The Carter Center

Explosive Weapons Use in Syria, Report 2

Damascus City and Rural Damascus Governorate

Syria Project, Conflict Mapping

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Executive Summary

This non-technical paper aims to analyze and visualize the Carter Center's Syria Project's conflict mapping historic data on explosive weapons use and contamination around Damascus city and Rural Damascus Governorate to highlight the scale of clearance needs ahead.

The Carter Center recorded at least 94,792 uses of explosive munitions based on 16,147 conflict events in Damascus city and Rural Damascus Governorate between July 2013 and May 2019.

Ground-launched explosive weapons comprised 61% of the total munitions used, while air-dropped explosive munitions made up 38%.

Explosive weapons impacted at least 273 communities[1] in the Rural Damascus Governorate. Nearly 70% of total explosive munitions use occurred in just 19 locations: Darayya, Harasta, Duma, Zabadani, Khan al Shih, Jobar, Arbin, Ain Terma, Marj Sultan, Misraba, Qaboun, Yarmouk Camp, Saqba, Deir Khabiyah, Dahiet al Assad, Zamalka, Hamouriya, Modira, and Moadamiyat al Sham. Darayya city alone saw 15% of total munitions use in the whole of Damascus city and Rural Damascus Governorate.

This report aims to support operational planners, raise awareness among key decision-makers, and highlight the need for an effective, long-term policy response.

[1] The term "communities" refer to a town, city, neighborhood, or point of interest with an associated latitude and longitude.

Introduction

Contamination from explosive remnants of war (ERW), unexploded ordnance (UXO), improvised explosive devices (IEDs), and landmines poses an enduring threat to a population long after violence has ended[2]. Remaining contamination from these explosive weapons can continue to kill and injure people for years to come and limit a community's development for generations.

While on-the-ground assessments, surveys, and clearance operations remain the most effective ways to mitigate the physical threat of explosive weapons contamination, these efforts can be challenging in the Syrian context because of access and security constraints.

Organizations have turned to desk-based studies to plan future operations that can be carried out when conditions improve, as well as to help prioritize risk-education programs.

The Carter Center aims to contribute to these efforts by analyzing and visualizing its own data on explosive weapons use in Syria between 2013 and 2019. This will provide a minimum representation of the number, type, and distribution of explosive munitions uses in Syria, recorded to the neighborhood level for the whole of Syria using U.N. Office for the Coordination of Humanitarian Affairs (UNOCHA) administrative boundary standards.

This project provides a detailed view of the minimum scale and complexity of explosive weapons use in Syria. This, in turn, can help with identifying and prioritizing areas that are potentially at risk from explosive weapons contamination and require on-the-ground assessments. However, one must keep in mind that a variety of factors contribute to the risk of explosive weapons contamination, including ground type, firing conditions, and munitions used.

Methodology

As the second report in a series exploring explosive weapons use in Syria between July 2013 and May 2019, this focuses specifically on Damascus city and the surrounding Rural Damascus Governorate.

The Center examined 16,147 conflict events in these areas, collected primarily through open-source investigation by the Carter Center's Syria Project and the publicly available Armed Conflict Location & Event Data Project (ACLED). Below is an example of the method used to estimate number of explosive weapons per conflict event:

> One conflict event from the Syrian Observatory for Human Rights that states, "Government Forces shelled Duma City on 3 February 2016 using 30 artillery shells, 20 mortars and 5 rockets while warplanes carried out at least 10 airstrikes" was recorded as 65 individual uses of explosive munitions (30 artillery shells, 20 mortars, 5 rockets, 10 airstrikes).

While much of the data contains specific numbers of munitions used in an event, some does not. In those cases, the number of explosive munitions was estimated by assigning a maximum count of 3 to any mention of plural munitions use. For example:

[2] For definition of frequently used terms in these reports, please see Appendix 1 in our first report, "Explosive Munitions in Syria – Daraa, Quneitra, and As Sweida Governorates."

> One conflict event that states, “A warplane conducted airstrikes onto Sheikh Miskine in conjunction with heavy shelling onto the town” will be recorded as 6 uses of explosive munitions (3 airstrikes and 3 shelling).

