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Vladimir Putin and Kim Jong Un during a visit by the Russian President in North Korea on June 19, in a photograph released by Russian state media. Photographer: Vladimir Smirnov/Sputnik/AFP/Getty Images

# Putin, Kim and the \$4 Trillion Threat on Cold War's Last Frontier

South Korea is a semiconductor factory built on top of a geopolitical fault line. War is a very low probability. If it does break out, the human and economic cost would be devastating.

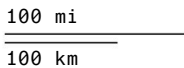
July 28, 2024



The human toll would be staggering. Semiconductor shortages would snarl supply chains worldwide. And the global economy would slide into recession.

The odds of an all-out war between North and South Korea are very low, but they aren't zero. Vladimir Putin's embrace of Kim Jong Un in Pyongyang last month – the Russian leader's first visit to North Korea in 24 years – revived a Cold War partnership and produced a new defense pact, adding another risk in a world already shaken by the war in Ukraine and China's threats to Taiwan.

A full-scale conflict on the Korean Peninsula could leave millions dead and cost the global economy \$4 trillion in the first year, or 3.9% of GDP – more than double the damage from Russia's assault on Ukraine, according to analysis by Bloomberg Economics.



When war broke out between North and South Korea in 1950, together they accounted for less than 0.4% of global GDP. Today, South Korea

alone accounts for more than 1.5%. And even that higher number underrepresents its importance to key supply chains.

The Seoul metropolitan region — within range of Kim's artillery — is home to about 26 million people, roughly half of South Korea's population.

The capital and surrounding areas account for 81% of South Korea's chip production and 34% of its total manufacturing output.

Those goods are shipped through southern ports including Busan – the fourth busiest in the world – to customers in China, Japan, Europe and the US.

Sources: US Defense Intelligence Agency; Center for Strategic and International Studies; WorldPop; Statistics Korea; Bloomberg SPLC Global Data; International Trade Centre; PortWatch; Global Maritime Traffic Density Service; Bloomberg Economics calculations

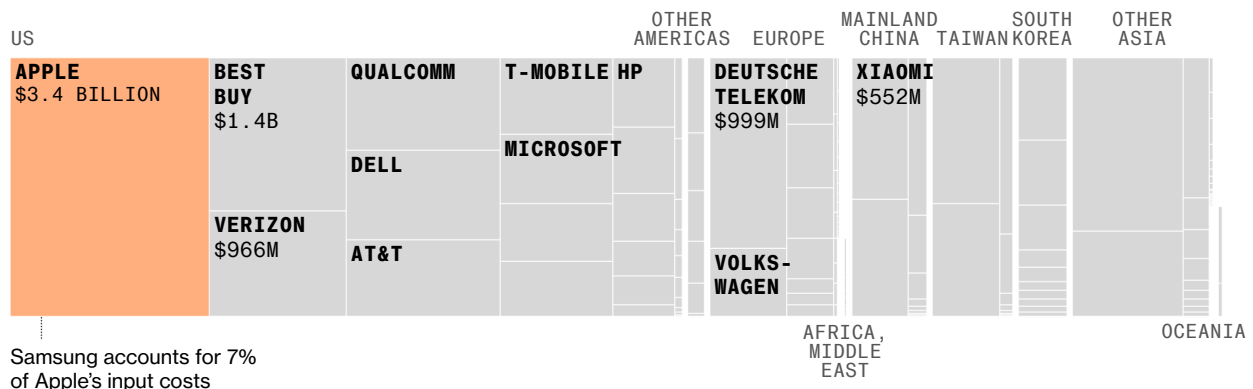
Note: Estimated MRL and SRBM ranges based on distances from Kaesong, an area close to the Demilitarized Zone where North Korea has massed artillery.

Like Taiwan, South Korea’s role as a major chip producer means its importance to the global economy goes beyond the size of its GDP.

Samsung Electronics – among the world’s top 30 firms by market capitalization – produces 41% of the world’s DRAM chips and 33% of NAND memory chips. Its products are crucial inputs for companies from Apple Inc. to the Chinese smartphone maker Xiaomi Corp.

