

# Visual Thinking in International Relations: Interactive Digital Maps, Spatial Conflict Dynamics, and Diverse Narratives

Annette Idler, Jota Samper, and Katerina Tkacova  
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## Supplementary Files

### Table of Contents

<i>Conceptualizing Armed Conflict</i> .....	2
<i>The IDM Process</i> .....	4
<i>Case Descriptions</i> .....	5
Armed Conflict in Colombia.....	5
Armed Conflict in the Lake Chad region .....	7
Armed Conflict in the Horn of Africa.....	10
Armed Conflict in Myanmar .....	12
Armed Conflict in Syria and Iraq .....	14
Note on Islamic State (IS).....	17
<i>Cross-stakeholder Forum Methodology</i> .....	17
<i>Interview Data</i> .....	18
<i>Software</i> .....	18
<i>Data Availability</i> .....	19
<i>Application to Interstate War – Russia’s Invasion of Ukraine</i> .....	19
<i>List of Figures and QRs for IDMs</i> .....	22
<i>References</i> .....	25

## Conceptualizing Armed Conflict<sup>1</sup>

We use Idler and Tkacova (2024, 3)’s conceptualization of armed conflict as a “dynamic multi-actor setting of organized violence with one or more contested issues between two or more conflict actors resulting in deaths”. Conflict actors are “organized state or non-state groups that use lethal violence to advance their position in relation to a conflict’s contested issue” (Idler and Tkacova 2024, 3). *Multi-actor* conflicts involve multiple violent nonstate and/or state actors. The contested issue is the main guiding principle to determine which conflict actors are included in the conceptualization of armed conflict.<sup>2</sup>

Actors are involved in a conflict when they directly participate in conflict events such as battles. We use the Uppsala Conflict Data Program (UCDP)’s definition of conflict events as “[a]n incident where armed force was used by an organised actor against another organized [sic] actor, or against civilians, resulting in at least 1 direct death at a specific location and a specific date” (Högbladh 2020, 4).<sup>3</sup>

To map a given armed conflict’s violent events and thus operationalize armed conflict as a dynamics spatial unit, we follow the first three steps of the six-step logic outlined in Idler and Tkacova (2024, Appendix, 1-2) using data from the UCDP Georeferenced Event Dataset (GED) (Croicu and Sundberg 2018; Sundberg and Melander 2013), fieldwork interviews, the literature, and interviews with regional experts who conducted in-depth fieldwork. The first step concerns selecting an anchor conflict and other conflicts connected to this conflict via the mutation or spread mechanisms. The mutation mechanism connects conflicts over time: the original contested issue changes or a new contested issue adds to the conflict. This can occur when actors involved in conflict seem to change but only regroup under a new name. The spread mechanism connects conflicts across space: an actor or actors involved in a conflict move(s) to a new location and trigger(s) or escalate(s) a new conflict there that can have the same or a different contested issue.<sup>4</sup> The second step consists in identifying the conflict actors involved. The third step involves selecting all relevant conflict events. We then check for additional conflict events via the friction mechanism, which means that a conflict intersects substantively in time and space with the anchor conflict yet revolves around a different contested issue.

We build interactive digital maps (IDMs) of the conflicts’ spatial dynamism using ArcGIS online (maps), Infogram (bar plots), and JavaScript with amCharts templates (network graph), integrating them through ArcGIS story maps.<sup>5</sup> We rely on these IDMs throughout all steps as we continuously visualize conflict events and actors in the form of maps and network graphs to confirm that all relevant conflict actors and conflict events are identified. If necessary, we repeat the steps to operationalize our conceptualization of conflict in an iterative process after gaining new insights from the maps and from network graphs.

Take the example of the friction mechanism. If the presence of a conflict actor—through the conflict events in which this conflict actor is involved—substantively overlaps in time and

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<sup>1</sup> Please note that, while the article itself is original and has not been published elsewhere, some text of the sections “Conceptualizing Armed Conflict” and “Case Descriptions” of these supplementary files were previously published as supplementary material for Idler and Tkacova (2024).

<sup>2</sup> See Idler and Tkacova (2024), supplementary material, 1 for more details.

<sup>3</sup> See Idler and Tkacova (2024), supplementary material, 2 for more details.

<sup>4</sup> See Idler and Tkacova (2024), supplementary material, 1 for more details.

<sup>5</sup> They can also be built with tools such as R packages (e.g. shiny, plotly, leaflet).

space with the anchor conflict, yet the actor is not involved in contested issue(s) of that conflict, we assume that it may nevertheless affect the anchor conflict, both in terms of the actors involved and the conflict's impact on civilians. We therefore add this actor to the conflict for the year(s) in which such substantial overlap is observed.<sup>6</sup>

IDMs help examine such spatio-temporal overlap and assess which events should be included in the conflict (Idler and Tkacova 2024). In the case of the conflict in the Lake Chad region for instance, ethno-religious violence in Jos Plateau is often viewed as clashes between Christian and Muslim communities, not directly connected to the Islamist insurgency in northeast Nigeria. However, the IDMs reveal substantial overlap of conflict events involving farmers (predominantly Christians) and pastoralists (predominantly Muslims) with conflict events involving Boko Haram and the so-called Islamic State (IS). Indeed, Boko Haram and IS activities in central Nigeria have highlighted the religious component of the violence in Jos Plateau and contributed to blurring the distinction between jihadists and Muslims, enhancing the narrative as a wider conflict between Christians and Muslims (Higazi 2016a). We include the clashes via the friction mechanism, requiring substantial overlap in time and space with the conflict. Figure 1 depicts the spatial-temporal overlap. The red dots represent conflict events that are part of the conflict in the Lake Chad region. The yellow dots are conflict events between farmers and pastoralists that were added via the friction mechanism.



Explore IDM, Figure 1

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<sup>6</sup> Note that the final online visualizations of the network graph do not display actors added through the friction mechanism. These visualizations focus exclusively on actors involved in the anchor conflict or those incorporated via the mutation or spread mechanism. Actors added through friction are typically not connected to others through shared involvement in conflict events. Instead, they are included based on the geographic and temporal proximity of the events they participate in. In other words, these actors become part of the conflict not through direct interactions with other actors, but because of when and where the violence involving them occurs.