While the count is likely higher, especially if the report includes adjectives such as “heavy” or “intense,” there was no way to accurately estimate munitions use. Conflict events that did not mention explosive munitions were not included in the study. These included small-arms fire (SAF) and heavy machine guns (HMG); abductions, kidnappings, detentions, and arrests; (armed) clashes; riots, protests, and demonstrations; stabbings; executions; murder; torture; assault; and curfews and arrest operations.

Previous studies on explosive weapons use in Syria typically focused on the number of conflict events to determine potential explosive munitions contamination rather than individual uses of explosive munitions. This method has often led to the under-representation of the scale and complexity of contamination, a gap this study aims to fill.

After extrapolating individual explosive munitions use from the conflict events, the data was divided into four broad categories: 1) air-launched explosive weapons, 2) ground-launched explosive weapons, 3) cluster munitions, and 4) landmines, improvised explosive devices (IEDs), or unexploded ordnance (UXO). The data was then analyzed and visualized based on administrative delineations provided by UNOCHA, which details locations to the neighborhood level.

While a variety of factors contribute to the presence of explosive weapons remnants in an area — including firing conditions, operator error, munitions age, and weather and terrain types — this method of providing a baseline use of explosive weapons could help prioritize communities in need of on-the-ground assessments. Clearly, there is a potentially higher risk of explosive weapons contamination in areas that have seen higher level of bombardments, as all munitions, regardless of manufacturer, have a failure rate.

Continued studies and additional data, especially related to explosive ordnance disposal and clearance, will refine and enhance this methodology in the future. This report does not aim to replace or supersede other methods used in the demining or clearance fields. Rather, this report hopes to support the advancement of work within these fields, contributing to a holistic strategy in alleviating the effects of weapons contamination.

As a final note, while The Carter Center strived to record as many conflict events as possible, given the restrictive reporting environment in Syria and the high level of violence, some incidents have likely gone unrecorded. Therefore, figures in this report should be viewed as a minimum representation of the situation rather than an exact depiction of every single incident.

Main Findings

From 16,147 documented conflict events between July 2013 and May 2019, this study estimates a minimum of 94,792 total individual uses of explosive munitions across Damascus city and Rural Damascus Governorate. Around 86% of these events occurred in Rural Damascus Governorate, with 81,710 individual munitions used.

Ground-launched weapons of various types (62%) made up the majority of explosive munitions used, followed by air-dropped explosive munitions (38%).

Various types of ground-launched munitions – rockets (12,329), artillery shells (13,401), and mortar shells (7,357) – account for 35% (33,058) of munitions use in Damascus city and Rural Damascus Governorate. This is followed by shelling of unknown types (26%), airplane-launched munitions (21%), and helicopter-dropped barrel bombs (17%). The remaining 1% (1,376 events) represent other types of ground-launched weapons, cluster munitions, and landmines or IEDs (Figure 1).[3]

INDIVIDUAL MUNITION USE IN DAMASCUS CITY & RURAL DAMASCUS			
MUNITION CATEGORY	MUNITION TYPE	NO. MUNITIONS USED	% OF TOTAL
AIR-LAUNCHED WEAPONS	*Helicopter-Dropped Munitions (Barrel Bombs)*	15,916	16.79%
	Fixed-Wing Aircraft Launched Munitions	20,040	21.14%
GROUND-LAUNCHED WEAPONS	*Shells (Unknown Type)*	24,414	25.75%
	Artillery Shells	13,398	14.13%
	Rockets	12,300	12.97%
	Mortar Shells	7,357	7.76%
	Tank Shells	331	0.35%
	Grenades	123	0.13%
	Anti-Tank Guided Missiles (ATGM)	65	0.07%
	Rocket-Propelled Grenades (RPGs)	46	0.05%
	UR 77 Explosive Hoses	8	0.01%
	Cruse Missiles	1	0.01%
CLUSTER MUNITIONS	*Air- & Ground-Launched Cluster Munitions*	143	0.15%
LANDMINE, IEDs, & UXOs	*IEDs/Unknown Explosives*	441	0.46%
	Vehicle-Borne IEDs (VBIEDs)	101	0.10%
	Peron-Borne IEDs (PBIEDs)	44	0.05%
	Landmines	42	0.05%
	Suicide Vehicle-Borne IEDs (SVBIEDs)	17	0.02%
	UXO (Unknown Types)	14	0.01%

Figure 1: Breakdown of explosive weapons types used in Damascus city and Rural Damascus Governorate.

