

Wargaming Urban Conflict

Working Paper

My Wargaming Urban Conflict Working Papers are short papers that probably don't merit peer review yet, but which contain information which will hopefully be of interest to the wargaming and urban conflict community, and which I can publish in a more timely way than through a journal. Any comments are welcome as are pointers to any errors and omissions. More information on my PhD in Wargaming Urban Conflict is at <http://www.taunoyen.com/phd> and you can contact me at david@burden.name.

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Civilians in Urban Warfare
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Introduction

This working paper collects relevant information and statistics on factors relating to the civilian population of urban areas during wars, particularly Large Scale Combat Operations. The initial factors considered are Death Rates and Internally Displaced Persons rates, but later versions will also include data on Casualty Rates and other pertinent factors.

Death Rates

That military conflicts usually result in civilian deaths is undeniable. The Centre for Civilians in Conflict considers that *"In cities — where 55 percent of the world's population currently resides — civilians account for 90 percent of the casualties during war."* (CIVIC, n.d.). Table 1 shows the estimated civilian deaths from recent conflicts, and dates to before the most recent conflicts in the Ukraine and Gaza (Khorram-Manesh et al., 2021).

Conflict	Period	Total deaths	Civilian deaths	Civilian death rate
Korean War	1950-1953	2,238,172	1,658,436	74%
Vietnam War	1965-1974	1,353,000	627,000	46%
Persian Gulf War	1990-1991	162,341-232,541	142,000-206,000	87%-88%
Balkan War	1991-2001	130,000-140,000	72,716	52%-56%

2nd Intifada	2000-2007	5,848	3000	51%
Afghanistan	2001-2019	157,052	43,571	28%
Pakistan	2001-2019	66,063	24,107	36%
Iraq	2003-2019	276,363-308,212	184,737-207,511	66%-67%
Syria/ISIS	2014-2019	179,424	49,852	28%
Yemen	2002-2019	90,072	12,069	13%
Ukrainian	2014-2019	13,117-13,496	3,367	25-26%

Table 1: An Estimate of the Number of Civilian Casualties in Modern Armed Conflicts. Source: Khorram-Manesh et al. (2021).

Figure 1 show a similar analysis by the Guardian up to May 2025 (Graham-Harrison & Abraham, 2025).

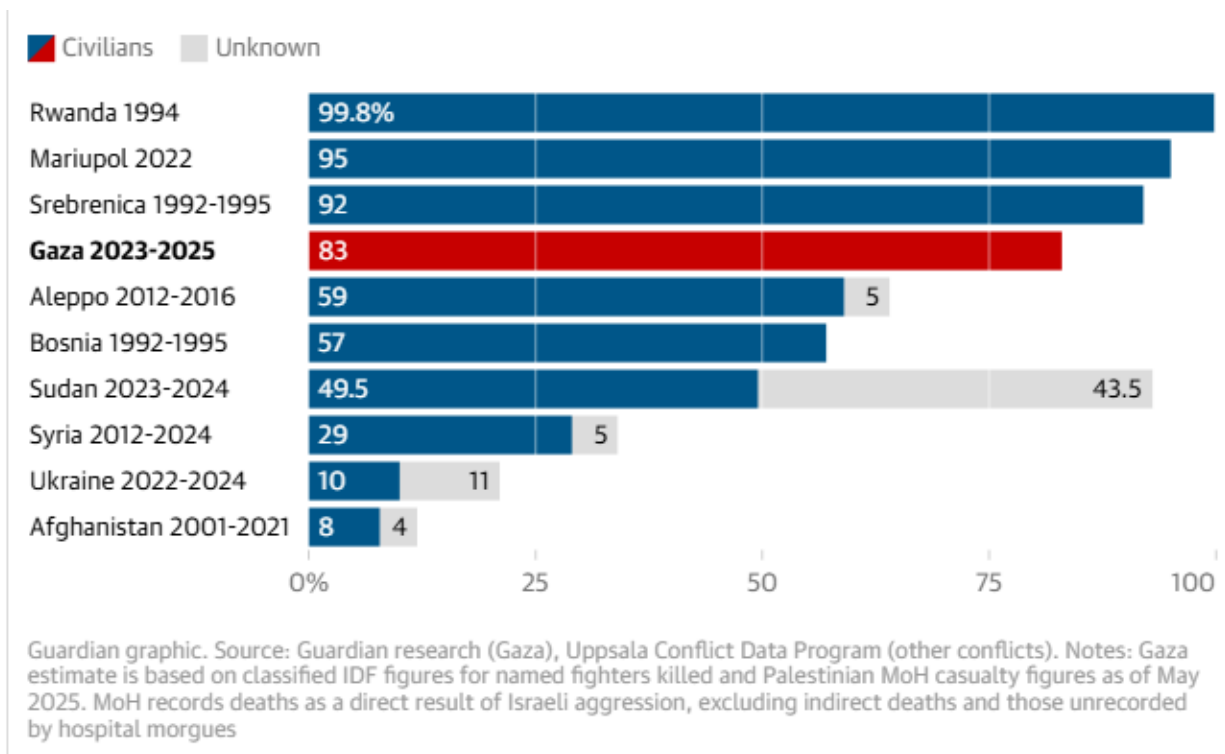


Figure 1: Estimated civilian death rate in selected conflicts (Source: Graham-Harrison and Abraham, 2025)

