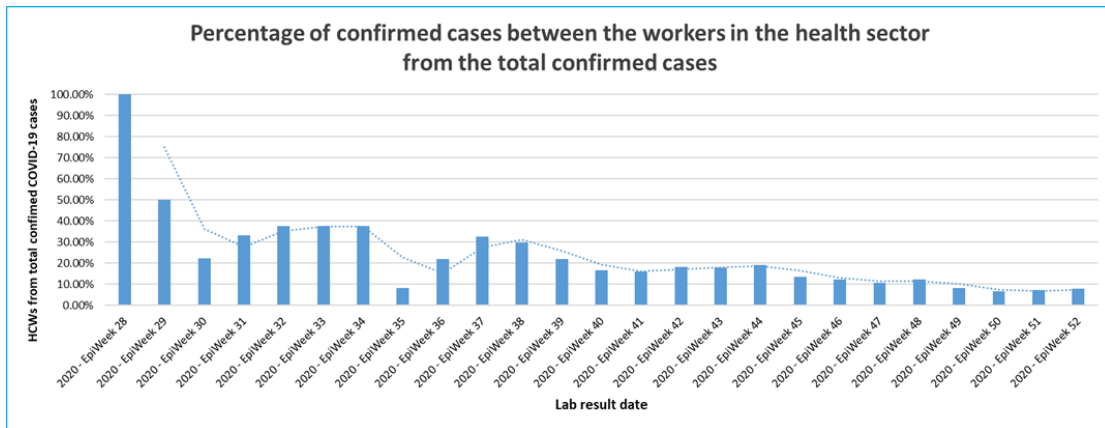
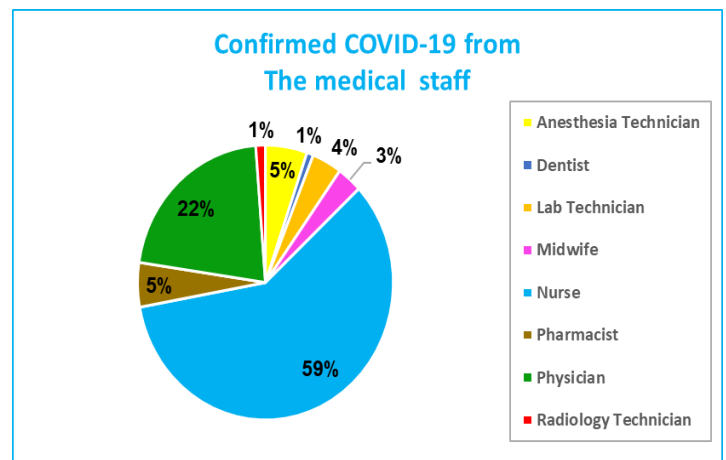
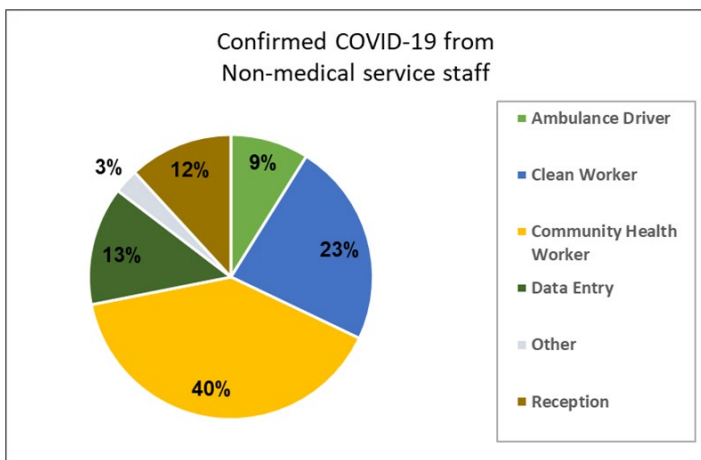


Figure 66: Proportion of HCWs infected with COVID-19 among total the cases reported from NWS in 2020

The staff in health care settings were divided into two major groups, the core medical staff, and the non-medical service staff who work in some health facilities or those who work as frontline workforces in response to COVID-19 and have the same risk of getting and transmitting the infection. The medical staff includes physicians, pharmacists, dentists, nurses, midwives, technicians etc. The non-medical service includes cleaners, data entry staff, ambulance drivers, community health care workers, reception staff, etc). The following charts show the categories of the specialization of the workers in the health care settings.



Figures 67 & 68: COVID-19 infections among non-medical service staff and core medical staff in NWS in 2020

Among HCWs, the highest number of COVID-19 cases were observed among the nurses followed by the physicians. The reasons behind this can be explained by their close contacts with the patients, maintenance of social distancing, inadequate precautionary and IPC measures.

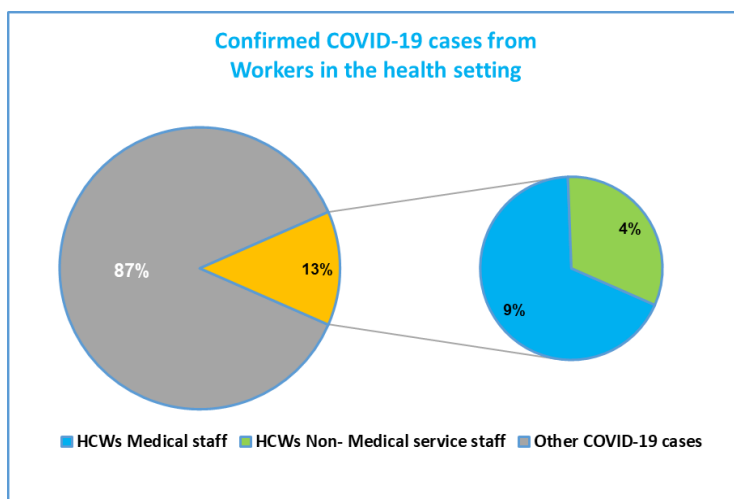


Figure 69: Proportion of HCWs among total COVID-19 cases divided by non-medical service staff and core medical staff in NWS in 2020

In 2020, total 73,817 samples from suspected cases were tested for COVID-19 using RT-PCR among which 8,682 (11.8%) samples were from the HCWs in NWS.

With regards to deaths among the HCWs, in 2020, total 7 deaths were recorded as confirmed COVID-associated deaths of whom, 5 were physicians, 1 nurse and 1 cleaner. Despite, this number appears low in comparison with the total confirmed cases of HCWs, protection of those HCWs and their families from getting an infection of COVID-19 in hospitals required paramount importance and it underscored a concern of rising numbers of HCW deaths in different countries. EWARN recorded a substantial number of cases of secondary infections among the family members of the health care workers and also recorded deaths for mothers of two physicians in one day, who were positive for COVID-19 infection as well.

2.4.8 COVID-19 in IDP camps

In 2020, among total 20,270 confirmed COVID-19 cases, 2090 (10.3%) were reported from the camp-based IDPs. Out of total 73,817 PCR tests conducted; 7794 samples were from IDPs.

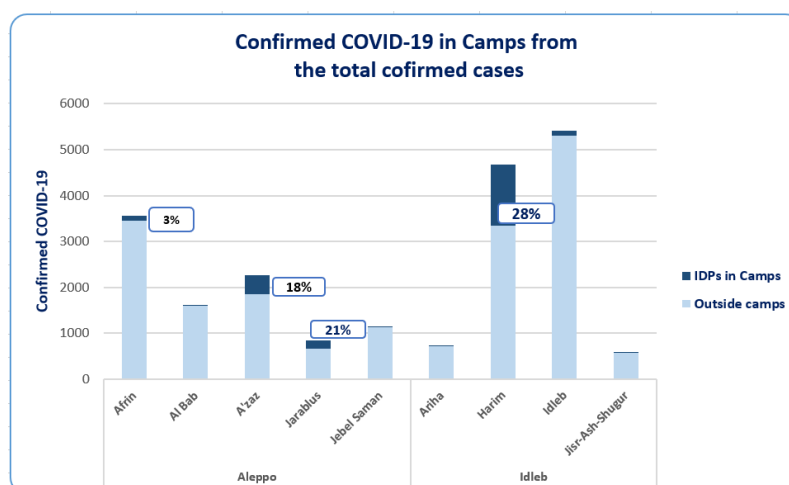


Figure 70: Proportion of confirmed COVID-19 cases among camp-based IDPs in NWS by districts in 2020

Most of the confirmed cases of camp based IDPs were reported from Harim District of Idlib governorate, which harbors the highest density of IDPs.

Confirmed COVID-19 in Camps from the total confirmed cases

■ Outside camps ■ IDP in camps

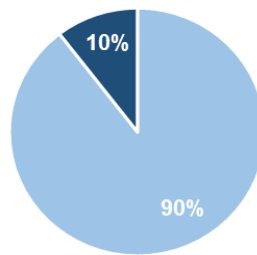


Figure 71: Proportion of cases among camp-based IDPs out of total COVID-19 cases in NWS

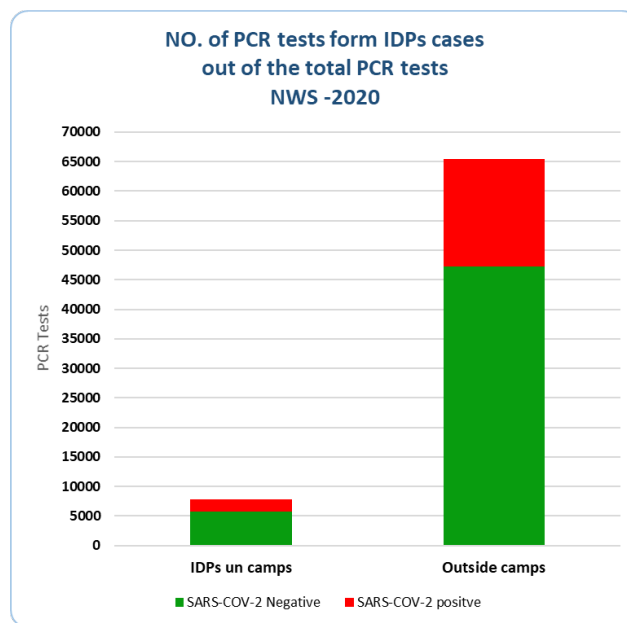


Figure 72: the number of confirmed-COVID-19 cases among camp-based IDPs and those who live outside camps in NWS

Challenges and gaps

In NWS, security has remained the overarching constraint for the EWARN with regards to restricting access, preventing the expansion of services. Additionally, the COVID-19 pandemic has added excess pressure and workload on the laboratory and EWARN-based surveillance system in the NWS. Low community risk perception and population displacement, inadequate isolation and quarantine measures, and infection among substantial number of HCWs etc are contributing to high transmission of the virus in the region. Among other challenges and gaps include:

- Contact tracing:

- Contacts detection is below expectation (surveillance staff is overwhelmed as number of suspect cases increase starting from September 2020), in addition there has been some problems in timely reporting of contacts of confirmed cases.
- Scarce resources of contact tracers
- Inverted case: contact ratio in second half of 2020 (5:2??) compared with first half.
- Shortage of surveillance staff at central as well as peripheral level.
- Timely procurement and delivery of supplies (esp. laboratory)
- Stigma and false information and refusal of testing at times
- Sustainability of surveillance system and activities as the only tool to document the increase or fading out of the epidemic and replan accordingly.
- Sub-optimal communication among partners; community; health staff
- Uncertainty of funds for 2021

Way forward and recommendations

For COVID-19, in 2021, priorities should be given to several areas which include –

- Strengthen coordination with partners to solve the problem of staff shortage whether for surveillance staff at central as well as peripheral levels.
- Recruitment of adequate human resources for strengthening active surveillance, rapid response, contact tracing, decentralized sample collection, and shipment.
- Ensure prepositioning of adequate and timely delivery of laboratory supplies and expansion of the testing capacity of the laboratories including rapid diagnostic tests.
- Prepare microplanning, procure and implement COVID-19 vaccine for high-risk population followed by the mass vaccination program.
- Mainstreaming community and event-based surveillance.
- Strengthening data management system.
- Continued capacity building of the EWARN staff on surveillance of communicable diseases, laboratory methods, case management, and response measures to disease outbreaks.
- Continue identifying donors to ensure fund flow for continued response to COVID-19 outbreak.
- Start working on integration of influenza and COVID-19 surveillance systems.

COVID-19 Investigation Form 19- استمارة تحقق لإصابة بفيروس كوفيد-19			
Basic Information المعلومات الرئيسية			
Health Facility المركز الصحي	HF Address عنوان المركز		
Case (C) Name اسم المريض	EPID # الرقم الوبائي		
Father Name اسم الأب	Mother Name اسم الأم		
C - Governorate المحافظة	C - District المنطقة		
C - Sub district الناحية	C - Community القرية/البلدة		
Telephone الهاتف	Address العنوان		
DoB تاريخ الميلاد (dd/mm/yyyy)			
Age العمر	Gender الجنس	Occupation مهنة المريض	حدد
Onset Date بدء الأعراض (dd/mm/yyyy)	Detection Date تاريخ الاكتشاف (dd/mm/yyyy)		
Investigation Date تاريخ الفحص (dd/mm/yyyy)	Notification Date تاريخ الإبلاغ (dd/mm/yyyy)		
Signs and symptoms العلامات والأعراض			
Fever الحرارة >38°C	Dry cough سعال جاف	Sore Throat ألم بلعوم	
Productive cough سعال منتج للضغ	Chest pain ألم صدري	Muscle pain ألم عضلي	
Haemoptysis نقيع دموي	GI Signs اعراض هضمية	Sneezing عطاس	
Altered consciousness تخيم وعي	Joint pain ألم مفاصلي	Seizures اختلاج	
Shortness of breath /Dyspnoea ضيق نفس /زلة تنفسية	Headache صداع	Nose bleed رعاف	
loss of taste or smell نقص في حواس التذوق أو الشم	Runny nose سيلان أنف	Cyanoses زرقة	
conjunctivitis التهاب ملتحمة	tiredness تعب عام	اعراض جلدية (طفح او تغير في لون الأصابع أو الأظافر) a rash on skin, or discolouration of fingers or toes	
Others أخرى	If others yes, specify		
fever's History clarification (شرح)			
Clinical Examination الفحص السريري			
Breathing Cycles عدد مرات التنفس	Other findings in clinical examination ملاحظات أخرى بالفحص السريري		
Systolic pressure الضغط الانقباضي			
Diastolic pressure الضغط الانبساطي			
Pulse النبض			
Temperature درجة الحرارة			
Conducted Test الفحوصات المجرى			
Chest X-Ray صورة بسيطة للصدر	Result		
Chest CT Scan طليقي محوري للصدر	Result		
CBC تعداد عام	Result		
Creatinin كرياتينين	Result		
Urea اليوريا	Result		
Others غير ذلك Y/N	If yes, specify		
Comorbidity Coding الأمراض المرافقة			
Cancer سرطان	Asthma ربو		
HIV/other immune deficiency نقص مناعة	Malnutrition سوء تغذية		
Heart disease أمراض قلبية	Obesity بدينة		
Hypertension ارتفاع توتر شرياني	Diabetes داء سكري		
Seizure disorder اختلاجات	Renal Disease مرض كلوي		
COPD الأمراض الرئوية المزمنة	Others غير ذلك	If yes, specify	يرجى التحديد
Epidemiological Information المعلومات الوبائية			
Did the patient travel to other areas within the last 14 days هل زار المريض مناطق أخرى خلال 14 أيام السابقة			
If yes, Specify حدد المناطق التي تمت زيارتها	Place المنطقة	Date of Departure تاريخ العودة	
Visitors from other areas within the last 14 days هل هناك زوار من مناطق أخرى خلال 14 أيام السابقة			
Has case had contact with an confirmed case in the 14 days prior to symptom onset هل كان المريض على تماس مع حالة مثبتة لمرض تنفسي خلال الـ 14 يوم السابق للأعراض			
If yes, please explain contact setting حدد اسم المخالط ونوع الحالة المثبتة وتاريخ اخر مخالطة	Contact ID معلومات المخالط	تاريخ آخر مخالطة Last Date of Contact	
Endemic area? مملطقة موبوءة؟	Epidemic Type نوع الوباء	Contacts with similar symptoms وجود مخالطين بأعراض مشابهة	
Sampling Information معلومات قطف العينات			
Rapid Test 19 هل تم اجراء اختبار تحري سريع لكوفيد-19	النتيجة لاختبار التحري السريع	Rapid Test Result	
Has a respiratory sample been taken? هل تم أخذ عينة تنفسية	If yes, Specify حدد نوعها		
Sampling Date تاريخ قطف العينة	حدد سبب جمع العينة؟ Why the sample collected?		
Sent to Lab date تاريخ الإرسال للمخبر (dd/mm/yyyy)			
Received in Lab تاريخ تلقي المخبر للعينة (dd/mm/yyyy)			
Lab Result نتيجة التحليل المخبري			
Result Date تاريخ اصدار النتيجة			

Figure 73: COVID-19 Investigation Form

2.5 Nutrition Surveillance

2.5.1 Introduction

The importance of establishing a well-built nutrition surveillance system came from the need for comprehensive system of data collection and analysis, the importance of clear defining of the malnutrition prevalence and detecting any undiscovered pockets.

According to the accessibility, availability of integration with both health (diarrheal diseases) and WASH, in addition to the experience of ACU in surveillance, ACU team start working on the needed preparations through defining the areas of gaps, thus planning to implement the NSS there.

The main **goal** of this system is to monitor the trends and to identify key areas for immediate response

The nutrition surveillance system **objectives** are:

- 1- Assess acute malnutrition both Moderate and severe malnutrition in children under 5 years old and PLWs.
- 2- Assess chronic malnutrition (stunting) in children under 5 years old.
- 3- Reducing the under-five mortality rate due to acute malnutrition.
- 4- Follow up the detected cases after 2 weeks of the referral, to evaluate the feasibility, accessibility, and adequacy of the provided case management.

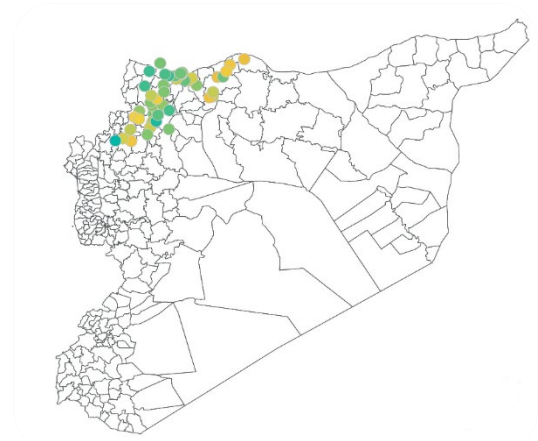


Figure 74: Nutrition Surveillance System_ 2020

2.5.2 Nutrition Surveillance for children under 5 years

By the beginning of 2020, the NSS screening activities were provided in 20 health facilities then by April of the same year the number of health facilities was expanded to 45 HFs providing NSS activities in two governorates (Aleppo, Idleb), 8 districts (Afrin, Al Bab, A'zaz, Harim ,Idleb ,Jarablus ,Jebel Saman , Jisr-Ash-Shugur), 27 subdistrict and 45 communities, by the end of 2020, 208,532 children 79,035 PLW were screened and the GAM rate between children was 4.8% and the MAM rate between PLW was 6%.

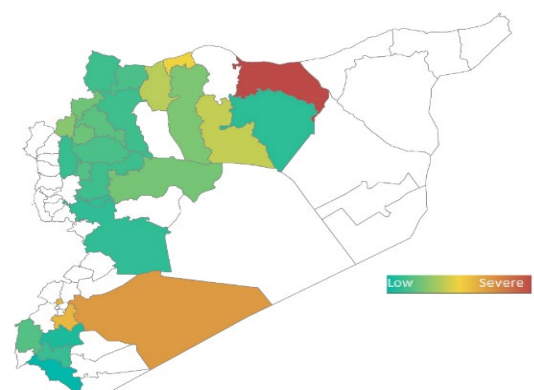
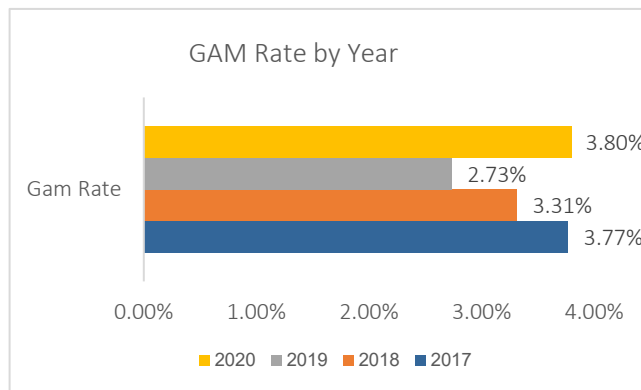
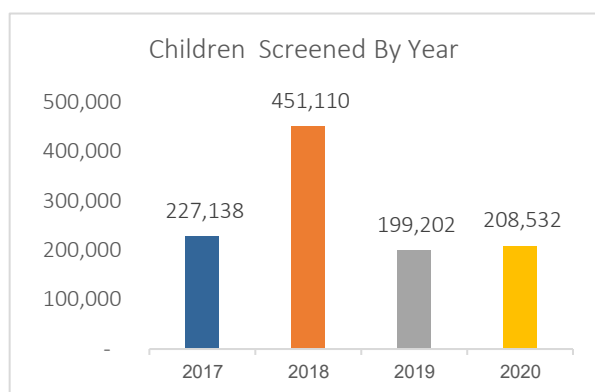


Figure 75: GAM rate during program life

The following table shows the coverage and children screening during program life and how it is deeply affected by area control shifts and fund issues:

Year	# of Governorate	#of district	#of sub-district	Children Screened	GAM cases	Health Facility
2017	8	18	42	227,138	8,554	95
2018	7	18	45	451,110	14,943	107
2019	4	16	45	199,176	5,439	132
2020	2	8	27	208,532	7,929	45
Grand Total				1,085,956	36,865	



Figures 76 & 77: No. of screened children & GAM rate by year

The Gam rate had a peak at nearly 8% when the nutrition surveillance system started in July 2017 then start declining, the comparison of GAM rate during the life of the system can give some idea of the monthly GAM trends through the years, while there is a data gap occurred due to 5-month suspense (June – Oct 2019). As can be noticed the overall yearly trend has characteristics of the GAM rate increasing by April every year reaching the highest value in July / August then the rate starts to decrease again till the end of each year.

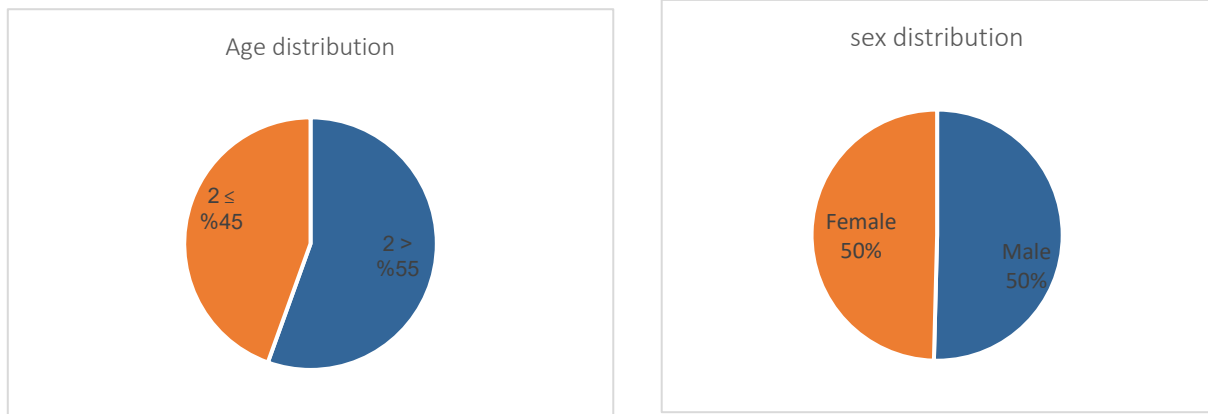
Month	Measured children	MAM	SAM	Normal	GAM rate	HFs No.
202001	7,826	130	76	7,620	2.63%	20
202002	11,443	160	77	11,206	2.07%	20
202003	9,124	134	67	8,923	2.20%	20
202004	13,278	291	120	12,867	3.10%	43
202005	15,903	362	127	15,414	3.07%	45
202006	23,502	809	318	22,375	4.80%	45
202007	17,108	637	316	16,155	5.57%	45
202008	18,183	764	358	17,061	6.17%	45
202009	21,220	781	315	20,124	5.16%	45
202010	23,112	629	292	22,191	3.98%	45
202011	22,651	465	150	22,036	2.72%	45
202012	25,182	399	152	24,631	2.19%	45
Total	208,532	5,561	2,368	200,603	3.80%	45

In 2020, 208,532 children under 5 years old were screened, the GAM was 3.8% (2.67% MAM - 1.14% SAM).

The sex distribution for the screened children was almost the same (50.4% male – 49.6% female).

The age distribution for the screened children was: 55% < 2 years and 45% ≥ 2 years (this is justified as the younger children have more frequent visits to HF).

GAM rate by governorate was in Aleppo 3.89 %, and in Idleb 3.64% classified by monthly trends during 2020.