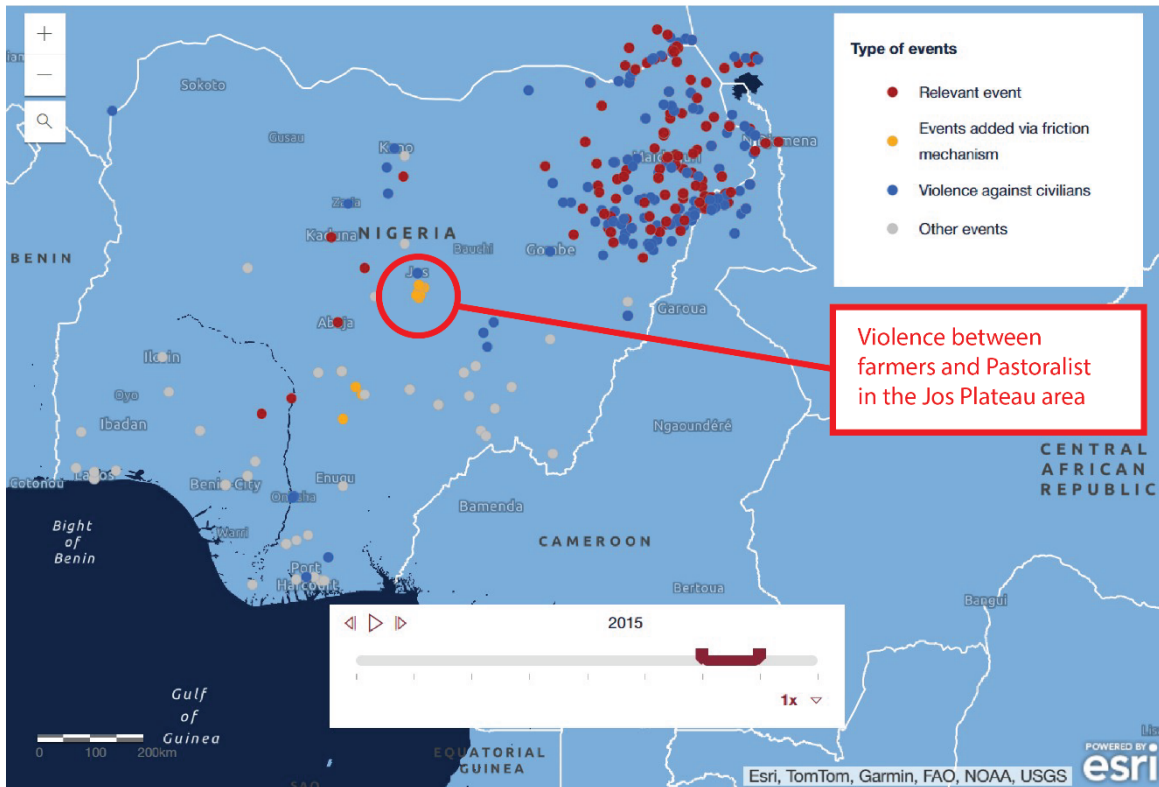


Figure 1. IDM of conflict events in the Lake Chad region in 2015. Source: The Changing Character of Conflict Platform. <https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform>. Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).

We use the events selected through the procedure described above for the IDMs featured in the article. We acknowledge that armed conflict also occurs in areas without conflict events and that it might manifest itself as uncertainty and perceived insecurity shaping the everyday lives of the civilian population. However, in this article, we limit our focus to mapping physical violence in the form of conflict events.

### The IDM Process

Figure 2 captures the general IDM process described in more detail in the article.

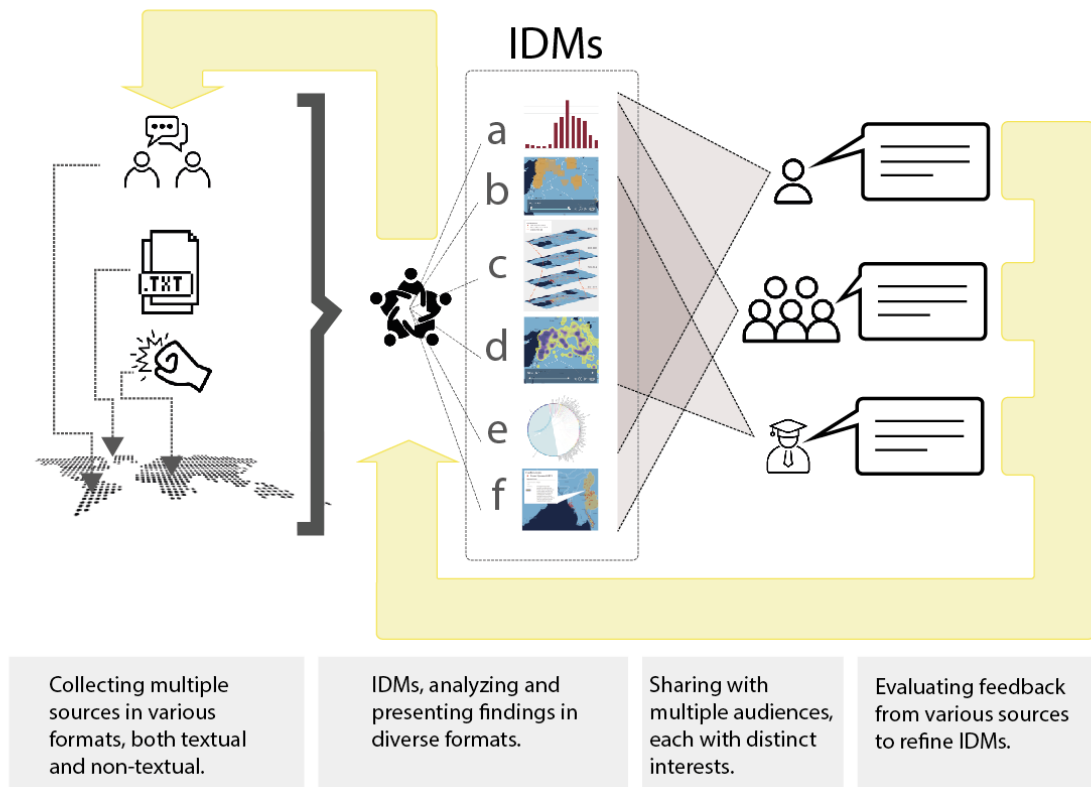


Figure 2: The Interactive Digital Map process

## Case Descriptions<sup>7</sup>

In what follows we briefly describe how our conceptualization maps onto each armed conflict discussed in the article. We also share additional interactive digital visualizations (IDVs) of these conflicts that complement the ones presented in the article and that we used in our research to better understand these conflicts as spatially changing social phenomena.

### *Armed Conflict in Colombia*

Anchor conflict: conflict between the Colombian government and left-wing guerrillas based on ideology, conflict actors, and events added via mutation mechanism (illegal drug trade component added to the ideological conflict).<sup>8</sup>

Analysis start date: 1989. While the beginning of the Colombian conflict is a matter of debate among academics, the conflict is possible to trace back at least to the 1950s. The UCDP GED data are available only for the period starting in 1989.

Analysis end date: 2022. The data cover the period up to and including 2022, although the conflict continued beyond that year.

Number of actors included: 12.

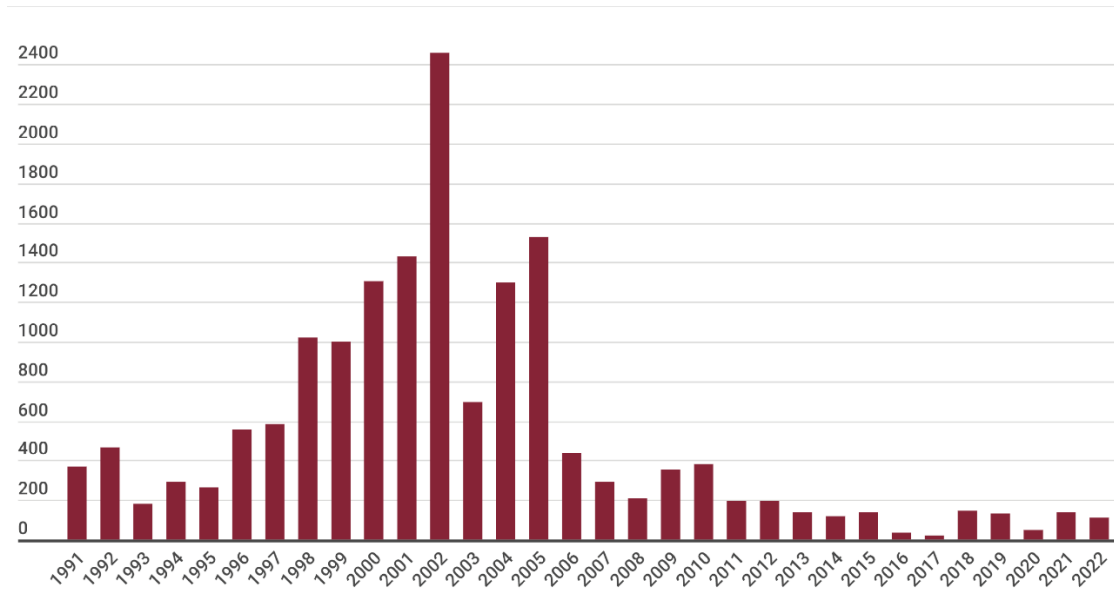
<sup>7</sup> For the underlying data see Zenodo, at <https://zenodo.org/records/18803832>.

<sup>8</sup> For more detailed discussions of the Colombian armed conflict see, e.g., Gray (2008), McDougall (2009), Safford and Palacios (2002), Sanín (2008), Felbab-Brown (2010).