In terms of the current (2025) conflicts, civilian deaths in the Ukraine are estimated at over 14,000 to September 2025, with over 36,000 injured (Janowski, 2025). In Mariupol, the largest urban battle of the war so far, there were around 8,000 civilian dead (Human Rights Watch, 2024) and about 90% of the city was destroyed (Yerushalmy, 2023). Civilian fatalities in Gaza have been estimated at around 66,000 (Mehvar & Khmour, 2025), and wounded at around 160,000 (El-Taji et al., 2025) but civilian deaths attributable to the conflict could be well over 186,000 (Khatib et al., 2024).

Internally Displaced Persons

It is also useful to know, particularly for wargaming purposes, how many civilians are likely flee from the fighting as Internally Displaced Persons (IDP), or more colloquially refugees. How many will remain in an urban area as it becomes the focus for conflict, and particularly how many might still be there once the street-fighting starts? One source, based on multiple case studies suggests that the percentage of the population who stay may be around 10% (Spencer & Blank, 2025), but this is very unpredictable and context dependent.

Even according to the ICRC there appear to be no heuristics as to how much of the civilian population might flee an impending urban battle since it is so case by case dependent (Stewart, 11 Jul 23). Civilians often have a preference to stay, especially to protect their own property, but if the battle lines are more clear-cut, and there is a clearer route to safety, then that may encourage them to leave (Kaelin, 3 Aug 23). As fighting becomes more intense, and if there is knowledge that refugees will be treated well, then this is likely to increase the number of refugees, and decisions to flee are often taken at a family rather than individual level (C. Baudot, personal communication, 17 Aug 23).

Kilcullen and Pendleton report that whilst 98% of the population of Marawi fled the city during the conflict there in 2017 (of a base of c.200,000), only 44% (of a base of 1.8m) were able to flee Mosul prior to the end of the 2016/17 assault (Kilcullen & Pendleton, 2021).

The current (2024) conflict in the Ukraine is yielding some valuable data in this regard – although of course it may be context specific. By late 2022 there were an estimated 6-7 million Ukrainian refugees and a similar number of IDPs (Lawson et al., 2023). Table 2 consolidates data from Wikipedia pages for a variety of Ukrainian urban areas, and shows their pre-2022 war population, populations reported prior to any ground assault (pre-battle population), population during/immediately after the ground assault (battle population) and population after cessation of hostilities in the location (post-battle population). Some of the current reportage provides an insight in to the experiences of those staying behind (Hill, 2025).

Battle	Dates	Pre-War Population	Pre-Battle Population	Battle Population	Post-Battle Population
Mariopul	Feb22 – May22	425,000			80-120,000
Sievierodonetsk	May22 - Jun22	99,000		10,000	
Lysychansk	May22 - Jul22	93,000		12,000	
Kherson	Aug22 - Oct22?	279,000			66,000
Bakhmut	Oct22 - Mar23	71,000	20,000 (May22)	4,000 (Mar23)	500 (May 23)
Avdiivka	Feb23 - Feb24	31,000		1,000 – 1,600	941
Chasiv Yar	Dec23 - now	12,000		600	
Vovchansk	May24 - now	17,000		300	0?
Toretsk	Jun 24 - now	31,000	5,000 (Jul24)		20
Pokrovsk	Sep24 - now	60,000	15,000	7,000 (Jan 25) 1,500 (Jul 25) 1,200 (Dec 15)(1)	
Vuhledar	Sep 24 - Oct 24	14,000		500 (Feb23)	
Velyka Novosilka	Mar 22 – Jan 25	5,235			335
Kostyantynivka	May 25 – now	67,350	15,000 (Feb 25)	8,500 (Jul 25) 5,200 (Nov 25)	
Sloviansk (Note: fought over in 2014)	Imminent (Oct 25)	141,066 (2001) 105,141 (2022)	24,000 (Jul 22) 40-50,000 (Apr 23)		
Kramatorsk	Imminent (Oct 25)	147,145			

Table 2: Population changes as a result of urban conflict. Source: Wikipedia entries for each

city/battle, as of Oct 25. (1) = *Guardian* 3/12/25.

Note also that given the timescales and changing foci of the fighting some cities, such as Sloviansk and Kramatorsk, saw people fleeing early in the conflict (McKernan, 2022) and then returning once the danger had passed (Hendrix & Korolchuk, 2023), only to possibly have to flee again as their cities come back into the danger zone.

