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The Jewish Institute for National Security of America

Shielded by Fire:
Middle East Air Defense During the June 2025 Israel-Iran War

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I. Executive Summary

Over the course of 12 days in June 2025, over a distance of some 2,000 km, Israel and Iran engaged in the first modern long-range missile and drone fire conflict between two countries that did not share a border. This unprecedented air war from June 13-24 demonstrated the effectiveness and tested the limits of modern missile defense capabilities. While the vast majority of the over 500 ballistic missiles fired by Iran did no damage to Israel, that success was due in large part to ad hoc U.S.-led air defense cooperation and achieved at the cost of significant drawdown of both U.S. and Israeli interceptor stockpiles. With Iran all but certain to rearm, the future security of both Israel and the United States will depend on formalizing and expanding the regional air defense network and investing in expanding the stockpiles and innovative capabilities of air defenses.

Over the course of the 12-Day War, Iran launched 574 ballistic missiles and 1,084 drones at Israel. Of these missiles, Israel and the United States intercepted 273 missiles, with only 49 missiles impacting on populated areas, Israeli infrastructure, and bases.[1] Meanwhile, Israel degraded Iran's missile stockpile from 2,500 missiles pre-conflict to between 1,000-1,500 missiles and brought down its launcher capacity from nearly 500 to roughly 100 launchers.

Demonstrating a remarkable level of integrated air and missile defense (IAMD), the United States and Israel collaborated in real-time across intelligence, command and control, and operational platforms to defeat the vast majority of Iranian projectiles. Israel's transition to the area of operations for U.S. Central Command (CENTCOM) in 2021—a move for which JINSA had advocated since 2018—enabled this unprecedented U.S.-Israel bilateral coordination.[2] Simultaneously, Arab and European partners also provided limited help defeating Iranian drones, continuing an air defense partnership that the United States stood up before Iran's April 2024 attack against Israel. Though Arab participation remained a small part of the defense of Israel, their efforts, despite the risks of Iranian retaliation, demonstrated their commitment to regional cooperation.

Unlike during Iran's previous attacks against Israel, the interplay between Israel's offensive and defensive operations proved decisive during the conflict. Offensive operations targeting Iranian missile launchers and command sites, disrupted Iran's ability to sustain attacks and reduced the volume and intensity of follow-on barrages.

At the same time, the war exposed several notable limitations and vulnerabilities within air defenses, revealing critical gaps in preparedness, coordination, and technology. While JINSA research shows that the 12-Day War was costlier for Iran than for the United States or Israel, substantial interceptor usage, costs, current slow restocking capabilities, and potential performance issues raise concerns for future American conflicts with Iran, Russia, China, or North Korea.

If Israel had not preemptively launched a surprise attack at the outset of the conflict—crippling Iran's missile stockpile and production—the outcome could have been far graver for Israel. Had Israel and the United States not coordinated and expanded air defense coverage ahead of the war, more of Iran's missiles might have pierced Israel's air defenses. And had Iran succeeded to expand its missile arsenal from 2,500 to 8,000 ballistic missiles by 2027, as it planned before Israel's Operation Rising Lion, any conflict would likely have been longer and deadlier. Israel's preventative measures in June mitigated this danger; however, Iran's potential efforts to rebuild its missile capacity could lead to another even more deadly war.

As the war proceeded, Iran adapted its tactics, shifting to smaller, more frequent attacks with heavier, more advanced missiles and munitions, causing more fatalities, damage, and disruption that revealed potential weaknesses in existing air defenses. The conflict also highlighted the security vulnerabilities

facing Gulf states in closer proximity to Iran than Israel, particularly evident when Iran targeted U.S. forces stationed at Al Udeid Air Base in Qatar.

With Israeli interceptor stockpiles diminishing amid Iran's unprecedented fire, Israel depended heavily on U.S. air defenses to intercept missiles. Absent this assistance, Israel may have needed to further diminish its own resources and face increased risk from deadly and destructive missile attacks in future conflicts. In particular, JINSA estimated that the United States launched over 150 THAAD "Talon" and 80 SM-3 interceptors—about 70 percent of all interceptors used during the war. Representing some 25 percent of the U.S. stockpile, replenishing these could take 1.5 years.[3]

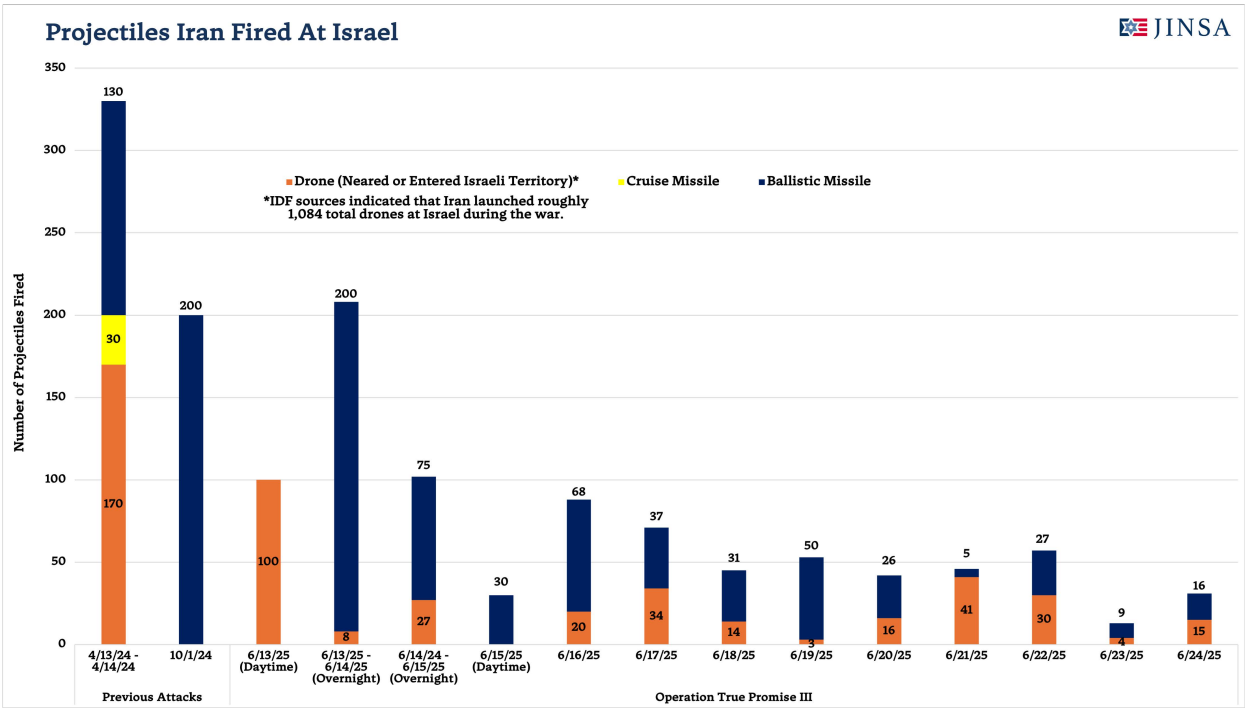
It is vital, therefore, that Israel and the United States understand that they are in a rapidly paced arms race against Iran and the other global competitors—Russia, China, North Korea—who use its weapons or contribute to their development. The timing and outcome of any future conflict will largely depend on which countries can most effectively strengthen their offensive and defensive abilities. Therefore, both the United States and Israel will need to advance their air defense systems, replenish and expand the air defense interceptor stockpiles and production capabilities—including through co-development and –production with Israel of innovative missile defense systems—and implement new strategies to address increasingly concentrated and unpredictable missile attacks, before Iran rebuilds its military capabilities.

Although the IAMD effort proved successful during the conflict, its effectiveness depended heavily on U.S. leadership and the rapid but temporary deployment of U.S. assets. Arab nations only had limited involvement in the air defense coalition, and they lack sufficient air defenses to counter Iranian missile attacks. Improving regional security cooperation will require U.S. leadership to move IAMD past the current temporary coalition into a permanent, formal U.S.-led IAMD network that could respond to surprise attacks and aggression against less well-defended targets than Israel. This would include real-time data sharing agreements, integrating radar and sensor systems, adopting joint planning protocols with regional partners, and ensuring the United States, Israel, and Arab partners each have sufficient capabilities. To facilitate these efforts and improve air defense capabilities, Congress should direct CENTCOM to assess IAMD effectiveness, address system gaps, and define joint protocols for regional missile defense.

This analysis builds on JINSA's previous work highlighting the strengths and challenges of IAMD in the Middle East.[4] JINSA's 2023 *Build It and They Will Come* report proposed a U.S. strategy for regional defense integration, while a JINSA report released only days before the 12-Day War, *Forged Under Fire*, examined IAMD performance during Iran's two previous attacks on Israel in 2024 and the IAMD response.[5] Echoing many key lessons and recommendations from JINSA's prior analyses, the recent conflict adds heightened urgency to threats and brings to light new operational dynamics that demand immediate attention, not only for conflict in the Middle East but against adversaries in Europe and the Indo-Pacific as well.