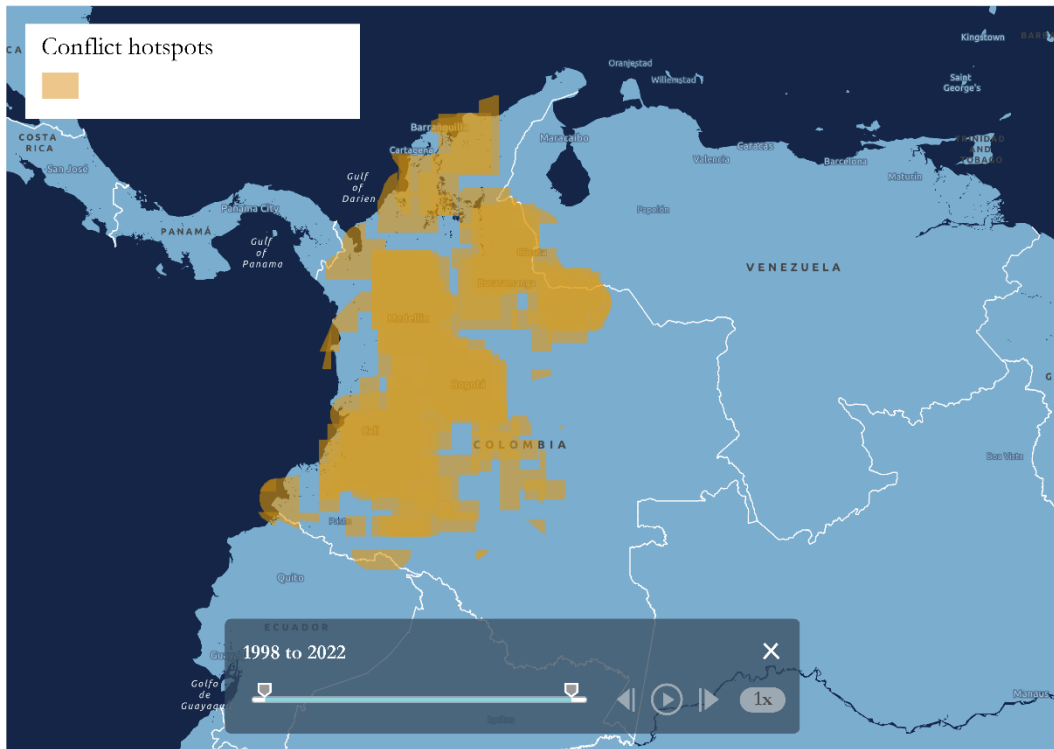


Explore IDVs, Figure 3.

a)



b)



c)

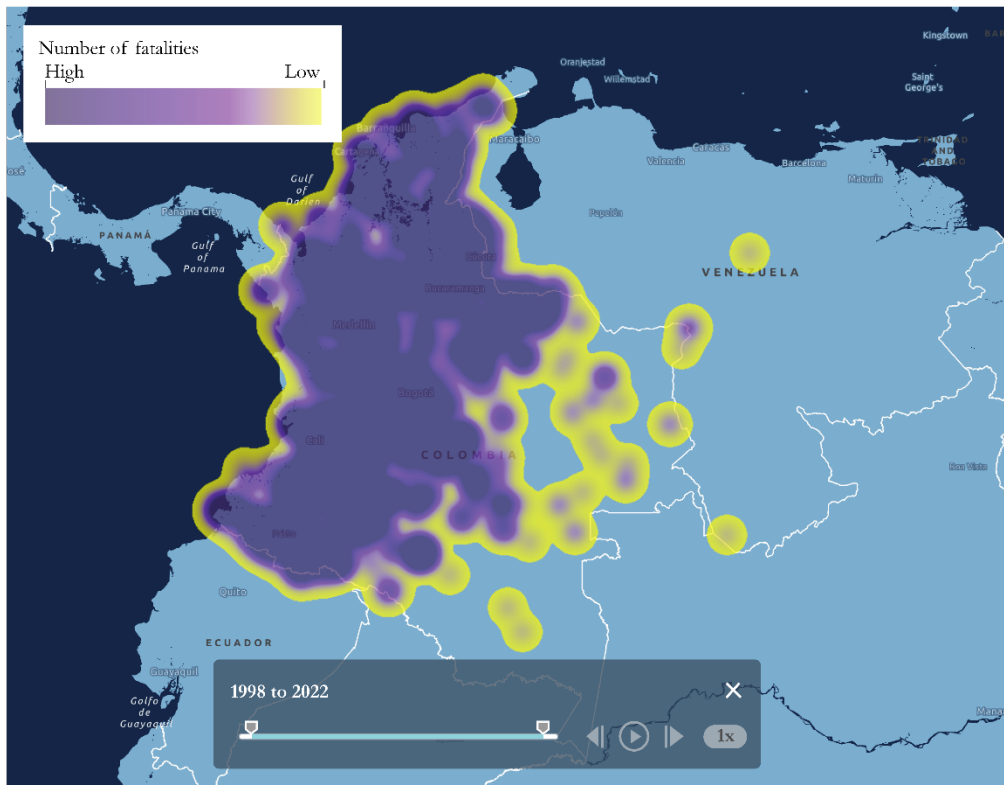


Figure 3. IDVs of the armed conflict in Colombia. a) Total number of fatalities per year caused by conflict events where only conflict actors are involved. b) Hotspots and spatio-temporal changes of the conflict. c) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform. <https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform>. Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).

Colombia's armed conflict started as a left-wing insurgency against Colombia's government in 1964, after bipartisan violence from 1948 to 1958. In the 1990s, the conflict mutated as the illicit drug trade became more central to the conflict. Left-wing guerrillas and paramilitary groups became involved in drug production and trafficking, providing them with financial resources. Thus, control over drug-related resources became a part of the contested issue that resulted in new actors such as drug cartels becoming intertwined with the Colombian conflict (Idler 2019).

#### *Armed Conflict in the Lake Chad region*

The anchor conflict: Islamist insurgency led by Boko Haram; conflict actors and events added via spread mechanism (across Nigeria's borders) and friction mechanism (overlap with farmer-pastoralist conflict in central Nigeria).<sup>9</sup>

Start date: 2009. While Boko Haram was founded in 2002 or 2003, they started using violence in 2009 (Hansen 2017).

Analysis end date: 2016. The data cover the period up to and including 2016, although the conflict continued beyond that year.