References

Baudot, C. (17 Aug 23). *Interview by David Burden with Caroline Baudot, ICRC* [Personal communication].

CIVIC. (n.d.). Urban Warfare. *Center for Civilians in Conflict*. <https://civiliansinconflict.org/our-work/conflict-trends/urban-warfare/>

El-Taji, O., Ali, A., Alser, O., Ghali, A., Jomaa, A., Sultan, M. J., Irfan, B., Jafar, A., Qandil, M., Jeelani, A., Darwish, A., Mokhallalati, A., McMonagle, M., Rose, V., Mamode, N., Khan, S., Maynard, N., Nott, D., & Chai, A. S. (2025). Patterns of war related trauma in Gaza during armed conflict: Survey study of international healthcare workers. *BMJ*, 390, e087524. <https://doi.org/10.1136/bmj-2025-087524>

Graham-Harrison, E., & Abraham, Y. (2025, August 21). Revealed: Israeli military's own data indicates civilian death rate of 83% in Gaza war. *The Guardian*. <https://www.theguardian.com/world/ng-interactive/2025/aug/21/revealed-israeli-militarys-own-data-indicates-civilian-death-rate-of-83-in-gaza-war>

Hendrix, S., & Korolchuk, S. (2023, February 18). Thousands of civilians fled Ukraine's front lines. These people returned. *The Washington Post*. <https://www.washingtonpost.com/world/2023/02/18/evacuation-returnees-ukraine/>

Hill, D. (2025, November 10). Don's Weekly, 10 November 2025: Part 2 [Substack newsletter]. *Sarcostosaurus*. https://xxtomcooperxx.substack.com/p/dons-weekly-10-november-2025-part-161?utm_medium=email

Human Rights Watch. (2024, February 8). *Counting the Dead: Documenting Loss in Mariupol, a Ukrainian City Besieged and Devastated*. Human Rights Watch. <https://www.hrw.org/feature/russia-ukraine-war-mariupol/counting-the-dead>

Janowski, K. (2025, September 10). *Civilian Casualties Remain Alarming High as Short and Long-Range Weapons Devastate Lives Across Ukraine, UN Human Rights Monitors Say*. United Nations Ukraine. <https://ukraine.un.org/en/301284-civilian-casualties-remain-alarming-high-short-and-long-range->

weapons-devastate-lives, <https://ukraine.un.org/en/301284-civilian-casualties-remain-alarmingly-high-short-and-long-range-weapons-devastate-lives>

Kaelin, D. (3 Aug 23). *Interview by David Burden of David Kaelin, ICRC* [Interview]. Author's Personal Archive.

Khatib, R., McKee, M., & Yusuf, S. (2024). Counting the dead in Gaza: Difficult but essential. *The Lancet*, 404(10449), 237–238.

Khorram-Manesh, A., Burkle, F. M., Goniewicz, K., & Robinson, Y. (2021). Estimating the number of civilian casualties in modern armed conflicts—a systematic review. *Frontiers in Public Health*, 9, 765261.

Kilcullen, D., & Pendleton, G. (2021). *Future Urban Conflict, Technology, and the Protection of Civilians*. Stimson Center. <https://www.stimson.org/2021/future-urban-conflict-technology-and-the-protection-of-civilians/>

Lawson, B., Glasman, J., & Mützelburg, I. (2023). Humanitarian Numbers in the Russian–Ukrainian War: An Interview with Irina Mützelburg (October 2022). *Journal of Humanitarian Affairs*, 5(1), 52–61. <https://doi.org/10.7227/JHA.102>

McKernan, B. (2022, April 13). 'I had blood all over me': Kramatorsk station attack survivors face long road to recovery. *The Guardian*. <https://www.theguardian.com/world/2022/apr/13/i-had-blood-all-over-me-kramatorsk-station-attack-survivors-face-long-road-to-recovery>

Mehvar, A., & Khdour, N. (2025). *Gaza after two years: As Israel expands control and sows chaos, Hamas adapts to survive*. Armed Conflict Location & Event Data. <https://acleddata.com/report/gaza-after-two-years-israel-expands-control-and-sows-chaos-hamas-adapts-survive>

Spencer, J., & Blank, L. (2025, February 28). *Urban Warfare Project Podcast: Siege Warfare and Civilian Evacuations - Modern War Institute*. <https://mwi.westpoint.edu/siege-warfare-and-civilian-evacuations/>, <https://mwi.westpoint.edu/siege-warfare-and-civilian-evacuations/>

Stewart, R. (11 Jul 23). *Interview by David Burden with Ruben Stewart, ICRC* [Interview]. Author's Personal Archive.

Yerushalmy, J. (2023, April 28). Mariupol before and after: Updated Google maps reveal destruction in Ukraine city. *The Guardian*. <https://www.theguardian.com/world/2023/apr/28/mariupol-before-and-after-updated-google-maps-reveal-destruction-in-ukraine-city>