II. IAMD During Iran's First Two Attacks Against Israel

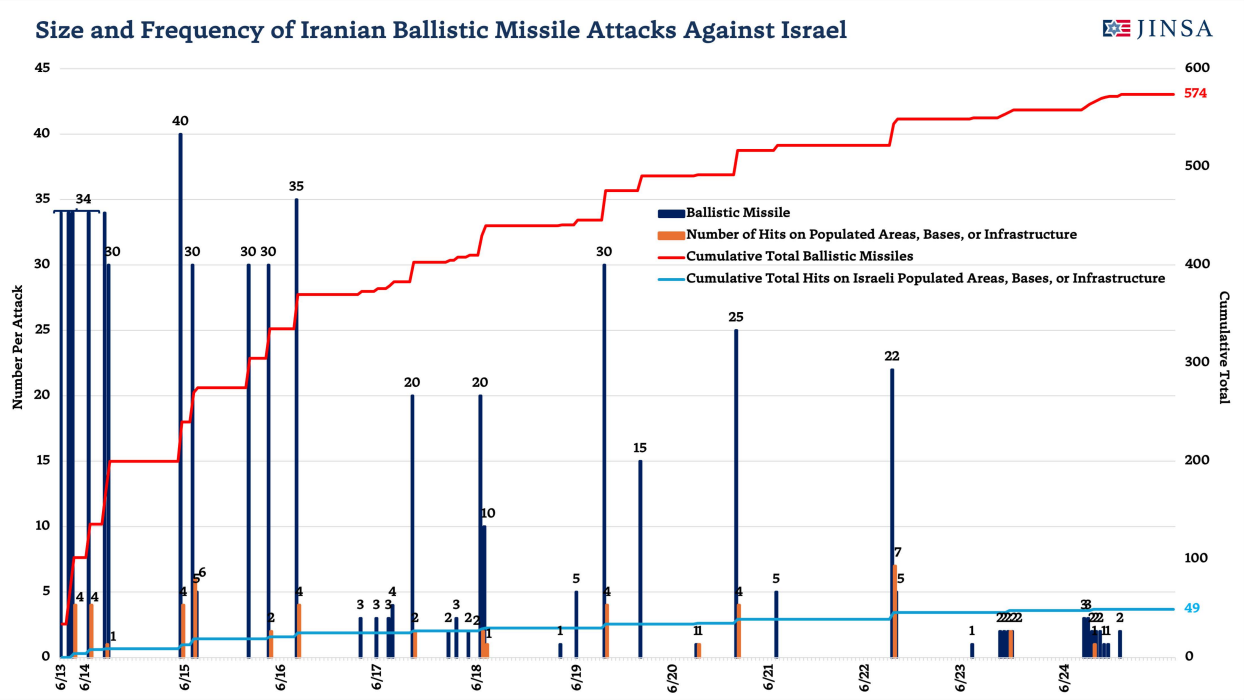
In 2024, direct attacks between Israel and Iran led to a significant leap forward in America's efforts toward integrated air and missile defense (IAMD) in the Middle East. In April 2024, Iran launched roughly 130 medium-range ballistic missiles (MRBMs), 30 cruise missiles, and 170 drones at Israel, as its Hezbollah proxy in Lebanon also launched dozens of short-range rockets.[6] Before the attack, the United States quickly leveraged years of quiet high-level regional military collaboration to form an air defense coalition with European and Arab nations—including Egypt, Jordan, Saudi Arabia, and Qatar—that overwhelmingly defeated Iran's attack, as described in JINSA's *Forged Under Fire* report.[7] Unlike the April attack, during Iran's next attack against Israel on October 1, 2024, it only launched MRBMs, leaving only the United States and Israel capable of mounting a defense. Of the roughly 200 missiles Iran launched in total, 180 reached Israeli airspace, and approximately 100 missiles struck Israeli bases, according to officials with knowledge of the incidents. After evacuations from multiple bases, Israel prioritized protecting key assets—especially radar installations—by focusing Arrow missile systems on protecting them and strategically allowing some missiles to hit other locations.[8]



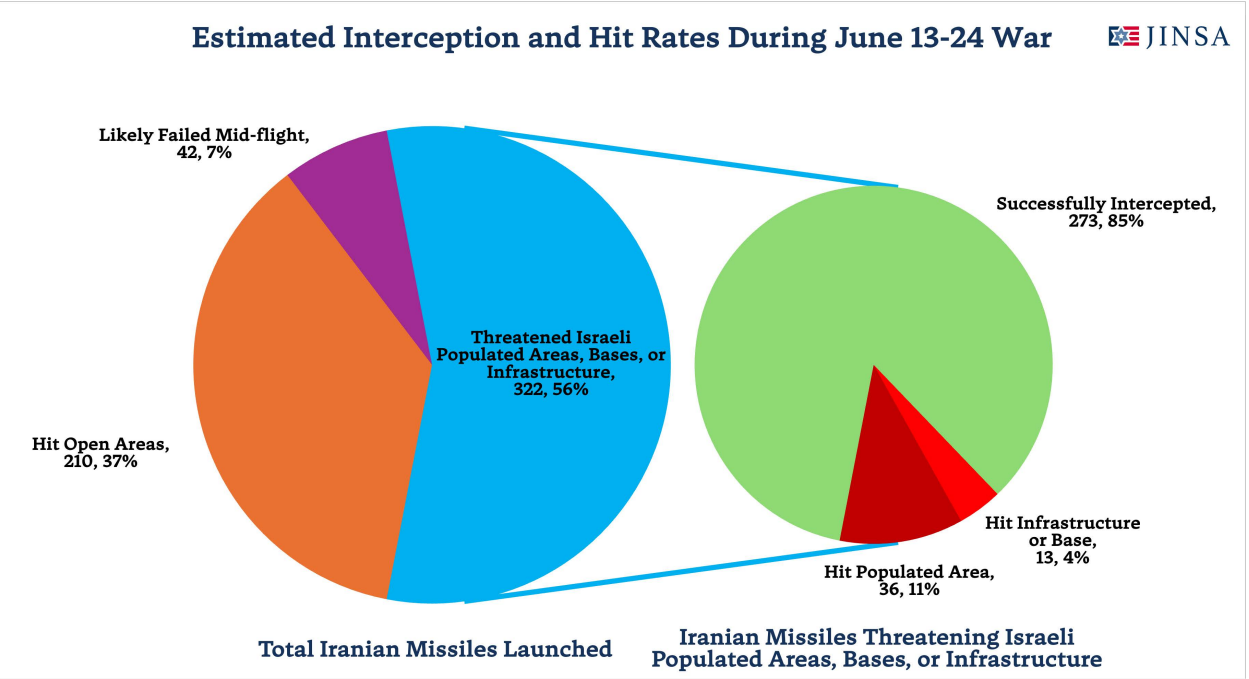
III. IAMD Lessons From the June 2025 War

After the Israel Defense Forces (IDF) launched Operation Rising Lion on June 13, Iran responded with Operation True Promise III, marking the third and longest round of direct fighting between them, as well as the first time both countries attacked each other simultaneously. The Israeli Air Force (IAF) coordinated the interception of incoming air threats, directing air defense operations across multiple ground-, air-, and sea-based platforms. Israeli Navy air defenses integrated with the ground-based platforms in Israel and had the primary responsibility for defending naval assets, such as gas rigs, as well as other threats specifically identified and designated by the IAF for interception. Facing this unprecedented onslaught, Israel employed all of its multi-tiered air defense architecture, including Arrow-3, Arrow-2, David's Sling, Iron Dome, C-Dome (Iron Dome's maritime variant), Barak-8, and Barak-1 platforms, as well as Apache helicopters and F-16, F-15, and F-35 fighter jets.[9] Yet, Israel did not face Iran's attack alone.

As in 2024, the United States again coordinated an informal multinational coalition, including Arab and European states, to help defend Israel from Iranian missile and drone attacks. As a result, the combined efforts of Israel, the United States, and other coalition partners contributed significantly to the robust multi-layered shield that protected Israel during the conflict, further solidifying the precedent for joint defensive measures in the region. The war demonstrated the benefits of IAMD and the importance of mutually beneficial defensive and offensive operations, as well as exposed limitations with the current impermanent IAMD coalition and vulnerabilities in existing air defense operations.



U.S. and Israeli efforts neutralized the vast majority of Iranian missiles, resulting in only 49 impacts on populated areas, Israeli infrastructure, and bases. While JINSA data indicates that Iran launched 574 ballistic missiles and roughly 1,084 drones at Israel, Israeli officials told JINSA that 532 missiles threatened Israeli territory, and of those 36 missiles struck populated areas and 13 hit Israeli bases or infrastructure. Out of the 322 missiles Israel and the United States attempted to defeat, they intercepted 273 missiles, for a success rate of 85 percent.[10] The remaining missiles likely failed mid-flight or hit open areas in Israel. Of the approximately 1,110 drones that Iran fired, the IDF neutralized 473; coalition partners destroyed 160, most of which were by the United States; two penetrated Israeli territory; and the rest failed outside of Israeli territory. Israeli helicopters and ground-based electronic warfare capabilities were highly effective at neutralizing numerous drones.