[3] Unidentified explosives or improvised explosive devices (441), tank shells (331), air- and ground-launched cluster munitions (143), grenades (123), vehicle-borne IEDs (101), anti-tank guided missiles (65), suicide-initiated IEDs (61), rocket-propelled grenades (RPG) (46), landmines (42), unexploded ordnance of unknown types (14), UR 77 explosive tank hose (8), and a cruise missile (1).

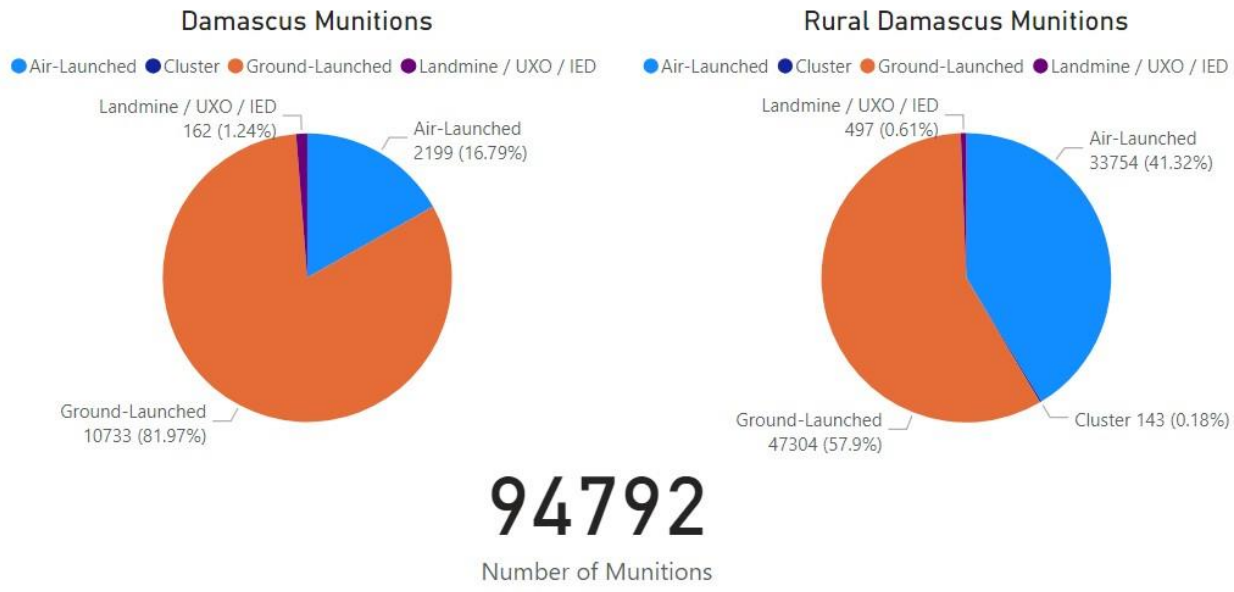

Figure 2: Breakdown of munitions categories by governorate and total number of munitions.

The geographical spread of recorded explosive munitions uses around Damascus city and Rural Damascus Governorate shows impact on at least 273 communities or neighborhoods. Nearly 70% (65,060) occurred within just 19 locations around Damascus city and Rural Damascus Governorate. Of the 65,060 munitions that impacted those 19 locations, 15% targeted Darayya city, which lies southwest of the capital, an area just 3 km by 3 km. The remaining 30% (27,958) of estimated munitions use occurred across 181 communities in Rural Damascus Governorate and 74 communities or neighborhoods around Damascus city. Figure 3 highlights these locations, while Figure 4 plots the locations of munitions use by subdistrict. The next sections will explore community-specific impact around Damascus city and Rural Damascus Governorate, respectively.