Figures 78 & 79: Age and Sex distribution for the screened Children in 2020

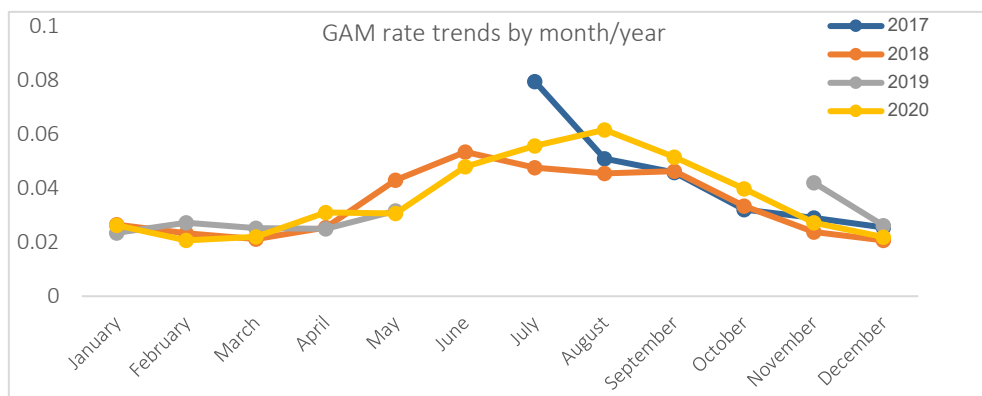


Figure 80: GAM rate by month / year

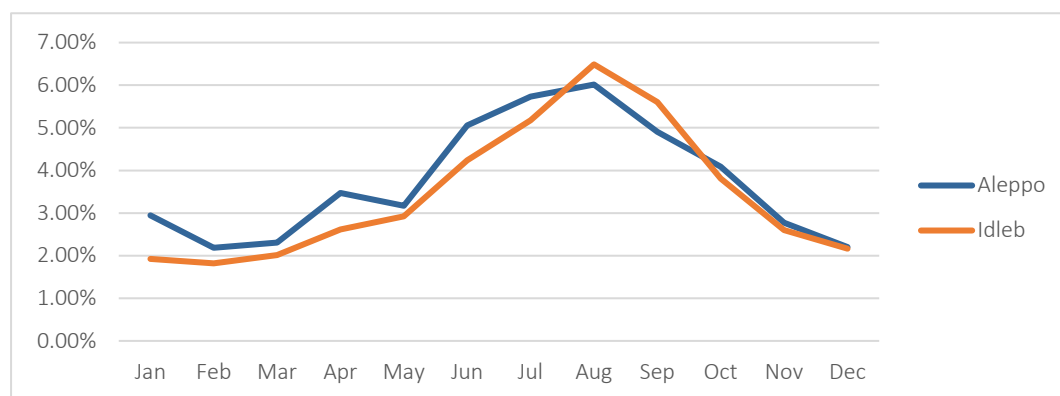


Figure 81: GAM rate by month and Governorate during 2020

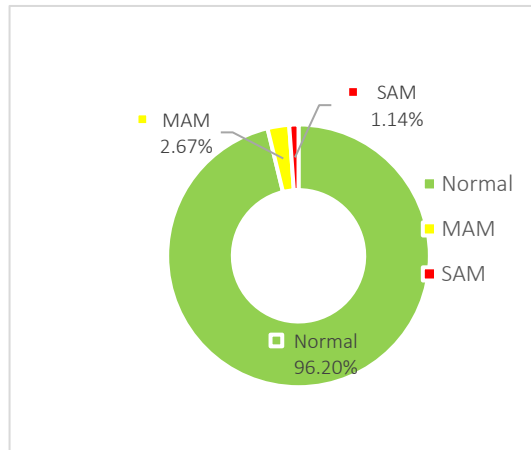


Figure 82: Classification of the screened Children 2020

Stunting and underweight during 2020:

- The stunting rate was 33.34 among male and 29.24 among females.
- The stunting rate was 34.51 in Aleppo and 25.09 in Idleb.
- The stunting rate was the highest rate at the age group between (24-35) months which means that we need to strengthen the IYCF activities to reduce the malnutrition cases.
- The underweight rate was 11.32 among male and 10.16 among female,
- The underweight rate was 12.35 in Aleppo and 7.61 in Idleb
- The underweight rate was the highest in the age group between (6-11) months which means that we need to strengthen the IYCF activities to reduce the malnutrition cases.

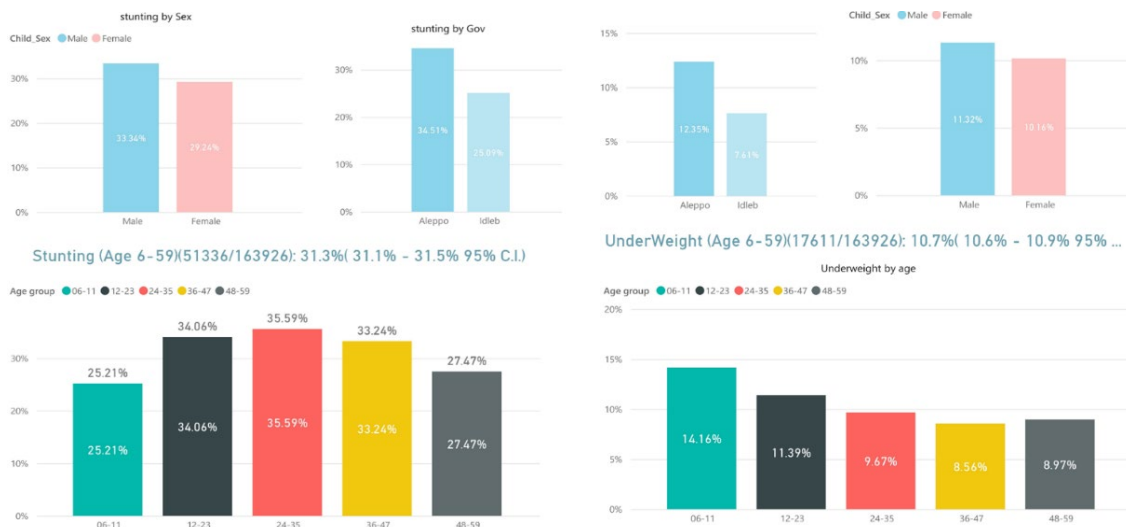


Figure 83: Stunting & Underweight during 2020

2.4.3 Nutrition Surveillance for PLWs

As pregnant and lactating women are susceptible to malnutrition, thus the nutrition surveillance system includes these 2 categories in the targeted population.

More than 79,035 pregnant and lactating women were screened, 4,709 (about 6 %) out of them were detected as malnourished.

Table 17: Classification of the screened PLWs_2020		
PLWs	Normal	Malnourished
Pregnant	30,419	1938
Lactating	41,998	2638

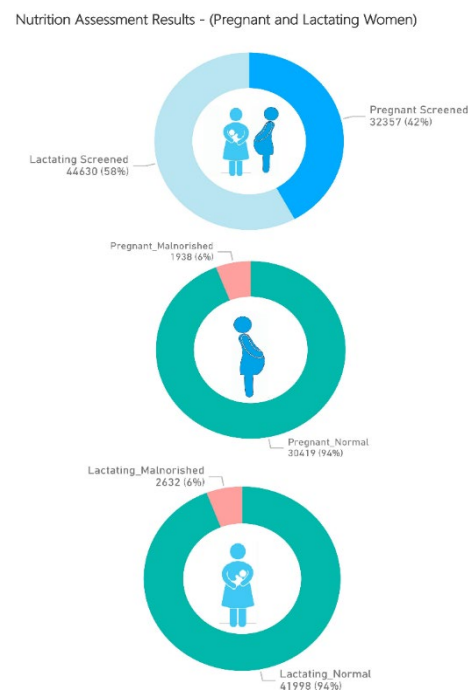


Figure 84: Screened PLWs classification_2020

Challenges

- Unsustainable fund, which caused instability in work conditions.
- Employees high turnover rate, which led to train new staff.
- Some partners in Gaziantep do not collaborate with the NSS and do not give permission to activate the surveillance at their HF.

Future Plan

- Advocate and do an extensive effort to secure stable funding for the program.
- Increase the number of fields supervisors and develop a plan of weekly supervision visits by them.
- partnerships development in health and nutrition sector.

Section 3: Response Updates in 2020

3.1 Response and related Logistic activities

In EWARN, the alerts are regularly monitored, whether received on daily basis or on weekly basis, from both health and non-health resources, then properly responding by on time verification of the alerts to contain any potential outbreaks as early as possible.

The outbreak control team (OCT) is being functioned just after the verification of the outbreak. This team includes representatives from NGOs that are active with a capacity to engage the field procedures during an outbreak investigation and response. EWARN focal

point is the leader of the team, and he/ she is accountable for field investigation and initiation the control.

The investigation and response processes require many resources (transportation, sampling materials, communication tools... etc), as well as a ready and well-trained team to carry out missions, response plans, standard case management protocols, define the cases that need isolation, in addition to repositioned warehouses with essential treatment kits.

The goals of the response activities implemented by EWARN is to:

- Prevent the spread of outbreaks by continues monitoring
- Perform an effective intervention as soon as possible
- Initiate the outbreak control procedures

The missions of the response department can be divided into two main missions:

1. Prepare for any potential outbreak: preparedness plans, ready field response team, and logistics supply management.
2. Implement rapid and effective response.

3.1.1 Monitoring weekly alerts (type B alerts)

Every week, the weekly alert (B-type alerts) is being received as a tableau file for analysis and discussion.

During 2020, **547 alerts** (excluding leishmaniasis alerts) were submitted. The high priority alerts were triggered, and other alerts were monitored during the following weeks to be classified later. Alerts are usually visualized as tableau file's map, the accessible areas are coloured in red and green, and the non-accessible areas are coloured in grey.

The file consists of seven sheets:

The home page offers the possible access areas divided into subdistrict, the red areas reflect existing alerts, the areas without alert remain in green.

Other sheets give more details about the alerts (cases number in both community and health facility levels, monitoring the epi-curve during the following weeks and compare it with the previous year).

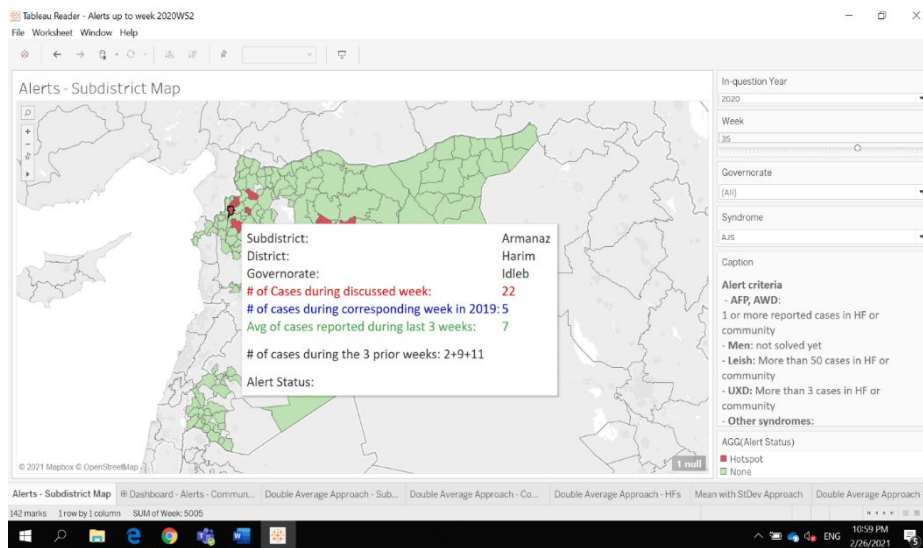


Figure 85: Type B alerts in Sub district level Epi week

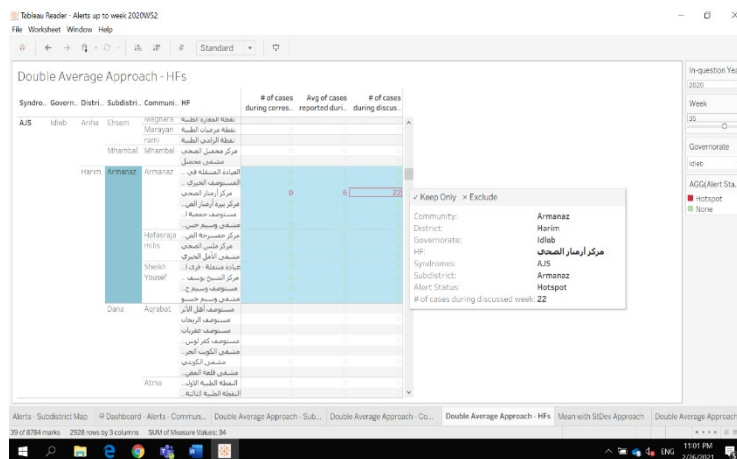


Figure 86: Double Average approach on HFI

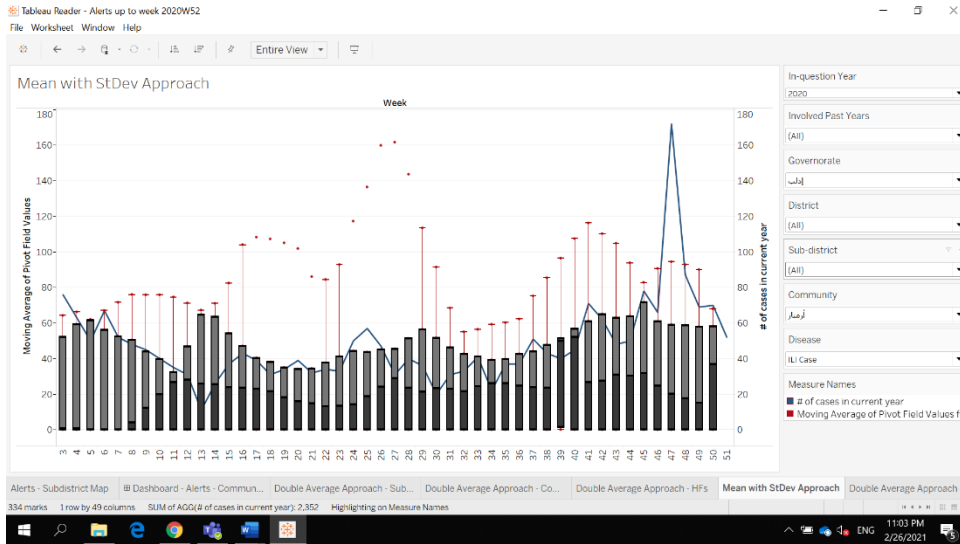


Figure 87: Mean & SD approach

The final classification of weekly alerts is done either centrally by monitoring epi-curve during the following weeks or after field verification.

The figure shows an Excel spreadsheet titled "Alerts_Classification_2020". The spreadsheet contains a table with the following columns: Syndromes, Governorate, District, Sub-district, Week No., # of cases during corresponding week in 2017, Avg of cases reported during last 3 weeks, # of cases during discussed week, Primary Classification, Central Classification, Field classification, and Final classification. The data rows show various syndromes like IJI Case, OAD, SARI, STF, ABD, and AIS across different governorates and districts, with their respective case counts and classification statuses (e.g., Pending, False, True).

Figure 88: Alerts classification list

Distribution of weekly alerts according to the Epidemiological week

The next chart shows the number of alerts notified by the health facilities in 52 epi-weeks.

The peak of the alerts was reported in Epi week 23. Smaller peaks were reported in epi-weeks 19,20, and in epi-weeks 32,33,34.

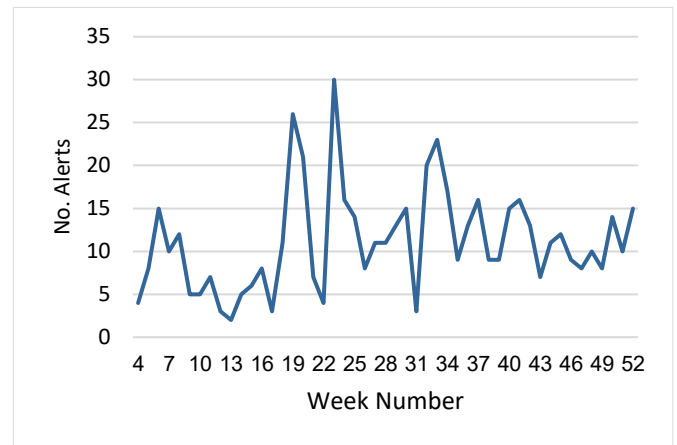


Figure 89: B-type alerts distribution by time

Distribution of weekly alerts according to the disease / syndrome

The alerts of waterborne diseases (STF, AJS, ABD, OAD) were the most notified alerts, with a total number of 363. While the alerts of acute respiratory diseases (ILI, SARI) were 184.

Most of the syndromes notified were AJS (142 alerts).

Because of starting of COVID 19 outbreak, the alerts of ILI and SARI increased, where the number of ILI alerts was 92, and SARI was 92.

The number of other alerts was OAD reported 82 alerts, STF 76, and ABD 63.

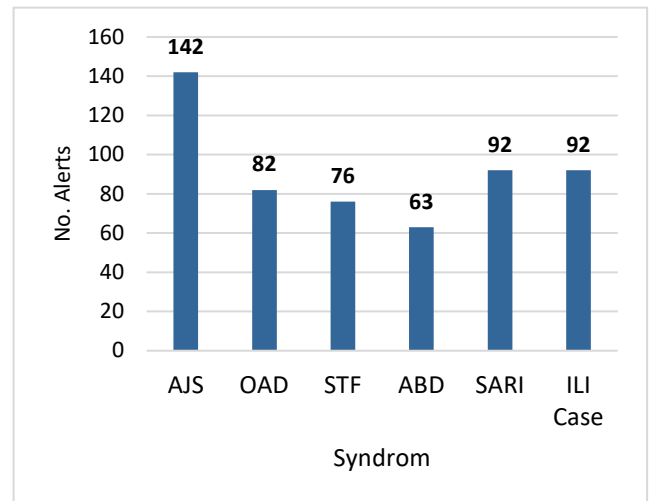


Figure 90: B-type alerts distribution by syndrome/ disease

Distribution of weekly alerts according to the governorate and district

Most of the alerts were notified from Idleb governorate (172), then Aleppo governorate (159). Whilst the reported alerts in Al-Hasakeh governorate were (89 alerts), and Ar-Raqqia governorate (86 alerts), and Deir-ez-Zor governorate (41 alerts).

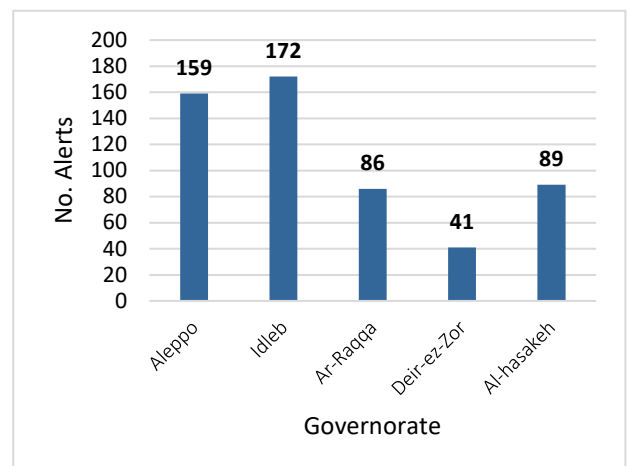


Figure 91: B-type alerts distribution by governorate

For distribution by district: Afrin district, Aleppo governorate was the highest (84 alerts), then Harim district _ Idleb governorate (70 alerts).

Other districts reported smaller alerts, Jisr-Ash-Shugur district 42, Idleb district 40, Azaz district 37, Quamishli district 33, Ath-Thawrah district 33, and Tell-Abiad district 33.

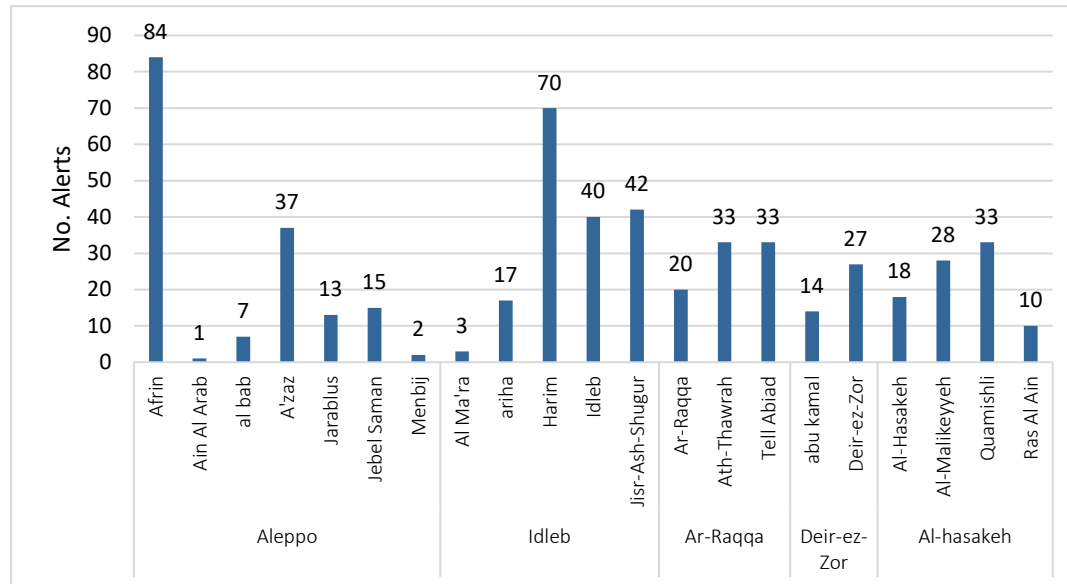


Figure 92: B-type alerts distribution by district

Weekly Alerts_Final classification

The final classification of 547 alerts that were received during 2020 on a weekly basis was: false alerts in 480 (88%), and true alerts in 67 (12%).

Most of the true alerts were AJS with 43 true alerts, it started in epi week 33 up to 52 (the period of Hepatitis A Outbreak inside Syria).

SARI syndrome reported 14 true alerts concurrently with starting of COVID 19 outbreak.

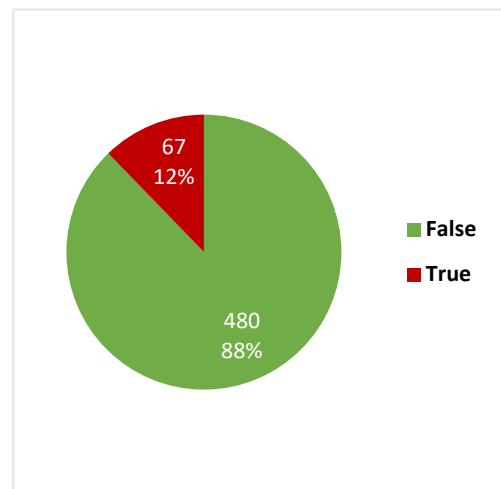


Figure 93: Final classification of the weekly alerts

3.1.2 Alerts verification

During 2020, **96 alerts** were verified in the field, the alerts were notified from different sources (health facilities, private clinicians, data entries, local councils, media, rumours ... etc). The method of verification must be easy and rapid (phone call, WhatsApp, field visiting...), and the source of the information must be relevant to the alert.

No.	Year	Epi-Week	Suspected Disease	If others, specify	Alert Type	Governorate	District	Sub-district	Community	Health Facility	Other Health Facilities	Notification Source
1	2020	2	AJS		Type B	Al-Hasakeh	Quamishli	Quamishli				Private Clinic
2	2020	2	AWD		Type A	Aleppo	Jarablus	Ghandorah	Ghandorah			Health Facility
3	2020	2	MEN		Type B	Aleppo	Jarablus	Jarablus	Zoghra			Health Facility
4	2020	5	SARI		Type B	Ar-Raqqa	Ath-Thawrah	Al-Thawrah	Al-Thawrah			Local Council
5	2020	6	SARI		Type B	Aleppo	Afrin	Afrin	Afrin			Zero Report
6	2020	6	ILI		Type B	Ar-Raqqa	Tell Abiad	Ein Issa				DLO

Alert Notification Date	Date Verified	Date Investigated	Alert Verified	Alert Verification Mean	Key Informant	Reported Cases	Cases that fits the case definition	<5 M	<5 F	>5 M	>5 F	Unknown Age
14-Jan-2020	15/Jan/2020	15-Jan-2020	Yes	Phone Call	Doctor	67	59	0	2	31	26	
10-Jan-2020	10/Jan/2020	10-Jan-2020	Yes	Personal Visit	Doctor	1	0			1		
9-Jan-2020	9/Jan/2020	9-Jan-2020	Yes	Personal Visit	Doctor	1	0			1		
29-Jan-2020	29/Jan/2020	30-Jan-2020	Yes	Personal Visit	Local Council	6	2	1	1	0	0	
7-Feb-2020	7/feb/2020	7-Feb-2020	Yes	WhatsApp	Doctor	11	10	3	4	3	0	
9-Feb-2020	11/feb/2020	11-Feb-2020	Yes	Phone Call	Doctor	74	74					

Clusterd cases (Time,Place,Person)	Alert Classification	Actions Taken	Cases Sampling?	Sample Type	Cases' Lab Confirmation	Environmental Sampling	Environmental Sample's Type
No	FALSE		No			No	
No	FALSE		No			No	
No	FALSE		Yes	C.S.F	No	No	
No	FALSE		Yes	N.P swap	No	No	
No	FALSE		No			No	
Yes	TRUE		No			No	

Environmental Sample's Result	Reported Deaths	Outcome	Investigated By	Response-Indicator	Log data status	Month	Key	Is it in the zeroreport dataset?
	0 Alert	RO	24 - 71	Completed	Jan	AJS - Quamishli - 2	No	
	0 Alert	DLO	< 24	Completed	Jan	AWD - Ghandorah - 2	No	
	0 Alert	DLO	< 24	Completed	Jan	MEN - Jarablus - 2	No	
	2 Alert	DLO	< 24	Completed	Feb	SARI - Al-Thawrah - 5	No	
	0 Alert		< 24	Completed	Feb	SARI - Afrin - 6	No	
	0 Alert	DLO	24 - 71	Completed	Feb	ILI - Ein Issa - 6	No	

Figure 94: Alerts & outbreaks list

After verification, the alert is being classified as a true or false, thus the rapid response to be taken in case of a true alert. Finally, the investigator (DLO, RRO) sends the alert verification form to the central response officer.