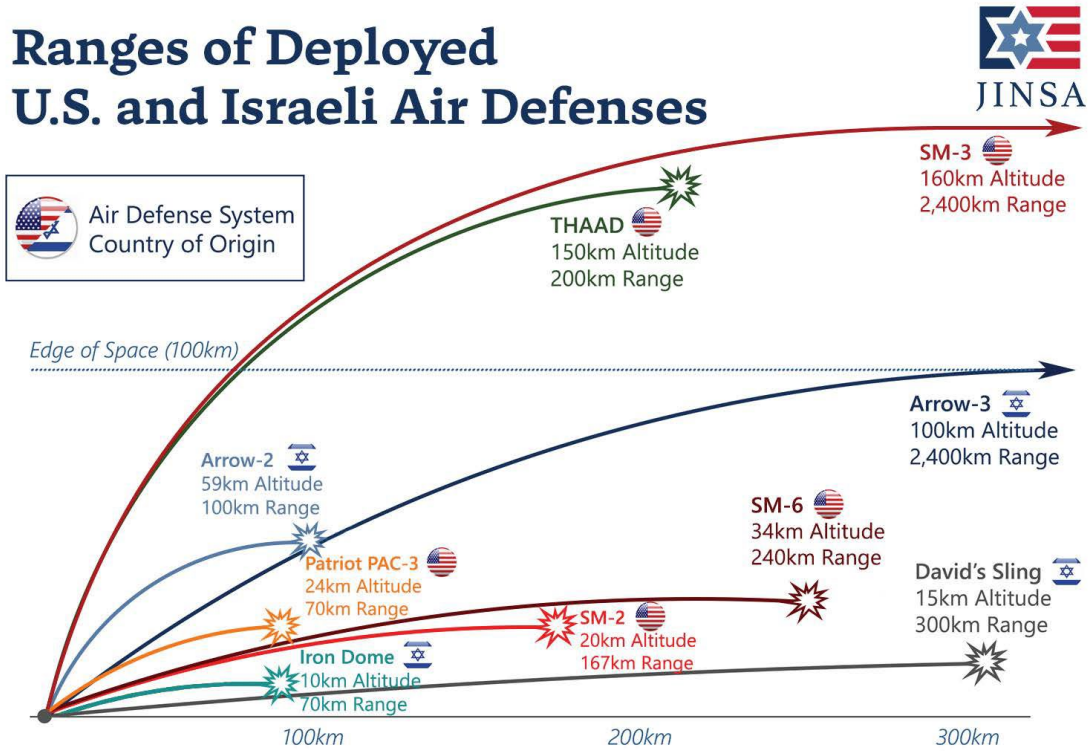
A. IAMD Provided Operational and Economic Advantages Over Israel Defending Alone

The June conflict further highlighted the extended success and remarkable value of IAMD. U.S. and Israeli air defenses intercepted the overwhelming majority of ballistic missiles and drones, safeguarding Israeli cities and strategic sites, but it also proved far more economical than Iran's offensive barrages. U.S. support enabled Israel to dramatically expand and diversify its air defense capabilities during the conflict, providing real-time data sharing, advanced interceptors, and coordinated strategies that would have been far less effective if Israel had defended alone. The participation of Arab and European nations sent a powerful signal of their willingness to assume risks in order to confront Iranian aggression, underscoring a shared commitment to collective defense and deterrence in the face of escalating threats. This cost-effectiveness and sustained high interception rates during intense and prolonged conflict underscored the advantage of robust and coordinated missile defenses.

i. U.S. Air Defenses Bolstered Israeli Capability and Capacity to Neutralize Iranian Attacks

U.S. air defense cooperation bolstered the IDF's capacity and capability to detect, identify, track, and defeat Iranian attacks. U.S. intelligence platforms likely provided early warning of impending attacks, as they did during Iran's previous attacks, while American destroyers and ground-based interceptors contributed to the broader missile shield. Alongside Israel's air defense systems, the United States bolstered protection by deploying two U.S. Terminal High Altitude Area Defense (THAAD) batteries—likely the first such dual deployment in a foreign country—and positioning Aegis-equipped Navy destroyers in the eastern Mediterranean Sea, Red Sea, and Arabian Sea.

A combination of U.S. land-, air-, and sea-based assets increased the volume and diversity of interceptors available, better enabling Israel and its partners to neutralize massed volleys of Iranian missiles and drones. With their advanced radar and high-altitude interception capabilities, the two THAAD batteries served as a crucial backstop against ballistic missile threats.[11] Meanwhile, Aegis-capable guided-missile destroyers that can carry standard missile interceptors, specifically the SM-2, SM-3, and SM-6, intercepted Iranian ballistic missiles.[12] U.S. and Israeli air defense systems brought complementary strengths to the integrated network, each covering distinct segments of the air domain and allowing both nations to layer their defenses and maximize coverage against diverse threats. For example, the American THAAD and SM-3 systems can intercept ballistic missiles at altitudes 50 km and 60 km higher than Israel's Arrow-3, respectively. Arrow-3 and SM-3 boast the same 2,400 km range, 2,220 km beyond that of THAAD.



The close, real-time integration between the U.S. and Israeli militaries formed the backbone of their air and missile defense partnership during the conflict. Daily coordination meetings enhanced the effectiveness of the integrated air and missile defense framework, with IAF liaison officers located at the U.S. Air Force's Combined Air Operations Command at Shaw Air Force Base in South Carolina and CENTCOM headquarters in Tampa, Florida, enabling both countries to rely upon a common operating picture to drive joint action. U.S. Air Forces Central Command (AFCENT) personnel deployed alongside every level of the IAF, from command and control (C2) centers to Arrow missile system units, which enabled an ability to execute an unprecedented breadth of pre-planned responses. Communicating all air defense assets through LINK-16 and other technologies guaranteed real-time sharing of target data and command decisions, with the Arrow system acting as the network's linchpin by synthesizing information from every platform and providing intercept options, recommending which units should fire, what they should engage, and in what order. Seamless integration provided operational flexibility, allowing forces to employ either shoot-look-shoot or shoot-shoot-look engagement tactics based on the threat and target.[13] Meanwhile, joint U.S.-IDF command teams coordinated every defensive move so that U.S. interceptors

almost never launched without Israel's knowledge or coordination, demonstrating the depth of trust and interoperability between the two nations. Although U.S.-Israel maritime domain integration remained less robust than in the air domain, through data-sharing protocols established before the war, the Israeli Navy's combat information center maintained a synchronized operating picture identical to that of the U.S. Aegis destroyers, ensuring seamless coordination and unified situational awareness across maritime defense platforms.[14]

ii. Israel and the United States Proved Air Defense Capability Over an Extended Timeframe

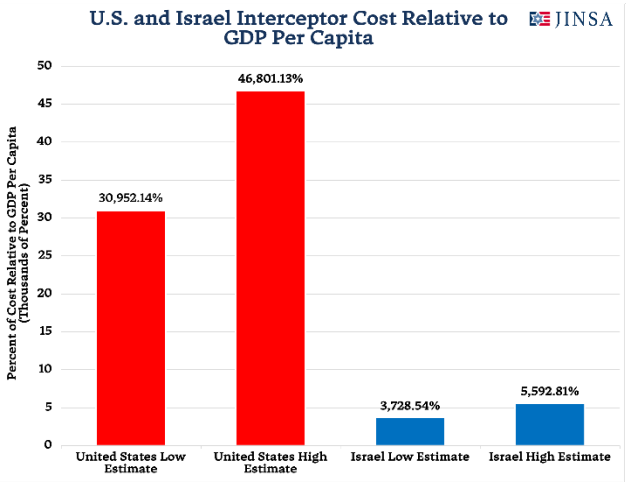
A key result of the June 13–24 conflict was the validation of Israeli and U.S. air defense capabilities working together in concert over a sustained period of high-intensity offensive and defensive operations. For nearly two weeks, Israeli and U.S. systems operated at unprecedented tempos, confronting volleys of Iranian ballistic missiles and drones. Despite the persistent threat and the inherent limitations posed by a finite supply of air defense interceptors, Israel and the United States managed to sustain high interception rates.

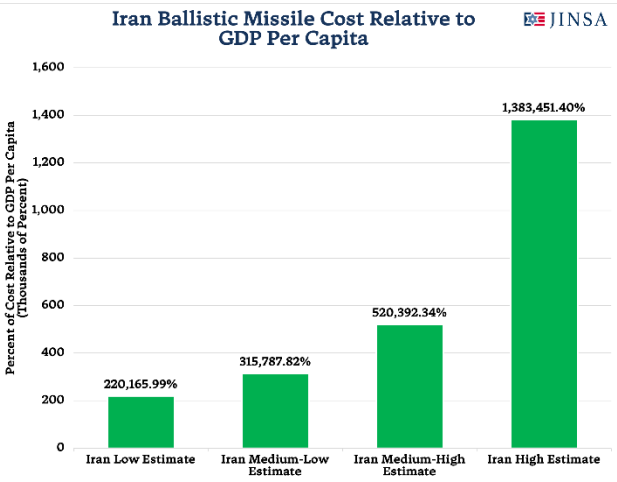
iii. Improved Air Defense Capabilities Became Critical

Israel's ongoing commitment to advancing its air defense technologies played a key role in neutralizing Iranian missiles and drones throughout the conflict. The IDF deployed newly developed long-range and electronic warfare air defense technologies that further strengthened the multi-layered shield protecting its cities and strategic assets.[15] This performance underscored not only the technical sophistication of U.S. and Israeli air defenses but also their operational resilience and flexibility during prolonged, resource-intensive conflict.

iv. The Relative Cost-Curve Favored the United States and Israel

JINSA research indicates Iran's relative economic burden was much higher than that of the United States or Israel. In terms of GDP per capita, the conflict cost Iran as much as 371 times more than Israel and 44.7 times more than the United States, per JINSA estimates that extrapolated broader trends based on a sample of videos showing interceptions. From June 13 to 24, Iran's missile strikes on Israel and Al Udeid Air Base cost $1.1-$6.6 billion, while U.S. and Israeli air defense expenditures were around $2.9-$4.3 billion.[16] Effective interceptor use prevented significant casualties and $15 billion in property damage, resulting in net savings of roughly $10.7-$12.1 billion for Israel.





v. Arab and European Nations Provided Limited Help Destroying Drones

Unlike in October 2024, when Iran's offensive involved only medium-range ballistic missiles (MRBMs), the dynamics during this recent conflict more closely resembled the situation in April 2024, with Arab and European nations again playing a role in regional air defense. This collaborative defense effort underscored the growing recognition among Arab countries of the importance of collective security. Notably, Arab states' participation in defending Israel stands out as particularly significant given their concurrent diplomatic efforts to distance themselves from any direct attacks on Iran, reflecting their acute concern about provoking Iranian retaliation and the extraordinary precautions they took to ensure their territories and airspace would not be used for offensive operations; nonetheless, their involvement still entailed substantial political and security risks.