GOVERNORATE	LOCATION	NO. MUNITIONS	% OF TOTAL
Rural Damascus	Darayya	14101	14.87%
Rural Damascus	Harasta	9925	10.47%
Rural Damascus	Duma	6828	7.20%
Rural Damascus	Zabadani	6155	6.49%
Rural Damascus	Khan al Shih	4684	4.94%
Damascus City	Jobar	4521	4.77%
Rural Damascus	Arbin	3208	3.38%
Rural Damascus	Ain Terma	2264	2.29%
Rural Damascus	Marj Sultan	1376	1.45%
Rural Damascus	Misraba	1340	1.41%
Damascus City	Qaboun	1335	1.41%
Damascus City	Yarmouk Camp	1303	1.37%
Rural Damascus	Saqba	1303	1.37%
Rural Damascus	Deir Khabiyeh	1266	1.34%
Rural Damascus	Dahiet Elasad	1158	1.22%
Rural Damascus	Zamalka	1096	1.16%
Rural Damascus	Hamouriya	1078	1.14%
Rural Damascus	Modira	1067	1.13%
Rural Damascus	Moadamiyat al Sham	1046	1.10%

Figure 3: Locations that saw nearly 70% of munitions use in Damascus city and Rural Damascus Governorate.

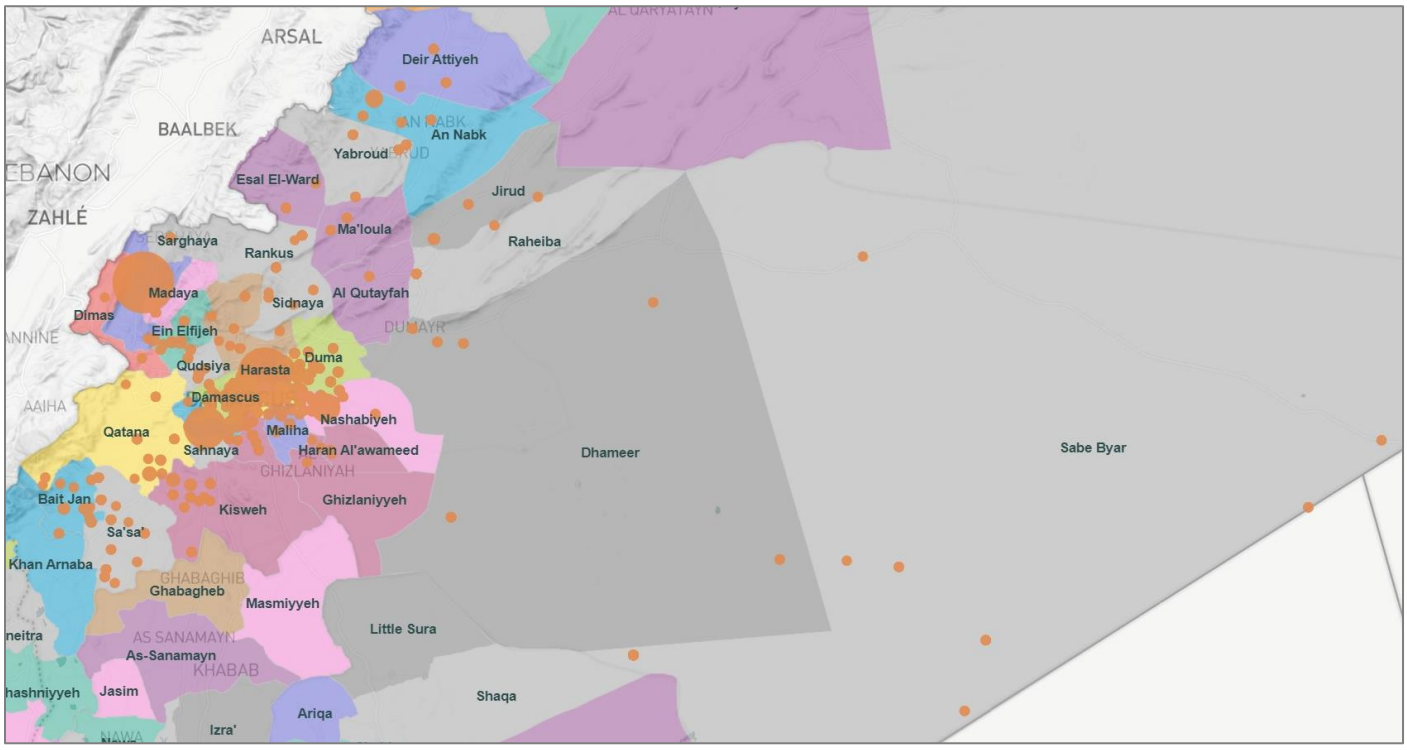

Figure 4: Location of individual munition uses across Damascus and Rural Damascus governorates, delineated by subdistrict.