Sources of notification

The alerts notified from the field were 61 alerts (64 %), whilst the alerts showed in the weekly alert's tableau (zero reports) were 35 alerts (36 %).

Most of the notified alerts were submitted by DLOs upon receiving the weekly reports from the sentinel sites (22%). The other sources (HF, private clinics, media...) notified 40 alerts (42%).

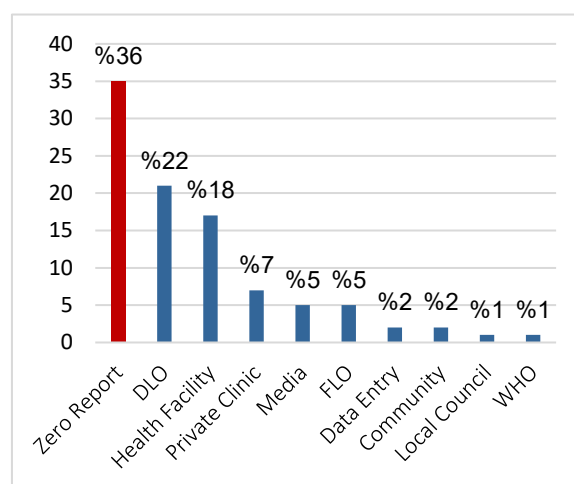


Figure 95: Sources of notification

Distribution of verified alerts according to the syndrome type

Most of the verified alerts were SARI (24 alerts), AJS (20 alerts). It due to COVID19 and Hepatitis A outbreaks in 2020.

The waterborne disease and foodborne disease alerts were 56 (58%), whilst vaccine preventable disease alerts were 34 (35%). The remaining alerts were dermatologic diseases (Lice, scabies) with 6%.

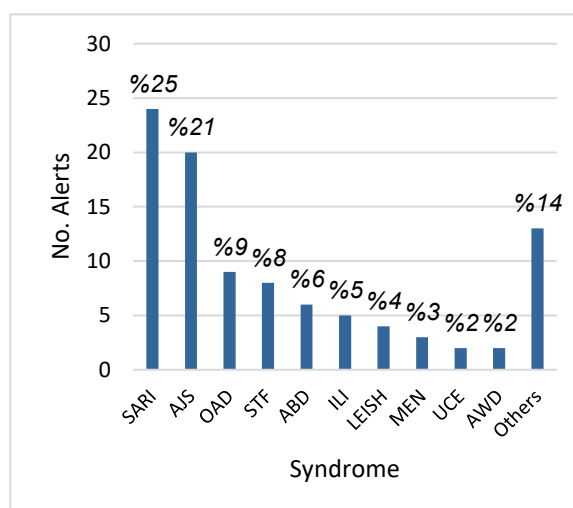


Figure 96: All alerts distribution by syndrome/ disease

Distribution of verified alerts according to the governorate

Most of the verified alerts were in Aleppo governorate with 34 alerts, Idleb governorate (32 alerts), then Ar-Raqqa governorate (15 alerts), Al-Hasakeh governorate (9 alerts), whilst Deir-ez-Zor were the lowest (6 alerts).

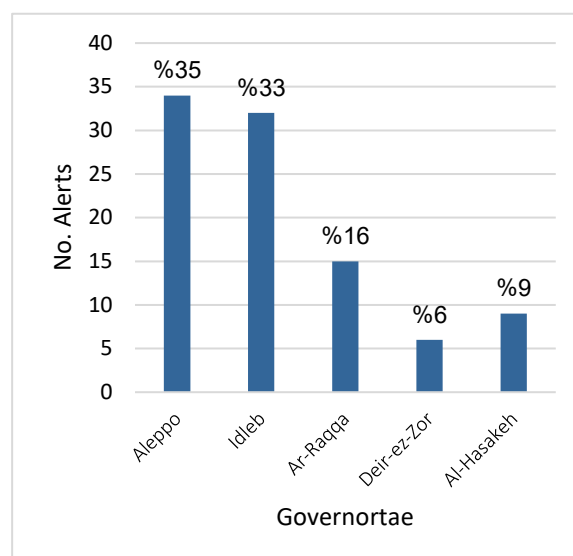


Figure 97: All alerts distribution by governorate

Distribution of verified alerts according to the epi-week

The next chart shows the number of verified alerts during 52 epi- weeks.

The verified alerts were distributed during all epi weeks with a concentration in the period between epi week 20 and 30, and between epi week 35 and 41.

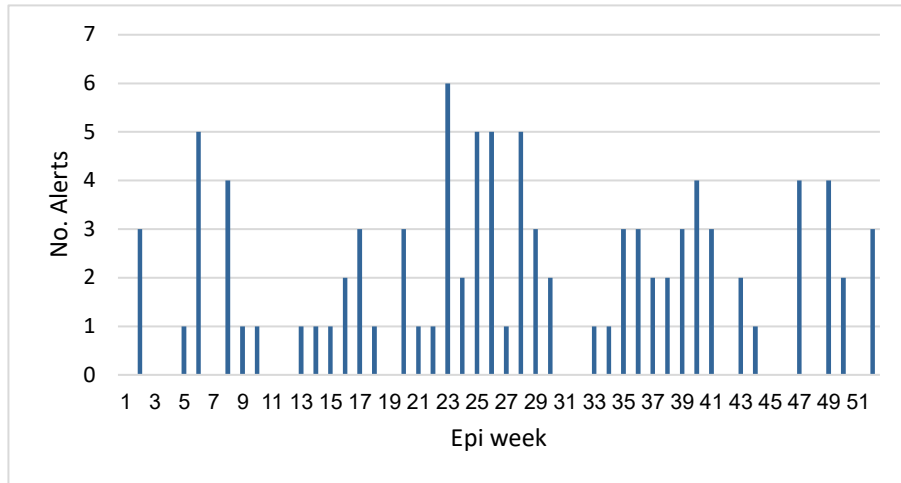


Figure 98: All alerts distribution by governorate by time

Type of Alerts

Among all verified alerts, type A alerts (AWD, Measles, Meningitis, UCE, UCD, and suspected outbreaks) were 22% of the total, and type B alerts (STF, ABD, AJS, ILI, SARI, leishmaniasis...) were 78%.

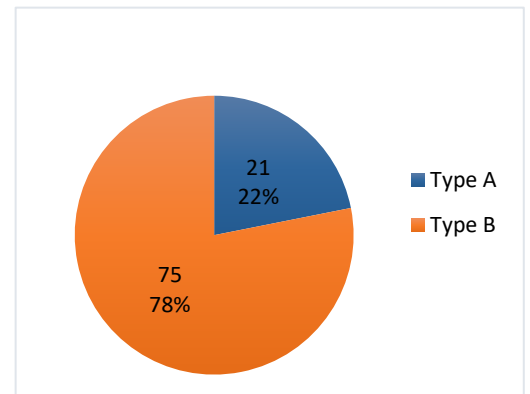


Figure 99: Type of Alerts

Verified alerts_Final Classification

Among all verified alerts (96 alerts), the true alerts were 57 alerts (59%), while the false alerts were 39 alerts (41%).

The reason for the high rate of true alerts is attributed to the large number of true alerts reported during the COVID 19 and Hepatitis A outbreaks.

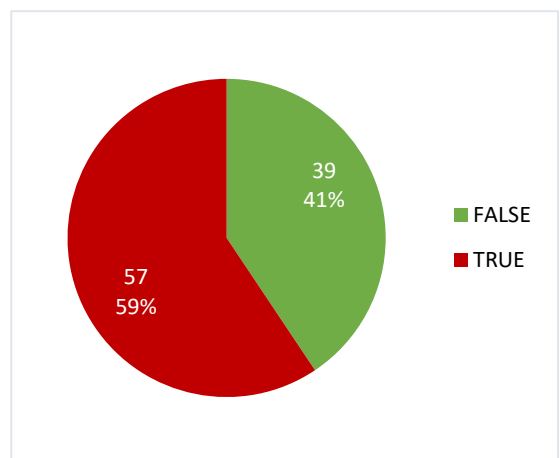


Figure 100: Verified alerts classification

Lab Confirmations

From the total alerts, 35 samples were taken (blood, N.P swap, CSF, smear...).

From all samples taken (35), the Lab confirmation was done in 69%, whilst 31% of the samples were negative.

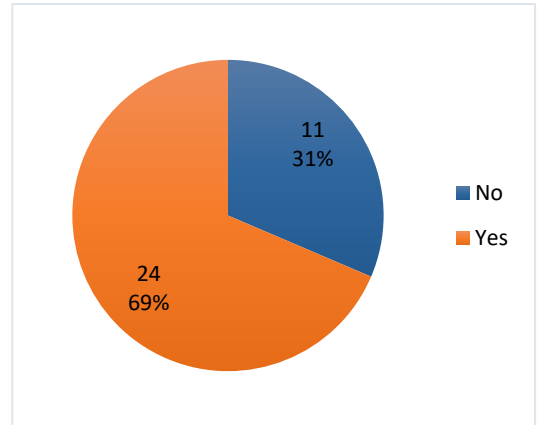


Figure 101: Lab confirmation of the alerts

Verified alerts Outcome

After verification of all the notified alerts, there were 9 outbreaks (9%).

The details of these outbreaks are in the subsequent paragraph.

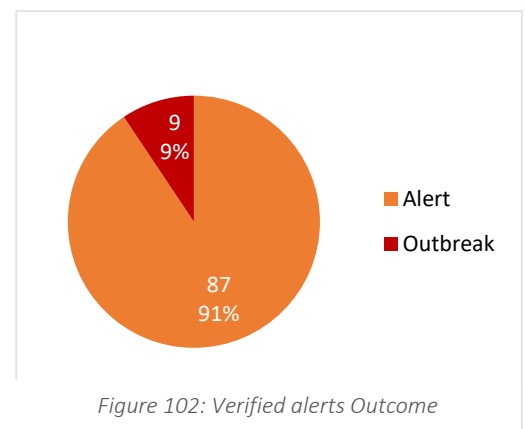


Figure 102: Verified alerts Outcome

Response Indicators

For type A alerts (AWD, Measles, Meningitis, UCE, UCD, and suspected outbreak), 90% from the total (21 type A alerts) were verified on time (less than 24 hours), whilst 10% (2 alerts) were verified after the proper time, but less than 72 hours.

For type B alerts (the other syndromes), 96% from the total (75 type B alerts) were verified on time (less than 72 hours), whilst 3 alerts (4%) were verified after 72 hours.

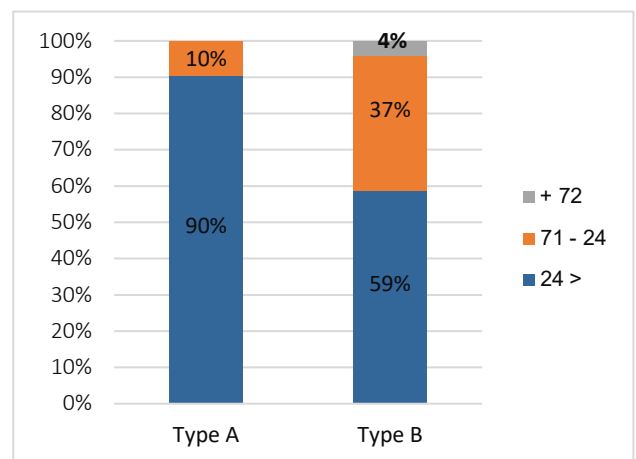


Figure 103: Response Indicator in Hours

3.1.3 Outbreaks management

In 2020, **10 missions** were implemented, in addition to issuing detailed reports for them.

Field investigation procedures (Lab and environmental sampling) were carried out to confirm the outbreak and determine the sources of infection, also other control procedures were taken (health awareness campaigns, medications for case management, WASH procedures including hygiene promotion distribution...etc). Coordination was made with partners during the investigation and response (WHO- health directorates - local councils - health facilities, NGOs...). Also, many epidemiological analytical studies were sat (case-control studies) during the investigations, where the Epi- info program was used for data analysis.

The map below shows the distribution of these outbreaks in Syria, in addition to the hepatitis A outbreak that distributed all north of Syria.

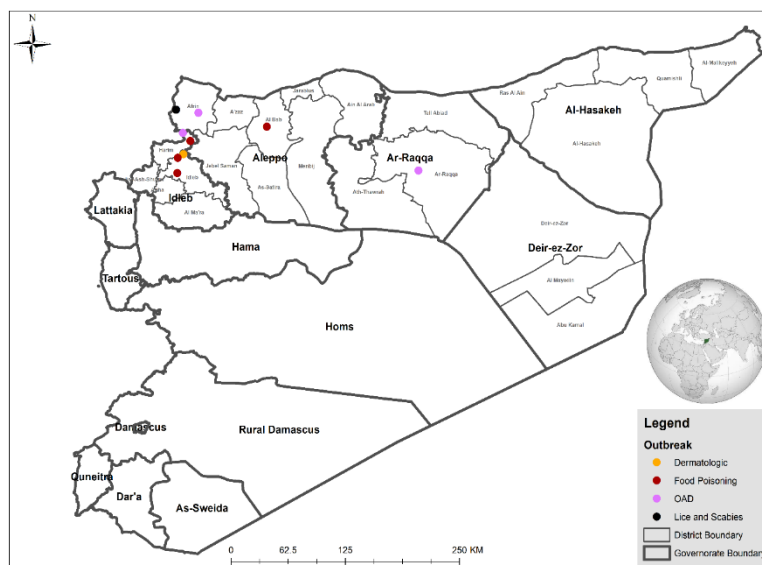


Figure 104: The distribution of detected outbreaks in 2020

Abstract of the most significant outbreaks will be shown in 2020, the COVID 19 outbreak will be detailed in other sections of this report.

Hepatitis A outbreak

In epi week 35, many alerts of AJS reported (the first one of them was in the Armanaz subdistrict-Idlib governorate), then other alerts from Idlib and Aleppo governorates were reported.

The OCT completed the investigation and response procedures, where all cases reported, lab confirmation was done, WASH procedures (drinking water and sanitation study, water chlorination, hygiene) also implemented, medicine was distributed.

From epi week 35 up to epi week 52, 19017 hepatitis A cases were reported in all of Syria

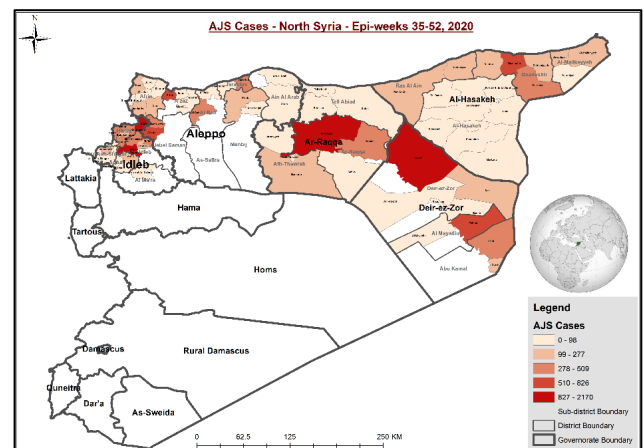


Figure 105: AJS cases in NS_ Epi weeks 35 to 52_2020

(Idleb, Aleppo, Ar-Raqqa, Al-Hasakeh, Deir-ez-Zor). the map shows the distribution of cases in the different areas.

Food poisoning outbreaks

In 2020, 4 poisoning outbreaks were investigated, all of them were notified in the camps (except the food poisoning outbreak in Al-Bab sub-district).

Food poisoning outbreak in Childcare and Kelly camps- Idleb governorate, 172 cases in Childcare camp, and 97 cases in Kelly camp were reported. The reason for the outbreak was the provision of spoiled meals to the two camps from the same source. The OCT conducted an analysis study (case-control study) to detect the suspected ingredients, Data analyzed by the Epi Info program, where an epidemiological association between the disease and the exposure to cooked food (especially rice) was noticed. The ministry of development and affairs suspended the kitchen to work and referred the file to the judiciary for taking the necessary measures.

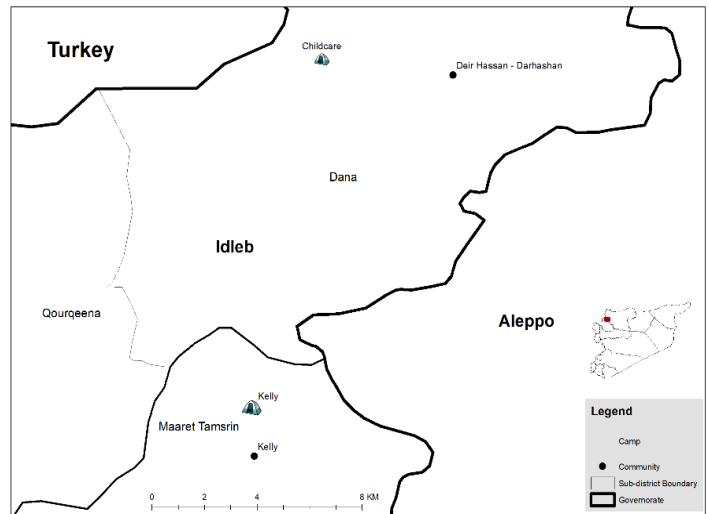


Figure 106: Food poisoning outbreak in Childcare and Kelly camps



Figure 107: Case-control study_ Food poisoning outbreak in Childcare and Kelly camps

Table 18: The details of response missions_2020

Epi-Week	Disease / Syndrome	Governorate	District	Community	Lab specimen	Environmental Sample's	in Coordination with	Actions taken
16	Dermatologic diseases	Idleb	Idleb	Kelly	-	-	Kelly HF- Kelly camp administration	health awareness campaigns/WASH/ supply medications
20	Food Poisoning	Idleb	Harim	Deir Hassan/ Kelly	-	Water	Deir- Hassan HF-Deir- Hassan camp administration	health awareness campaigns /WASH
23	Food Poisoning	Idleb	Idleb	Idleb	-	Water	HFs in Idleb city	health awareness campaigns/ WASH
25	OAD	Aleppo	Afrin	Ma'btali/ Zagrous Camp	-	Water	Local Council – Bahar Organization- The health Office	health awareness campaigns/WASH/ supply medications
28	OAD	Idleb	Harim	Atma/Ataa Camp	-	Water	Ataa HF- Ataa camp administration	health awareness campaigns/WASH
28	Food Poisoning	Idleb	Idleb	Atma Camps	-	Water		health awareness campaigns /WASH/Source shutdown
30	Food Poisoning	Aleppo	Al-Bab	Al-Bab	-	-	Directorate of Health/ Local Council	health awareness campaigns/ Source shutdown
33	OAD	Ar-Raqqa	Ar-Raqqa	Ar-Raqqa	-	-	-	Source shutdown/Cases management
34	Lice/ Scabies	Aleppo	Afrin	Sheikh El- Hadid	-	-	Turkish Ministry of Health/ Directorate of Health	health awareness campaigns/ supply medications
35	Hepatitis A	North of Syria			Serum	Water	Directorates of Health/ Local Councils	health awareness campaigns/WASH/ supply medications

3.1.4 Outbreak Preparedness and logistics

As outbreak investigation and response need many resources (transportations, specimen collection and shipment materials), the rapid response team was well equipped to set up the response plans, utilize standard protocols of case management, identify isolation sites for cases, as well as preposition the warehouses that contain the essential treatment kits. These procedures have been done through organizing the needed logistics, and well-trained outbreak control team (OCT).

- Two main warehouses were prepared to respond to any potential outbreaks, one of them in Azaz district- Aleppo governorate, and the other in Ath- Thawrah district- Ar-Raqqa governorate. Those warehouses contain medicines (including cholera kits), consumables, personal protection equipment, medical devices, and awareness leaflets.

- Support field team with logistical supplies, each DLO is equipped with a laptop, internet device, mobile phone, reversed cold chain equipment (refrigerator, cold box, ice packs, and generators), and other logistics (printer, projectors ...etc).
- Recruit logistics officers to facilitate the shipment of specimens and other needed materials. This includes vehicles and logistics services in Idlib.

The below map shows the distribution of warehouses and cholera kits in Syria during 2020.

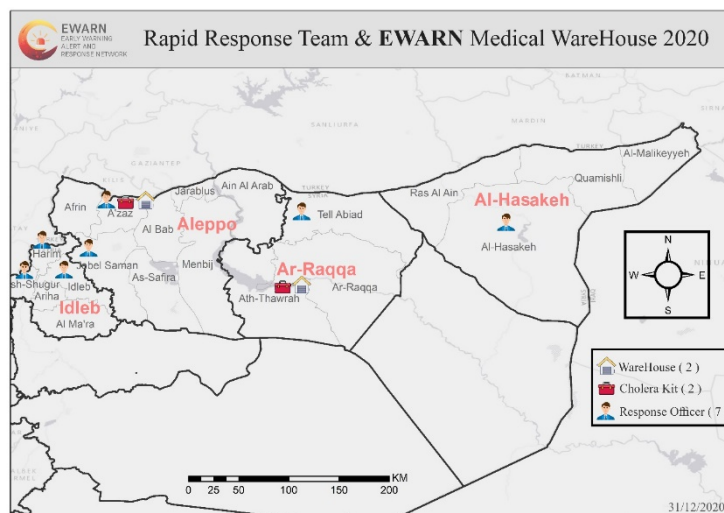


Figure 108: RRT & Warehouses location_2020

3.1.5 Rapid response team (RRT)

The rapid response team is defined as members of EWARN who are ready to respond to any sudden event of epidemiological nature, they are trained on case definition and alert threshold, outbreaks and control procedures, each one of them is an essential member of the OCT in a pre-defined geographical area.

In general, their tasks and responsibilities are being identifies and updated during the outbreak repose. The followings are the roles and responsibilities of RRT:

- Provide logistical support to OCT: communication devices – getting the permissions from local authorities - investigation requirements.
- Provide essential supplies for a potential outbreak such as medicines, transportation media, personal protection equipment, investigation forms, educational & communication materials.
- Coordinate the activities of the OCT: participating in defining work plan and its trimline - field visit - daily meetings.
- Train the involved partners on appropriate protocols for treatment and prevention.
- Provide a daily report about their achievements to the team leader.

3.2 EWARN Laboratories Network

3.2.1 Introduction

The Epidemiological laboratory is a corner stone in any surveillance system. In EWARN, the main responsibilities are:

- Establish early diagnosis for diseases with high mortality and morbidity rates, thus to notify the central team in EWARN and health partners as early as possible.
- Improve the quality of surveillance by timely confirmation of any outbreak at any place to avoid the spreading of the outbreak.
- To have a national laboratory system with high diagnostic capacity

The functions of Surveillance laboratories

- Strengthening the rapid response to outbreaks through timely testing of specimens and identification of the causative pathogens.
- Ensuring the capacity to process a large volume of specimens in an emergency.
- Training and continuing building capacity for laboratory personnel on laboratory techniques, use of equipment, appropriate and safe specimens' collection, storage and transportation of specimens.



Figure 109: Idleb PCR

3.2.2 EWARN Labs capacity and personnel

There are five surveillance laboratories with trained staff and standard equipment inside Syria, which are located in different areas to facilitate accessibility, they are located in: Idleb city, Ar-Raqqa city, two labs in rural Aleppo (Afrin, and Jarablus), and a new lab in Tal' Abyad district. Given that Northwestern of Syria is one of the most serious parts in Syria, adequate measures were put in place, as a matter of urgency, to ensure a strong and effective immediate response by the focus on emergency COVID-19 response and by supporting the enhancement of disease detection capacities through the provision of technical expertise, laboratory equipment, and systems to ensure prompt case finding and contact tracing.

The EWARN laboratories in Idleb, Afrin, and Jarablus has the capacity to confirm the diagnosis of COVID-19 by Real-time PCR techniques and they are a BSL-2 laboratory,

The laboratory investigation is ongoing in 4 laboratories (Idleb – Afrin – Jarablus - AR Raqqa) for the cases that are detected by the surveillance team.