**Some of the World’s Biggest Companies Depend on Samsung**

Samsung Electronics’ revenue from selected customers, most recent reported quarter

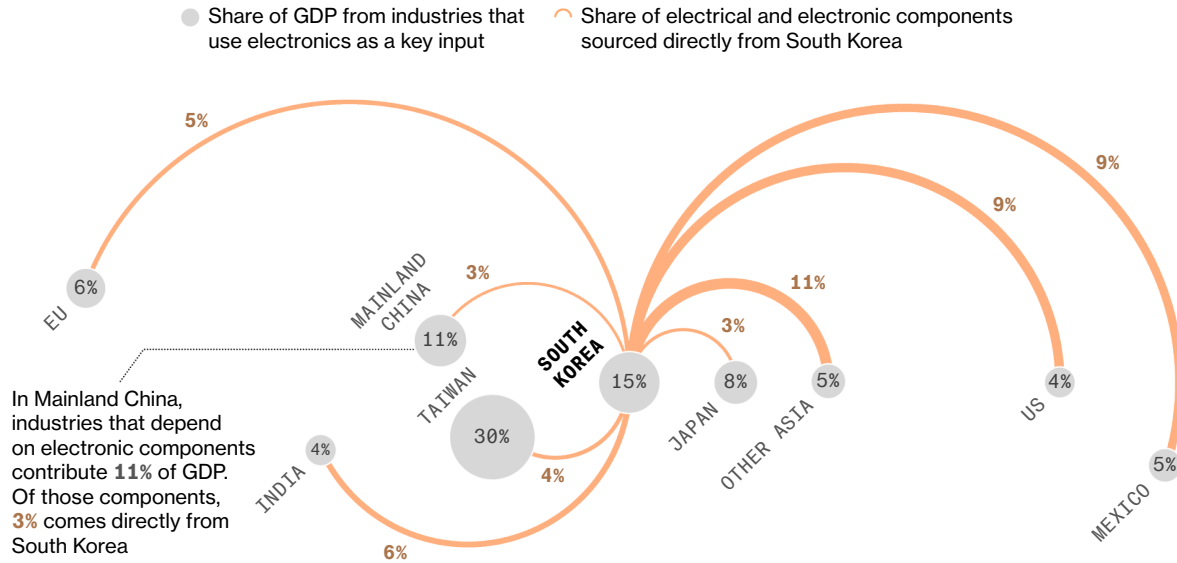


Source: Data compiled by Bloomberg from company disclosures or other publicly available sources  
 Note: Data as of July 24.

If South Korean electronics exports are halted, that would send a shock across the global economy. South Korea produces 4% of all electronic components used in factories worldwide, and around 40% of all memory chips. In 2022, sectors like electronics and autos that use semiconductors as a crucial input, accounted for 30% of GDP in Taiwan, 11% in China and 8% in Japan.

### South Korea Is Crucial Link in the Electronics Supply Chain

Exposure to industries that depend on electronic components and reliance on South Korea for those components, major trade partners



Source: Bloomberg Economics analysis of Asian Development Bank data (2022)

## COLD WAR DÉJÀ VU

As the US backs NATO’s expansion and shores up alliances in Asia, it’s facing off against adversaries tied together by formal and informal pacts, armed with an array of conventional and nuclear weapons, and underpinned by the world’s most powerful industrial base.

Ukraine – engaged in trench warfare with Russian troops that are firing North Korean munitions, and backed by a Made-in-China war economy – is experiencing the bloody consequences. Beyond Europe, Taiwan is in the crosshairs as China steps up military pressure.

Putin’s pact with North Korea, along with Kim’s recent threats to “annihilate” his southern neighbor, have laid bare the risks facing South Korea.

As the tectonic plates of the global order shift, few economies are more exposed. The border it shares with North Korea – the old Cold War’s last frontier – is one of the most heavily armed on the planet. Partnership with Russia threatens to accelerate Pyongyang’s nuclear capability.





Vladimir Putin and Kim Jong Un visit the Vostochny Cosmodrome in the Amur region of Russia on Sept. 13, 2023, in a photograph released by Russian state media. Photographer: Vladimir Smirnov/Sputnik/AFP/Getty Images

Already this year, the 40-year-old Kim has tested his southern neighbor with brief border incursions and fired artillery near a disputed island where North Korea launched a deadly bombardment in 2010.

Wi Sung-lac, South Korea's nuclear envoy from 2009 to 2011 and now a lawmaker with the opposition Democratic Party, said the chances of a skirmish on the Korean Peninsula in the years ahead were around 30% – and any clash had the potential to escalate into a broader conflict.