While the role that Arab partners played differed from April 2024 because Iran sent more drones through Syrian airspace in June, instead of over the territory of coalition partners, several Arab nations actively intercepted Iranian drones, demonstrating a coordinated approach to countering aerial threats in the region. Israeli officials who spoke with JINSA indicated that Saudi Arabia and Jordan allowed foreign aircraft to fly within their territory for air defense, as they did during previous Iranian attacks.[17] During the war, Jordanian air defense systems shot down Iranian projectiles, including drones and rockets, that had crossed into Jordan's airspace, similarly to how the country reacted to past Iranian barrages targeting Israel in 2024.[18] France also intercepted fewer than 10 drones during the conflict.[19] However, the fact that these partners only intercepted drones highlighted the current gaps in their regional missile defense capabilities and underscored the pressing need for broader, more advanced air defense integration.

B. Defensive and Offensive Operations Were Mutually Beneficial

During the Israel-Iran conflict, the IAF conducted extensive offensive operations thousands of miles away from its borders deep into Iranian territory while simultaneously defending against Iranian missile and drone attacks. Yet, the offensive and defensive missions were not separate lines of effort. Israel's unified air force, responsible for the air offensive and defense, enabled mutually beneficial coordination between intercepting threats and launching strikes.

i. Israel's Offensive Operations Supported Air Defense

Israel's air superiority played a critical role in shaping the trajectory of the conflict. Unlike during Iran's April and October 2024 attacks, Israeli aircraft targeted Iranian missile launchers as Iran sought to fire them, preventing numerous missiles from endangering Israel. IAF crewed aircraft and drones flew across Syrian, Iraqi, and Iranian airspace on 1,500 sorties to hit 900 targets in Iran with 4,300 munitions, accompanied by roughly 700 mid-air refueling operations.[20] With each sortie averaging about five hours of flight time, the IDF had initially planned for a rate of one sortie per day. Yet, the absence of significant threats from Hezbollah or Syria on the northern border in June enabled the IAF to conduct two sorties daily—effectively doubling both the number of missions flown and the volume of targets struck within a single day. During the war, IAF aircraft flew sorties that included striking targets in Iran and defending against Iranian drone attacks, with some even conducting strikes in Gaza using remaining munitions.[21]

Months before open hostilities erupted, Israeli operations shaped the future battlespace. During Israel's April and October strikes against Iran, it destroyed its S-300 air defenses.[22] Another pivotal factor enabling Israel's deep offensive reach was the intense early emphasis on neutralizing Syrian surface-to-air missile

(SAM) sites within the first seventy-two hours following the fall of the Assad regime—a campaign that proved decisive in establishing a free air corridor over Syria to Iran in June; this allowed IAF aircraft to refuel unopposed over Damascus and to encounter no resistance until reaching the Iraq-Iran border. Israel also implemented a left of launch strategy that countered threats before missiles ever left the ground. These efforts included both cyber operations as well as proactive measures to compromise the entire Iranian supply chain.

As soon as the conflict began, the IDF initiated a high-stakes race to neutralize Iran's missile launchers and stockpiles before Tehran could unleash enough attacks to drive U.S. and Israeli interceptor reserves toward a critical tipping point that would change their calculus about how to defend or even whether to continue the conflict. By initiating Operation Rising Lion with a surprise attack that degraded Iran's missile launch capacity and eliminated much of its senior military leadership, Israel secured an early edge that proved decisive for shaping the outcome of the war. While Iran intended for its initial response to involve firing 500-1,000 ballistic missiles, swift and effective IAF strikes on Iranian missile bases forced Tehran to drastically scale back its immediate response—limiting it to the launch of just 100 drones, and delaying the first significant wave of ballistic missile fire for 18 hours after Israel initiated Operation Rising Lion.[23]

Israel's proactive approach not only reduced the intensity of subsequent Iranian barrages but also appeared to inflict uncertainty within Iranian decision-making due to the breakdown of Iran's leadership hierarchy and communication networks. Once air superiority was achieved, IAF drones played a pivotal role in the relentless hunt for Iranian missile launchers, maintaining round-the-clock surveillance and delivering rapid strike options that further undermined Iran's ability to coordinate effective barrages. Indeed, Israeli use of drones may have been the biggest surprise to Iran, with IAF drones destroying 200 Iranian launchers, roughly half of all the launchers Israel neutralized.[24]

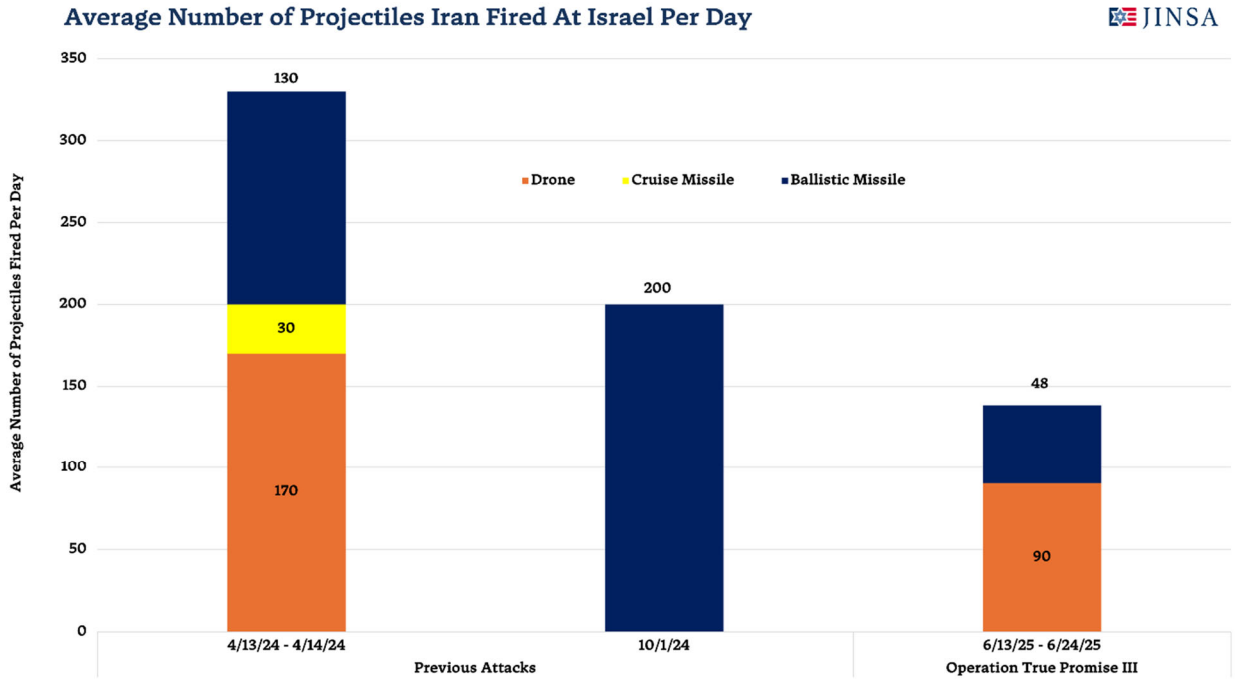
Iran relied on mobile missile launchers, which have slow fueling processes that exposed them to Israeli counterattack. While Iran has built large underground missile sites to shield its missiles, these facilities can only launch one missile at a time, limiting their usefulness for coordinated barrages.[25] Instead, Iran has overwhelmingly relied upon using mobile transporter erector launchers (TEL), often disguised as trucks, that must be moved from protected facilities into the open, exposing them in the process to IAF counterattack. Iran uses both liquid- and solid-fueled missiles, but most launched during the war were likely liquid-fueled models like the Emad and Ghadr MRBMs, which require long fueling times at launch, making them vulnerable to counterattacks.

As a result of IAF strikes, Iran's response throughout the conflict remained fragmented and less effective than initially anticipated. While Iran fired nearly twice as many ballistic missiles at Israel during the 12-Day War as it had in its previous two attacks combined, the nearly two-week duration of the war meant that Iran's daily average missile fire was roughly 48 missiles, a 63 and 76 percent drop from the single-day April and October 2024 attacks, respectively. For the 12 days of fighting in June, Iran launched about 550 percent more drones overall than in its April 2024 attack but averaged 90 per day, a 47 percent decrease from April.

ii. Defense Enabled Time for Offensive Operations

The defensive success also benefited Israel's offensive operations. Since Israeli and U.S. air defenses intercepted 85 percent of missiles and over 99 percent of drones that threatened populated areas, infrastructure, and bases, Israeli leadership did not face urgent internal pressure to conclude the conflict quickly. With the pressure of defending its homeland mitigated by high interception rates, Israel could devote greater resources and attention to conducting deeper, more varied strikes within Iranian territory. The IDF was able to expand their target set beyond immediate threats like missile launchers and command

centers. The operational window enabled the IAF to identify and neutralize a broader spectrum of Iranian military assets, including nuclear sites, weapons depots, and key infrastructure supporting Iran's war effort and regime control. As a result, Israel's air campaign not only blunted Iran's capacity for sustained retaliation but also systematically eroded a wide array of military assets throughout the conflict.