With support from the World Health Organization, the Idlib laboratory was activated to test coronavirus (COVID-19) by real-Time PCR technique) in March/ 2020.

Daily analysis of specimens and sharing laboratory data & publishing reports with EWARN's weekly bulletin.

Develop, review, and publish the Guidance and Standard Operating Procedure COVID-19 Virus Testing in EWARN Laboratories.

Online reporting of laboratory results to local authorities, partners, and WHO

Quality control tests were performed in Jarablus, Afrin, and Idlib PCR- laboratories (provided by WHO and Turkish Ministry of Health).



Figure 110: Jarablus PCR

Ensure availability of necessary equipment, kits, reagents, and consumables including PPE and Safe disposal of laboratory waste.

Due to the nature of the outbreak and the need to establish greater testing capability, the stated aim of providing a minimum capacity of 1000-1500 tests per day for COVID-19 in EWARN laboratories with support from the World Health Organization, the Afrin laboratory was activated to test coronavirus (COVID-19 by real-Time PCR technique) and Jarablus COVID-19 laboratory by GIZ grant in Sep/ 2020 and we received more than 100.000 Universal Transport Medium, Swabs from WHO, and about 125000 tests for Covid-19 by PCR Technique. And the PCR laboratory for COVID-19 in Tal' Abyad district was establishment at the end of 2020.

Each lab is operated by a medical doctor who is specialized in laboratory diagnosis, and assisted by lab technicians, in addition to employees for sample transportation from field to labs.

All of them were trained and provided with the equipment and supplies. Regular supervisory visits (whenever possible) are usually done by the central team to those labs on regular basis to review their performance and Update them on any new technologies.

Frequent inventory of lab supplies, equipment, and maintenance is regularly performed.



Figure 111: COVID-19 testing

Table 19: The available equipment at each laboratory		
Item ##	Item Name	Quantity
1	Eliza Reader	1
2	Eliza Washer	1
3	Spectrophotometer	1
4	Hematology Analyzer Device	1
5	Blood culture device and culture bottles (only Idleb Lab)	1
6	Real-time PCR (Idleb Lab 3devices, Afrin 2devices)	1
7	Refrigerator 2-8 °C	1
8	Deep freezer -20 °C	1
9	Hot Air Sterilizer	1
10	Autoclave	1
11	Class- II Biosafety Cabinet	1
12	CO2 Incubator	1
13	Bacterial Incubator +37°C	1
14	Ahaking Water Path with Thermostat	1
15	Water Distillation Device 2-4 L/hr	1
16	Binocular Microscope	1
17	Tube Centrifude	1
18	Hematocrit Centifuge	1
19	Electronic Balance (0.01-100 gr)	1
20	Vortex Mixer	1
21	PH Meter	1
22	Bunsen burner and accessories	1
23	Micropipettes(Different sizes)	Enough quantities

24	Culture media for stool culture	Enough quantities
25	Sensitivity discs kits, Petri dish	Enough quantities
26	Ziehl–Neelsen,Giemsa,and Gram stains	Enough quantities
27	Measuring cylinder, and glasses	Enough quantities
28	Laboratory consumables: (Tubs, syringes, Disinfectants and disinfectants...etc)	Enough quantities

EWARN laboratories have the capacity to do lab confirmation for:

- Coronavirus and Influenza.
- Acute jaundice syndrome.
- Measles, Mumps, and Rubella.
- Salmonella typhoid fever.
- Acute watery and bloody diarrheal diseases.

Some labs are providing the support to:

- Check the Safety of blood transfusion.
- Screening of health care workers and hemodialysis patients.
- Clinical diagnosis of some diseases as per requested from clinicians.

Cooperating with private laboratories, hospitals, and clinics for viral testing or confirming the findings of the tests performed in inaccurate methods.

The tests listed are available daily on a priority basis, with minimum delay, after receipt in the Laboratory, if less urgent tests are also ordered, a backlog may develop and each specimen will be processed in order of receipt, thereby delaying the reports for true emergencies, quality is ensured and testing is started according to a set time frame so that the results are shared, In a timely manner for the weekly bulletin, tests are completed within about 48 hours of receiving the sample for testing, certain tests such as stool culture take 3- to 5 days to complete.

The currently available tests in Each Laboratory are divided into 7 groups as following:

#	Table 20: The available tests in each EWARN Laboratory	Estimated Time
1	Covid-19, Other Influenza tests	24-48 hours
2	Vaccine-preventable diseases Tests: Measles IgM, Rubella IgM, Mumps IgM, HBsAg	24-48 hours
3	Water-borne diseases Tests: HAV IgM, HEV IgM	24-48 hours
4	Stool culture for: Typhoid fever, Shigellosis, Vibrio Cholera	4 to 5 days
5	Hepatitis viruses (for Blood Banks) HIV, HCV, HBV, and Serological markers (HBs Ag, Anti HBs, Anti HBc)	24-48 hours
6	Chemical and blood tests: Liver functions, Renal functions, Complete Blood Count	12-24 hours
7	Other tests: Ziehl–Neelsen stain for demonstration of acid-fast bacteria (suspected TB), Giemsa stain for Malaria and Leishmaniosis	12-24 hours

3.2.3 EWARN Labs 2020 achievements

The number of different tests which performed in 2020 were 76,786 analysis.

Table 21: No. of different tests performed _2020				
Disease	Test	# tests	# +ve Results	% -ve Results
Measles	Measles IgM	159	94	59
Rubella	Rubella IgM	96	1	1.04
Mumps	Mumps IgM	133	97	73
Acute Jaundice Syndrome	HAV IgM	448	304	68
	HEV IgM	380	1	0.7
Hepatitis B	HBs Ag	351	55	15.7
Hepatitis C	HCV Abs	335	34	10.1
AIDS	HIV (1&2) Abs	21	3	14.3
Coronavirus and Influenza	COVID-19 by PCR	74880	20760	27.7
	Influenza Multiplex (Real-time PCR)	322	1	0.3
Grand Total		76790	21260	27.7

The 5 laboratories are functioning from 8:00 to 17:00 daily, The Specimens that previously collected are delivered to the labs by logistics employees when transportation service is available, the samples are hand-delivered to the Laboratory, with verbal notification of the specimen’s arrival to ensure appropriate processing.

All laboratories have both Excel and paper registers for each disease.

All the specimens came with investigation forms and lab requests, and they are well documented with the results in both hard and soft copies in the lab’s registration system, then sent via E-mail during a specific period of time (24-48 hours) to the laboratories coordinator at the central team.

“Read-back” with confirmation of all results reports (including both state and critical values) is being reviewed to verify values and assure accuracy by the laboratory coordinator, in order to achieve surveillance goals. Finally, results are sent to the DLOs directly from the central level by E-Mail, or WhatsApp.

The patient usually receives his laboratory results from his physician who previously request the test for him.

Challenges

- Lack of funding and logistical support for laboratory issues in general, and for upgrade the available equipment in specific.
- Poor infrastructure, power supply problems, and lack of basic equipment and consumables.
- Shortage in qualified trainers and training activities for the lab field team, and shortage of qualified technicians for equipment maintenance.
- Insufficient quality control tests.

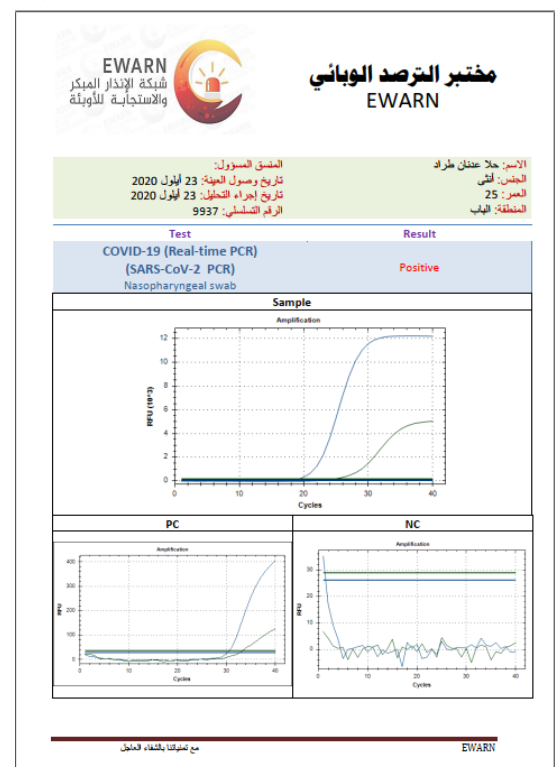


Figure 112: Covid-19 Lab result

- Borders' problems (needed documentation and security) that lead to delay or inability to ship all needed materials.

Future Plans

- Seeking financial support for continuous training in immunology and macro-biology field to add it in EWARN scope of tests.
- Increase the capacity of EWARN lab staff inside Syria.
- Refresh the training about laboratory safety procedures.
- Continue providing regular maintenance for the current lab’s equipment and ensure backup equipment is available to keep the lab Response and related Logistics activities are functioning.

3.3 Vaccination Activities

Immunization program in EWARN is considered as essential part of technical committee of SIG (Syrian Immunization Group) co-chaired by WHO and UNICEF, the responsible for implementing all vaccination activities (supplementary immunization activities (SIAs) and routine immunization (RI)) in all accessible areas of Syria.

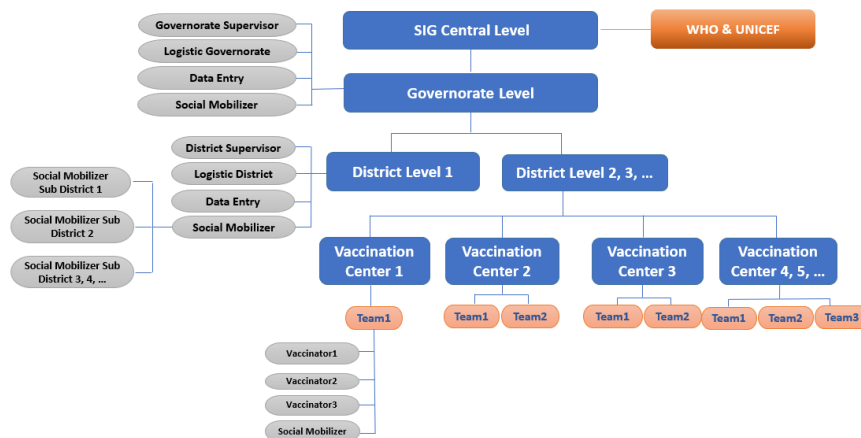


Figure 113: Structure of SIG

3.3.1 Main Tasks

- Planning for all vaccination activities in coordination with SIG / WHO.
- Conducting TOT, Primary and refresh trainings for Supervisors and service providers according to WHO criteria.
- Participate in designing and printing IEC materials for social mobilization activities in coordination with UNICEF.
- Receiving required vaccines & logistics in coordination with UNICEF and delivering them to central warehouses in governorates.
- Monitoring the implementation of all activities and following up outputs.
- Preparing and publish final reports.
- During 2020, participation with SIG in planning, implementing and supervising all vaccination campaigns where one round of OPV vaccination campaign has been implemented in all accessible areas. Completing the revitalization of the Expanded Immunization Program (EPI) in the governorates of Aleppo, Idlib, Tell Abiad and Ras Al Ain.

3.3.2 Routine Immunization (RI) Centers

The total number of EPI centers in northern Syria was **30** during 2020 (20 in Idleb ,8 in Aleppo, 1in Ar-Raqqa, and 1 in Al-Hasakeh). Those centres are supported by EWARN according to micro-plan which is detailed in the following table:

(It should be noted that some of teams and centers were relocated into new more safety sites as a result of the security situation and changing of control maps in the field).

Governorate	Centers	Teams	Annual Target U1Y	# Total Sessions/Year
Aleppo	8	9	8,904	2,000
Idleb	20	29	40,572	6,220
Ar-Raqqa	1	1	100	238
Al-Hasakeh	1	1	100	76
Total	30	40	49,676	8,534

Year	Planned (EWARN)	Implemented (EWARN)	Total (SIG)	% of Total
2017	10	14	56	25%
2018	20	24	91	26%
2019	30	33	101	33%
2020	35	30	93	32%

Gov.	District	Sub-District	Center Name EN	#Teams	U1 Monthly Target	U1 Yearly Target	#. Required Sessions	#. Scheduled Sessions	#Fixed Sessions	#Outreach Sessions
Idleb	Idleb	Idleb	Althaoura PHC	1	263	3,156	33	20	20	0
Idleb	Idleb	Idleb	Abi Zar PHC	2	315	3,780	40	43	28	15
Idleb	Idleb	Idleb	Alsalam	1	109	1,308	14	21	16	5
Idleb	Idleb	Idleb	Hie Al jameaha	1	136	1,632	17	22	22	0
Idleb	Idleb	Maaret Tamsrin	Kafar yahmool	1	174	2,088	22	24	8	16
Idleb	Idleb	Maaret Tamsrin	Hazano	3	142	1,704	18	23	12	11
Idleb	Idleb	Maaret Tamsrin	Bhora	1	100	1,200	13	14	4	10
Idleb	Idleb	Maaret Tamsrin	Maaret Mesrin	1	136	1,632	17	23	23	0
Idleb	Idleb	Maaret Tamsrin	Zardana	1	121	1,452	16	16	8	8
Idleb	Harim	Harim	Harim	1	174	2,088	22	21	16	5
Idleb	Harim	Salqin	Ezmarin	1	109	1,308	14	16	4	12
Idleb	Harim	Armanaz	Armanaz	1	93	1,116	12	15	8	7

Idleb	Harim	Dana	Aqrabat	3	324	3,888	41	48	0	48
Idleb	Harim	Dana	Aldana 2	2	169	2,028	22	33	9	24
Idleb	Harim	Dana	Mashhad Ruhin	1	100	1,200	13	13	13	0
Idleb	Harim	Dana	Sarmada 1	1	179	2,148	23	46	46	0
Idleb	Harim	Dana	Atma ACU 1	3	372	4,464	47	49	20	29
Idleb	Harim	Dana	Atma ACU 2	1	76	912	10	13	13	0
Idleb	Jisr-Ash-Shugur	Badama	Kherbet Al Jouz	2	184	2,208	23	44	4	40
Idleb	Jisr-Ash-Shugur	Janudiyeh	Al Janodia	1	105	1,260	14	24	8	16
Aleppo	Jarablus	Ghandorah	Tal Elhajar	1	53	636	7	17	4	13
Aleppo	Jarablus	Jarablus	Jarablus	2	239	2,868	30	43	26	17
Aleppo	Jarablus	Jarablus	Ain Albaida	1	84	1,008	11	20	4	16
Aleppo	Al Bab	Al Bab	Albab 2	1	98	1,176	13	20	4	16
Aleppo	Al Bab	Ar-Ra'ee	Ar-Ra'ee	1	130	1,560	17	20	8	12
Aleppo	Afrin	Bulbul	Bulbul	1	46	552	6	20	4	16
Aleppo	Afrin	Jandairis	Jalma	1	64	768	8	17	5	12
Aleppo	Afrin	Raju	Beit Adin	1	28	336	4	18	4	14
Ar-Raqqa	Tell Abiad	Tell Abiad	Tell Abiad	1	100	1,200	13	26	26	0
Al-Hasakeh	Ras Al Ain	Ras Al Ain	Ras Al Ain1	1	100	1,200	13	26	26	0

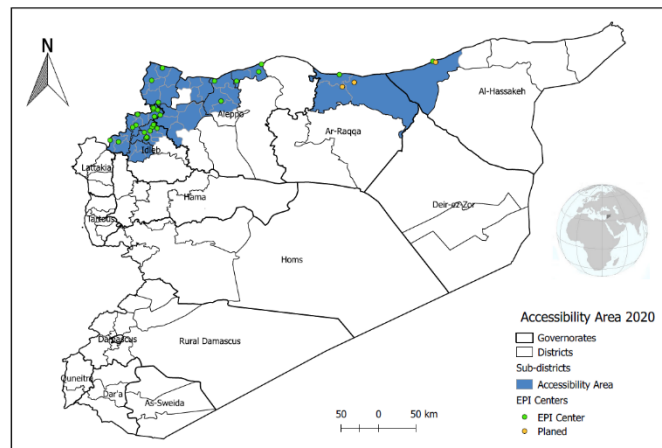


Figure 114: EPI centers and the planned Epi centers for 2021

Vaccine	< 1[Y] Total	< [2Y] Total	Coverage	>[2Y] Total	Total Vaccinated
BCG	48,792	48,792	101%	-	48,792
Hep(B)	10,027	10,027	21%	-	10,027
Protected children	31,261	31,261	91%	-	31,261
Unprotected ch.	2,967	2,967		-	2,967
OPV1	46,032	49,667	102%	1,812	51,479
OPV2	41,674	47,750	99%	2,257	50,007
OPV3	35,809	47,680	98%	3,351	51,031
OPV4	-	35,223	73%	9,093	44,316
IPV1	47,012	50,341	104%	90	50,431
IPV2	42,550	45,704	94%	75	45,779
Penta1	46,548	50,196	104%	1,855	52,051
Penta2	42,257	48,411	100%	2,311	50,722
Penta3	36,492	48,544	100%	3,418	51,962
Penta4	-	37,068	76%	9,273	46,341
MR1/MMR1	-	46,815	97%	4,579	51,394
MR2/MMR2	-	38,642	80%	9,945	48,587
Vit(A)1	0	0	0%	0	0
Vit(A)2	0	0	0%	0	0

	1 Dose	2 Dose	3 Dose	4 Dose	5 Dose	Total
Pregnant	83	131	1,090	2,454	15,093	18,851
Unpregnant	494	483	942	2,039	4,465	8,423



Figure115: RI Activities _ 2020

3.3.3 SIAs (Supplemantry Immunization Activities)

After the spread of the Covid-19 pandemic, the implementation of vaccination campaigns was suspended for a limited period, until WHO issued the framework for decision-making for implementation of mass vaccination campaigns in the context of COVID-19, after that based on WHO recommendations and in coordination with SIG we implemented two rounds first one in NW Syria and the second in NW Syria in Ar-Raqqa and Al-Hasakeh gov. which became new accessible area for EWARN.

This campaign is the first campaign to be conducted in Tell Abiad & Ras Al Ain since at least 2 years after conducted health need assessment and epidemiology status analyzing by EWARN team to targeting 42,743 children in (0- 5 years) age group in 5 TSCs.

The teams reached 585 communities and Vaccinated 45,527 Children. The main thing in this campaign was the number of vaccinated children for the first time was 19,456 with percentage of 43% of total vaccinated children.

Total Administrative coverage (106%), PCM (post campaign monitoring) coverage (97.5 %). EWARN provided full financial support for the operational cost and social mobilization activities of the campaign.

Activity	Gov./Dis.	Target	Vaccinated	Coverage
Polio Campaign R1 –10 to 15 Oct 2020	Idleb	443,912	489,477	110%
	Aleppo	371,330	357,098	96%
Total (Idleb, Aleppo)		815,242	846,575	104%
Campaign R1 –24 to 29 Oct 2020	Tell Abiad	22,743	28,431	125%
	Ras Al Ain	20,000	16,826	84%
Total (Tell Abiad, Ras Al-Ain)		42,743	45,257	106%



Figure 116: SIAs Activities _ 2020

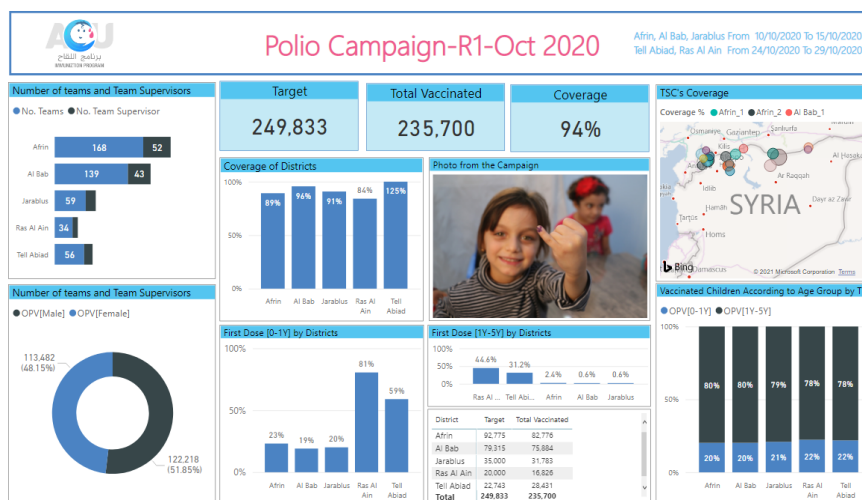


Figure 117: Polio campaign R1_ 2020

3.3.4 Training & Building Capacity

EWARN team has effectively contributed to vaccination activities (SIAs, RI) through staff trainings:

- Refresh training on EPI for all our service providers (160 trainees / 12 training groups).
- Basic (detailed) training on EPI for new service providers (12 trainees / 3 training group) in November.
- As a result of the Covid-19 pandemic conditions, many training sessions were conducted online, via Skype and WhatsApp for SIAs and RI.



Figure 118: Training of EPI teams_ Idleb



Figure 119: Training of SIAs teams_ Ras Al-Ain

3.3.5 Supervision on EPI centers during 2020

- Monthly visits conducted by Central supervisors to some of EPI centers (14 visits).
- Continuous filed follow up and monthly Visits conducted by 3 liaison officers to all centers.
- Online technical & administrative daily following-up to all centers (WhatsApp, Skype and Telegram groups), to keep track of work throughout the day and we also use them for educational purposes for teams.
- There is a daily online meeting (the meeting of SIG technical committee) in which the daily details are discussed according to the EPI districts (as each central supervisor is responsible for a health district) and the measures taken are followed up.
- Usually, 2 types of supervisory visits are implemented:
 - A quarterly visit to the centers affiliated with SIG (according to district).
 - A monthly visit to all ACU centers.

After the end of each supervisory visit, the visit report is discussed with SIG technical committee and appropriate decisions are taken.

Table 28: Team Performance Indicators for SIAs

1-Team members wearing campaign cloths (one of them)?
2-Is the vaccine given at 45 degree without touching the child's mouth?
3-Finger marking on the left hand after vaccination?
4-Team asked about missed children?

5-Team asked about (AFP)?
6-Team have a training card?
7-Vaccine stored in vaccine holder with enough ice packs?
8-Polio vaccine stored in a special bag in the vaccine holder?
9-VVM valid for vaccine?
10-Team know how to read VVM?
11-Team have a daily work plan with a known target?
12-Team have a complete map for all campaign days?
13-Map have daily itinerary?
14-Team follow his location on the map?
15-Polio vac. delivered according to target?
16-All deliverable registered (Polio vac.)?
17-Team have masks and sterilizers as required?
18-Team members wearing masks?
19-Team members change the mask every 4 hours or when contaminated?
20-Team sterilize his hands well?
21-The distance is at least a meter between the beneficiaries and the vaccination teams?
22-Number of vials compatible with vaccinated children?
23-Team recorded missed children and their adress clearly?
24-Team recorded (AFP) and their adress clearly for the previous day?
25-Vaccinated children, and zero dozes registered in the tables correctly?
26-Data is completed in the team register?
27-Team visited by the supervisors during the day?
28-Supervisor's observations documented today?
29-Supervisor's observations documented yesterday?

Table 29: The team commitment of the prevention measures related to the COVID-19

1- Is the session held in a well-ventilated place - the pollen room is wide and well-ventilated or the session is held outdoors.
2- Are the beneficiary's table, surfaces, floors, and tools wiped with chlorine solution at the outset and end of each session, and when contamination occurs?
3- In the case of isolation, does the team deal with the beneficiaries according to the adopted procedures in the work?
4- Are the beneficiaries sitting in the waiting room according to the social distance (a distance of at least 1 meter)?
5- Does one of the team members make sure that the beneficiaries do not shows flu or creep symptoms (fever - cough - general tired - general bad situation, ..etc...)?
6- Does one of the team members inform the parents that the people have a cold or creep symptoms, and those over 65 years of age should be not come to the vaccination center?
7- Is the team members follow the social distance between themselves, and the beneficiaries during the working hours?

8-	Are all vaccination center team wear the mask in the correct way during the work hours?
9-	Are the hands washing with soap and water for 20 seconds or sterilize the hands with an alcohol after each beneficiary?
10-	Are the adopted awareness messages about the COVID-19 provide to the beneficiaries?
11-	Is there a full no-smoking commitment during the sessions?
12-	Does the team get rid of the masks correctly by the end of the session?

For more details, click: <https://urlzs.com/BDCys>

3.3.6 Communication for Development (C4D)

Communication for Development (C4D) is one of the core change strategies contributing to results across the goal areas of the vaccination program Strategic Plan.

C4D is also a critical component of vaccination responses, whether to SIAs or EPI Program.

All social mobilization activities are continuous and periodic, in cooperation with the Syria immunization group (SIG).

1-SIAs:

- Before the start of each campaign, several activities of social mobilization are carried out to inform the people about the campaign and to raise community awareness on importance of vaccination for children.
- Because of Covid-19 Pandemic we change a lot of our activities to be safer and more effective.
- Many activities were planned to promote vaccination campaigns via cars with loudspeaker, the Mosque Loudspeakers, house visits by health workers and social mobilizers and some of IEC materials like Posters and Banners.