Rural Damascus Governorate

From the 12,911 documented conflict events in 196 communities across Rural Damascus Governorate, the Center recorded at least 81,698 individual uses of explosive munitions. Ground-launched explosive munitions comprised 58% (47,310) of explosive munitions used in the governorate. Shelling of unknown types (17,556), artillery (12,549), and rockets of various types (10,389) made up most of the ground-launched explosive count. Aerial-launched munitions represented 41% of munitions, primarily involving airplane-dropped munitions (18,054), followed by helicopter-dropped barrel bombs (15,699). Landmines, IEDs, or detonation of UXOs represented just under 1% (494) of documented activity in the governorate.

Seven subdistricts saw 85% of the activity in the governorate: Markaz Darayya (15,200), Harasta (13,493), Duma (9,913), Kafr Batna (7,073), Zabadani (6,576), Nashabiyeh (6,565), Arbin (5,382), and Quatana (5,137) (Figure 5). The towns of Darayya, Harasta, Duma, Zabadani, Khan El Shih, Arbin, and Ain Terma recorded 58% (47,165) of munitions use in the governate. Outside of these areas, the remaining 42% (34,482) of explosive munitions occurred across 189 communities.

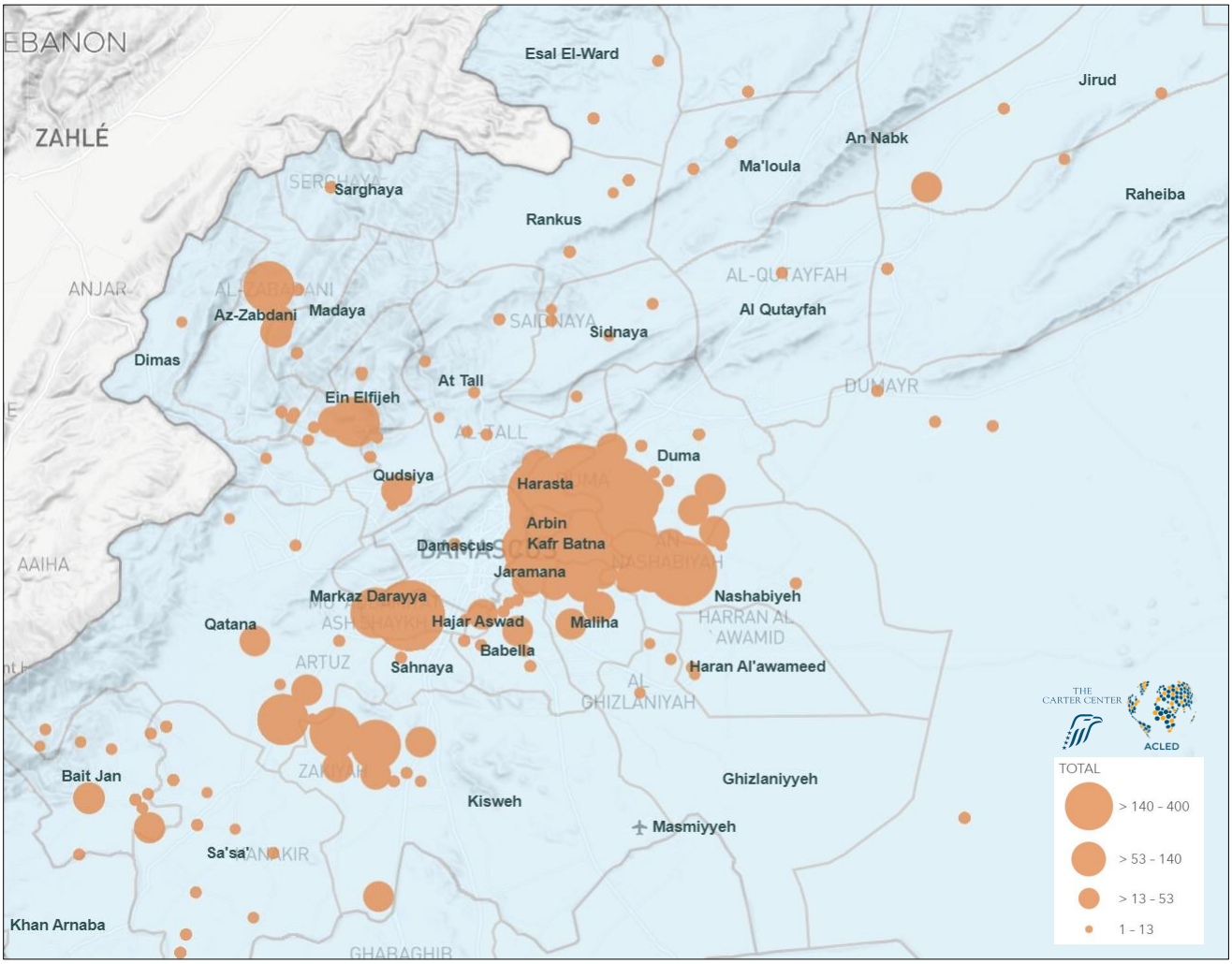

Figure 5: Location of munitions uses across Rural Damascus Governorate, delineated by subdistrict.

This data aligns with the nature of the conflict in Rural Damascus Governorate. At the start of the conflict in 2011, various pockets of resistance to the government formed in five general regions in Rural

Damascus: 1) Eastern Ghouta, 2) areas south of Damascus city, 3) the Wadi Barida Valley to the northwest of the capital, 4) areas between Khan el Shih and Kisweh towns, and 5) the Beit Jan area in the southwest of Rural Damascus Governorate. Over the course of the conflict, government forces sought to regain various towns that had become key hubs for armed groups opposed to the government, with static frontlines often forming for several years.[4]