C. IAMD Remains Informal and Reliant on Key U.S. Roles

Although the IAMD effort proved successful during the conflict, its effectiveness depended heavily on the rapid deployment of U.S. assets and remained temporary, relying more on swift coordination than on a formalized architecture. In the months leading up to the conflict, the United States began deploying key military assets to the region, and, once hostilities erupted, it rapidly surged additional forces to reinforce defensive and offensive operations.

i. U.S. Leadership Remained the Glue of a Makeshift IAMD Partnership

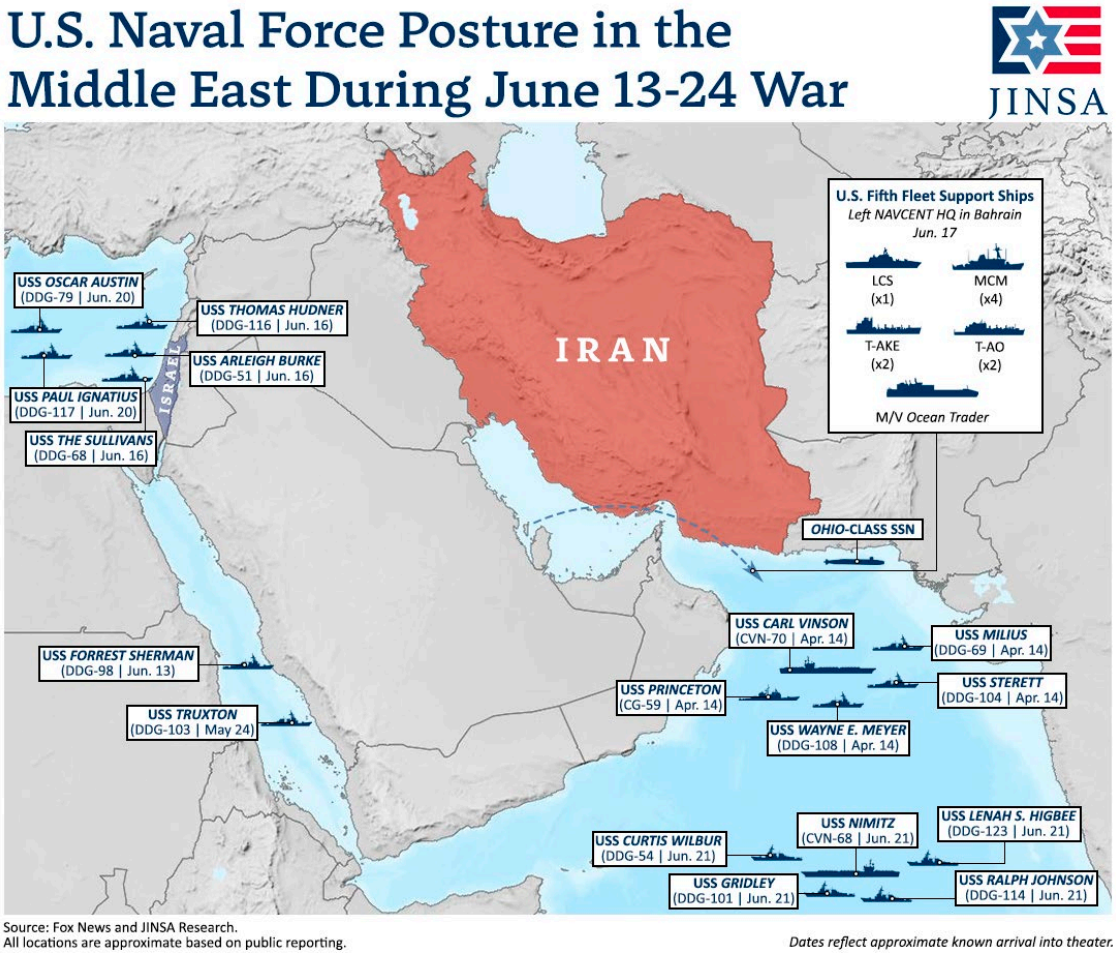
U.S. leadership remained indispensable to each of the IAMD efforts against Iran's attacks targeting Israel. Through the determined leadership of the United States, the coalition has achieved notable progress in sharing intelligence and strengthening collective defense. However, despite these advances, participation from Arab nations remains limited, and in future operations, the extent of support from coalition partners cannot be guaranteed. In this fluid and reactive cooperation framework, U.S. oversight and coordination have been the linchpin holding together a patchwork of rapidly assembled defenses.

CENTCOM leadership's sustained and proactive efforts have repeatedly brought together an air defense coalition and rapidly boosted U.S. military assets in the region, enabling the temporary defense network to function effectively in the face of Iranian threats. Nevertheless, neither Washington's continued commitment to these operations or the deployment of military assets nor the ability of U.S. officials to secure participation from partner nations remains guaranteed.

ii. A Surge of U.S. Capabilities Before and After the War Started Became Critical

Before the war began, the United States surged additional capabilities to the region, including advanced missile defense batteries, naval assets, and electronic warfare teams. Since the United States relies heavily on rotational deployments rather than a large, permanent air defense presence in the Middle East, it had to quickly surge naval forces into the region when the war began. Not all naval and air assets were in place at the start of the war; many had to be rapidly repositioned from other locations.

To further bolster capacity, the United States deployed a THAAD battery to Israel in October 2024 after Iran's attack and sent another battery in April 2025, providing an additional layer of protection against ballistic missile threats.[26] Since the United States only has seven operational THAAD batteries, this represented a substantial deployment of U.S. air defense capacity. Between April and May, the United States Navy also surged warships into the eastern Mediterranean and the Red Sea. Once the war began, the United States sent additional Aegis-equipped destroyers to these areas, with these warships arriving mid-conflict to reinforce the layered missile defense architecture against Iranian missile salvos. Meanwhile, the United States took several steps to bolster deterrence against Iran, including the deployment of the USS *Carl Vinson* aircraft carrier group in the Arabian Sea since April, the arrival of the USS *Nimitz* aircraft carrier group from the South China Sea near the end of the war, and the positioning of F-22, F-35, and F-16 fighter aircraft, as well as deploying KC-46 and KC-135 aerial refueling tankers in Europe.[27]

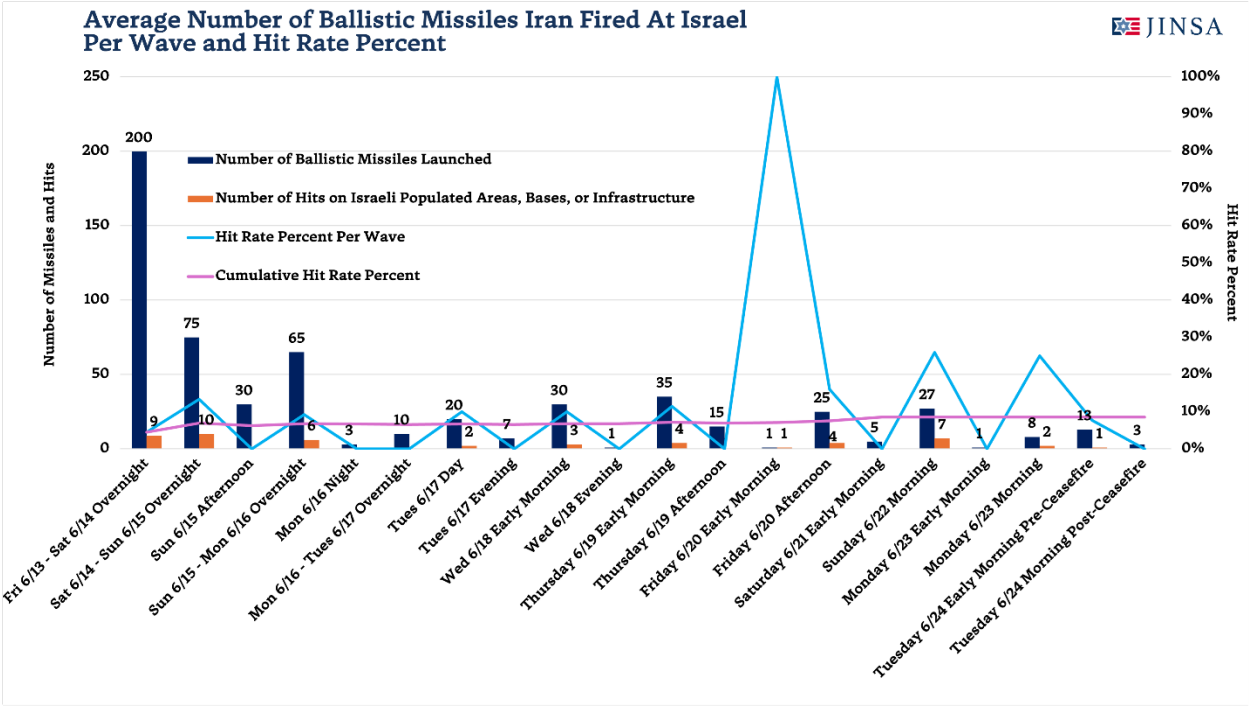


D. Iran's Attacks Demonstrated Vulnerabilities in Existing Air Defenses

Although IAMD was highly effective, Iran's attacks revealed weaknesses in current air defenses. During the conflict, Iran's missile attacks killed at least 31 people and injured over 3,000, demonstrating the immense and escalatory human cost that even a limited number of successful strikes can inflict.[28] Despite defensive successes, Iran's ability to adapt and periodically penetrate Israeli airspace with advanced missiles underscored persistent vulnerabilities in air defense coverage. Military planners were concerned that, had the war continued, unresolved pressure on interception systems could have resulted in even greater risks to Israeli cities and critical infrastructure. Since Israel had already struck most of its target list by the time that U.S. President Donald Trump abruptly announced the ceasefire that ended the war, the ongoing depletion of munitions and a steady stream of Iranian strikes, with the growing risks of homeland damage and potential for lost aircraft, drove a strong desire among Israeli officials to end the war because further fighting offered diminishing returns for mounting costs and danger.