2-EPI Program:

- There is 1 social mobilizer in each vaccination team, he works in a specific plan to achieve the goals of C4D plans.
- The social mobilizers played an important role in raising awareness about the prevention of Covid-19 disease and the importance of following up vaccination despite the spread of the pandemic.
- Continuously tracking all dropouts' children online via WhatsApp, Facebook and also through houses visits by social mobilizers, reviewing and analysing the data on monthly basis.

- In context of Covid-19 pandemic we cancelled some activities and modified some of them



Figure 120: Social Mobilization Activities

3.3.6 Cold Chain

To enable the safe and effective delivery of vaccines, EPI centers have been equipped with adequate supply of high-performing cold chain equipment (CCE) From GAVI through UNICEF. The CCE package includes:

- A WHO-prequalified Ice lined (IL)vaccine refrigerators (127 L in baskets).
- Solar Direct Drive Vaccine Refrigerator & Ice-pack Freezer TCW 2043SDD Vaccine storage capacity: 70 L, Ice-pack storage (at 0.6 L): 16, WHO PQS Code: E003/043, Freeze protection: Grade A.
- Chest freezers (for mass ice packs production).
- Cold boxes, and vaccine carrier with double sets of designated water packs.

The quality of vaccine storage has been maintained and monitored by using standard electronic temperature logger (Log – tag, Q-tag, Libero....).

About the cold chain& logistic plan in the campaigns: before the campaign cold chain assessment conducted at all levels (Central - District – TSC’s) in terms of capacity and efficiency.

Thus, a plan was prepared to:

- Receipt, distribution and monitor of vaccines and supplies at all levels.
- Prepare required logistic forms to document all activities.
- Monitoring temperature and inventory on daily basis before, during and after the campaign.
- Comprehensive contingency plan to dealing with situations that may occur in the cold chain at any level or in security situations.

- Management and Disposal vaccines and wastes.



Figure 121: Keeping the vaccine in Routine vaccination centers

Challenges

1- COVID-10 pandemic

- At the beginning of the pandemic, the epi centers have been stopped for one and a half months, during this period, plans were updated to work in the context of Covid-19 pandemic and to secure PPIs materials for the staff.
- The coverage had decreased due to public fear of the pandemic and rumors related to the disease. (most of the vaccination center was at medical points, which people avoided).
- If one member of the vaccination team is infected in Covid-19, he will be quarantined for 14 days and his co-workers will be quarantined for 5 days, according to SIG protocols, which affected the number of sessions and the vaccine coverage.
- In some districts, the school vaccine was rejected, especially in private schools, due to rumors, and it was mistakenly linked to the Covid-19 vaccine.
- Some outreach sessions are conducted outdoors or under the trees and cold places in the winter, which weakens the coverage.
- Some of our staff moved from EPI to other programs in search of better salaries, and this is losing trained personnel.
- Follow up of low dropouts due to losing contacts and changing addresses continuously.
- The lack of a unified database for all EPI centers.

2- Logistic difficulties

- Crossing the borders by supervisors.
- The need for more logistical services, especially when many centers are relocated, and new ones are opened.
- In the context of Covid-19 pandemic we developed contingency plans for the supply so that no interruption of service or a shortage of vaccine occurs in any EPI center.

3- The absence of a unified database for all EPI centers.

Future Plan & Recommendations

- Inoculating the entire staff with the Covid vaccine.
- Providing heating for outdoor sessions (Done).
- Increase the wages of the vaccination team (Done).
- Continuous training and update of information for all staff, especially those newly appointed, according to the recommendations of the WHO.
- Increase coordination with the education sector to increase coverage of school vaccination activities.
- Building a unified database for all EPI centers (adding data entry officers to the program).
- Involving DLOs, FLOs, and nutrition staff in EWARN in raising awareness of the vaccine.
- Increase coordination with all health care workers, medical staff, and other health programs to raise awareness of the importance of the vaccine.

3.4 WASH (Water, Sanitation and Hygiene)

3.4.1 Introduction

WASH team was established in June 2013. The program focused on the training of staff working inside Syria within the sector of drinking water quality. Training courses were conducted on how to do chemical and biological analyzes of water using portable analysis devices inside Syria.

The team has 27 staff members (3 at the central level and 24 at the field level) covering 6 governorates (Aleppo, Idleb, Hama, Raqqa, Dier Ezzor and Alhasaka) in line with the expansion of the early warning and response network (EWARN) and has a clear and strategic work plan coordinated with other network programs.

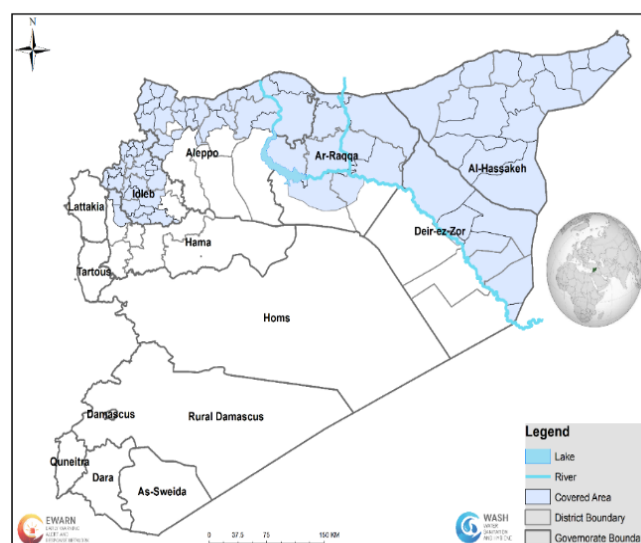


Figure 122: WASH coverage map _2020

3.4.2 Water quality monitoring

This activity will ensure the implementation of the water safety plan (WSP) adopted by the World Health Organization (WHO) and the International Water Association (IWA) and it be at three levels:

A. Monitoring of drinking water sources:

WASH staff monitor the functionality of the water stations that feed the communities with potable water. If the stations stop, WASH officer warns about the alternative sources used (tanks, agricultural wells ...), Then these sources are tested through mobile laboratory (Total coliforms – e-coli) to investigate of sewage pollution.

Number of stations monitored during the year 2020 per month 1145 water stations in 6 Governorates, and WASH program issue semi-monthly bulletin on a regular basis. WASH staff are doing laboratory analyzes of the new water resources that local organizations and local councils are using in supplying of drinking water, water quality reports for each water source are done.

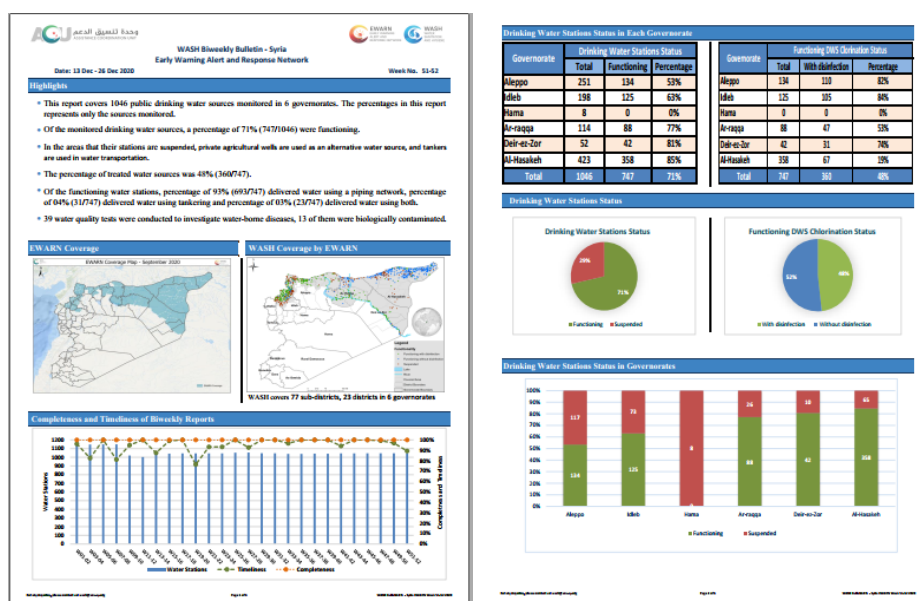


Figure 123: Semi-Monthly WASH

B. Monitoring the sterilization of drinking water:

The free residuals chlorine (FRC) test is carried out to evaluate the effectiveness of the sterilization process at the three levels (water source, transporter, container) means (station - household and network) to reduce the spread of waterborne diseases

During the year 2020, the water plants in Aleppo and Idlib governorates were supplied with calcium hypochlorite and Alum to improve water quality in Afrin water station.

As a response to COVID-19 control, WASH program distributed calcium hypochlorite to disinfect the surfaces especially in health facilities in coordination with DLO's.



Figure 124: Mobile laboratory with WASH field team

C. Monitoring of water transporter to homes

Determination of the method of delivery of water (regular network - tanks), the transport using tankers is more susceptible to bacterial contamination than transport using regular networks.

Through the testing of samples of drinking water in the network and houses, the situation was rather good in comparison with the previous years, because of the stabilization in the north of Syria.

In 2020, there was not any alert of WBDs related to transporting devices.

3.4.3 Participation in WBDs response missions

WASH staff participate with the rapid response team in water contamination investigation and implement the response activities as well.

Table 30: The details of WASH missions in health sectors_2020				
#	Mission	Governorate	District	Location
1	OAD Investigation	Idleb	Jisr-Ash-Shugur	Al-Raiyat camp
2	OAD Investigation	Idleb	Harim	Deir Hassan camp

3	OAD Investigation	Aleppo	Afrin	Zagharous camp
4	OAD Investigation	Idleb	Harim	Ataa' camp
5	OAD Investigation	Idleb	Maaret Tamsrin	Al-Rayan camp
6	OAD Investigation	Aleppo	Azaz	Al-Haramin camp
7	STF Investigation	Aleppo	Jebel Saman	Abin Samaan
8	Leishmaniasis Investigation	Deir ez zor	Deir ez zor	Al-Kasra
9	AJS Investigation	Al-Hasakeh	Ras Al Ain	Ras Al-Ain
10	AJS Investigation	Aleppo	Jebel Saman	Abin Samaan
11	AJS Investigation	Idleb	Harim	Armanaz
12	AJS Investigation	Aleppo	Jebel Saman	Ajjena
13	AJS Investigation	Aleppo	Azaz	Al Samala camp
14	AJS Investigation	Aleppo	Jebel Saman	Batabo
15	AJS Investigation	Idleb	Jisr-Ash-Shugur	Sham camp
16	AJS Investigation	Idleb	Harim	Salqin
17	AJS Investigation	Idleb	Harim	Al Amal camp
18	AJS Investigation	Aleppo	Afrin	Mohammadea camp

During the response missions, chlorine tablets are distributed for the household to reduce the cases of water-borne diseases due to the random water sources used by people.

3.4.4 Participation in COVID-19 Response

a. Distribution Water Tanks:

Distribution of 1500 water tanks with capacity of 1000 liters to the IDPs in the camps in Idleb and Northern rural of Aleppo in the camps in need as below:

No.	Name of camp	District	Sub district	Number of water tanks	No. of families
1	Aljisir camp	Azaz	Azaz	13	65
2	Shohadaa Tal rifaat	Azaz	Azaz	4	20
3	Sijo school	Azaz	Azaz	2	10
4	Alsiramik	Azaz	Azaz	1	5
5	Sfirat Sijo	Azaz	Azaz	5	25
6	Karaj Sijo	Azaz	Azaz	2	10
7	Maarin	Azaz	Azaz	73	365
8	Yazibag Aljabal	Azaz	Azaz	47	235
9	Sfirat Aljabal	Azaz	Azaz	5	25
10	Yazibag 1	Azaz	Azaz	7	35
11	Yazibag 2	Azaz	Azaz	8	40
12	Yazibag 3	Azaz	Azaz	3	15
13	Yazibag4	Azaz	Azaz	14	70
14	Yazibag 5	Azaz	Azaz	14	70
15	Alrahma	Azaz	Azaz	17	85
16	Mafrak Niyara	Azaz	Azaz	1	5
17	Alrayan Random	Azaz	Azaz	27	135
18	Alrisala Random	Azaz	Azaz	13	65
19	Iwaa Shamaarin	Azaz	Azaz	5	25
20	Taljbeen	Azaz	Azaz	50	250

21	Almokawamah Camp	Azaz	Azaz	100	500
22	Soran camps	Azaz	Soran	12	60
23	Akhtarin camps	Azaz	Akhtarin	12	60
24	Kara kopri camp	Azaz	Akhtarin	20	100
25	Alazrak camp	Albab	Albab	20	100
26	Maree camp	Azaz	Maree	15	75
27	Azaz camp	Azaz	Azaz	10	50
28	Jabal Harim	Harim	Harim	10	36
29	Qah	Harim	Dana	200	470
30	Dana	Harim	Dana	50	100
31	Tal Al Karama	Harim	Dana	100	200
32	Kelly	Idleb	Maaret Tamsrin	80	180
33	Haranbush	Idleb	Maaret Tamsrin	60	120
34	Ariha	Ariha	Ariha	250	250
35	Mhambal	Ariha	Mhambal	250	250



Figure 125: Distribution water tanks

b. Distribution Water Jerrycans:

The total quantity that has been distributed of water jerrycans is 25000.

Table 32: The details of WASH missions in COVID-19 response / distribution water jerrycans					
No.	Name of camp	District	Sub-district	Number of water Jerrycans	No. of families
1	Taljebin camp	Azaz	Azaz	1430	1430
2	Alharamin	Azaz	Azaz	815	802
3	Almokawamah Camp	Azaz	Azaz	3000	2817
4	Almokawamah random	Azaz	Azaz		299
5	Almokawamah fostok	Azaz	Azaz		128
6	Ahl Alsham	Azaz	Azaz	331	331
7	Sijo karafan	Azaz	Azaz	1872	1874
8	Alhilal camp/Mafrak Niyara	Azaz	Azaz	200	197
9	Alrisala	Azaz	Azaz	978	980
10	Alnour camp	Azaz	Azaz	1800	1801
11	Kara kopri camp	Azaz	Akhtarin	650	445
12	Dodyan	Azaz	Akhtarin	540	540
13	Jabal Harim	Harim	Harim	5000	
14	Qah	Harim	Dana	5400	
15	Dana	Harim	Dana	1200	
16	Tal Al Karama	Harim	Dana	6000	
17	Kelly	Idleb	Maaret Tamsrin	6900	
18	Haranbush	Idleb	Maaret Tamsrin	7500	
19	Ariha	Ariha	Ariha	10000	
20	Mhambal	Ariha	Mhambal	8000	



Figure 126: Distribution water jerrycans

c. Distribution Hypo chloride calcium and chlorine tablets:

With each water jerrycan, chlorine tablets were distributed to the IDPs in the camps and to the camp management in case of emergency. 6 tons of Hypo chloride calcium were distributed to the water stations as below:

Table 33: The details of WASH missions in COVID-19 response / Distribution Hypo chloride calcium and chlorine tablets					
No.	Name of water station	District	Sub-district	Cluster	Hypo chloride calcium 25 kg
1	Kastal Jando	A'zaz	A'zaz	A'zaz	4
2	Yazi bagh	A'zaz	A'zaz	Alkarom	4
3	Maarin	A'zaz	A'zaz	Maarin	4
4	Ghouror	A'zaz	Aghtrin	Ghouror	5
5	Albaroza	A'zaz	Aghtrin	Albaroza	3
6	Owelin	A'zaz	Aghtrin	Owelin	2
7	Kabieh	A'zaz	Aghtrin	Kabieh	2
8	Tal aar	A'zaz	Aghtrin	Tal aar	2
9	Alzayadieh	A'zaz	Aghtrin	Alzayadieh	3
10	Tat Hams	A'zaz	Aghtrin	Tat Hams	2
11	Turkman Barih	A'zaz	Aghtrin	Turkman Barih	3
12	Bahurtah	A'zaz	Aghtrin	Bahurtah	1
13	Doaybik	A'zaz	Suran	Doaybik	2
14	Doaybik farm	A'zaz	Suran	Doaybik	2
15	West Ihtimelat	A'zaz	Suran	Ihtimelat	3
16	Shwerin	A'zaz	Suran	Shwerin	2
17	Kara koz	A'zaz	Aghtrin	Kara koz	2
18	Sandra	A'zaz	Aghtrin	Sandra	2
19	Mrighel	A'zaz	Suran	Mrighel	2
20	East Raael	A'zaz	Suran	Raael	1
21	Dabik	A'zaz	Aghtrin	Dabik	2
22	East Dabik	A'zaz	Aghtrin	Dabik	2
23	Kafra	A'zaz	Suran	Kafra	3
24	Albal	A'zaz	Suran	Albal	3
25	Suran	A'zaz	Suran	Suran	4
26	Kafr Kalbin	A'zaz	A'zaz	Kafr Kalbin	3
27	Kaljabrin	A'zaz	A'zaz	Kaljabrin	3
28	Sandaf group	A'zaz	Mare'	Mare'	2
29	Albarid well	A'zaz	Mare'	Mare'	2
30	Akrimeh well	A'zaz	Mare'	Mare'	2
31	Eastern reservoir well	A'zaz	Mare'	Mare'	2
32	Kafr alward	A'zaz	Mare'	Kafr alward	3

33	North Arshaf	A'zaz	Aghtrin	Arshaf	2
34	South Arshaf	A'zaz	Aghtrin	Arshaf	2
35	Alsalihih	A'zaz	Aghtrin	Alsalihih	1
36	Yazi bagh	A'zaz	A'zaz	Yazi bagh	1
37	Akdeh	A'zaz	Suran	Akdeh	1
38	Shamarin	A'zaz	A'zaz	Shamarin	3
39	Jarablus				50
40	Albab				98
	Total				240



Figure 127: Distribution Chloride

d. Conducting awareness campaigns to raising awareness about infection of COVID-

Awareness campaigns were implemented through printing IEC materials (brochures, fixing brochures on jerrycans, 1000 wall posters, 70 road billboards, and 10 lighting billboards).



Figure 128: Distribution IEC materials for awareness campaigns

e. Rehabilitation of drinking water stations:

The rehabilitation of 26 drinking water stations is conducted to increase the per capita share of water for the people to enhance hygiene and hand washing.

Table 34: The details of WASH missions in COVID-19 response / Rehabilitation of drinking water stations					
#	Governorate	District	Sub-district	Community	Water Station Name
1	Aleppo	Albab	Ar-Ra'ee	Atharia	Atharia
2	Aleppo	Albab	Ar-Ra'ee	Waqf	Waqf
3	Aleppo	Albab	Ar-Ra'ee	Tal Ahmar	Tal Ahmar
4	Aleppo	Albab	A'rima	Shweiha	Shweiha
5	Idleb	Ariha	Ariha	Korin	Korin
6	Idleb	Ariha	Ariha	Motaram	Motaram
7	Idleb	Ariha	Ariha	Orm Eljoz	Orm Eljoz
8	Aleppo	Jarablus	Jarablus	Jarablus	Hjeileh
9	Aleppo	Jarablus	Jarablus	Jarablus	Zoghra
10	Aleppo	Jarablus	Jarablus	Jarablus	Rif Jarablus
11	Aleppo	Azaz	Aghtrin	Tat Hims	Tat Hims
12	Aleppo	Azaz	Aghtrin	Zayadiyeh	Zayadiyeh
13	Aleppo	Azaz	Aghtrin	Turkman Bareh	Turkman Bareh
14	Aleppo	A'zaz	A'zaz	Kafr Kalbein	Kafr Kalbein
15	Aleppo	A'zaz	Mare'	Tlaline	Tlaline
16	Aleppo	A'zaz	Mare'	Mare'	Mare_Albarid
17	Aleppo	A'zaz	Mare'	Mare'	Mare_Akrama
18	Aleppo	A'zaz	Mare'	Mare'	Mare_Alkhazan
19	Aleppo	A'zaz	Suran	Jakkeh	Jakkeh
20	Aleppo	A'zaz	Suran	Zayzafun - Ekdeh	Zayzafun - Ekdeh
21	Aleppo	A'zaz	Suran	Shweirin	Shweirin
22	Aleppo	Al Bab	Al Bab	Qabasin	Qabasin
23	Aleppo	Al Bab	Al Bab	Sosyan	Sosyan
24	Aleppo	Albab	Ar-Ra'ee	Qantaret Elbab	Qantaret Elbab
25	Aleppo	Jarablus	Jarablus	Jarablus	Jarablus
26	Aleppo	Al Bab	Al Bab	Sheikh Elwan	Sheikh Elwan

3.4.5 Coordination with organizations working in WASH sector and sharing data

In the WASH-cluster meeting - held monthly - the WASH team presents the numbers and cases of waterborne diseases with their locations. Then the coordination with the organizations operating in these areas to increase water sterilization procedures, promote hygiene, and distribute hygiene kits.

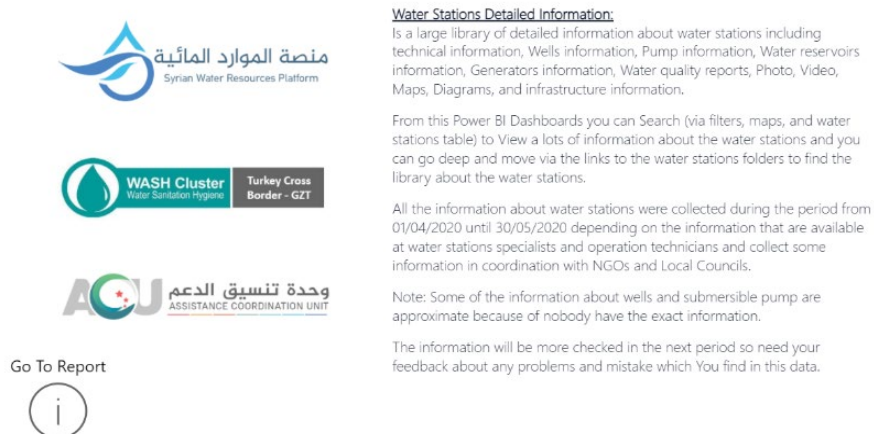


Figure 129: WASH Platform

3.4.6 Implementation of activities in WASH sector

WASH Program implements some activities that support public health measures, such as hygiene campaigns, supporting the repair of some water stations, distribution of health awareness brochures.

No.	Session	Location	District	Gov
1	Maintenance of water station	Hazwan	Al bab	Aleppo
2	Maintenance of water station	Almohamadea	Afrin	Aleppo
3	Maintenance of water station	Alqarea	Maaret Tamsrin	Idleb
4	Maintenance of water station	Rajo	Afrin	Aleppo
5	Maintenance of water station	Azaz	Azaz	Aleppo
6	Maintenance of water station	Tel abyed	Tel abyed	Ar Raqqa
7	Implementation of a solid waste management campaign	Almohamadea	Afrin	Aleppo
8	Implementation of a solid waste management campaign	Dar Alaetam	Al Mara	Idleb
9	Implementation of solid waste management campaign	Alhejra camp	Harim	Idleb
10	Implementation of solid waste management campaign	Sakan Hosbital	Harim	Idleb
11	Implementation of solid waste management campaign	Kherbat Aljouz	Jeser Ashghour	Idleb
12	Implementation of solid waste management campaign	Tal Abyad	Tal Abyad	Ar Raqqa



Figure 130: Distribution drinking water in A'zaz schools



Figure 131: Water Trucking _A'zaz

3.4.7 Wastewater Treatment

In northern Syria, when a high number of WBDs is recorded, wastewater treatment is done as an initiative to improve public health procedures.

In 2020, two wastewater treatment plants were implemented in Ram Hamdan and Kafr Yahmoul in Idlib governorate, the treated wastewater was used in irrigation. In addition to, launching the wastewater quality assessment through setting up a laboratory for wastewater tests in Azaz, where most of the wastewater tests are being conducted.



Figure 132: Ram Hamdan wastewater treatment

Challenges

- Absence of the coordination among of NGOs inside Syria.
- Lack of governance for WASH sector.
- Immigration of most of Syrian WASH specialist.
- COVID-19 reflect on the training face to face, so Skype is used for training.

Future Plan

- Developing Syrian water resources platform to be as a coordination body for the stakeholders of water sector (Website: <http://www.wrp-sy.org/>).
- Enhancement water quality surveillance.

- Increasing communication with stakeholders in WASH sector.
- Increasing the number of the trainees in WASH sector.
- Using of modern electronic techniques and enhancing electronic surveillance, especially Tableau, QGIS and Power BI.

Section 4: Building Capacity and Advocacy

Training is an essential cornerstone in EWARN, with a vital objective in order to strengthen the surveillance and response system (EWARN) for communicable disease in Syria through capacity building of EWARN and NGO staff, and include raising awareness for both local communities and health workers about communicable disease prevention. The training coordinator keeps all the scientific materials updated and provides the trained staff with the power point presentations; the training materials and tools are reviewed to suit the targeted trainees.

During 2020, the total number of the trainees that were trained by EWARN was **5596**.