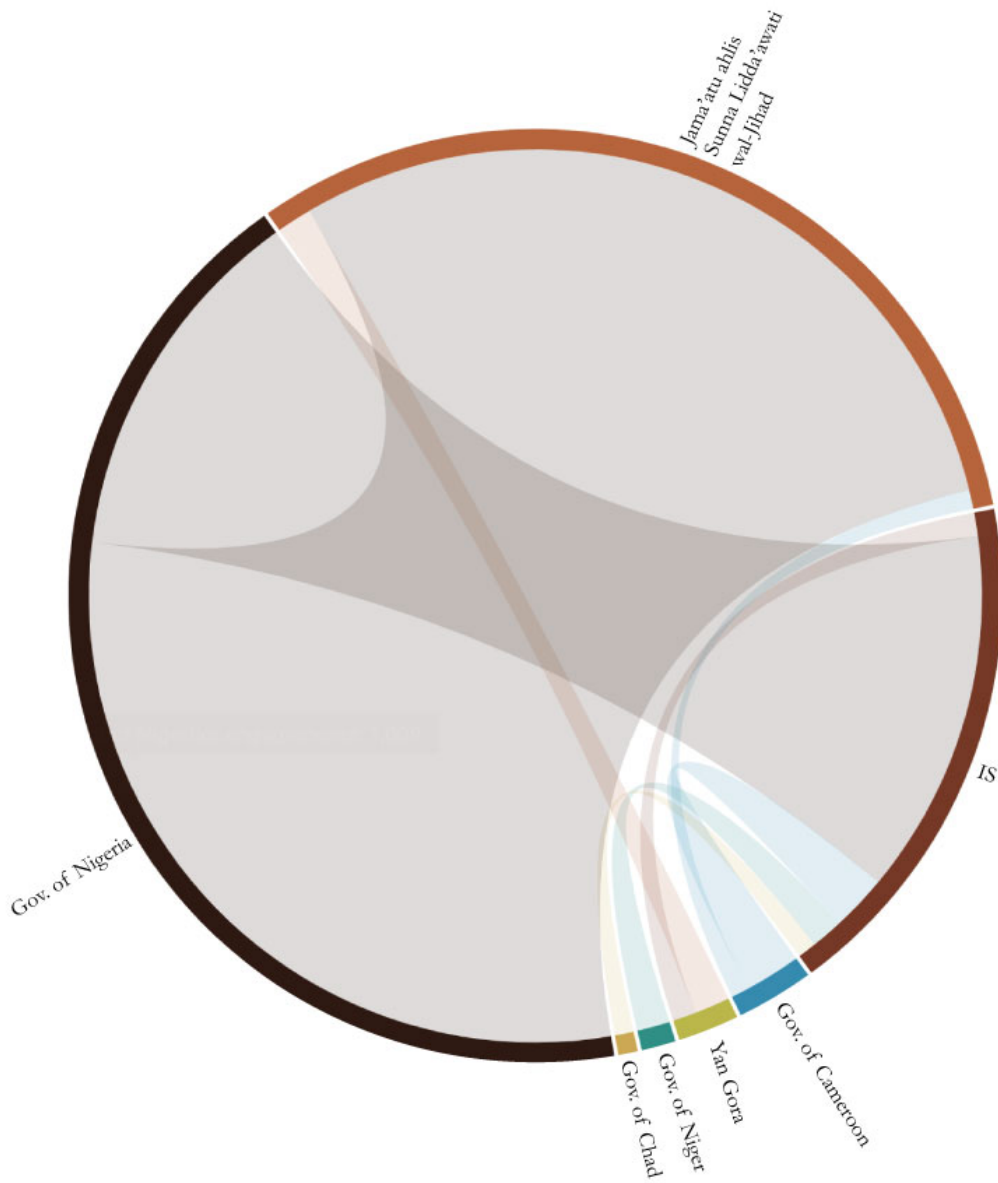
Number of actors included: 13.

<sup>9</sup> For discussions on Boko Haram see Aghedo and Osumah (2015), Foyou et al. (2018), Iyekepolo (2016), Agbiboa (2015).

Explore IDVs, Figure 4



a)



b)



c)

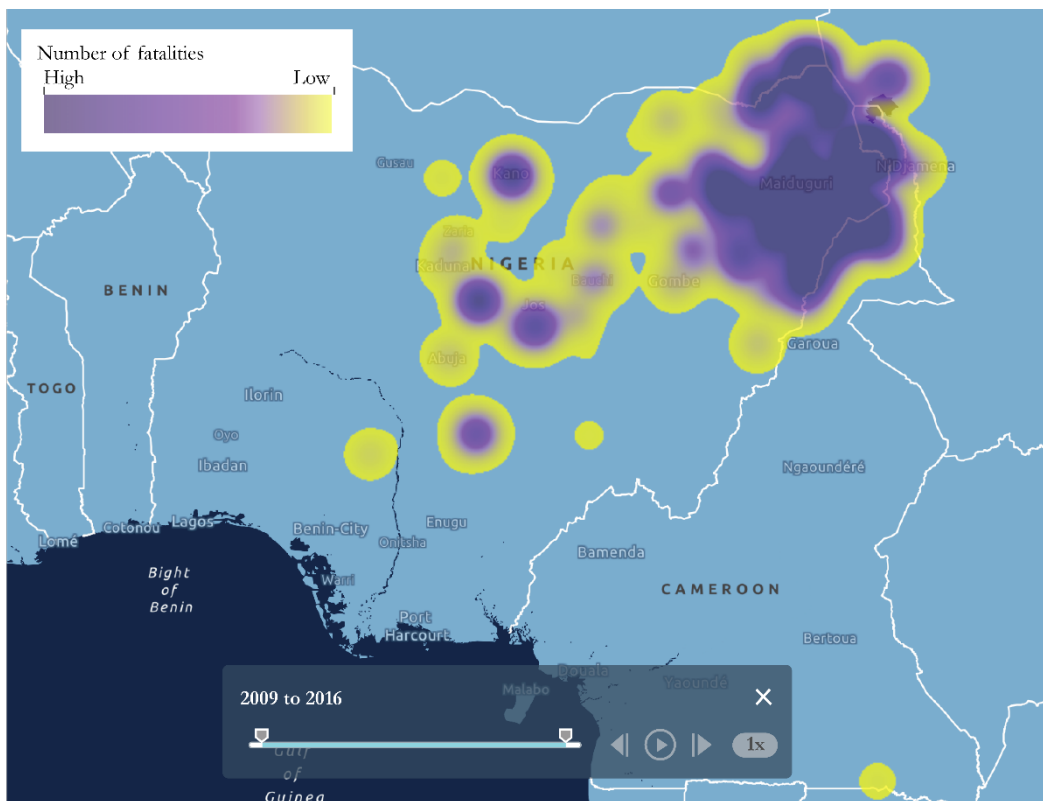


Figure 4. IDVs of the armed conflict in the Lake Chad region. a) Violent engagements of conflict actors, illustrating the conflict's multi-sided character. b) Hotspots and spatio-temporal changes of the conflict. c) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform. <https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform>. Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).

Boko Haram started to fight Nigeria's government in 2009 and, over time, more actors became involved. The military pressure from the Nigerian government and Yan Gora forced the

Islamist groups to retreat to the Lake Chad region, and they then engaged in violent activities across Nigeria's borders in Chad, Cameroon, and Niger (Osumah 2013). This *conflict spread* led the governments of Cameroon, Chad, and Niger to join Nigeria in the fight against the Islamists (Weeraratne 2017). Ethno-religious violence in the Jos Plateau and throughout Nigeria is often seen as clashes between farmers and pastoralists. We do not consider the violence in Jos Plateau as a part of the armed conflict because it is not directly connected to the Islamist insurgency in northeast Nigeria. However, the activities of Boko Haram and IS spread to central Nigeria and contributed to the blurred distinction between the jihadists from northeast Nigeria and Muslims in central Nigeria. The Islamists' activities enhanced the conflict's narrative as being between Christians and Muslims while omitting the clashes' locally specific roots (Higazi 2016b). Since one of the cleavages between those communities is religion, it is reasonable to assume that increased activity of Boko Haram or IS's West Africa Province (ISWAP) can increase the violent activity there too. Therefore, we include the farmer-pastoralist clashes only via the friction mechanism. Since the violence between Christians and Muslims is community-based rather than a conflict between two armed actors, we do not add the UCDP conflict "Christians-Muslims" to the armed conflict, even when there is substantial overlap in time and space. Thus, we treat the resulting events as instances of one-sided violence against civilians.

#### *Armed Conflict in the Horn of Africa*

Anchor conflict: al-Shabaab insurgency,<sup>10</sup> conflict actors added via spread (to Somaliland, Puntland and Ogaden), mutation (Somalia civil war mutated over time to the al-Shabaab's insurgency), and friction mechanisms (overlap with farmer-pastoralist conflict in Kenya).

Analysis start date: 1991. The conflict in the Horn of Africa can be traced back at least to the 1970s. The UCDP GED data are available only for the period starting in 1989.

Analysis end date: 2020. The data cover the period up to and including 2020, although the conflict continued beyond that year.

Number of actors included: 93.