With the Russian military engagement in the Syrian conflict in late 2015, the government was able to focus on retaking these pockets. These efforts began with the Darayya area in August 2016, moved to areas near Khan El Shih and the Wadi Barida Valley in 2017, followed by the 2018 recapture of Eastern Ghouta, the southern Damascus neighborhoods, and the Beit Jan area. This was achieved through a mixture of military action and political deals, including the well-known reconciliation agreements.

Damascus City

Across the 95 neighborhoods within Damascus city, there were at least 13,094 individual uses of explosive munitions.

Shelling made up the vast majority (82%) of explosive munitions used in the city. Of this, shelling of unknown types was most frequently documented (6,888), as conflict events often described shelling in generic terms. This is followed by rockets of various types (1,911), mortars (1,056), and artillery (852). Air-dropped munitions accounted for 17% of explosive munitions use in the governorate. This activity included primarily airplane-dropped munitions (1,979), followed by helicopter-dropped barrel bombs (220). The remaining 1% of activity consisted of 165 instances of landmines, IEDs, or UXOs, and five other types of ground-launched weapons.

Nearly 70% of munitions use concentrated in the former opposition-held neighborhoods of Jobar, Qaboun, Yarmouk Camp, Barzeh, Tadamon, and Tishreen. Government-controlled areas of the capital also experienced sizable counts of munitions use, especially Qassa', Qadam, Abbasiyeen (Mamouniyah), Adawi, and the Old City, totaling 1,322 munitions uses. The remaining 2,855 munitions used represented 65 other areas of Damascus.

[4] Notable: Duma City served as the headquarters of Jaish al Islam; Khan El Shih, a Palestinian refugee majority city, became the center of Syrian Palestinian resistance to the government (some Palestinian groups also supported the government); Darayya saw some of the first protests in the conflict after Daraa City and, in 2011, after experiencing heavy fighting, became viewed as symbolically important for the opposition movement because of its resistance.