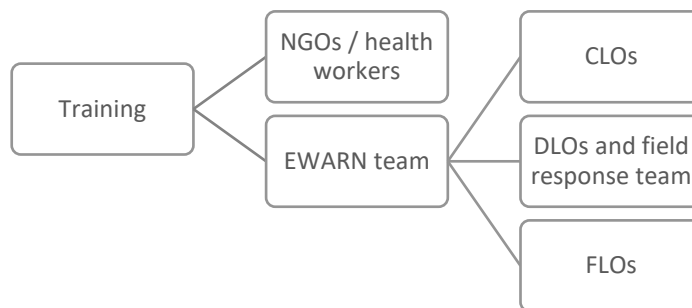


Figure 133: Training categories in EWARN

The donors for Training's Activities during 2020 are BMGF and WHO.

The training of Health workers with NGOs was planned and implemented according to both accessibility and control forces, thus, it was divided according to that into North West (NW) and North East (NE).

4.1 NGOs Health workers' training

4.1.1 North West NGOs / Health workers trainings

That's including: Idleb, and some districts of Aleppo governorate (Afrin, A'zaz, Al Bab, Jebel Saman, Jarablus).

A. Surveillance & Response to COVID-19:

2170 health workers (M 1286, F 884) were trained from different organizations through 123 sessions in between 28 March to 19 May 2020.

The topics were:

- The ABCs of Coronavirus and the Current Global COVID-19 Situation Update.
- COVID-19 surveillance.
- Sampling for laboratory tests For COVID 19 Patients.



Figure 134: NGOs Training _ Idleb

Table 36: Surveillance & Response to COVID-19 / Health workers in NW_2020						
Governorate	District	No. of Trainees	Doctor	Nurse	CHW	Others
Idleb	Harim	705	116	309	61	219
Idleb	Ariha	10	1	3	3	3
Idleb	Idleb	367	38	177	42	110
Idleb	Jisr-Ash- Shugur	133	27	45	21	40
Aleppo	Jarablus	38	7	17	0	14
Aleppo	Afrin	319	61	137	47	74
Aleppo	A'zaz	227	26	118	28	55
Aleppo	Al Bab	88	12	39	19	18
Aleppo	Jebel Saman	283	47	111	22	103
Total		2170	335	956	243	636

B. COVID-19 Surveillance:

2500 health workers (M 1491, F 1009) were trained from different organizations through 213 sessions in between 18 August to 8 October 2020.

Main topic was COVID-19 surveillance.

Table 37: COVID-19 Surveillance / Health workers in NW_2020						
Governorate	District	No. of Trainees	Doctor	Nurse	CHW	Others
Idleb	Harim	832	160	415	72	185
Idleb	Ariha	67	9	23	16	19
Idleb	Idleb	285	46	153	23	63
Idleb	Jisr-Ash- Shugur	159	22	85	28	24
Aleppo	Jarablus	65	18	33	5	9
Aleppo	Afrin	265	64	134	31	36
Aleppo	A'zaz	414	59	209	51	95
Aleppo	Al Bab	78	15	33	5	25
Aleppo	Jebel Saman	335	42	171	37	85
Total		2500	435	1256	268	541

4.1.2 North East NGOs / Health workers trainings

That's including Deir-ez- Zor, Ar-Raqqa, Al-Hasakeh and some districts of Aleppo governorate (Menbij, Ain Al Arab).

339 health workers (M 213, F 126) were trained from different organizations through 20 sessions.



Figure 135: NGOs Training _ Ar-Raqqa

#	Topics	Facilitators	No. of participants	No. of Sessions	Training Place	Date
1	Case definition COVID-19 Surveillance	DLOs	222	10	Syria	10 Mar to 22 Apr
2	COVID-19 Surveillance	DLOs	117	10	Syria	26 Aug to 20 Dec

4.2 EWARN team trainings

4.2.1 Central Level Team

#	Title	Topics	Facilitators	Training Place	No. of participants	Date
1	Laboratory diagnosis of COVID-19	- Practical training on Laboratory diagnosis of COVID-19	Dr. Gültekin Ünal	Reference Virus Laboratory in Ankara	2 CLOs & Idleb lab's physician	9 & 10 Mar
2	Strengthening Capacities of Rapid Response Teams for COVID-19 in EMR Member States	- Investigate and respond to COVID -19. - Contact tracing. - Sampling for laboratory tests For COVID 19 Patients. - Laboratory testing. - Active case finding - Data management. - Risk communication and community engagement. - COVID-19 surveillance.	WHO consultants	Via Microsoft team	16 CLOs 26 DLOs 2 Lab team 4 RRT	17 & 18 Jun
3	Refresh training on laboratory diagnosis of COVID-19	- Refresh training on laboratory diagnosis of COVID-19. - Practical training on Robotic Nucleic Acid Isolation.	Dr. Gültekin Ünal	Reference Virus Laboratory in Ankara	2 CLOs & Idleb lab's physician	27 & 28 Jul
4	Workshop on transitioning from EWARN systems in	- Early Warning and alert response network (EWARN) in complex emergency settings in	WHO Consultants	Via Microsoft team	10 CLOs	26 to 28 Oct

<p>emergencies to routine surveillance systems</p>	<p>the Eastern Mediterranean Region in context of COVID pandemic.</p> <ul style="list-style-type: none"> - Country experience. - Sustainable Early warning and alert response Network in Complex Emergency: Transition, Integration and Exit strategy). - Early Warning and Alert Response Transition Scenarios: Could one scenario fits all implemented EWARN systems in the region? - Early warning and alert response Transition: Identify challenges and opportunities - Regional plan for integrated disease surveillance and response (IDSR) - Overview on District Health Information Software 2 (DHIS2) - Transition plan: How to move smoothly from EWARN to routine / national surveillance 				
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Figure 136: Refresher’s training on laboratory diagnosis of COVID-19, Ankara

4.2.2 District Level Team

Four quarterly meetings were conducted for DLOs during 2020. All the details about topics, participants, and facilitators are in the table below:

Table 40: The details of District Level Team Trainings _2020					
#	Topics	Facilitators	Trainees No.	Place	Date

1	<ul style="list-style-type: none"> - The ABCs of Coronavirus and the Current Global COVID-19 Situation Update. - COVID-19 surveillance. - COVID-19 case management - IPC during health care for patient with COVID-19 - Sampling for laboratory tests For COVID 19 Patients. - Advice for health workers when investigating cases of COVID-19. 	CLOs	26 DLOs	Via Microsoft team	21 & 22 Mar
2	<ul style="list-style-type: none"> - Covid-19 surveillance. - Sampling for laboratory tests For COVID 19 Patients. - AFP surveillance review. - Alerts in Epidemiology. 	CLOs	28 DLOs 4 Lab team 4 RRT 1 WASH team	Via Microsoft team	28 to 30 Jun
3	<ul style="list-style-type: none"> - Up and running with Go.Data mobile application. - Practical session on using COVID-19 surveillance forms. 	CLOs	27 DLOs 3 Lab team 3 RRT 7 field data team	Via Microsoft team	17 Jul
4	<ul style="list-style-type: none"> - COVID-19 surveillance. - AFP surveillance review. 	CLOs	25 DLOs 5 RRT 4 lab team 3 field data team	Via Microsoft team	10 & 11 Nov

4.2.3 Field Level Team

All the details about topics, participants, and facilitators are in the table below:

Table 41: The details of Field Level Team Trainings _2020						
#	Topics	Facilitators	Trainees No.	Sessions No.	Place	Date
1	<ul style="list-style-type: none"> - The ABCs of Coronavirus and the Current Global COVID-19 Situation Update - COVID-19 surveillance - COVID-19 case management - IPC during health care for patient with COVID-19 - Sampling for laboratory tests For COVID 19 Patients - Advice for health workers when investigating cases of COVID-19. - Communication skills in COVID-19 epidemic 	DLOs	193	10	Aleppo & Idleb Deir-ez- Zor, Al-Hasakeh, Ar-Raqqa	23 to 28 Mar
2	<ul style="list-style-type: none"> - COVID-19 surveillance. - Sampling for laboratory tests For COVID 19 Patients. 	DLOs	190	27	Aleppo & Idleb Deir-ez- Zor, Al-Hasakeh, Ar-Raqqa	5 to 14 Jul



Figure 137: 1st FLOs Training _ Idleb



Figure 138: 2nd FLOs Training _ Aleppo

4.4 Advocacy

The good relationship with NGOs and local authorities is essential for the successful implementation of EWARN activities, and facilitate the teamwork, therefore, several advocacy meetings were conducted in Syria and Turkey to strengthen the relationship between EWARN and other organizations, aim to let them know what kind of support can be provided to them by EWAN field network and how they can be part of it.

Table 42: The details of Advocacy activities _2020						
#	Targeted NGO / Partner	Goal	Related activities	Participants No.	Place	Date
1	Health workers in HFs that are supported by Relief international Organization (SRD)	<ul style="list-style-type: none"> - Introduce EWARN, and case definition - Strengthening coordination level 	Introducing EWARN and case definition, AFP Surveillance	21	Afrin Harim Idleb	20 to 25 Feb
2	Health workers in private clinics			15	Idleb	4 Sep
3	Health workers in Ath-Thwarah district			52	Al- Thwarah	14 Feb



Figure 139: Advocacy meeting _ Ath-Thwarah

Challenges

- Borders' closure obstructs training sustainability
- Serious security situation impedes moving between covered areas.
- Depending on the virtual form of training for CLOs and DLOs training due to COVID-19 outbreak.

Future Plan

- CLOs training: very important and needed to improve the skills of central team.
- Continue capacity building for health workers with NGOs to increase the sensitivity of reporting, detection of AFP cases and other communicable diseases in sentinel sites.
- Quarterly meetings or DLOs training, FLOs training are planned to be conducted next year to improve the skills of EWARN team.
- Training for Health workers in private clinics and for Community based surveillance focal points: important to increase the sensitivity of reporting, detection of AFP cases and other communicable diseases.

Section 5: Data Management in EWARN

The data management team supports all programs of EWARN by providing efficient data collection tools and safe storage and sharing procedures. To get that achieved, the team works persistently to create information solutions, build databases, design forms, and generate reports.

They implement and manage all the processes related to data quality and management. They support both the central and the field staff, through supervision, training, and building capacity in different computer-related aspects.

The data team plays an essential role in strategic planning through supporting data-driven decision-making. In addition, they are involved in conducting research and assessments; and in determining the proper presentation and reuse of data.

5.1 Highlights

2018

- Epi Info was utilized in alert management and outbreak response.
- EWARS-in-a-box pilot was rolled out in Aleppo, Idleb, and Hama.
- A field visit to train the staff on EWARS-in-a-box was implemented.
- The data team received an advanced training on EWARS-in-a-box system conducted by its developer.
- Built the capacity of the team to deal with research methodologies and statistical analysis through training conducted by Gaziantep University and WHO.
- Focus more on developing products using Power BI and Tableau.
- Participated in workshops organized by WHO concerning DHIS2.

2019

- Recruited six field data officers to support and provide cascading training to non-data EWARN staff.
- Epi Info was utilized in alert management and outbreak response.
- EWARS-in-a-box pilot was rolled out in North Western and Eastern Syria.
- Conducted several field visits to conduct in-office training and build the field staff's capacity.
- The data team received an advanced training on EWARS-in-a-box system conducted by its developer.
- Built the capacity of the team to deal with research methodologies and statistical analysis through training conducted by Gaziantep University and WHO.
- Utilized Power BI and Tableau to analyse data and present information.
- Started to utilize DHIS2 to manage the routine immunization data.

2020

- Recruited an additional field-based data officer to support non-data staff in Northern Ar-raqqa and Northern Al-Hasakeh.
- Go.Data system was utilized to implement case and contact management of COVID-19 activities.
- A HQ-based data officer was recruited to manage the COVID-19 surveillance data-related activities.

5.2 Structure

Different functionalities and tools are developed by the data team to support the team works. The data team provides required support in all EWARN scopes. Each member of data team is designated to manage the data of one division:

1. AFP surveillance.
2. Nutrition surveillance
3. Alerts and WASH management.
4. Syndromic weekly reporting and active surveillance.
5. Vaccine-Preventable diseases.
6. Vaccine campaigns and routine immunization.
7. Labs and capacity building.
8. COVID-19 surveillance.

The field-based data officers are distributed as follows: Aleppo (2), Idleb (2), Ar-raqqa (2), Al-Hasakeh (1), and Deir-ez-Zor (1). This team is responsible for delivering computer-related training to non-data EWARN staff and providing technical support and generating field-level analyses.

EWARN has recruited the field-based team based on the distribution of the reporting sites as well as our medical staff. The central data team is used to meeting the field team on a semi-monthly basis aiming at building capacity, delegating tasks, and monitoring performance as well as mobilizing the field data team to provide technical assistance and guidance to the medical staff.

The field-based team is playing a vital role in providing technical support to activities implemented on the ground. In addition, they were tasked to deliver cascading training to the rest of the field network. In particular with regard to the COVID-19 pandemic, in that, they

were mainly responsible to manage the lab data and involved in supporting the central team with filling missing values and correcting outliers. They were also tasked to train the field medical staff on using a variety of tools such as mobile data collection app, web-based case management system, utilizing MS Excel, MS Word, meeting and communication apps, and email.

5.3 Implementation

5.3.1 Utilities and Software

Microsoft Office 365 package provides us with services to run data management processes. MS Excel, Epi Info, and ODK/ONA are used to design data collection tools such as surveys and data collection forms. Those tools enable us to apply data validation rules that ensure the quality of data collection.

Epi Info is used to provide us with statistics as studying health events and outbreaks studies, and to address aetiologies.

MS Power BI and Tableau are used to better visualize data and track surveillance and response indicators.

Other ad-hoc tools are used to implement certain purposes such as information for action (IFA), which is software developed by WHO EMRO and used to manage AFP surveillance data. The second application is emergency nutrition assessment (ENA) which is developed by CDC and used to implement SMART surveys and analyze Plausibility and other anthropometry results.

In terms of maps, ArcGIS, QGIS, Power BI, and Tableau are used to store, analyze, and visualize data.



Figure 140: The set of used tools

Acute Flaccid Paralysis Data Management System

On March 2015, WHO provided EWARN with a data management system called Information for Action for AFP surveillance.

This system is adopted in EMRO, WHO and built based on MS Excel, EpiData, and EpiData Analysis software.

The system provides two main forms, the first one is used to record investigation data related to AFP index cases, whilst the second one is used to record data related to contacts of AFP index cases.

This system displays AFP indicators and variables using MS Excel, with ability to create customized dashboards and summaries.

It also provides data sharing through files, which have *.rec extensions, include up-to-date data associated with AFP index cases and contacts. On a weekly basis, AFP data is shared with EMRO, WHO.

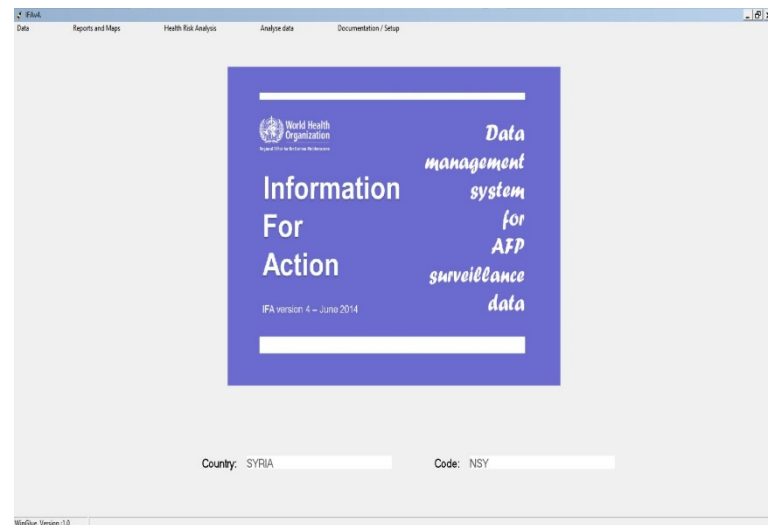


Figure 141: IFA's main window

Emergency Nutrition Assessment (ENA)

ENA, which is a tool developed by CDC, is utilized by EWARN to support nutrition surveillance as of 2017. ENA is a user-friendly system recommended by SMART. It has automated functions for sample size calculations, sample selection, quality checks, standardization for anthropometry measurements, and report generation with automatic analyses. ENA is highly favored by field practitioners; it facilitates survey planning, data collection, analysis, and reporting with the ability to generate automatic standard tables and graphs for anthropometric indices and plausibility check reports.

ENA and WHO Anthro Survey tools both have some limitation regarding data size and aggregation level, the nutrition surveillance data team designed a new tool to analyze the stunting and underweight and other nutrition main indicators with the relevant statistical measurements and confidence interval to be fully done by MS Power Bi without the need to external third-party applications. This has produced an interactive new level of micro and macro data insight that was not possible before.

5.3.2 Data Flow

A few means are used to transfer data and communicate at central and field levels, the essential mean of receiving reports is by email. WhatsApp, Skype, and phone calls are used to

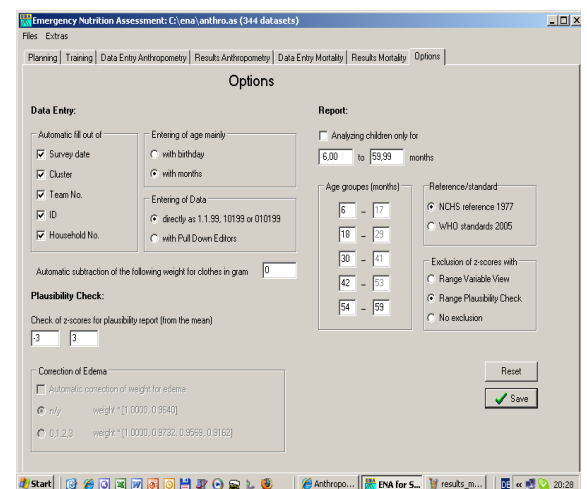


Figure 142: ENA's main window

communicate back and forth with the field staff, to guide staff, and discuss health events in detail.

There are three approaches to submitting data. First approach, reports are submitted by field level officers to district level officers who in turn submit reports to the central level of EWARN on an interval (weekly, semi-monthly, and monthly). The second approach, reports are submitted by DLOs right after occurred health events without the need to postpone reporting. The third approach, frontline users use ODK to submit reports to the ACU server, afterwards, the data team implements data processing at the central level.

The central team communicates with the field staff and share back feedback on a regular basis. Raw data are compiled and stored in databases which are used in further analyses and research and shared with partners.

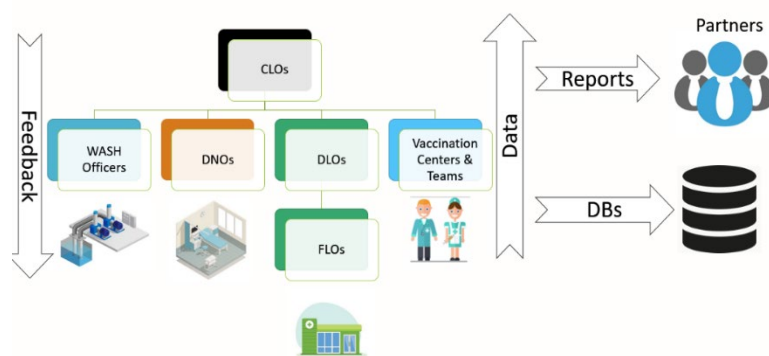


Figure 143: Data flow

5.3.3 Data Collection Methods

Many data collection line-lists and forms are created, by benefiting from WHO guidelines, to collect data from reporting sites and key informants. At the central level, plenty of tools are developed and used in data cleansing and analyzing. In terms of data presentation, summarization tools and dashboards are developed to inform decision-making.

Diverse regular and flash reports are developed and disseminated to the public and UN and non-UN organizations.

Case-based Surveillance

The case-based surveillance system is activated for AFP, and measles surveillance.

Forms in this system are often detailed and contain thematic information related to personal details, investigation places, dates concerned cases developments, clinical signs and symptoms, immunization, lab tests, cases outcomes, follow-ups and contacts tracing.

The collected data is reviewed and verified by the surveillance coordinator. Afterwards, the data is compiled, cleaned, analysed and converted into line-list form. The case-related files are organized and archived based on DLO and area names.

Active Surveillance

In active surveillance, DLOs regularly conduct field visits to AFP reporting sites to detect missed cases. Active surveillance is used to increase the surveillance sensitivity and to show the effectiveness of passive surveillance through revealing the probable, not reported cases.

The DLOs conduct visits to AFP reporting on different frequencies, weekly, bi-weekly, or monthly bases in accordance with the site type and the number of referrals accepted by those sites.

On a monthly basis, the active surveillance completeness is mapped out against the completeness of passive surveillance.

The active surveillance status is often analyzed at varied administrative levels to see the gaps in detailed view.

At the beginning of 2017, we piloted collecting the active surveillance data using electronic MS Excel forms. In fact, the results were under expectations mainly due to the lack of in-office training.

In 2018, we shifted to using ODK forms in data collection. ODK forms made the data collection more efficient and easier.

Insecurities inside Syria and continuous controlling forces' changes often make difficulties in reaching some areas. Consequently, drops in scheduled visits might take place.

Acute Flaccid Paralysis (AFP) Investigation Form
استمارة تقصي حالة شلل رئوي حاد مشتملة بشدة Hot case

1. Basic Information **معلومات أساسية**

1.1 Personal Information **معلومات شخصية**

EPID # الرقم الوبائي # Unique ID Lab # الرقم المخبري #
 Case name اسم الحالة Gender الجنس
 Father الأب Mother الأم
 DoB (d/m/y) تاريخ الولادة Age(m) العمر بالسنين
 Governorate المحافظة **Idlib** District المنطقة **Harim**
 Sub-district الناحية **Amanaz**
 Detailed address العنوان بالتفصيل
 Possible address after 60 days العنوان المحتمل بعد 60 يوم
 Identified by - please specify by date معرف من قبل - يرجى التحديد بدقة
 Phone No رقم الهاتف رقم الجوال Mobile No رقم الجوال رقم الجوال

1.2 Case Reporting Information **معلومات الإبلاغ عن الحالة**

Is the case nomad, IDP or host-community? هل الحالة بدو رحل، نازح أو محلي? **Host-community محلي**
 If nomad or IDP, for how long has the case stayed in this place? إن كانت الحالة من المورسل أو النازحين فمُنذ متى بنات إقامتهم في مكانهم الجديد
 First Reporter مصدر الإبلاغ **Doctor طبيب**
 If others, specify غير ذلك حدد من فضلك
 If the notification is done by doctor, specify the speciality إذا تم الإبلاغ من قبل طبيب يرجى تحديد اختصاصي الطبيب **طبيب أطفال**
 Notifying person اسم المبلغ
 Detection Date تاريخ الإكتشاف **15-Feb-17** Notification Date تاريخ الإبلاغ **15-Feb-17**
 Paralysis Onset Date تاريخ بدء الشلل **12-Feb-17** Investigation Date تاريخ التقيمي **16-Feb-17**
 Place of Investigation مكان إجراء الاستقصاء **Home منزل**
 Health Facility/Nearest HF اسم المرفق الصحي أو أقرب مرفق صحي للحالة **Home منزل**
 Delay/ Inadequacy Cause سبب التأخر / عدم كفاية الحالة
 تأخر الإبلاغ / عدم كفاية الحالة

Figure 144: AFP investigation form

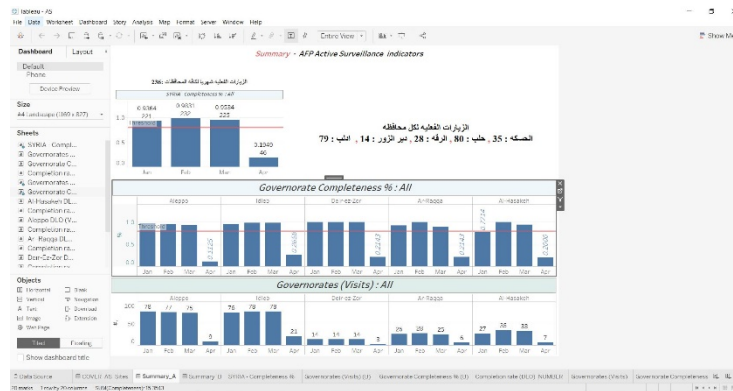


Figure 145: Active surveillance at national and subnational level

Regular Reporting

EWARN reporting sites submit reports to the central level at agreed intervals, weekly, semi-monthly, or monthly, according to the nature of collected data. In this kind of report, reporting sites are requested to submit their reports persistently, and when they have no cases or changes to be reported, they assign zeros to unchanged variables within reports and submit reports.

The essential zero report forms are as follows:

- The weekly syndromic zero report.
- The semi-monthly report of the water stations.
- The monthly report of nutrition surveillance.
- The daily routine reports of vaccination centres.

In zero reporting, two performance indicators generally are monitored. 1) Timeliness which indicates that reports are received before a specified deadline on a given interval. 2) Completeness which means reports are received beyond that deadline.

Constantly, the data team compiles and consolidates these datasets after back-and-forth communications with the field staff to fill missing values, address gaps, and acquire markable observations. Through the databases, we usually assign unique identification codes to the reporting sites to enable us implementing better analyses, visualization, and track changes.