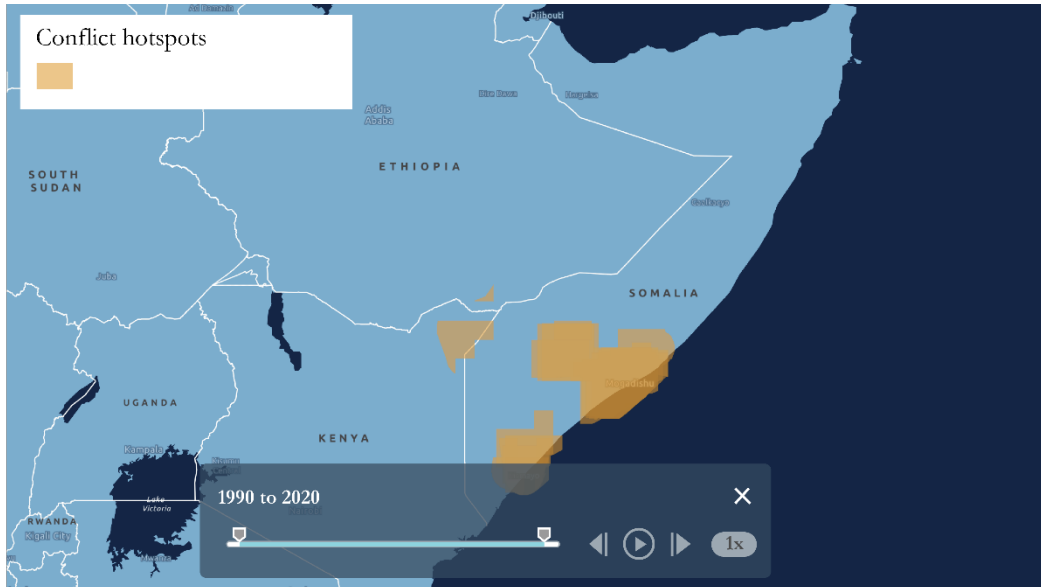


Explore IDMs, Figure 5

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<sup>10</sup> For discussions on the armed conflict in Somalia see Menkhaus (2007), Mwangi (2012), Shortland, Christophoulou, and Makatsoris (2013), Vidino, Pantucci, and Kohlmann (2010), Woldemariam (2018).

a)



b)

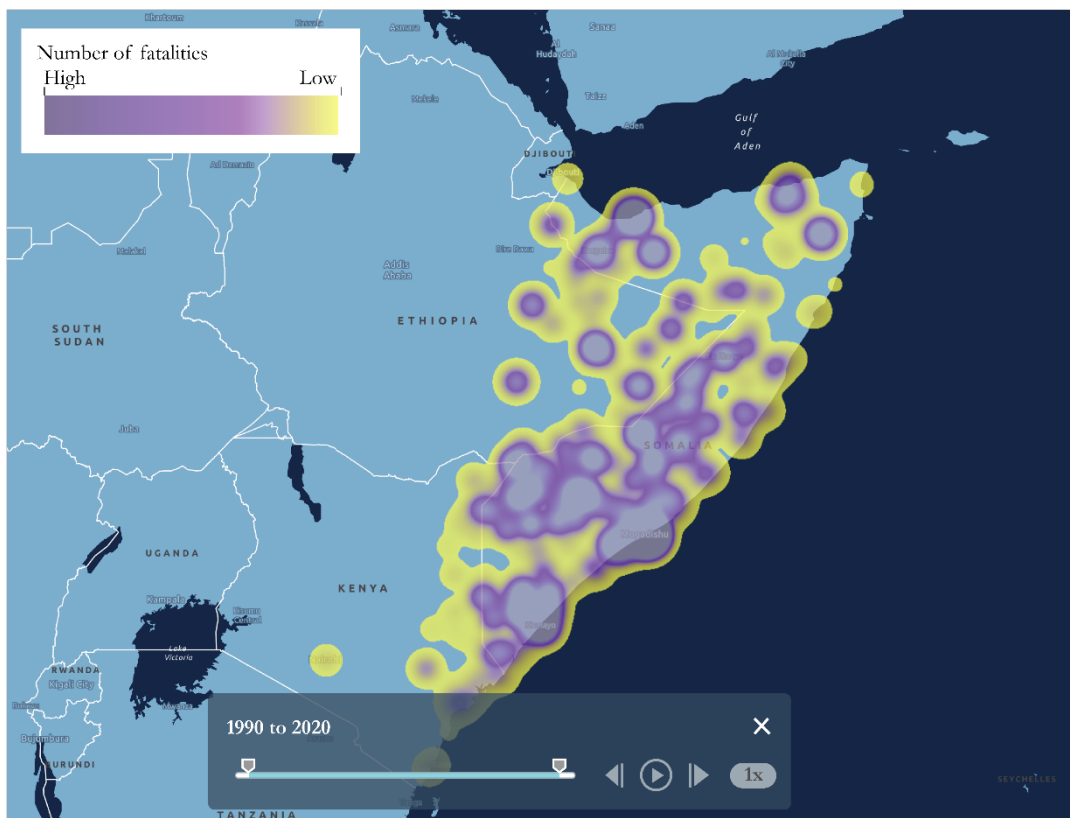


Figure 5. IDMs of the armed conflict in the Horn of Africa. a) Hotspots and spatio-temporal changes of the conflict. b) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform. <https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform>. Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).

The armed conflict in Somalia has a complex history due to its large number of interlinked actors. Clans and people's loyalty to them have played a key role in the conflict, as many of the armed actors mobilize along clan lines. During his reign, President Siad Barre relied

predominantly on the support of the major Darood clan (Shay 2008, 6). His autocratic rule and conflicts with Somalia's neighbors resulted in the formation of the armed opposition, led by the Somali National Movement (SNM) and the United Somali Congress, who drew their forces predominantly from Isaaq and Hawiye clans. The opposition gained control over large parts of Somalia and ousted the president in 1991. The clans supporting President Barre did not accept the political change, and the anti-president coalition broke (Woldemariam 2018, 217, 224–26). Subsequently, Somalia entered decades of violence and fragmentation of political power as fighting for power, land, and resources erupted among various clans, sub-clans, their militias, and other armed groups. Somalia's state collapse also affected the north of Somalia as conflict-related violence and struggle over power *spread* to Somaliland and Puntland. SNM became instrumental in forming Somaliland and declaring its independence in 1991 to separate itself from the unstable south (Woldemariam 2018, 226). However, the movement also suffered from clan-based violence and clashed with the regional government in Puntland over disputed territory.

In 2004, Islamists, subsumed under the Union of Islamic Courts (UIC), took advantage of the non-existent state governance structure to consolidate their power and establish themselves in Mogadishu. The civil war in Somalia *mutated* into an Islamist insurgency. While the Somali government was fighting the UIC, Ethiopia invaded Somalia with the support of the United States of America, leading to the collapse of the UIC in 2006. In addition, the armed conflict *spread* to Ethiopia as the Ogaden National Liberation Front, an insurgent group operating in Ethiopia and seeking to establish an independent Ogaden, launched attacks against Ethiopian targets to punish them for their military involvement in Somalia (Menkhaus 2007). Following the ICU's military defeat, al-Shabaab formed from its radical elements and soon became a dominant armed actor in Somalia. Contrary to the previous Islamist groups, al-Shabaab managed at least to some extent to overcome clan loyalties by drawing support from multiple clans (S. J. Hansen 2013, 7, 22). Al-Shabaab extended its attacks beyond the borders of Somalia to Kenya and Ethiopia. After 2007, al-Shabaab also carried out attacks in northern Somalia, including in Somaliland (Horton 2019).

### *Armed Conflict in Myanmar*

Anchor conflict: conflict between Myanmar's central government and various groups demanding regime change, independence, or more autonomy; conflict actors added via spread (to Karenni State, Shan State, Nagaland, Wa State, Mon State, Karen State, Kachin State, Rakhine State, and Kokang region).

Analysis start date: 1989. We trace the beginning of the conflict in Myanmar to at least 1949. However, the UCDP GED data are available only for the period starting in 1989.