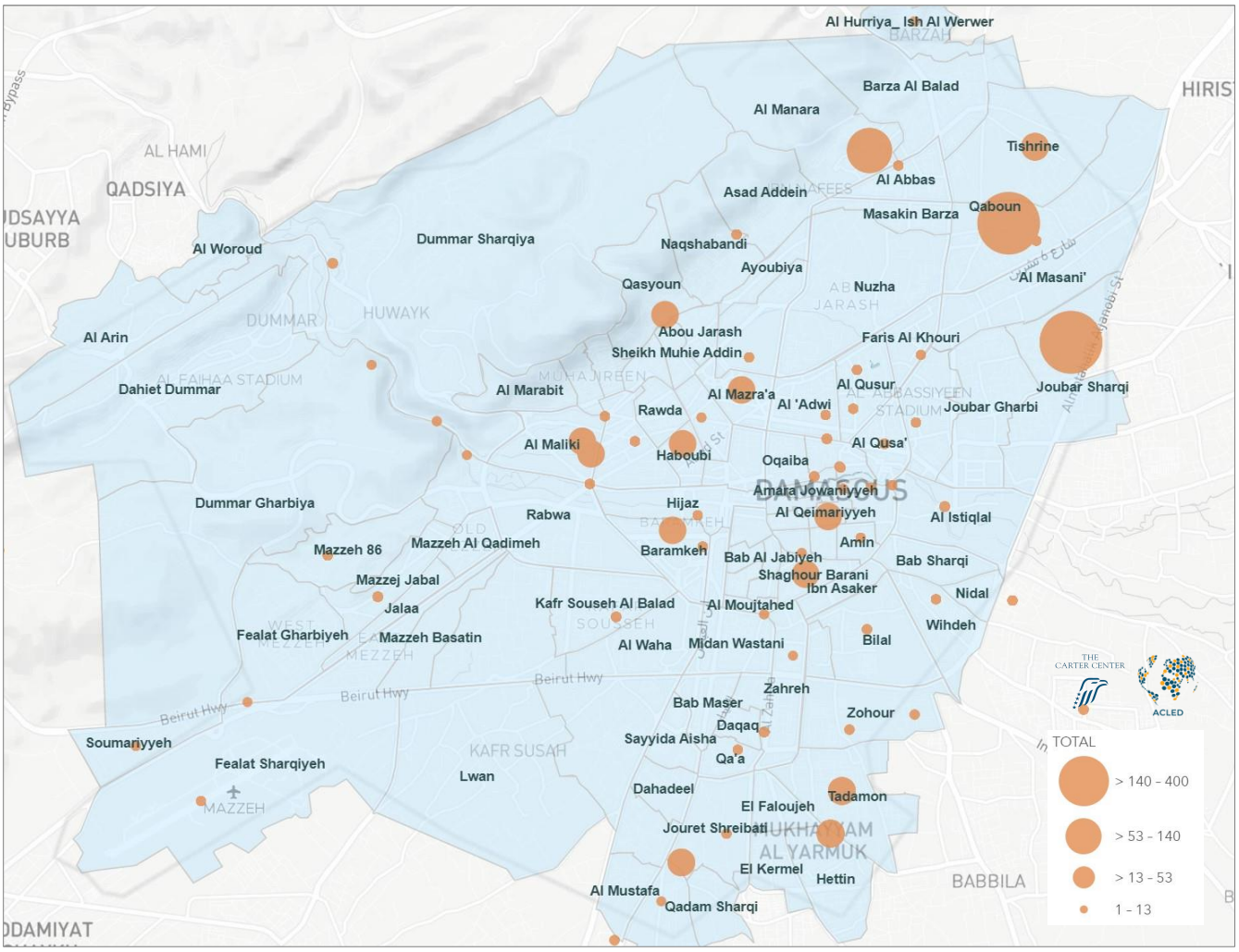

Figure 6: Damascus neighborhoods and location of munitions uses, with point size corresponding to the number of munitions.

The spread of munitions use aligns with conflict trends in the capital. Conflict focused predominately in opposition-held areas, including the Jobar, Qaboun, Tishreen, and Barzeh neighorhoods that connected to the opposition stronghold of Eastern Ghouta.[5] The southern neighborhoods of Yarmouk Camp and Tadamon frequently experienced conflict. From 2015 to 2018 ISIS dominated the Palestinian-majority Yarmouk Camp, along with the Hajar al Aswad area to the south, before relocating to the Badia Desert in eastern Rural Damascus Governorate after a deal with the government in May 2018. Though Tadamon remained in government control throughout the conflict, its location on the frontlines between Yarmouk Camp and the opposition-dominated Babila and Yalda areas meant that it was frequently in the crossfire. Despite the persistent fighting, these neighborhoods had lower levels of conflict activity and barrel bombs in comparison with areas outside of the city, likely because of their proximity to the capital and to static frontlines. Additionally, because opposition groups in these areas used mainly mortars and rockets, which have limited range and accuracy, shelling activity was limited to eastern and southern areas of the capital.