Zero reporting is an essential source of information that gives a preliminary understanding of the health situation on a regular basis.

Weekly Zero Report Form استمارة التقرير الأسبوعي الصفري									
Basic Information معلومات أساسية									
Epi Week الأسبوع الوبائي	Month الشهر								
Health Center Name اسم المركز الصحي	من قسماة ذكر أسماء المراكز المستقبلة من المركز		هل المركز يخدم من حالات شلل الرعاش (AFP reporting center)?						
Does the health facility serve a	Please write down the camps served by the health facility.								
Governorate المحافظة	District المنطقة		Subdistrict الناحية						
Catchment Population عدد السكان المستقبين	Community قرية / بلدة / حي		Write village/ham/neighborhood if it were located in the village/ham.						
Report Period الفترة الإبلاخ/From من	Report Period الفترة الإبلاخ/To إلى								
Name of reporter اسم المبلغ	Job title الوظيفي								
Date received by DLO* تاريخ التسليم إلى منسق المنطقة	Entered to system by DLO on تاريخ إدخال المعلومات من قبل منسق المنطقة								
Reporting of cases الحالات المبلغة									
DISEASE المرض	Code رمز	Type النمط	Alert threshold عتبة الإنذار	0-4 years		≥ 5 years		Alerts الإنذارات	TOTAL المجموع
				Male ذكر	Female أنثى	Male ذكر	Female أنثى		
Acute bloody diarrhea (suspected shigellosis) الإسهال الدموي الحاد (الاشتباه بداء الشيغيلات)	ABD	B	5					0	0
Acute watery diarrhea (suspected cholera) الإسهال الحاد المائي (الاشتباه بالحمى التيفية)	AWD	A	1					0	0
Acute jaundice syndrome متلازمة الصفراء الحاد	AJS	B	5					0	0
Severe Acute Respiratory illness المرض التنفسي الحاد الوخيم	SARI	B	5					0	0
Acute flaccid paralysis شلل الرعاش الحاد	AFP	A	1					0	0
Suspected Measles الاشتباه بمرض الحصبة	Mea	A	1					0	0
Suspected Meningitis الاشتباه بمرض التهاب السحايا	Men	B	5					0	0
Unusual cluster of health events مجموعة عتقودية من الأحداث الصحية غير المعتادة	UCE	A	3					0	0
Unusual cluster of death مجموعة عتقودية من الوفيات غير المعتادة	UCD	A	3					0	0
Suspected Typhoid Fever اشتباه الحمى التيفية	STF	B	5					0	0

Figure 146: Syndromic Zero report form

Immediate Reporting

Alerts are often monitored at the sub-district, the community, and reporting site levels . This approach provides a better way of detecting alerts; however, it sometimes raises false alerts. Thus, an enhanced approach has been built to raise alerts.

In 2019, the standard deviation was involved in driving alerts raising. When reported cases of in a given week range between the Mean \pm STD, it means no alert to be raised, however, if cases are not in the norm, higher or lower, the rapid response team conduct variant measure to assess situation and focus on probable changes.

During 2020, the data team supported the RRT as verifying and investigating 96 alerts, 10 out of which were announced as outbreaks. The team took part in analyzing and generating outbreak reports.

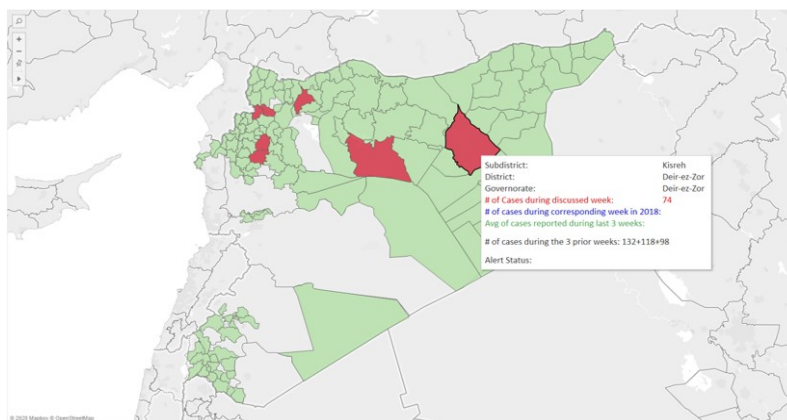


Figure 147: Alert at sub-district level

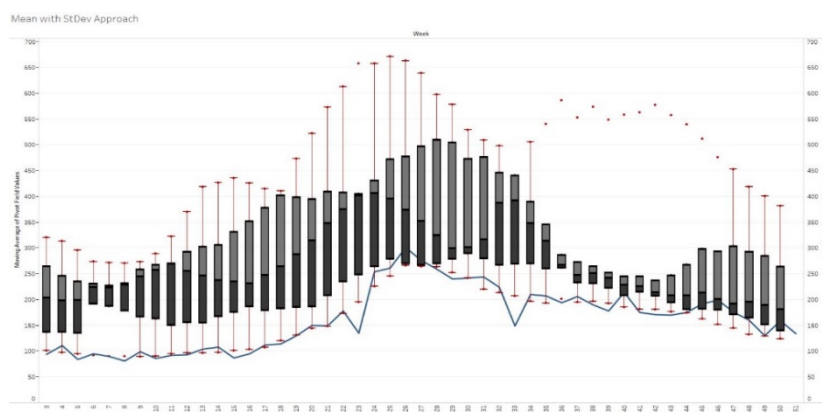


Figure 148: Alert tracking using moving average

Line Listing

Post to alert confirmation, the newly reported cases are collected and compiled in a line list format. Line lists usually contain information about three major themes, person, time, and place in order to follow up and monitor ups and downs during outbreaks.

Line-lists are live documents updated during outbreak timespan and play an essential role in addressing etiologies.

No	Address	Patient	Age	Sex	Private Wells	Bottle	Sosyan Wells	Primary Water Source
1	Al Bab - Zamzam	Yes	15	Female	No	No	Yes	Sosyan Wells
2	Al Bab - Zamzam	No	20	Male	No	Yes	No	Bottle
3	Al Bab - Zamzam	No	45	Female	No	No	Yes	Sosyan Wells
4	Al Bab - Zamzam	No	19	Male	No	Yes	No	Bottle
5	Al Bab - Zamzam	No	20	Female	No	Yes	No	Bottle
6	Al Bab - Zamzam	No	27	Female	No	Yes	No	Bottle
7	Al Bab - Zamzam	No	33	Male	No	No	Yes	Sosyan Wells
8	Al Bab - Zamzam	No	40	Female	No	Yes	No	Bottle
9	Al Bab - Zamzam	Yes	37	Male	No	No	Yes	Sosyan Wells
10	Al Bab - Zamzam	Yes	16	Male	No	Yes	No	Bottle
11	Al Bab - Zamzam	No	21	Male	No	Yes	No	Bottle
12	Al Bab - Zamzam	Yes	9	Male	No	No	Yes	Sosyan Wells
13	Al Bab - Zamzam	No	22	Male	No	No	Yes	Sosyan Wells
14	Al Bab - Zamzam	No	40	Male	No	Yes	No	Bottle
15	Al Bab - Zamzam	No	31	Male	No	Yes	No	Bottle

Figure 149: Line list of STF case control study_2020

Survey

The data team is requested to provide technical support as implementing surveys and research.

In 2019, EWARN conducted survey concerning dialysis patients and workers in dialysis centres.

In 2020 with relation to COVID-19, a survey was developed to screen the number of medical and community health workers inside NS. Another survey was dedicated to tracking the behavior of the immunization field team, in that, it shows venue status, adherence to social distancing, following protective measures, wearing face-coverings, and implementing social awareness. A survey aiming at screening the health profile of the vaccine teams as well as managing the chronic diseases as getting infected with COVID-19.

5.3.4 Electronic Surveillance

EWARN is tasked to surveys health events, conducts analyses, disseminates findings in a timely manner, to follow up and inform response efficiently.

EWARN utilizes MS Excel to collect data in different divisions of EWARN. In terms of statistics, Epi Info is used to calculate stats on outbreaks. As of 2019, EWARS-in-a-box has been utilized as a system to manage weekly zero reports and event-based reports.

Mobile Data collection

ODK collection tool has been utilized to develop forms to collect data of the active surveillance and nutritional surveillance.

The field staff has received smartphones to submit reports using ODK.

As ODK provides data validation rules to control data entry, it makes data collection easier and accurate. The collected data is stored on the ACU's server.

Epi Info

It is a tool developed by the CDC to enable epidemiologists to implement statistical tests to address outbreaks reasons and identify etiologies. This tool has been used to analyze alerts by providing statistical analyses and required maps.

In October 2017, we received training from CDC on how to employ Epi Info for data collection, analysis, and presentation.

Epi Info provides quick stats like p-value, risk ratio, odds ratio, sensitivity, and specificity aiming at finding the correlation between exposure and outcome and determining etiologies.

Figure 150: Active Surveillance ODK

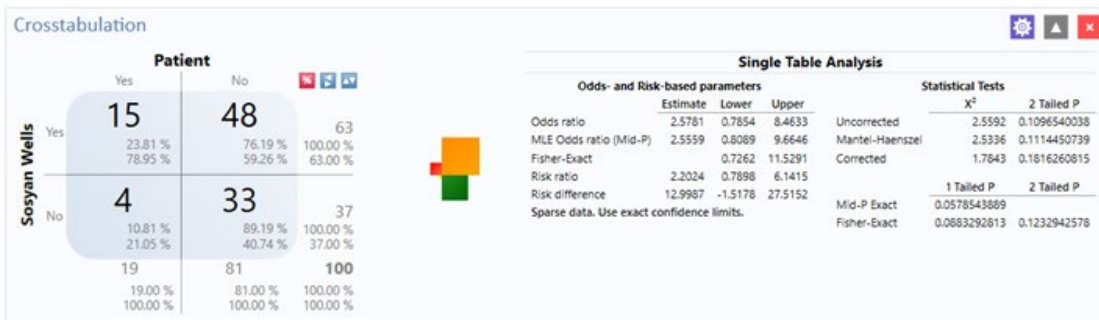


Figure 151: Statistical analysis of STF outbreak

EWARS-in-a-box

This system is being developed by WHO to help ease data collection and manage alerts and outbreaks.

The system provides a variety of functionalities as follows:

- Design forms to collect data, control how frequently the forms should be submitted and from which locations, and track completeness and timeliness across locations and users
- Create reporting sites at health facility or community-level as per needs, and easily update and edit map boundaries to map our data as soon as it is collected.
- Assign users with accounts that match their profile. For example, as a frontline health worker, laboratory technician, or rapid response member.

- Set up dashboards to graph or map data in real-time as it is received, and design professional bulletins that can be automatically published and shared with a click of a button.
- Raise alerts to potential disease outbreaks in order to promote a rapid response, configure alerts to determine how and when they will be triggered, and configure alerts to determine how and when they will be triggered.
- In terms of mobile application, create reports and enter data immediately, save drafts offline to complete later, and sync any queued reports when a connection is ready.
- Add integrations to ensure all data collected is interoperable with other systems within a country or internationally.
- Control how external users' access data and approve external user access to specific indicators and timeframes.
- Remain part of the EWARS community by receiving updates when available.

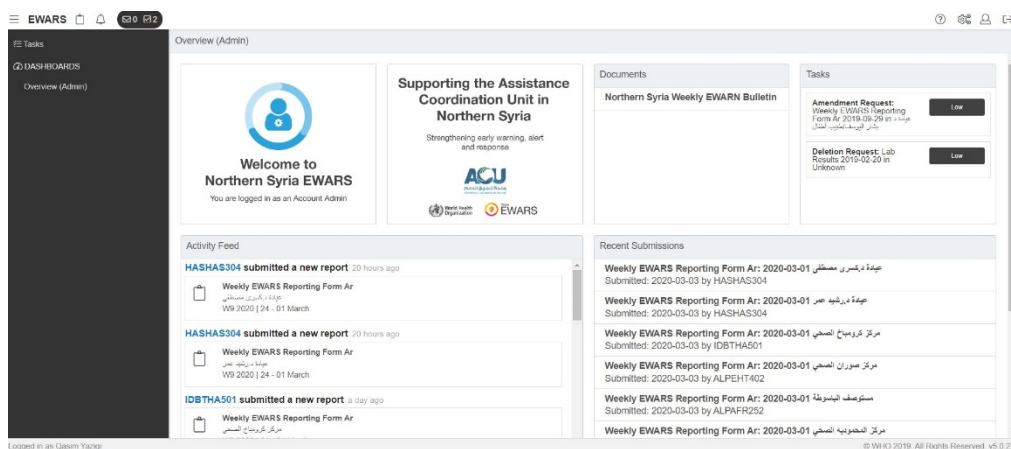


Figure 152: EWARS portal of Northern Syria

At the beginning of 2018, the WHO Geneva provided us with quick training on this system. By the end of 2018 and the beginning of 2019, we received two advanced training conducted by the core development team on how to create analyses and bulletins through the system, and how to roll out according to the settings within Syria.

It has been used to collect weekly zero reports of the 13 syndromes and event-based reports. Besides, it was planned to be utilized in EBS, but due to the stoppage of technical support, we were not able to implement EBS using it. The frontline users, who are working in health facilities or detecting alerts, submit reports to the central level; however, the district level staff are able to review and confirm those reports and to monitor the health situation in their respective areas through mid-level dashboards.

The frontline users who are working in health facilities or detecting alerts, submit reports to the central level; however, the district level staff can review and confirm those reports and to monitor the health situation in their respective areas through mid-level dashboards.



Figure 153: EWARS-in-a-box main window

In August 2018, the central data team conducted a field visit to train the field staff on how to use the smartphone version of the system. The training was provided to the staff of reporting health facilities and the EWARN field staff.

In mid-2019, EWARN started to roll out this system in Eastern Syria after a series of training conducted by the field data team.

During 2020, the usage of this system within EWARN has increasingly dropped due to the stoppage of technical support for nearly 18 months. By end of the 2020, 25% of our HFs were only using the system. The technical support was cut as WHO-HQ was seeking a tech company to further the development and enhancement of the system. Nov 2020, a new release of the system was launched and rolled out in some countries but not in North Syria yet.

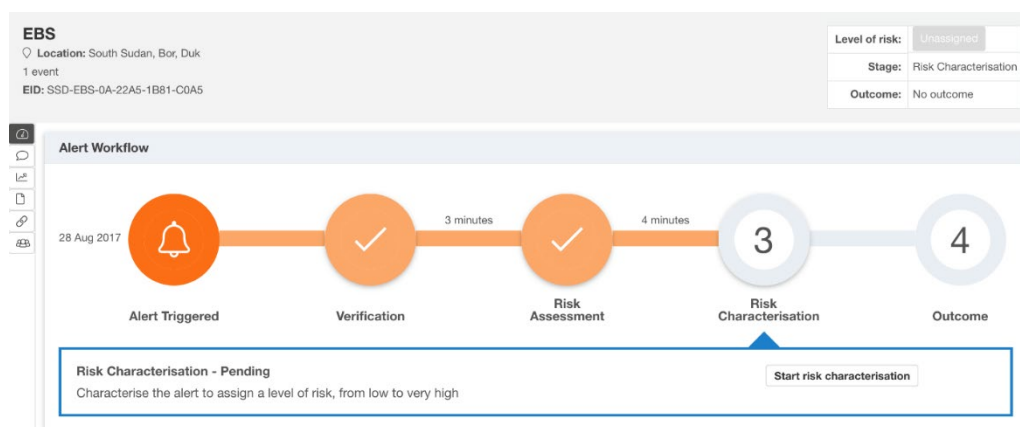


Figure 154: Alert management workflow

Covid-19

Prior to the confirmation of COVID-19 in NWS on July 9th, 2020, the EWARN team was developing the forms of case investigation, contact, and lab forms to be in place as announcing the outbreak. The development of these forms has done through cooperation with the WHO team. Building the COVID-19 forms is also done by benefiting from our experience as surveying SARI and ILI.

There were big concerns regarding case management and the burden placed on our team. Prior to announcing the first case, there was consistent communication with WHO-GZT to seek support and guidance. Luckily, they suggested using a tool developed by EMRO, namely Go.Data, to manage the COVID-19 data. We had taken part in the Go.Data training conducted by WHO.

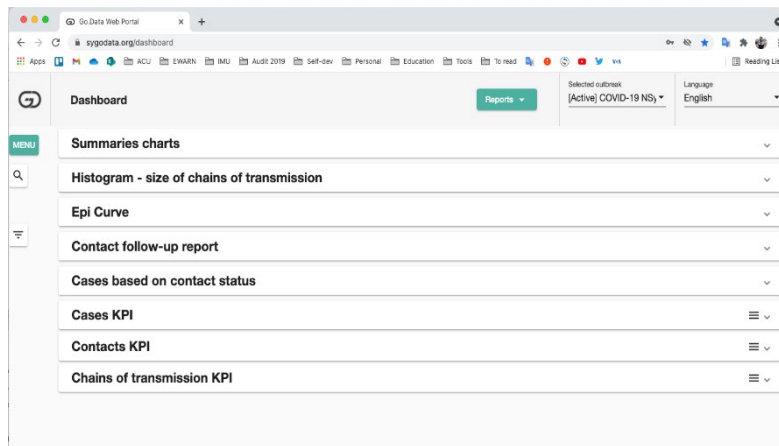


Figure 155: Go.Data web-based UI

During the first week of July 2020, we installed the system on the ACU's server with support from WHO EMRO and HQ colleagues. We started building the main building blocks of the system to fit with Syria's settings. We created all the accounts for the surveillance, lab, and data teams. We injected the Syria gazetteer (the common operational databases) into the system. Afterward, we mapped the field staff with their respective areas to organize the reporting mechanism.

Mid-July 2017, we provided hands-on remote training on Go.Data mobile-based and web-based versions to the field network consisted of the DLOs, lab technicians, and field-based data team.

The central data team is responsible for 1) troubleshooting Go.Data and communicating bugs and glitches to Go.Data project team. 2) training and supporting the whole team on using Go.Data as well as ensuring the quality of the case and contact data. 3) creating infographics, daily sitreps, and weekly bulletins 4) Accomplishing data consolidation and manipulation 5) building interactive dashboards to inform surveillance and response missions 5) Generating lab result reports.

The field data officers were tasked to intensively support lab workloads and train the medical and data entry personnel on using the mobile and web-based versions of the system. In addition, they were taking part in supporting the central data team by entering and verifying data, matching lists, filling gaps, removing duplicates, and troubleshooting the system.



Figure 156: Go.Data mobile

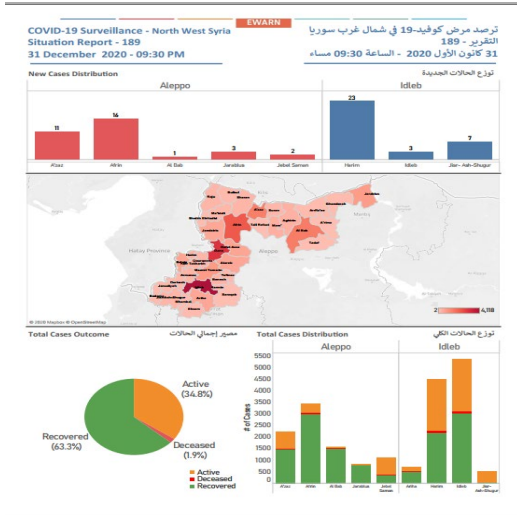


Figure 157: COVID-19 sitrep

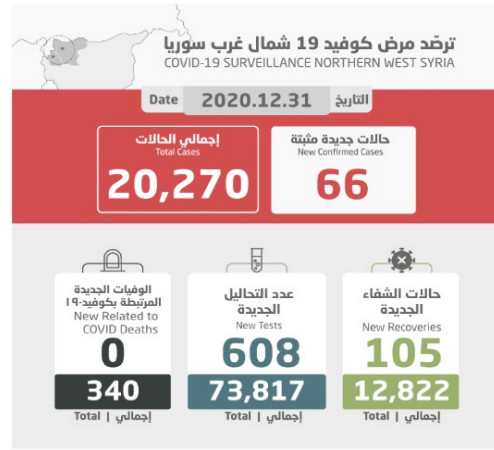


Figure 158: COVID-19 infographic daily update

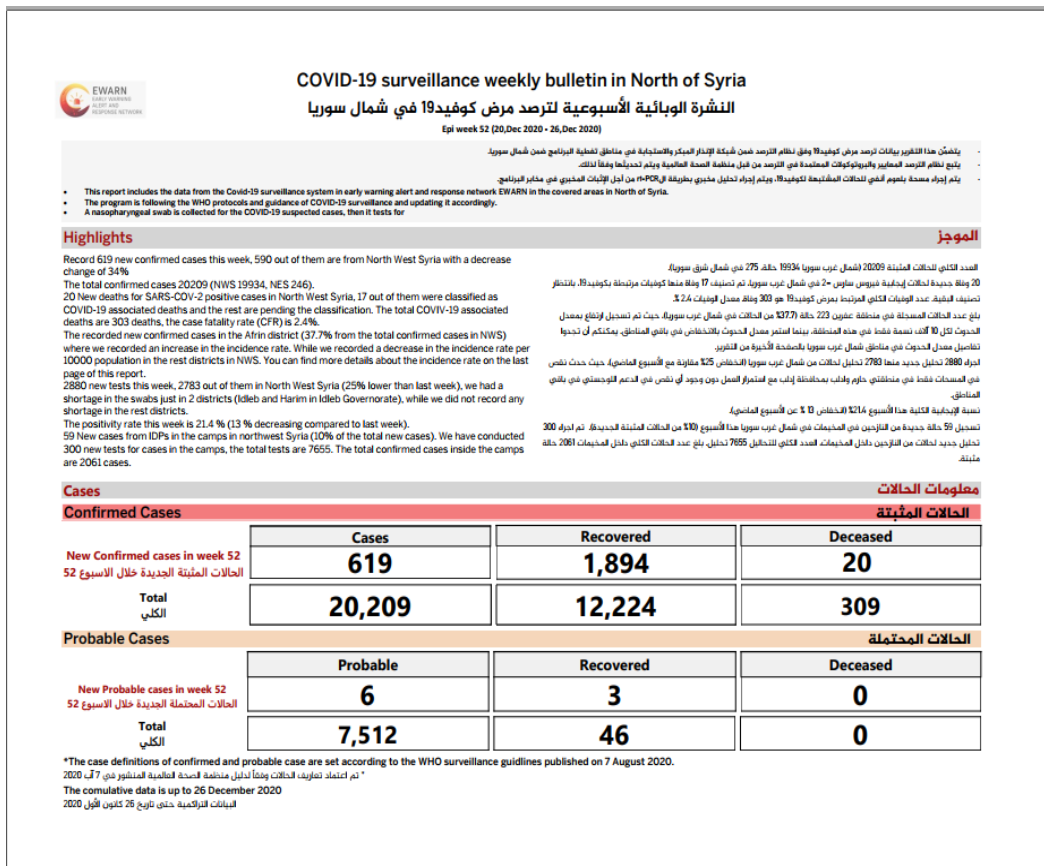


Figure 159: COVID-19 weekly bulletin, end of Dec 2020

We share regular data with WHO-GZT in a line-list form such as the case and the lab update line-lists on a semi-daily basis.

Lab COVID-19 dashboard was developed to show the lab testing results as well as lab performance indicators that inform the logistic and lab work planning.

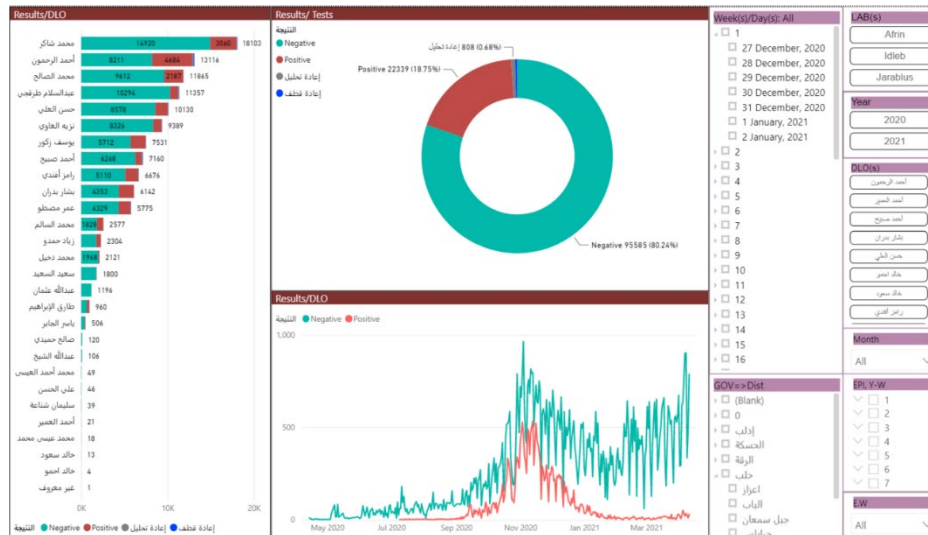


Figure 160: COVID-19 Lab Results

Aggregated cases of COVID-19 are semi-daily submitted to a region-wide platform, namely ActivityInfo, developed by EMRO. This platform aims to show the big picture of COVID-19 status across the region.