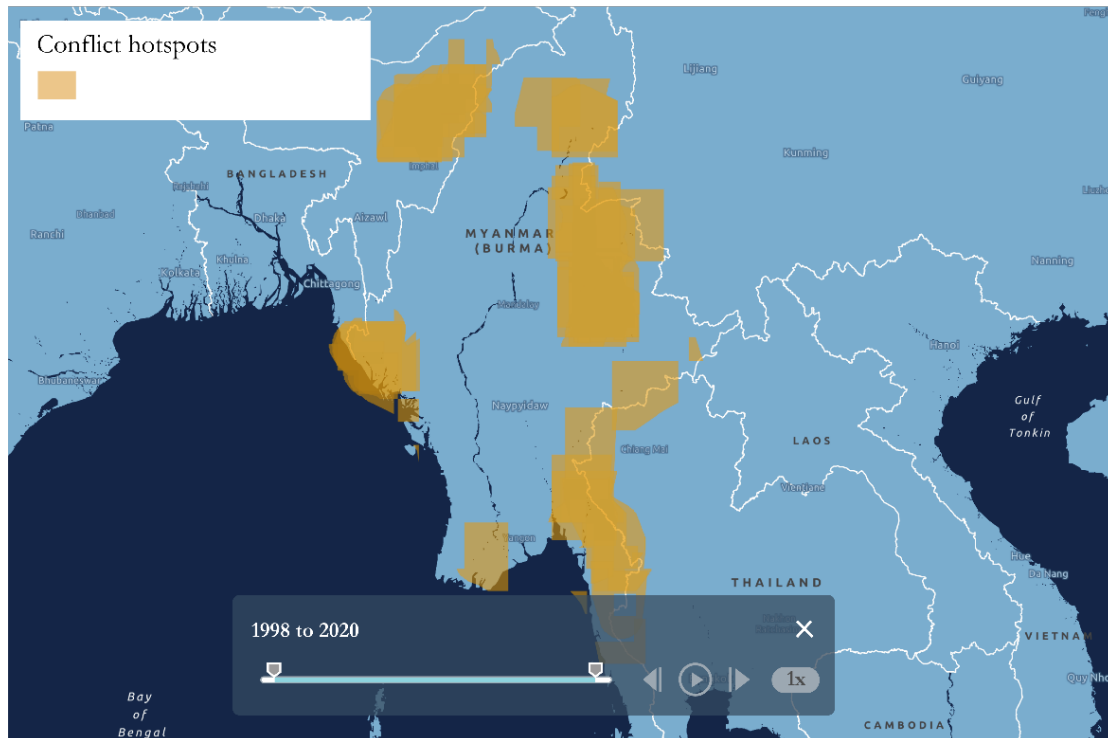
Analysis end date: 2020. The data cover the period up to and including 2020, although the conflict continued beyond that year.

Number of actors included: 27.



Explore IDMs, Figure 6

a)



b)

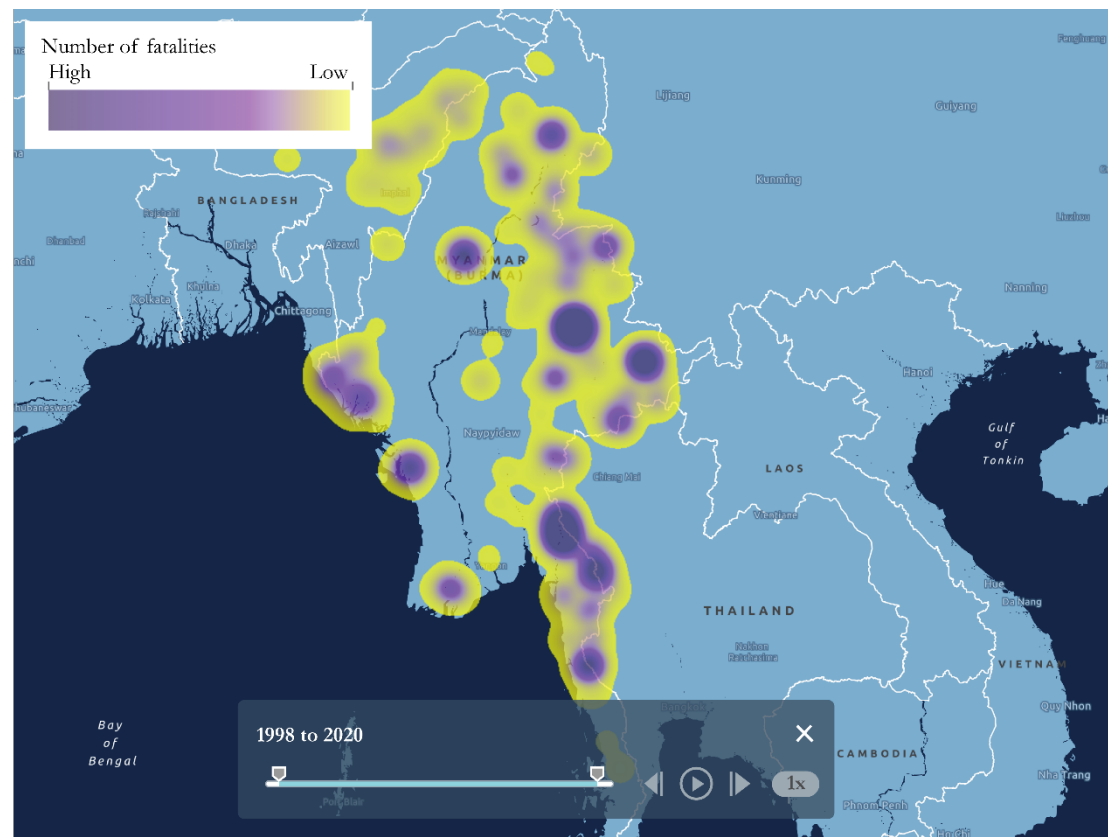


Figure 6. IDMs of the armed conflict in Myanmar. a) Hotspots and spatio-temporal changes of the conflict. b) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict

Myanmar's conflict became violent after the ethnically and religiously diverse country gained independence in 1948. The conflict has concerned long-rooted issues such as self-determination and greater autonomy of some of the ethnic groups it comprises as well as factors such as the illegal exploitation of natural resources and the struggle over the character of the political system in Myanmar. Actors involved have included the Burmese military, who ruled the country until 2011, and again after 2021, various ethnic armed organizations (EAOs), militias, and other groups.

After intense fighting in the 1980s and 1990s, the new constitution, used since 2011, set the ground for democratization, e.g., through forming sub-national governments that many ethnic groups had long demanded. The newly elected president Sein Theint (2011-2015) pursued peace and peace negotiations; however, the Myanmar military continued an intense counter-insurgency strategy against EAOs. Despite the disconnect between the president's efforts and the military's actions, a series of ceasefires were negotiated with various EAOs. The territories under the ceasefire received autonomy yet also faced natural resource extraction. During this period, the Myanmar military intensified counter-insurgency operations against EAOs that refused to negotiate, mainly affecting the regions in Karen, Karenni, and Shan States.

Only eight armed groups signed the National Ceasefire Agreement in 2015, leaving many other groups to continue fighting. In some regions, various signatories violated ceasefire regulations, and in regions such as Kachin State, open armed conflict returned. In 2017, the Myanmar military started to violently target ethnic Rohingya in Myanmar's Rakhine State at large scale. The situation in Myanmar deteriorated further after February 2021, when the Myanmar military staged a coup and declared a state of emergency. By 2022, more than one million Rohingya had fled the country, and an estimated 1.1 million were internally displaced (United Nations High Commissioner for Refugees 2022).

### *Armed Conflict in Syria and Iraq*

Anchor conflict: Islamist insurgency led by IS, conflict actors and events added via spread (conflict for Kurdish independence in Iraq, Syria, and Turkey; civil war in Syria), mutation (conflict in Iraq after the US-led invasion), and friction mechanisms (conflict between the Iranian government and the Kurds in Iran; conflict between the Turkish government and left-wing groups).

Analysis start date: 2003.