[5] The Jobar neighborhood connected to the Zamalka and Ein Terma areas of the Jaish al Islam and Faylaq al Rahman-dominated Eastern Ghouta enclave. The Qaboun, Tishreen, and Barzeh neighborhoods, although separated from Eastern Ghouta by the government, held the M5 Highway. Several underground smuggling tunnels, controlled by Fajr al Summa, connected the neighborhoods with the main pocket.

Furthermore, the strict security environment in government-held areas of the capital and the capacity of government forces to clear UXOs in the city considerably reduced the risk of remaining contamination. In contrast, in opposition-held areas, the higher levels of conflict and lower capacity of civil defense units to engage in clearance operations led to greater degrees of UXO contamination on the ground.

Conclusions

The estimated minimum of 94,792 explosive munitions use in Damascus city and Rural Damascus Governate is a conservative baseline to indicate levels of contamination in these areas. Operational planners can use information in this study to reinforce other datasets, such as casualty counts or humanitarian needs, to assist in identifying areas of prioritization for on-the-ground assessments of weapons contamination and risk-education programs. Also, policymakers can use this study to evaluate the scale of explosive munitions use in Damascus city and Rural Damascus Governorate.

This study reveals notable differences between and within the two areas, highlighting the complexity of the issue and the need for a response grounded in localized detail. Findings in the Carter Center's "Explosive Weapons Contamination in Syria, Report 1," covering As Sweida, Daraa, and Quneitra governorates, documented the use of 36,404 munitions across 255 communities.

While the effects of explosive weapons remain difficult to fully anticipate, previous studies have highlighted the long-term psychological, social, economic, and environmental effects associated with explosive weapons contamination. Explosive weapons clearance has proven an arduous process. For example, clearance efforts following the Angolan Civil War (1975 – 2002) are ongoing, nearly 50 years after it began. In Iraq, a country that has seen intense explosive ordnance use since the 1980s through various conflicts (including the Gulf wars and combatting ISIS' takeover of large parts of the country since 2012), decontamination efforts continue. Though Mozambique's 30-year conflict ended in 1992, its status did not change from "heavily contaminated" until 2015, after 23 years of clearance operations. These multigenerational clearance operations require long-term vision. Syria cannot be an exception.

A barrier for decontamination programs, including clearance, risk education, and victim assistance, is often the high cost. The 21 mine action projects listed in the U.N. Mine Action Strategy's portfolio cost an average of US$27 million each. Mozambique's explosive clearance operations are estimated to have cost US$220 million. Clearly, policy decisions regarding resource mobilization for decontamination projects should be based on a long-term and sustainable response. Momentum is building for this sector in Syria. In July 2018, UNMAS established its first office in Damascus after a memorandum of understanding was signed with the government. Currently, the UNMAS office coordinates 27 U.N. partners and international and local NGOs around the country. Demining and explosive munitions clearance operations offer conflict actors the opportunity to collaborate on a common goal.

The U.N. Mine Action Strategy for 2019-2023 views the life-saving activity as key in helping return communities to a "prosperous economic and social life" as well as a "nexus between humanitarian action, peace and security, and development as well as a cornerstone for conflict prevention." In the cases of Somaliland, Niger, Afghanistan, South Somalia, and Columbia, former combatants took part in demining and clearance efforts, using their experience and knowledge to help agencies map locations of explosive munitions use in exchange for long-term, paid employment. In Lebanon, mine clearance provided women opportunities for employment and skills training. Despite the politicized nature of international responses to the Syrian conflict, it behooves policymakers to think in holistic and humanitarian terms about the impact of demining and clearance efforts.

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Since 2012, The Carter Center's Conflict Resolution Program has endeavored to analyze open-source information related to the Syrian conflict in as much detail as possible, with the goal of assisting mediators and conflict responders with up-to-date, detailed analysis of developments on the ground. Using these publicly available resources, as well as information gleaned from regular consultations with stakeholders, the Center has documented and mapped 155,00 conflict events in Syria, with support from ACLED, as well as the ever-changing relations between armed groups. For more information, visit our website at www.cartercenter.org.

The Center's Syria Project also produces weekly conflict summaries, covering the main developments of the week. To sign up, please visit our website and select "Subscribe Now."