i. Iranian Attacks Occasionally Overwhelmed Air Defenses

Similar to its playbook during its April and October 2024 attacks against Israel, Iran began the recent war by launching concentrated missile barrages to saturate Israeli airspace, aiming to overwhelm and confuse Israeli and U.S. air defense systems. By launching a high volume of missiles simultaneously, Iran sought to exploit any potential gaps in defensive coverage, banking on the premise that some weapons would slip through even the most robust shield. This approach achieved a few successful hits against Israel early in the war, including a strike that hit the Kirya, the IDF's headquarters in Tel Aviv, on June 13, and attacks that killed seven people in the first two days of the war. Ultimately, these large attacks became unsustainable as Israeli operations degraded Iran's MRBM launch capabilities and were not as effective as its later adaptation to focus on targeting civilian locations.[29]

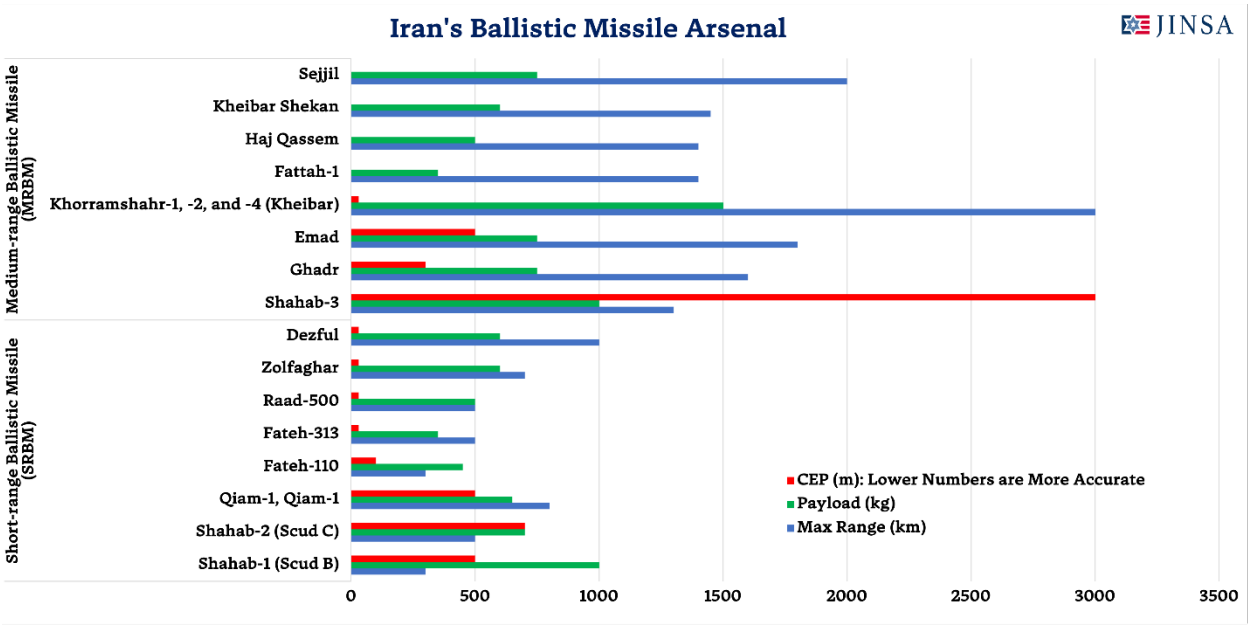


ii. Iran Pierced Air Defenses Through Tactical Adaptation

Adapting to mounting losses, Iran shifted what missiles it launched, where it targeted, when it fired, and how many missiles it used in each attack. Iran's more frequent and smaller waves starting on June 18 achieved higher hit rates than its earlier attacks. Launching more frequent but smaller missile attacks, coupled with the use of longer-range, heavier, and more precise missiles, enabled Iran to sneak projectiles past robust air defense systems. By targeting critical infrastructure and densely populated urban centers, Iran not only inflicted greater physical and psychological damage but also tested the limits of defensive capabilities. This shift from a primarily counter-force strategy, focused on military targets, to a greater emphasis on attempting to exhaust Israel's resilience placed unprecedented stress on air defenses.

a. Shifting to Longer Range, Heavier, and More Advanced Missiles Inflicted Greater Damage

Coinciding with this shift in firing fewer missiles per wave, Iran turned to using its longer-range, more accurate, heavier payload missiles and cluster munitions. This enabled Iran to inflict greater damage on Israel with fewer missiles and fire from further east, after Israel degraded launch capabilities in western Iran. While the majority of the ballistic missiles that Iran launched were likely Ghadr (1,600 km range, 750 kg payload) and Emad (1,800 km range, 750 kg payload) MRBMs, Iran may have also fired the Kheibar Shekan (1,450 km range, 600 kg payload), Sejjil (2,000 km range, 750 kg payload), and Khorramshahr-4 (3,000 km range, 1,500 kg payload), Iran's longest range, highest payload, and likely most accurate missile.[30] Iran's use of solid-fueled Kheibar Shekan and Sejjil missiles may have also made air defense more difficult because solid fuel burns throughout the flight, enabling mid-air maneuvers that reduce speed to make it more difficult to predict trajectories and conduct interceptions.



b. Targeting Israeli Infrastructure and Cities Increased Destruction and Casualties

While Iran began the war by prioritizing Israeli military targets, a similar targeting strategy to the April and October 2024 attacks, it quickly shifted to targeting infrastructure and Israeli population centers. By shifting its focus, Iran was able to hit key targets, such as the Haifa natural gas refinery. In the later stages of the war, Iran then proceeded to focus on targeting cities that it had achieved success at striking, including repeated attacks against the southern Israeli city of Be'er Sheva. Iran's decision to target civilian population centers during the 12-Day War significantly amplified the human toll of the conflict. In comparison to the seven deaths from June 13-14, Iran killed 17 Israelis from June 15-16. While Iran caused no further fatalities until the end of the war, it is notable that the Iranian attacks with the highest hit rates all occurred toward the end of the war when it was focusing on targeting civilian sites.

By directing missile and drone barrages at densely populated urban areas, Iran favored striking where the potential for casualties was highest. Unlike during Iran's October attacks that primarily targeted IDF bases—where authorities could sometimes evacuate and allow limited strikes—in this conflict, with missiles aimed at population centers, Israel had no choice but to intercept a far greater proportion to prevent civilian casualties and widespread destruction. Many of these areas, including Tel Aviv and Haifa, also host key military installations that Iran was likely trying to strike. This shift in strategy overwhelmed air defense systems and strained emergency response networks, resulting in higher fatalities and widespread trauma. The deliberate targeting of cities marked a clear escalation in Iran's approach and underscored the growing risks to non-combatants. While Israeli law since 1951 has required new residential buildings to have shelters, 56 percent of homes in the country lack one, particularly in Arab areas.[31] Occasional glitches in Israel's early warning notification system to civilians early in the war meant that several missile strikes caught civilians off guard, providing little to no warning before impact and compelling Israeli authorities to adjust the alert protocol.[32]

iii. Disruption, Not Only Physical Damage, Was a Key Form of Warfare

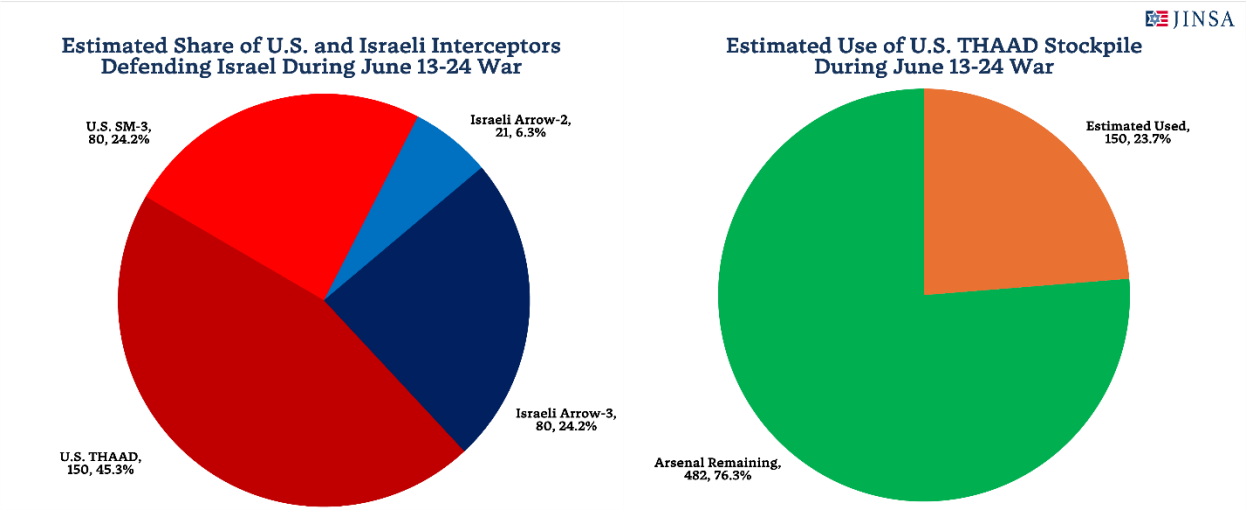
After three days of Iran primarily launching large overnight barrages, Iran began launching a series of smaller attacks over a longer portion of the day that created continuous disruption. In doing so, Iran was able to fire fewer total missiles per attack, exposing fewer launchers to counterattacks, while simultaneously forcing Israel to exhaust a greater number of interceptors that needed to protect civilians. Having quickly lost the ability to control its own airspace and stop IAF sorties, as the conflict wore on, Iran adapted its tactics, beginning to stagger its attacks into the early morning and daytime hours to heighten disruption and psychological strain on Israeli society. The persistence and unpredictability of these attacks not only tested the resilience of Israeli air defenses but also sought to exhaust the population and disrupt every aspect of ordinary life. Over time, this tactical evolution—moving from concentrated overnight strikes to unpredictable waves—enabled Iran to pressure Israel's defensive systems while increasing societal disruption with fewer overall missile launches. By alternating the tempo and timing of its strikes, Iran was able to maximize disruption and force Israelis—military and civilian alike—to remain in a perpetual state of readiness.