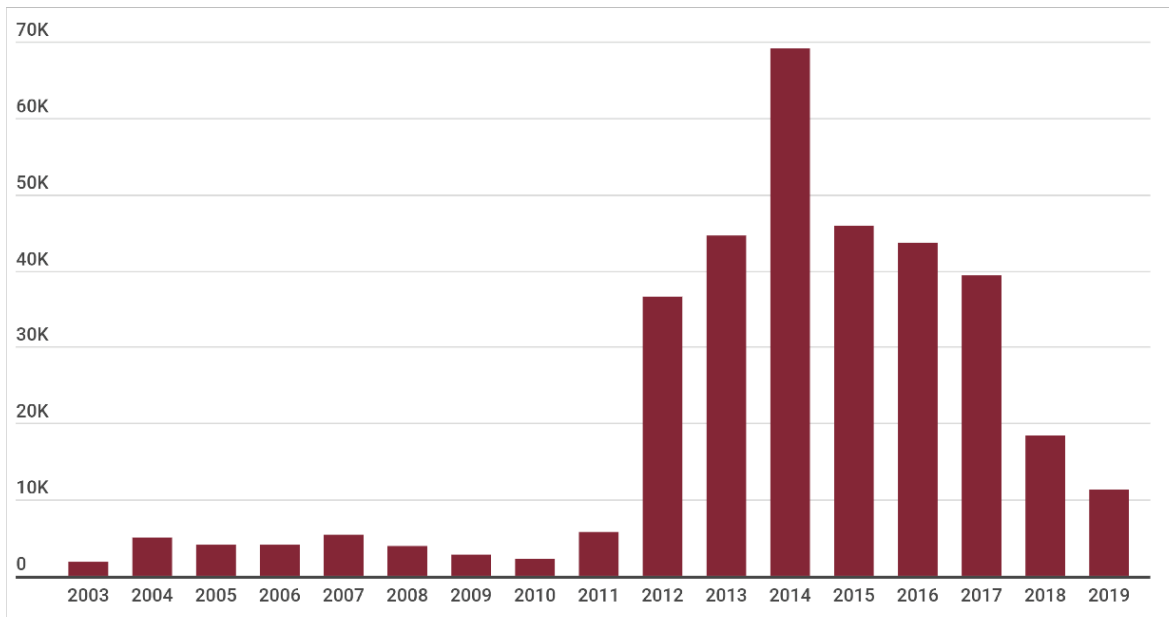
Analysis end date: 2019. The data cover the period up to and including 2020, although the conflict continued beyond that year.

Number of actors included in the analysis: 121.

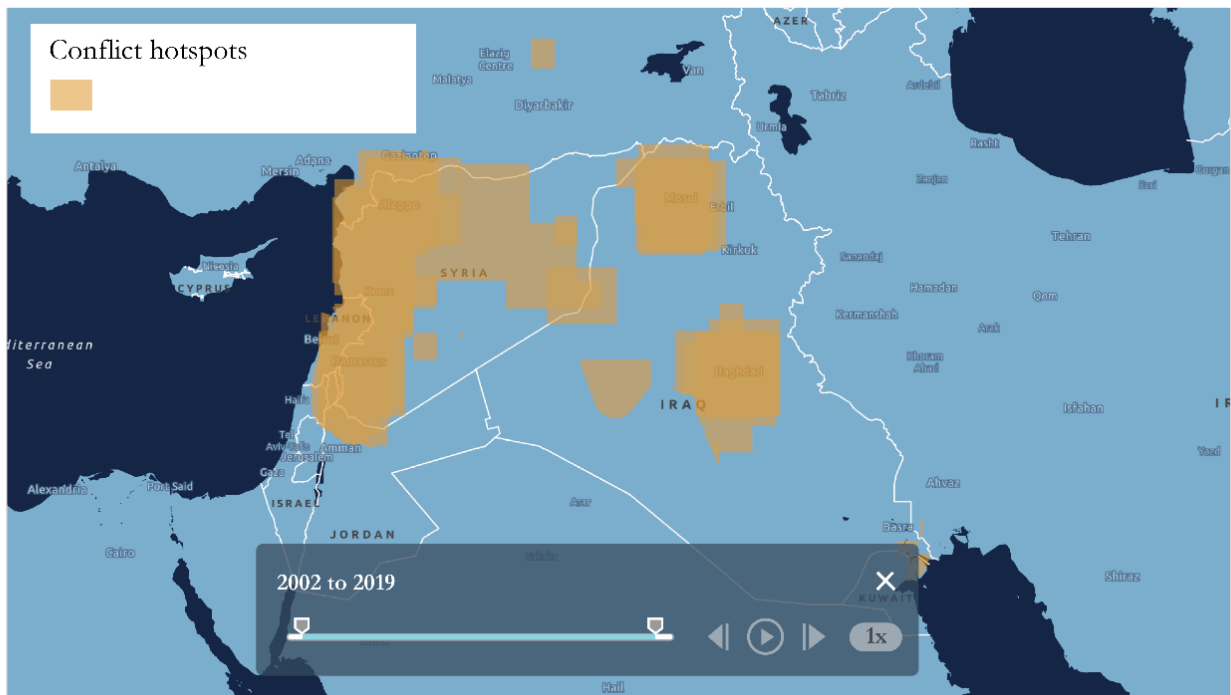


Explore IDVs, Figure 7

a)



b)



c)

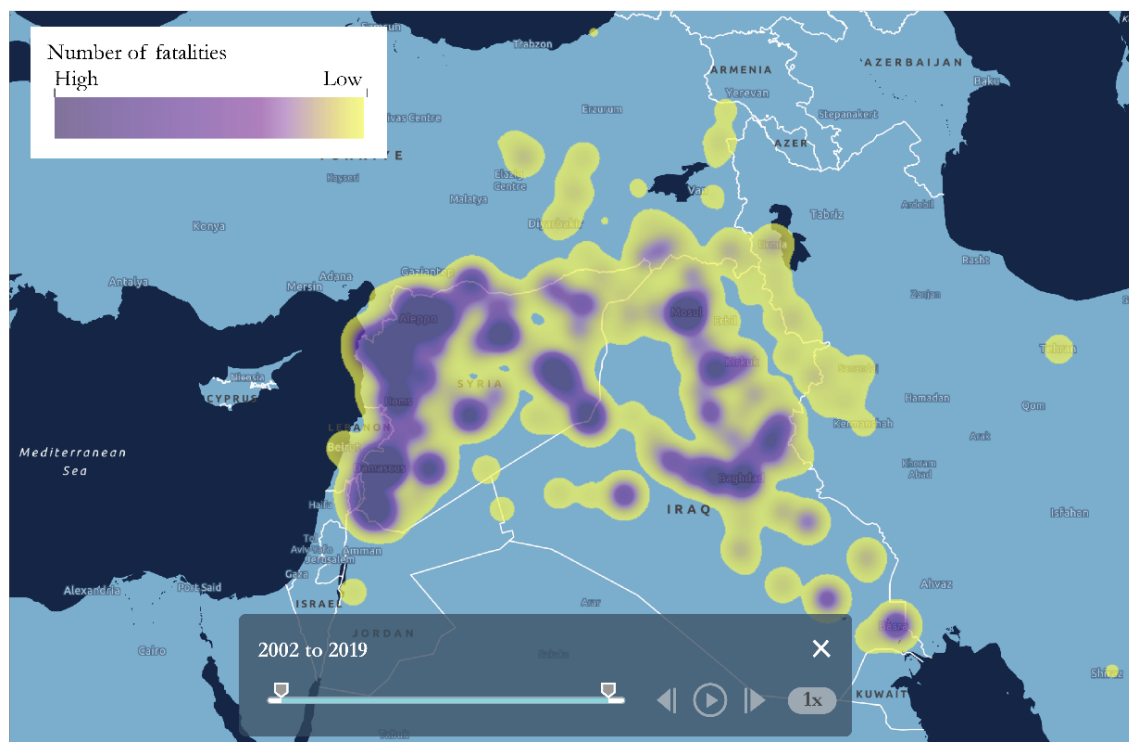


Figure 7. IDVs of the armed conflict in Syria/Iraq. a) Total number of fatalities per year caused by conflict events where only conflict actors are involved. b) Hotspots and spatio-temporal changes of the conflict. c) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform. <https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform>. Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).