In December 2020, the data team developed a mechanism to inform patients about their testing results. The algorithm used is developed using Python, and it fetches and sends lab results through a specified EWARN’s contact number to patients using WhatsApp.

5.3.5 Products

Reports

The EWARN produces a bunch of frequent bulletins as well as ad-hoc reports that show updates on both the health and WASH situation in NS. The products are developed in dual languages, Arabic and English. In 2018, we started producing them in the Turkish language too. These bulletins highlight events through narrative information and storytelling visuals such as graphs, maps, tables, and images. MS Power BI or Tableau has been used to generate interactive and printable versions of those bulletins. The bulletins are uploaded on the ACUs’ website and published using MailChimp to a diverse audience.

1. The [weekly epi bulletin](#) that shows updates on 13 syndromes.
2. The [monthly nutrition surveillance bulletin](#) that exhibits the nutritional situation in northwest Syria. The nutrition data is collected from nearly 110 HFs.

3. The [weekly surveillance bulletin of acute AFP](#) that shows cases distribution, the performance indicators of AFP surveillance, and the immunity status of investigated AFP cases.
4. The semi-monthly WASH bulletin that shows updates on more than 1,100 water stations covering their functionality and chlorination.
5. The monthly routine immunization bulletin generated using DHIS2 and shows the activities done by the EPI post centers.

Ad-hoc reports of vaccination campaigns are produced upon completion. Those reports show stats regarding vaccinated children, consumed vaccines, and challenges and learned lessons during campaigns. Data of previous implemented campaigns is often referred to as planning further campaigns.

The EWARN vaccination team which is a part of the SIG utilizes DHIS2 under the supervision of WHO-GZT, to manage the EPI data collected from 99 routine immunization centers since mid-2019. Those bulletins are uploaded on the ACU website and disseminated via email to stakeholders.

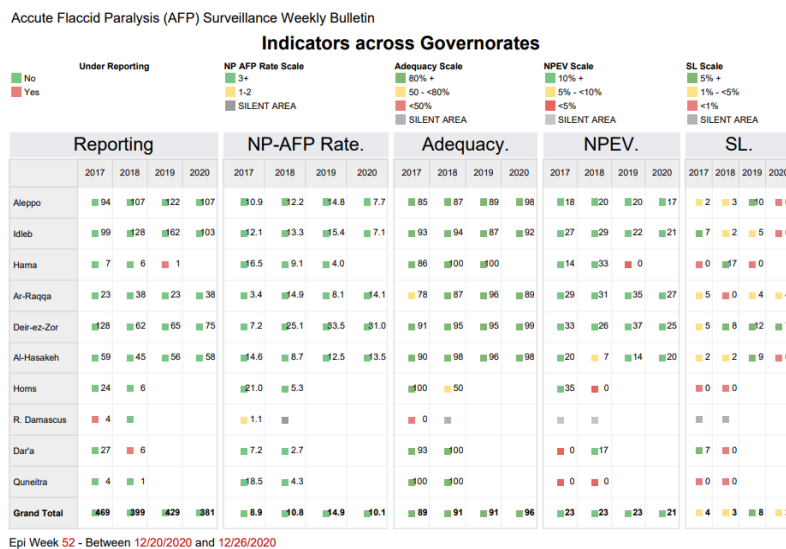


Figure 161: AFP indicators - bulletin w52, 2020

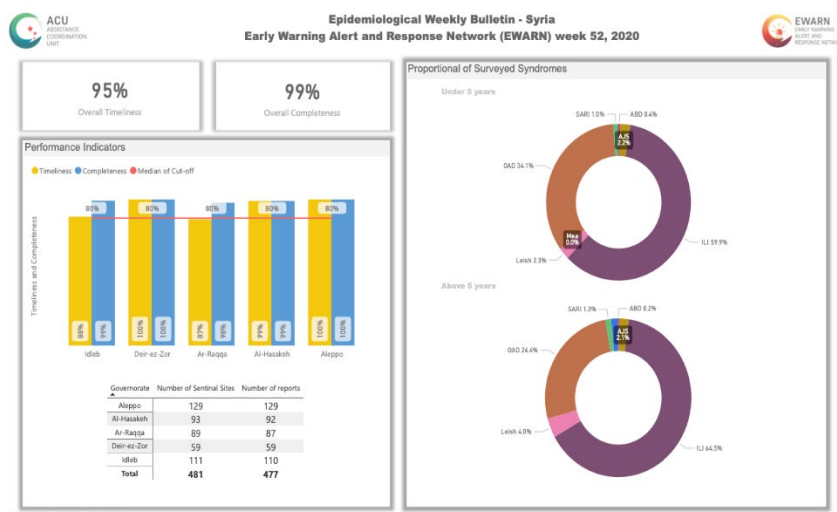


Figure 162: The Epi weekly bulletin

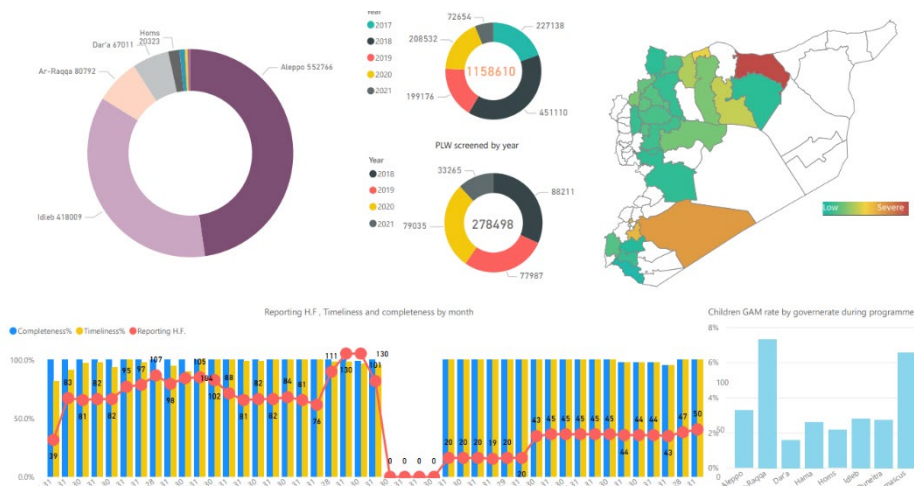


Figure 163: The nutrition surveillance bulletin

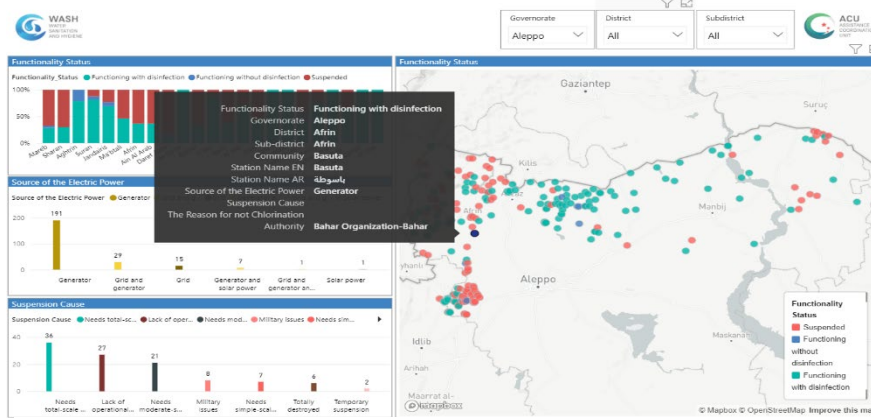


Figure 164: The WASH bulletin

Interactive Dashboards

The data team aims to learn and utilize cutting-edge data visualization and analytics tools, to convey information in an attractive compelling way. Our information is visualized through a variety of visuals such as graphs, maps, tables, and dynamic narrative texts. These visuals are arranged in a specified layout to create bulletins, dashboards, summaries, or ad-hoc reports.

Prior to 2018, MS Excel was ordinarily used to create visualizations, whilst ArcGIS or QGIS are used to present data as maps.

In 2018, we started using Business Intelligence (BI) tools such as Power BI and Tableau to generate interactive visualization. Those tools provide better understanding of data and conducting rapid analyses at different granularities leading to monitor health events accurately and timely.

Some examples of dashboards generated using BI tools are as follows:

- The weekly AFP surveillance updates dashboard which is used to inform the AFP surveillance on both national and subnational levels.
- The monthly WBD surveillance dashboard which is used to show hotspot areas that need response.

Our technical officers are used to sharing updates through PPT presentations. These PPTs are composed by picking indicators of interest broken down using interactive comprehensive dashboards.

The top frequent presentations held on a regular basis are as follows:

- Biweekly Epi update presentation shared with the UN Health cluster
- Monthly WASH update presentation shared with the UN WASH cluster
- Weekly AFP update presentation shared with the UN WHO
- Weekly measles update presentation shared with the UN WHO
- Regular presentations showing the performance of EPI immunization. Whilst daily presentation may occur during campaigns.

GIS Mapping

Maps can provide informative visualizations through linking multi-piece of information within one map. Also, having variables presented on maps maximizes understanding of the contextual information on the health situation using geolocation data.

During 2020, big advancements were achieved in data visualization using maps. Plenty of maps was generated to inform AFP surveillance on regular basis such as AFP case distribution linked controlling forces, land cover, population density, accessible areas. Creating multi-thematic maps can underpin the correlation between a given indicator and other factors.

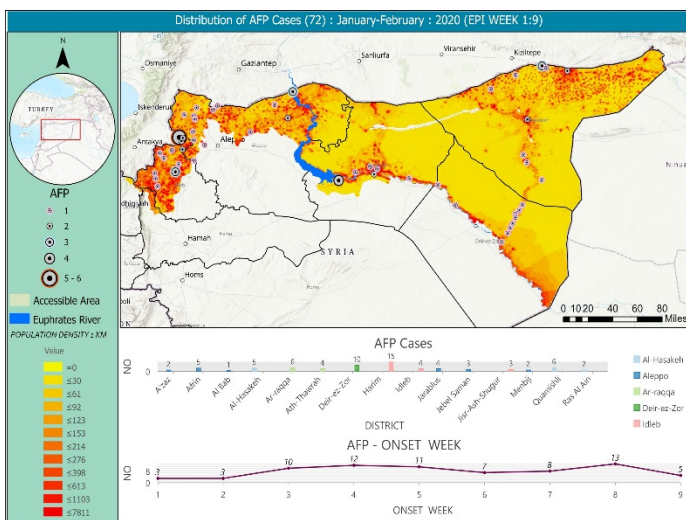


Figure 168: AFP case distribution mapped against pop density

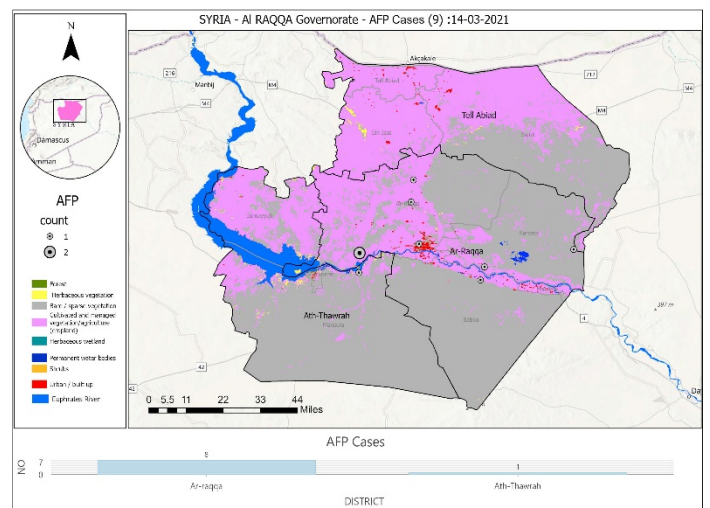


Figure 1693: AFP case distribution mapped against land cover

5.4 Data Storage

Data backup and data archiving are business processes designed to protect corporate digital assets.

Data backup focuses on preserving multiple copies of data, so it can be recovered promptly in the event of loss due to disaster, outage, system corruption, human error, or other unforeseen interruption.

Data archiving focuses on retaining a single provably correct copy of non-changing data that may be required for historical, legal, or external compliance reasons.

Bill and Melinda Gates Foundation has donated us accounts of Office 365. Therefore, OneDrive for Business is used to store files from local computers into the cloud, and access them from any device anywhere, or share them with others. In addition, SharePoint is used, so we can collaborate on files, documents, and ideas. It is set up to facilitate communication between team members.

Copies of archives and backups are often kept on the server of ACU. There are also multiple shared drives designated for different departments, to enable them to store and share big volume files internally.

Naming conventions of files and folders are set to enable users to access files fast and efficiently, and the data team ensures that the naming convention is maintained by the central and field-based employees.

5.5 Partnership

Meetings are regularly conducted with the UN clusters in order to share information regarding the epidemiological situation, WASH updates, immunization activities, and malnutrition surveillance.

Review sessions are regularly conducted with the UN WHO and UN UNICEF offices in Gaziantep, to share findings and receive technical support. Also, we have communication with WHO-EMRO and WHO-HQ through WHO-GZT to seek support and exchange experience.

Coordination with the Ministry of Health of Turkey, partner organizations, and researchers have been carried out to promote the health of the Syrian people and implement efficient response.

EWARN shares data and information with stakeholders in different products such as dynamic reports, summarizations, maps, data sets, and so on.

5.6 Sharing Policy

Data sharing is essential for maximizing the benefits that can be obtained from institutional and research datasets.

Since EWARN is considered a part of the health department of ACU, it follows ACU's data sharing policy. It commits to share and disseminate health data from its programs and studies in an open, timely, and transparent manner in order to promote health benefits for populations while respecting ethical and legal obligations towards patients, participants, and their communities.

Principles Underlying Data Sharing in EWARN

- **Ethics:** EWARN data sharing will abide by the following ethical principles:
 - o Medical confidentiality is fully respected.
 - o The privacy and dignity of individuals and communities are not jeopardized.

- Collaborative partnerships are undertaken in line with EWARN's Ethical Framework for Medical Research and emergencies response; recipients of EWARN datasets will engage, wherever possible, with the local community where the EWARN dataset originates.
- **Equity:** EWARN data sharing will recognize and balance the needs of researchers who use health data, other organizations which may want to reuse such data, and communities and funders who expect health benefits to arise from surveillance and response.
- **Efficiency:** EWARN data sharing will improve the quality and value of the delivery of health care and increase its contribution to improving public health and hygiene promotion. Approaches should be proportionate and build on existing practice and reduce unnecessary duplication and competition.
- **Non-maleficence:** Data sharing shall not put at risk, or be used against, the interests of EWARN investigated cases, EWARN research participants, EWARN employees, or EWARN partners.
- **Social benefit:** To promote health benefits and rapid responses to the greater population, data sharing should bring health benefits to individuals and communities outside of those in which the data were collected.
- **Open access:** Recipients of EWARN datasets shall strive to avoid prohibitively costly approaches, restrictive intellectual property strategies, or other approaches that may inhibit or delay the use of the results of their research to the benefit of the Syrian society. Recipients shall not seek any intellectual property rights of any kind with respect to results generated by or arising out of the use of EWARN datasets without prior written consent.

Challenges

- The insecurity and diverse de-facto authorities inside Syria cause delays in reporting and acquiring clearances to collect data in some sites.
- The lack of in-person field training pushes us to use online training, they do not provide the same training quality though!
- Adding or removing sentinel sites from the health map can delay reporting in some areas.
- There is a need for all-in-one data management solution to manage workflow starting from data collection and analysis until information presentation and dissemination. This pushes us to use diverse tools to operate, however, it makes the work cumbersome.
- Raising alerts at the sentinel site level is challenging without using a system supporting EBS. Hindrances in archiving part of work documents may take place since some non-data colleagues are newbies to tools like Sharepoint or Onedrive.

Recommendation

- Seeking certified and accredited training and courses regarding data management.
- Strengthening the trust bounds with partners and working groups for the sake of knowledge exchange.
- Establishing networks with other management teams across local and international organizations to share experiences and to improve gained knowledge.

Future Plans

- Piloting the DHIS2 system to manage the zero reporting and EBS mainly.
- Rolling out Epidemic Intelligence from Open Sources or EIOS to complement EBS.
- Generating advanced interactive dashboards as per need.
- One data field officer to be recruited to support the medical staff in Menbij.

- Receiving data-related training to build the capacity of the data team at both the central and field levels.
- Utilizing data science advanced tools such as R script and Python in analysis and visualization.
- Building the capacity of the medical staff through continuing conduction of more computer-related training

Section 6: Coordination with WHO, Clusters & Other Partners

Regular meeting with the WHO, EOC and SIG team continued in 2020 to review the updates and develop strategic plans:

- The program maintained the regular communication channels with WHO. Weekly meeting to review the AFP surveillance indicators and discuss the needed actions related the vaccination status of AFP cases. The vaccination teams report all suspected AFP cases that they encounter during the SIAs to the surveillance team to commence the verification process. Regular visits to the polio laboratory in Ankara continued, to maintain the good relationship with the lab, update the lab management of the latest updates from the field.
- Visits from WHO EMRO to Gaziantep helped in maintaining the communication channels with the regional office.
- Weekly meetings to review VPDs surveillance indicators, a detailed discussion about the zero dose investigated cases, a presentation of measles death related and complications justifying the confirmed but vaccinated measles cases, updating the classification, recommendation for Epi centres coverage and the need for vaccination campaign, challenges and plans.
- Providing regular update to EOC on the field situation, and continuous analysis of the situation and feedback from the field staff to reflect the actual situation on the ground.
- Daily meetings with SIG, WHO and QRC to pre, during and post campaign, to present and discuss the planning, team technical performance and coverage results.
- Coordination with SIG during the vaccination activities to notify the suspected AFP cases.
- Regular reviews and sessions with WHO and UNICEF to share information with them and to receive the required technical support and guidance.
- Providing regular feedback to EMRO through sharing the IFA's rec file on weekly basis and the weekly AFP surveillance presentation.

Also, regular and occasional meetings are conducted with the health, WASH, and the nutrition clusters in order to review the communicable disease's situation updates in health cluster, water-borne diseases updates in WASH cluster, and malnutrition situation in nutrition cluster.

Sharing data is shared with clusters and other NGOs in different forms such as dynamic reports, summarizations, maps, and data sets.

A lot of coordination with the Ministry of Health of Turkey, few organizations, and researchers were carried out to promote health benefits and rapid responses.

Section 7: Media aspects in EWARN

Each year the media plan is being reviewed and revised, in order to access to the largest recipients, spread the benefits to the target group, create an active and attractive channel with stakeholders, partners, beneficiaries and public.

7.1 Website:

Working on improving the EWARN page on the ACU website is ongoing (<http://www.acu-sy.org/en/early-warning-alert-and-response-network/>) , all the related materials are available for downloading. All materials are generated and uploaded in both Arabic and English, in addition to Turkish for the frequent issued reports.

The search results for EWARN on Google search engine comes in the second position.

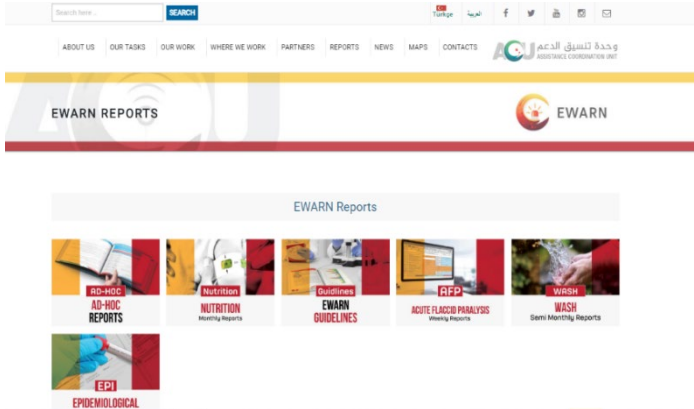


Figure 170: EWARN Page on ACU website

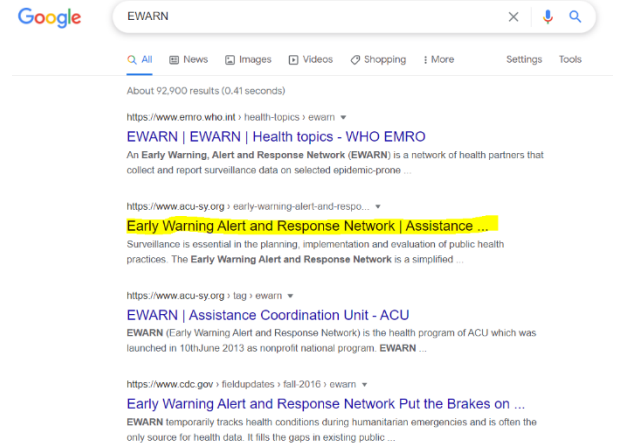


Figure 171: EWARN standing on Google

7.2 IECs Materials & awareness activities

Those materials are very important to increase the impact of the awareness campaigns, strengthening the knowledge about the communicable diseases, enhancing the reporting from the HFs, and facilitating the field teamwork.

Many awareness and education materials were designed or revised according to the feedback from the beneficiaries.



Figure 172: Samples of EWARN IEC materials

Many awareness and education materials were designed or revised according to the feedback from the beneficiaries.

Table 43: The main IEC material which have been designed and / or revised in 2020						
Brochures	EWARN definition	Measles awareness	Lice awareness	Typhoid fever awareness	Pertussis awareness	Rabies awareness
	Leishmaniasis awareness	Mumps' awareness	Meningitis awareness	Pertussis awareness		
Fliers	Cholera awareness	Water treatment at home and safe storage	Influenza awareness for public	Hand Hygiene	Covid-19 awareness for public	
Posters	Case definition	Influenza aware-ness for health workers	Rules of safe injection	AEFIs awareness	EPI awareness	Butterfly's Poster

	Tetanus Vaccine awareness	EPI Program awareness	Covid-19 awareness for Health workers			
Guidelines	AFP surveillance	Measles and Rubella surveillance	Laboratory Surveillance	AEFI Surveillance	EWARN guidelines – English version	EWARN guidelines – Arabic version
	Covid-19 awareness for public					
Others	2020 Calendar & notebook	Wall Clocks	Pens and bags	Mugs	Prescription for clinician	USB Memories
	Vests					

7.3 Videos (Producing, TV)

Supporting the producing of a health TV show on **Aleppo Today** channel, which is widely seen in northern Syria. This show was named (**Hayat Soheah**). 12 episodes were presented about the main syndromes monitored by EWARN.

COVID-19 Pandemic

In the context of the Covid-19 pandemic, some activities were canceled (the marathon for example) or modified to be more suitable and effective.

Modification of many IEC materials and scientific materials to comply with the recommendations of preventing infection with COVID-19.

Special awareness-raising videos were prepared by the field coordinators, containing all the instructions for preventing the disease.

Many interviews were conducted with radio and television stations, and many press articles were written for international and local media agencies.

An automated answering machine number was activated through WhatsApp (+905527555500), which answered the most common questions about the disease.

A Telegram channel has been opened to broadcast daily and weekly reports of the epidemic with the publication of awareness materials for disease prevention:

https://t.me/covid19_arabic

A direct link has been activated to access reports, videos and social channels on the ACU website: <https://www.acu-sy.org/covid19/>



Figure 173: COVID-19 Awareness Poster

Table 44: The main activities which have been covered in 2020	
<p>Hayat Soheah TV show / Aleppo Today TV Channel</p>	<p>https://halabtodaytv.net/archives/category/program/family/healthy-life-healthy-life-حياة-صحية</p> <p>https://www.youtube.com/playlist?list=PLY8ccXV4iN5QlxCx6Uxx-I_sumAhgsWMk</p>
<p>COVID-19 disease and vaccination: awareness and frequent Q & A</p>	<p>https://www.facebook.com/ACUSyria/videos/997357790672607/</p> <p>https://www.facebook.com/404021213010253/posts/3004127312999617/</p> <p>http://www.aparchive.com/metadata/MEEEX-Syria-Virus-ldlib/1ab567319bab49259dca8aa019e358ee?query=idlib+2020&current=11&orderBy=Relevance&hits=88&referrer=search&search=%2fsearch%2ffilter%3fquery%3didlib%25202020%26from%3d1%26orderBy%3dRelevance%26ptype%3dIncludedProducts%26_%3d1585428485221&allFilters=&productType=IncludedProducts&page=1&b=e358ee</p> <p>https://www.enabbaladi.net/archives/368457</p> <p>https://www.youtube.com/watch?v=ivRln8Gods4</p> <p>https://www.facebook.com/Rozana.fm/videos/140371420747383/UzpfSTE4MzAwNjEwODU3MDk1NToxMjQxNzQ1OTk5MzYzNjly/?eid=ARCDkljEDKnW5nxYFLnoayRpmYuZNx7zrd6_Q00zJFDcm85sZB22Z9sce5S3N8I7MTeGcj4vKwzd9Yg-</p> <p>https://www.youtube.com/watch?v=s0D7PLYNQpw</p>



وحدة تنسيق الدعم
ASSISTANCE COORDINATION UNIT



Incilipinar Mah.3 Nolu Cd.
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