iv. High Interceptor Use May Signal IAMD and Air Defense Deficiencies

While U.S. air defenses bolstered the IDF's capacity to defeat Iranian attacks, JINSA estimates that U.S. interceptors may have accounted for almost 70 percent of all interceptors used defending Israel during the war. While this does not directly reflect how many Iranian missiles each country targeted or stopped—due to multiple interceptors being fired at a single missile—the use of numerous U.S. interceptors

demonstrated Israel's significant reliance on U.S. air defense support. Absent this level of U.S. involvement, Israel would have had to further expend Arrow interceptors or potentially face more casualties and destruction. The situation underscores the need to replenish and expand air defense inventories, while also highlighting strategic risks and deterrence implications for future conflicts with adversaries like Iran, Russia, China, or North Korea. U.S. missile defenses may not be sufficient against the increasing threat of these countries' numerous ballistic missiles.

The United States reportedly used over 150 THAAD "Talon" interceptors, roughly 25 percent of all its THAAD stockpile. The United States will only receive 12 Talon interceptors this year and is set to acquire 37 in 2026.[33] The United States could restock in roughly 1.5 years if Lockheed Martin devotes its entire production capacity of up to roughly 100 per year to the effort, but this would upset delivery to foreign partners who have ordered them, like the 360 that Saudi Arabia has ordered.[34] Although the plan never materialized, U.S. officials reportedly considered redirecting Talon interceptors that the United States had already delivered to Saudi Arabia to Israel, a sensitive issue given risks to Saudi cities and oil sites.[35] U.S. ships also fired roughly 80 SM-3 missiles, each costing $8-$25 million depending on the variant, at Iranian threats. The high number of interceptors that U.S. Navy ships used also underscored that the United States lacks a reliable capability to reload interceptors at sea, requiring vessels to return to port for rearmament instead of staying in combat areas.[36] If Iran were to launch a surprise attack in the coming months, Israel could face acute vulnerability given the potential shortage of interceptors, and the depletion of U.S. interceptor stocks could lead Washington to reconsider the extent of U.S. involvement in defensive operations in order to conserve remaining interceptors.



v. U.S. Interceptors May Suffer from Weaker Performance than Israeli Platforms

A partial reason for high U.S. interceptor usage may have been a need to use more of them to ensure interceptions. U.S. air defense systems, such as THAAD, may have exhibited lower interception rates than Israel's Arrow platforms, according to JINSA data, raising questions about relative effectiveness in high-intensity missile engagements.[37] Iran's large-scale missile campaign may have revealed vulnerabilities in air defense systems, providing lessons that Iran or other U.S. adversaries could exploit in the future. Although officials who spoke with JINSA indicated that U.S. systems performed better in June 2025 than October 2024, when the United States fired 12 ship-launched interceptors at Iranian missiles but succeeded in striking only 6, issues may remain with the performance of U.S. air defense platforms that either required launching more of them or resulted in failed interceptions.[38]

vi. The Ongoing Arms Race with Iran

The conflict between Israel and the United States on one side and Iran on the other has evolved into a high-stakes arms race. Iran's likely efforts to rebuild production and capacity for missile launchers and stockpiles need to fuel rapid advancements in missile defense for the United States, Israel, and America's regional partners. Based on IDF estimates, Iran's missile stockpile diminished from 2,500 missiles pre-conflict to between 1,000-1,500 missiles, and the IDF degraded its launcher capacity from nearly 500 to roughly 100 launchers.[39] Iran decreased its fire against Israel throughout the war, as a result of Israel's degradation of its launchers and likely to preserve its remaining missile and launcher arsenal for future conflicts. Iran also maintains a considerable supply of short-range ballistic missiles that can reach Arab nations and U.S. forces deployed in the region, as it demonstrated during the Al Udeid attack. This preserved capacity means that the threat remains and that Iran can launch further strikes if future hostilities erupt, a danger that will only get worse as it seeks to rebuild its lost arsenal. As Iran reconstitutes its strength, Israel and the U.S. face mounting pressure to continually upgrade their air defense systems, increase interceptor inventories, and innovate in response to more concentrated and unpredictable missile volleys. The timing of the next war and the outcome of it will hinge on which side can best evolve its capacity and capabilities for both offensive and defensive operations.

If Iran had possessed a larger and more advanced missile arsenal, as it had planned to build before Israel began Operation Rising Lion, any conflict would likely have been prolonged and far more lethal. Iran was planning to increase its missile stockpile by 220 percent over two years from the 2,500 medium-range ballistic missiles it had in its arsenal when the IDF began Operation Rising Lion to 4,000 missiles by March 2026 and 8,000 by 2027.[40] Israel's decision to take preventative action in June reduced Iran's ability to build a larger arsenal or rearm its proxies. However, if Iran's missile capacity increases, it could launch more missiles and drones over a longer period, leading to greater damage and casualties.

vii. U.S. Middle East Bases and Gulf Partners Remain More Vulnerable Than Israel

Notably, near the war's end, the United States struck Iranian nuclear sites on June 22, triggering Iran to fire 14 ballistic missiles at U.S. forces in Qatar. Iran's attack against Al Udeid did not involve IAMD coordination as only U.S. forces defended against it, but the inherent vulnerabilities to U.S. partners near Iran offer critical lessons for air defense cooperation. Israel's advanced, multi-layered air defense systems and strategic partnership with the United States offer it a stronger defensive position against Iran compared to Gulf nations. Geographic distance also gives Israel more time to respond to threats. In contrast, Gulf states such as the United Arab Emirates, Saudi Arabia, and Qatar are nearer to Iran, leaving them and deployed U.S. forces with less response time. Gulf nations also have limited missile defense capabilities against Iranian attacks. While Iran launched a limited attack on a single U.S. facility on June 23, General Kenneth "Frank" McKenzie, former CENTCOM commander and a JINSA distinguished fellow, detailed in a report on U.S. basing in the Middle East that these bases would not remain viable in a large extended fight.[41] Iran's demonstrated willingness to target bases in the region has amplified this threat.

When Iran retaliated after the U.S. strikes on its nuclear facilities by targeting U.S. forces deployed to the Al Udeid Air Base in Qatar, it telegraphed its attack and only launched a minimal number of missiles. Although U.S. Patriot batteries at the Al Udeid Air Base launched roughly 30 interceptors that neutralized 13 of the 14 SRBMs Iran fired, during what Chairman of the Joint Chiefs of Staff General Dan Caine called "the largest single Patriot engagement in U.S. military history," one missile hit and damaged a $15 million communications dome at the facility.[42] Without clear signs of an Iranian attack, the United States would have had less time to respond, reducing its ability to intercept or seek shelter.

Given Al Udeid's proximity to Iran and the heightened vulnerability it faced during the conflict, the United States replicated the functions of the Combined Air Operations Command at Shaw Air Force Base in South Carolina. Considering the risks to Al Udeid and the United States eventually evacuating almost all its personnel from the base, Shaw became a critical hub for fusing IAMD sensor data, ensuring all partners had a common operating picture, and coordinating air operations throughout the war.

IV. Recommendations

The June 2025 war between Israel and Iran represented a watershed moment for air defense in the Middle East. This conflict again tested the limits of current IAMD capabilities, force posture, and interception capabilities. The United States should leverage this success to transition from a temporary partnership to a permanent, institutionalized regional IAMD framework. To confront evolving threats, the Trump administration and Congress should also reinforce IAMD by connecting it to broader regional cooperation efforts, conducting proactive operations to prevent Iran from rearming, signaling support for IDF actions, enhancing partner capabilities, and investing in innovative air defense technologies and stockpiles.