“I would call it the most serious situation since the collapse of the Soviet Union,” Wi said in an interview in Seoul. “Some sort of encounter could lead to small-arms fire, and that leads to machine-gun fire and artillery fire.”

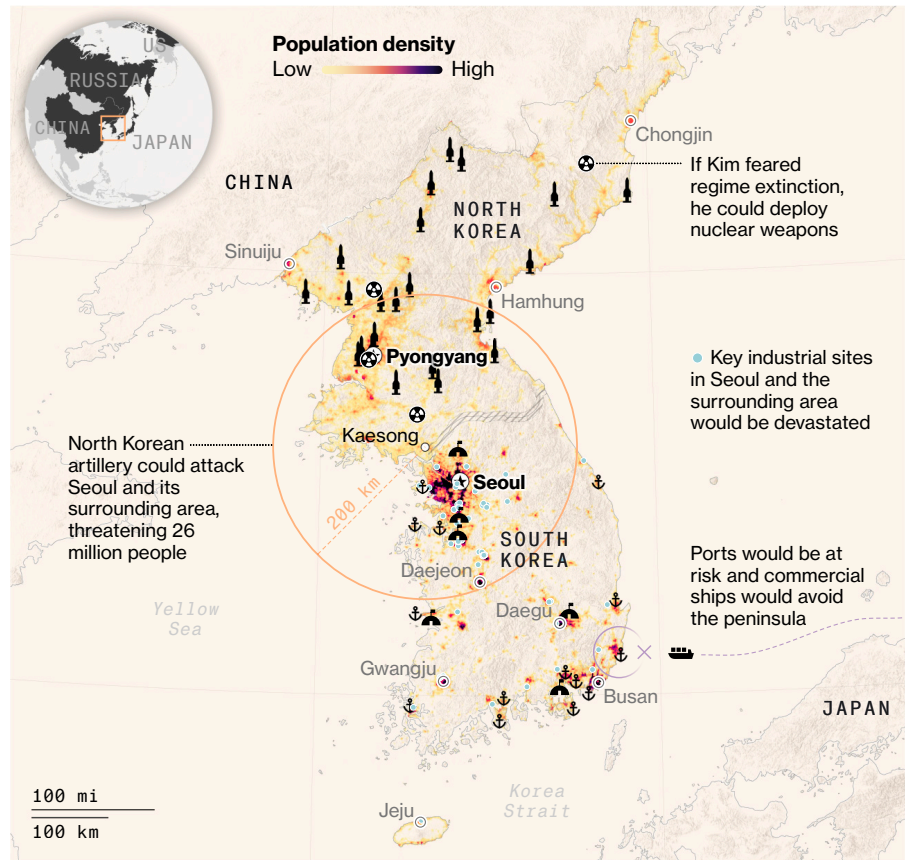
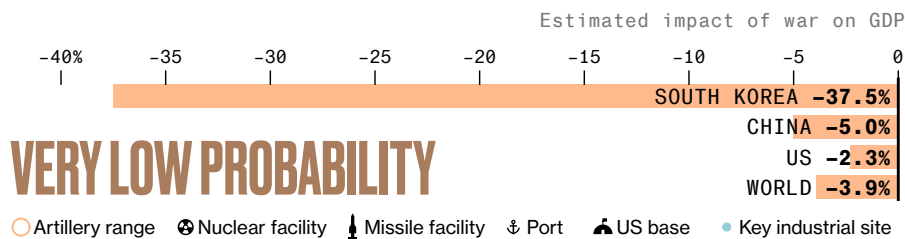
## SCENARIO: WAR

An all-out war would likely involve a North Korean artillery barrage on key military, political and economic targets in Seoul. In recent months, Kim has tested weapons that would be used in a first-wave strike, including precision artillery rockets that could destroy semiconductor manufacturing facilities within 70 kilometers (43 miles) of the border, as well as short-range ballistic missiles that can fly some 250 kilometers.

If Kim perceives an existential threat to his regime, he could launch a nuclear attack. A study from the Seoul-based Korea Institute for Defense Analyses last year said North Korea is estimated to have about 80 to 90 warheads – enough to attempt nuclear strikes on South Korea, Japan and even the US.

All told, close to half of South Korea’s manufacturing and most of its semiconductor capacity could be destroyed. Nearby shipping lanes to China, Russia and Japan would also be disrupted.

With the US and China likely to line up on opposite sides of the conflict – as they did in the Korean War – trade between the world’s economic superpowers would face new barriers. Global markets would plummet.

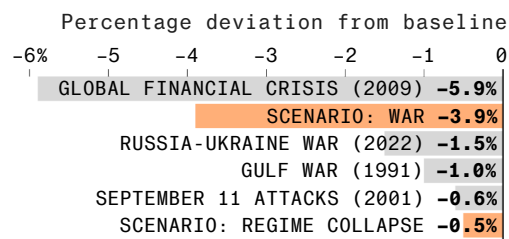


Sources: Nuclear Threat Initiative; The James Martin Center for Nonproliferation Studies; Military OneSource; DIA; CSIS; PortWatch; Bloomberg SPLC Global Data; WorldPop  
 Note: “Key industrial sites” are Samsung and SK Hynix factory locations.

Plugging those shocks into a suite of models, Bloomberg Economics estimates the impact on GDP after a year:

- South Korea's economy is devastated, shrinking by 37.5% as industrial output and exports crater.
- Missing semiconductors from South Korea, a drop in trade with the US and disruptions to shipping add up to a 5% blow to China's GDP.
- Further from the action, and with a services-dominated economy, the US is relatively insulated. Still, chip shortages and plunging markets mean a 2.3% of GDP blow.
- Global GDP is down 3.9%. Southeast Asia, Japan and Taiwan – dependent on South Korea's chips and vulnerable to maritime disruptions – take the biggest hit.

#### Impact of Recent Crises and Korea Scenarios on Global GDP



Source: Bloomberg Economics estimates

The Bloomberg Economics exercise is unique in bringing together geopolitical and economic modeling expertise. Still, the results are significantly driven by the scenario assumptions, and the band of uncertainty is wide.

A limited war that leaves a higher share of South Korea's industrial base intact would have a smaller impact. One that brings US and Chinese troops face to face, and sees North Korea's missiles striking a broader set of targets, could be even more costly.

## SHIFTING ENVIRONMENT

War remains a low-probability outcome – not least because it would almost certainly result in Kim's demise. The North Korean leader has said he needs nuclear weapons to deter the US from seeking to oust him, and almost every war scenario ends with him being toppled and his country in ruins.

“Kim is rational enough to not be suicidal,” said Lami Kim, a professor of security studies at the Daniel K. Inouye Asia-Pacific Center for Security Studies.

Despite war, famine and poverty, Kim family rule has persisted for more than 75 years, and there’s been no major conflict on the peninsula since the Korean War armistice in 1953. The most likely scenario in the years ahead is that North Korea’s regime will endure, and tensions will be persistent but manageable.



People visit Mansu Hill to pay their respects to former leaders Kim Il Sung and Kim Jong Il on the 30th anniversary of the death of Kim Il Sung, in Pyongyang, North Korea, on July 7. Photographer: Jon Chol Jin/AP

Still, North Korea today is in a much stronger position than in the early 2000s, when the US, China, Russia, South Korea and Japan all participated in six-party talks aimed at peacefully seeking to end Pyongyang’s nuclear ambitions.

Now Kim has a stockpile of nuclear weapons, Moscow is aligned with North Korea, and China and the US are in a protracted geopolitical struggle. Russian technology could further improve the range and reliability of North Korea’s missiles – increasing the possibility of success if he ever wants to threaten New York, Los Angeles or another major US city with a nuclear strike.

Another presidential term for Donald Trump, who in 2017 threatened to wipe out North Korea with “fire and fury” before sitting down for a face-to-face meeting with Kim, could add a new and volatile component to the mixture. Trump has been vocal in questioning whether the US should continue paying to underwrite global security, while also meeting three times with Kim.

“President Trump’s background is from real estate business, the peculiar characteristic is that it’s usually a one time deal,” said Kim Gunn, South Korea’s nuclear envoy from May 2022 to February 2024. “State-to-state relationship is different because this is a repeat game.”

Trump’s policy toward South Korea could lead to shifts in joint military exercises, deployment of US strategic assets, and the 28,500 US troops currently stationed in the country. If he were to show signs of abandoning the long-time US ally, South Korea would see calls increase to obtain its own nuclear weapons.