A. Trump Administration

To address these challenges and strengthen U.S. and partner security in the region, the Trump administration should formalize the IAMD network, support it with a clear willingness to use offensive military force, and expand regional security cooperation. Public support for IDF operations and measures to prevent Iran from rearming, while enhancing U.S. and partner interception capabilities, remains critical.

i. Formalize the Middle East IAMD Network

Focused U.S. political leadership remains necessary to guide the transition from a temporary IAMD partnership to a formal, standing Middle East IAMD network. The Trump administration should lead negotiations for joint planning and permanent intelligence-sharing agreements that integrate participant radar and sensor feeds into a real-time common operational picture shared across the IAMD network. The central U.S. role in fusing and safeguarding IAMD sensor data remains indispensable in reassuring regional partners. Their willingness to join depends on their trust in U.S. leadership and impartial stewardship, often exceeding their confidence in one another. As efforts progress toward a formalized IAMD framework, expanding conferences of senior regional military leaders and air commanders to include political leadership will be essential, since the transition to a fully integrated system will require critical political decisions and consensus at the highest levels.

ii. Connect IAMD with a Strategy for Broader Regional Security Cooperation

Expanding IAMD should coincide with broader regional cooperation initiatives, especially involving cyber, maritime security, and counterterrorism. These domains remain deeply interconnected. Air and missile threats often exploit vulnerabilities in digital infrastructure, target critical maritime routes, or support extremist networks. As countries work together to strengthen IAMD capabilities, they will continue to build essential trust through communication networks, shared technologies, joint planning, and coordinated defense exercises. When partners trust each other's intentions and abilities, they are more willing to share intelligence, coordinate strategies, and collaborate on cyber, maritime, and counterterrorism challenges.

iii. Support IAMD with a Strategy of Proactive Offensive Operations

To ensure enduring security in the region, the United States must integrate its support for IAMD with a dynamic strategy of proactive offensive operations. No matter how advanced, attacks can strain defensive measures, particularly when adversaries employ saturation tactics or novel attack methods. Therefore, the

United States should pair robust IAMD capabilities with the readiness and resolve to conduct preemptive and retaliatory strikes if Iran or its proxies choose to escalate.

iv. Signal Support for Future Israeli Operations

Beyond a willingness to conduct its own military strikes, the Trump administration should make clear—publicly and privately—that it supports future preemptive or retaliatory Israeli strikes on Iranian military or nuclear assets. This message should be coupled with diplomatic efforts to ensure Iran understands the United States will have unwavering support for Israel and will be prepared to again join another round of fighting. Diplomatic efforts should also ensure U.S. partners understand that such operations are essential to regional security.

v. Prevent Iran from Rearming or Proliferating Weapons

The strikes on Iran's nuclear and missile infrastructure delayed, but did not eliminate, its ability to threaten the region. Iran's proxies remained mostly inactive, with the Houthis launching six projectiles at Israel and Iran-backed groups conducting six attacks on U.S. forces in Iraq and Syria. Iraqi Prime Minister Mohammed al-Sudani claimed that Iraqi forces prevented 29 more attacks but did not specify whether those were targeting Israel or U.S. forces.[43] However, both Iran and its proxies retain capabilities that could again threaten U.S. forces, Israel, or other American partners in the Middle East.

The Trump administration should lead a coordinated campaign using the full spectrum of U.S. diplomatic, intelligence, military, and economic power to prevent Iran from rebuilding its missile stockpiles, particularly long-range and precision systems. This includes interdicting arms shipments, pressuring suppliers like China, Russia, or North Korea, sanctioning procurement networks, and maintaining aerial surveillance of known development sites. Washington should collaborate with Middle East and European partners to stop Iran from supplying or producing weapons in Lebanon, Syria, Iraq, and Yemen.

vi. Review Adequacy of U.S. Naval and Air Presence in the Middle East

The conflict highlighted the vital role of U.S. rotationally deployed assets—especially Aegis-equipped destroyers and long-range airpower—in countering Iran's missile and drone barrages. While the expanded U.S. force posture in the region is not viable as a lasting solution because of competing priorities in other regions, the need to surge the large number of forces that the United States deployed during the war is also not sustainable for the long term. While Israel has weakened Iran's capabilities, the Trump administration should assess CENTCOM's force posture to determine what can be reduced and what must remain to deter future Iranian actions. This includes, for the foreseeable future, ensuring at least one THAAD battery in Israel and an Aegis guided-missile destroyer in the Eastern Mediterranean. Stationing a U.S. destroyer in Israel or Greece, as JINSA suggested in 2020, would help facilitate a long-term regional presence.[44] Additionally, strengthening multilateral training initiatives and conducting more frequent exercises would foster interoperability and bolster the operational readiness of regional IAMD networks.

vii. Review Performance of Air Defense Interceptors

A thorough review of the performance of U.S. and Israeli air defense interceptors during the conflict is essential to identifying any systemic or technical vulnerabilities. Despite the effectiveness of these platforms in blunting attacks, the sheer volume of missiles exposed stress points, ranging from interceptor depletion rates to potential gaps in coverage during attacks. Systematic evaluation of real-world engagement data and sensor integration will be crucial in diagnosing weaknesses and guiding targeted investments for upgrades. Carefully reviewing these operational lessons allows the United States and its partners to adjust defenses, address vulnerabilities, and prepare for new threats.

viii. Develop "Golden Dome" Space-based Interception Capability

With missile threats growing, the Trump administration's Golden Dome initiative offers a chance for the United States to revise its missile defense strategy. Traditional ground- and air-based defenses have become insufficient on their own for current and future needs. Along with expanding space-based intelligence, new technology now enables necessary space-based interception capabilities.[45] Developing interceptors that launch from platforms already in space would improve the ability to destroy ballistic missiles in their post-boost and midcourse phases before they re-enter the Earth's atmosphere. This would also put interceptions further away from targets, reducing the likelihood of destruction or casualties from falling debris.

ix. Expand Arab Partner Capabilities

The Trump administration should collaborate with Congress to streamline foreign military financing and foreign military sales processes. The United States should prioritize platforms essential to CENTCOM's IAMD, but as the IDF's operations demonstrated, enabling partners to target launch capabilities is vital for defense. The Trump administration has already taken steps to improve this process through an executive order in April to improve speed and accountability of weapons transfers, and the administration should emphasize expanding regional air defenses.[46] The United States should ensure IAMD participants have secure data-sharing infrastructure, expand regional sensor coverage, and prioritize sales of air defense platforms. To strengthen the IAMD network and encourage more nations to join, the United States should create a faster procurement process for participating countries. As part of efforts to enhance Arab capabilities, the United States could work to incorporate Israel's experience and missile defense systems into a broader regional framework.

x. Expand Basing in Israel and Western Middle East

Iran's June 23 missile attack highlighted the vulnerability of the Al Udeid Air Base in Qatar, along with CENTCOM's other forward operating bases in the Gulf, and the need to pursue new basing agreements further west in the Middle East. Given that Israel lies further from Iran and possesses a highly advanced, multi-tiered air defense system, expanding the U.S. military footprint in Israel would provide greater security. Increasing U.S. forces and resources in Israel would enhance joint training, streamline logistics, improve coordination on contingency plans and intelligence sharing, and demonstrate a strong U.S. commitment to regional security that strengthens readiness against threats from Iran.

B. Congress

To further strengthen regional security and U.S. military readiness, Congress should mandate a comprehensive lessons learned report, require CENTCOM to develop a detailed plan for formal IAMD operations, expand funding for replenishing air defense interceptor stockpiles, and support innovative manufacturing and next-generation defense technologies.

i. Mandate a Lessons Learned Report

Congress should task CENTCOM with producing a formal after-action report assessing the 12-Day War, including analyzing the effectiveness of existing U.S. and partner air defense systems, gaps that Iran's missile attacks exposed, and opportunities for deeper regional integration. This report should evaluate sensor interoperability, interceptor performance, and the efficacy of pre-war deterrence efforts. While the U.S. Army is preparing to issue an air defense strategy this fall that considers lessons learned from the Middle East and Ukraine, the U.S. Department of Defense will also need to develop an inter-service and multinational approach, considering the diverse means that the United States used during the 12-Day War.[47]

ii. Require CENTCOM Develop IAMD Concept of Operations (CONOPS)

Congress should require that CENTCOM develop an ambitious but realistic concept of operations (CONOPS) for a formal Middle East IAMD, which defines its structure, participants, capabilities, and operational framework. The CONOPS should identify force structure requirements, joint data-sharing protocols, layered defense configurations, and command relationships under various wartime scenarios—including direct Iranian attacks, proxy strikes, and multi-theater contingencies. This plan should also clarify how partner capabilities can be operationally integrated, especially Gulf and Israeli assets.

iii. Expand Funding for Air Defense Interceptor Replenishment and Stockpiles

The June conflict saw unprecedented rates of U.S. and Israeli interceptor use in under two weeks by Israel's Iron Dome, David's Sling, and Arrow systems, as well as U.S. Standard Missiles, THAAD, and Patriot interceptors. To ensure strategic endurance, the United States must be able to sustain prolonged air defense operations without depleting interceptor inventories at a rate that would exhaust several years' worth of production. Notably, the U.S. Missile Defense Agency awarded a $2.06 billion contract modification to produce THAAD Talon interceptors on July 28, an important but inadequate step to meet the scale and urgency of emerging threats.[48] Congress should respond to this operational reality by significantly increasing appropriations to replenish interceptor stockpiles, expand those stocks baseline levels, build redundant production facilities, and ensure the ability to surge production capacity in the event of future conflicts. Additionally, the United States should prioritize expanding funding for the co-production of the next evolution of Israel's proven air defense platforms, including Arrow-4, Arrow-5, and Iron Dome-2 systems.

iv. Support Innovative Air Defense Means and Manufacturing

In addition to replenishing current interceptor stockpiles, Congress should appropriate robust funding for the research, development, and deployment of next-generation interception capabilities. Congressional funding should support co-development and co-production of innovative, cost-efficient systems, such as space-based interceptors and advanced directed energy air defense systems. To further enhance readiness, Congress should fund joint efforts with Israel and other partners for innovative manufacturing processes and advanced technologies that increase the speed, scalability, and cost-effectiveness of interceptor production, ensuring a robust and sustainable supply in times of crisis. Efforts should also focus on designing missiles that can be more easily reloaded onto ships at sea and developing naval platforms that facilitate the easier loading of existing missiles onto the current fleet so that U.S. ships can stay in the fight for longer. Through increased funding for air defenses, Congress can directly empower the United States and its partners to maintain resilient and adaptive regional security in the face of future global threats.

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