Kim Jong Un and Donald Trump during a break in talks at the US-North Korea summit in Singapore in 2018. Photographer: Anthony Wallace/AFP/Getty Images

## SCENARIO: REGIME COLLAPSE

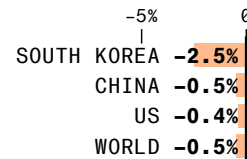
War isn’t the only path to crisis on the Korean Peninsula: The collapse of Kim’s regime is another potential scenario.

North Korea’s history of internal turmoil, the concentration of power on a single leader with health issues and the short path from grinding poverty to political instability means it’s a real – if unlikely – possibility. The nation’s annual GDP per capita of about \$590 is among the lowest in the world, positioning it among the ranks of instability-wracked countries like Sudan and Yemen.

An immediate imperative for the US, South Korea and China if the Kim regime imploded would be securing North Korea’s nuclear weapons. That could lead to a confrontation between troops from the US and South Korea and those from North Korea and China, which would do whatever it took to prevent an American-backed power on its doorstep.

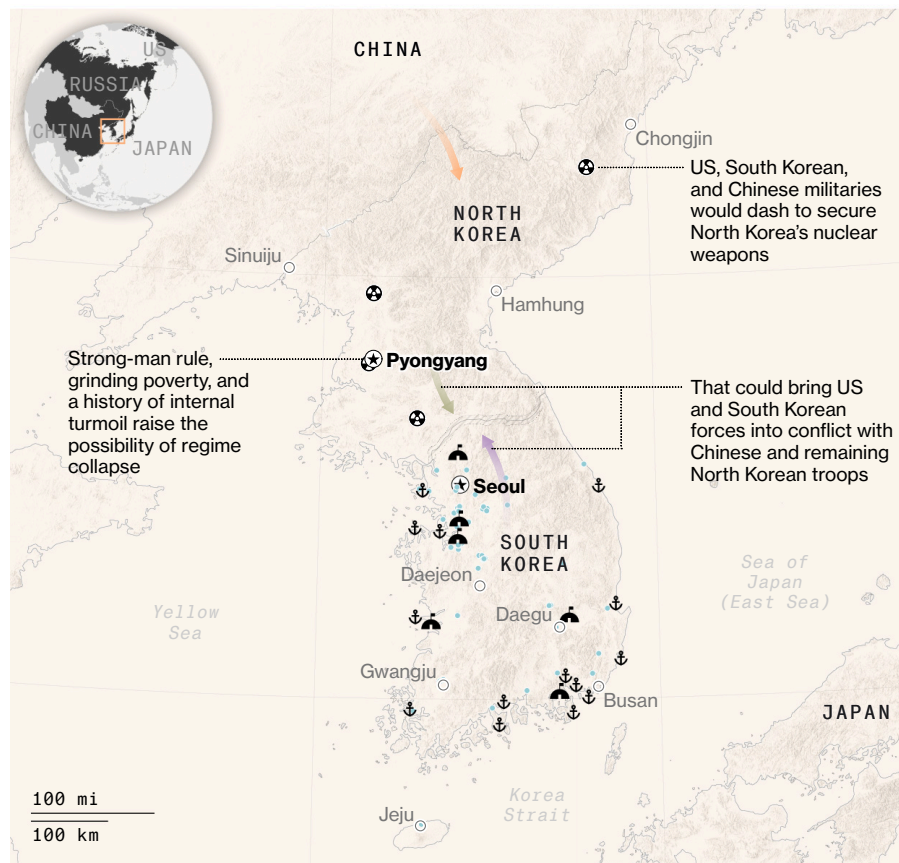
In this scenario, Bloomberg Economics estimates South Korea takes a 2.5% hit to GDP as disruptions to industrial production and deteriorating sentiment take a toll. With the loss of South Korea’s output small enough to be largely offset by amping up production elsewhere, China, the US and global GDP drops 0.5%, 0.4% and 0.5%, respectively.

Estimated impact of regime collapse on GDP



# LOW PROBABILITY

☢ Nuclear facility   ⚓ Port   🇺🇸 US base   • Key industrial site



Sources: NTI; CNS; CSIS; Military OneSource; PortWatch; Bloomberg SPLC Global Data

Kim Gunn, the former nuclear envoy, views the situation as tense but stable, with neither side having an incentive to escalate. “North

Korea knows that they cannot win,” he said. “We know that even though we will win it will come with a heavy cost.”

Even with the chances of conflict very low, Kim Gunn says South Korea is prepared for any eventuality. For a world economy dependent on South Korea’s semiconductors as a crucial link in the electronics supply chain, there isn’t a plan B.

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## Methodology

Bloomberg Economics estimates of the impact of war and regime collapse are based on use of a suite of models to gauge the impact of four shocks:

- A blow to South Korean semiconductor and broader manufacturing output as factories within range of North Korea’s artillery are destroyed.
- A hit to South Korean, Chinese, Russian and Japanese trade as ports and shipping routes within range of North Korean missiles are disrupted.
- A trade shock as the US and its allies and China line up on opposite sides of the conflict and impose new barriers on exports.
- A financial shock as risk assets sell off.

Scenario (probability)	Main modeling assumptions, year one	GDP impact, year one
War (very low)	<ul style="list-style-type: none"> <li>• 40% cut in all South Korean manufacturing, 80% in semiconductors production</li> <li>• 70% cut in South Korean trade globally; 27% reduction in China’s trade and 14% reduction in Russia and Japan’s trade globally</li> <li>• 50% cut in US–China trade; 10 ppts. increase in tariffs between US allies and China</li> <li>• 40-point spike in VIX</li> </ul>	<ul style="list-style-type: none"> <li>• South Korea: –37.5%</li> <li>• China: –5.0%</li> <li>• US: –2.3%</li> <li>• World: –3.9%</li> </ul>
Regime collapse (low)	<ul style="list-style-type: none"> <li>• 10% cut in South Korean manufacturing, 20% in semiconductors production</li> <li>• 10% cut in South Korean trade globally; 5%, 4%, and 2% reduction in China, Japan and Russia’s trade globally, respectively</li> <li>• 10% cut in US–China trade; 5 ppts. increase in tariffs between US allies and China</li> <li>• 15-point spike in VIX</li> </ul>	<ul style="list-style-type: none"> <li>• South Korea: –2.5%</li> <li>• China: –0.5%</li> <li>• US: –0.4%</li> <li>• World: –0.5%</li> </ul>

The impact of the semiconductor shortage is assessed using OECD Trade in Value Added data for 2018. We first assess direct disruptions to sectors using semiconductors as an input. We also use OECD input-output data to estimate the spillover impact on other sectors — for example, the impact on metal output if production of automobiles

slows.

Our estimates of the geographical origin of semiconductors production are based on analysis of planned production capacity at the end of 2024 by Bloomberg Intelligence. We assume some capacity of other countries to ramp up chip production, and that large customers can realign production to work around some of the missing inputs.

We simulate the disruptions to regional shipping and ports based on the ranges of missiles that North Korea likely has in large numbers. This is a proxy for the geographic conflict zone risk as perceived by firms. We overlaid those ranges with ports based on IMF PortWatch data and then estimated how much trade would be affected for economies in that risk zone.

Trade shocks are assessed using the WTO Global Trade Model (GTM) (Aguar et al, 2019). The GTM is a recursive computational general equilibrium model based on the GTAP model (version 7) (Corong et al, 2017). We shock tariffs and non-tariff measures, including as a proxy for sanctions and export controls.

In the war scenario, we assume tariffs between China and the US allies are raised by 10 percentage points. In the regime-collapse scenario, we assume a 5 percentage-point increase.

Financial shock impacts are estimated following a structural approach based on the Bayesian Global VAR model (Bock, Feldkircher and Huber, 2020).

The impact of war and regime collapse on South Korea is estimated separately based on the gross value added by industry. In the war scenario, we assume that most industries in South Korea lose 40-50% of their output, while output in public administration, defense and social security, health and social work increase 50%. In the regime-collapse scenario, we assume a 10% loss in manufacturing, a 5% decrease in wholesale and retail trade, and a 10% rise in public administration, defense and social security output.



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July 17, 2024



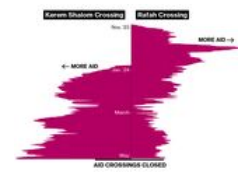
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