The contemporary Iraqi armed conflict started in 2003 after the US-led invasion. In 2011, Syria's ongoing civil war started after the former Syrian government's oppression of the Arab Spring uprising. The same year, the US forces withdrew from Iraq, leaving the Iraqi forces weakened. Al-Qaeda in Iraq (AQI)<sup>11</sup> increased offenses on the Iraqi forces and entered Syria (Brenner 2019). The newly formed Islamic State in Iraq and Syria (ISIS) (Hashim 2014), AQI's successor, gained positions in large parts of Syria and Iraq, taking advantage of the Sunni grievances bolstered by the Iraqi approach to the Sunni minority. Syrian rebel groups fighting against Syria's former government progressed from Syria's peripheries in the north and east toward more central, and then more southern, parts, benefiting from local support bases. When they captured Raqqa on March 4, 2013, for example, local inhabitants took down a statue of former Syrian president's Assad's father, suggesting their support for the rebels rather than the Assad regime (Harding 2013). As the rebels moved further toward Damascus up to October 2013, they captured territory near Jordan and bombarded Central Damascus. Nonetheless, as the Syrian state forces' bombing of Raqqa shortly after the incident and many other subsequent government-led strikes show, the rebels failed to weaken the Syrian government's position. Syria's former government and Syrian rebels were not the only new actors who joined the conflict. Following ISIS's human rights violations committed against Syrian Kurds in 2013, the People's Defense Units (PYD), a Syrian Kurdish armed non-state group, mobilized against the rising ISIS. Evidence of their violent engagements, however, suggests that they were not dominant actors; they did not influence the conflict hotspots as strongly as ISIS. We consider

<sup>11</sup> AQI changed its name to Islamic State in Iraq in 2012 and later to Islamic State in Iraq and Syria (ISIS).

only those Kurdish armed groups that participated in the conflict in Syria or Iraq as part of this umbrella conflict. The instability in Iraq after the US-led invasion and the civil war in Syria intensified Kurdish efforts in Iraq and Syria to gain broader autonomy. They fought against other relevant conflict actors in those two conflicts and had their military bases located in, or gained recruits from, Syria and Iraq. For example, we include the Kurdistan Workers' Party (PKK), a Turkish armed non-state group, as it had several bases in Syria and Iraq and drew recruits from both countries. PKK's battles with the Turkish government took place in Turkey and Syria. In addition, PKK used its military bases in Iraq to launch attacks on the Turkish forces, and the Turkish forces attacked PKK camps in Iraq. We include the Kurdish Democratic Party of Iran (KDPI), an Iranian armed non-state group only for specific years via the friction mechanism because the group's focus was on regime change in Iran. Although, initially, the KDPI also drew recruits from Iraq, the Iraqi Kurds later formed their own branch.

#### *Note on Islamic State (IS)*

IS is an umbrella identity for loosely connected armed groups across the world. In addition to the brand name, the groups often use the name of the region in which they operate. We refer to several of these groups in the following way:

- Islamic State of Iraq and Syria (ISIS): armed conflict in Syria and Iraq.
- Islamic State's West Africa Province (ISWAP): armed conflict in the Lake Chad region.

### **Cross-stakeholder Forum Methodology**

Figures 8 and 9 provide an overview of the make-up of the cross-stakeholder fora we held to use IDMs as a participatory research tool. Given the sensitivity of the research topic, we carefully planned these events in a way that reduced the participants' vulnerability.

For example, we co-designed the format and curated the discussions together with our partners to ensure that the events were culturally appropriate and in line with their vision of the events. Before the fora, several discussions with the prospective participants shaped topic selection, timing, and participant list, guided by their deep local expertise. This collaborative preparation process mitigated typical external-internal power asymmetries in participatory research. The agendas were developed and adjusted to prioritize participant feedback over pre-set objectives. For example, when participants of the Myanmar cross-stakeholder forum wished to discuss issues related to sexual violence in more depth, we adapted accordingly. Simultaneous Burmese-English interpretation ensured equal participation.

We only invited participants who were trusted by our partners. We hosted the events online rather than in person to minimize security risks and left cameras switched off where necessary to protect the participants' anonymity. The research was approved by the University of Oxford's Research Ethics Committee (Ref. No.: CUREC 1A/ ODID C1A\_22\_041).

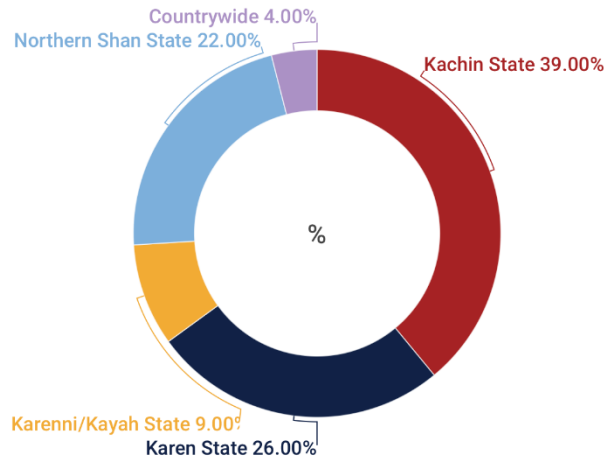


Figure 8. Distribution of the Myanmar cross-stakeholder forum participants based on region. In total, there were 23 forum participants.

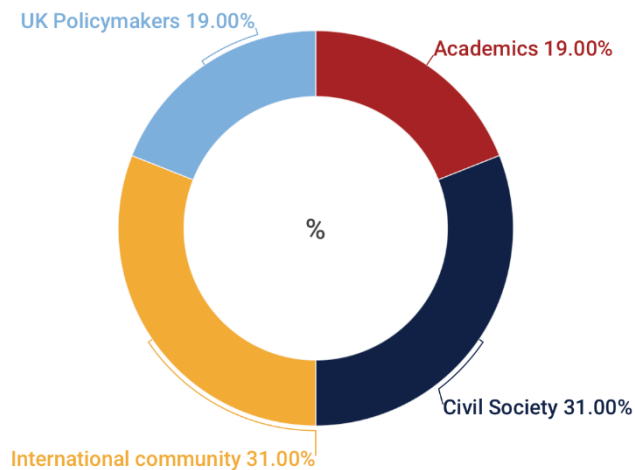


Figure 9. Distribution of stakeholder groups represented at the Horn of Africa cross-stakeholder forum. In total, there were 16 forum participants.

## Interview Data

All fieldwork mentioned in the article was conducted following a strict ethical review process. The fieldwork was approved by the University of Oxford’s Research Ethics Committee as per the following reference numbers: SSD/CUREC1A/11-240; R48604/RE001; R50663/RE004.

## Software

We used R software version 4.1.2 (2021-11-01) “Bird Hippie” for most of the data processing. List of the key R packages:

- Tidyverse (Wickham et al. 2019)
- Rnaturalearth (South 2017)
- Sf (Pebesma 2018)
- Ggplot2 (Wickham 2016)
- Leaflet (Cheng et al. 2025)

We built the IDMs with ArcGIS online (maps), Infogram (bar plots), and codepen.io in combination with the amCharts templates (network graph). To display all visualizations together with an explanatory text in a compact manner, we utilize ArcGIS story maps.

## **Data Availability**

The data and relevant R and JS code underlying this article are available in Zenodo, at <https://zenodo.org/records/18803832>.

## **Application to Interstate War – Russia’s Invasion of Ukraine**

While the article focuses on cases of internal armed conflict, we also applied the IDM approach throughout the research process to interstate conflict. The case of Russia’s invasion of Ukraine for example also illustrates the importance of spatial visualizations. Since this case constitutes an interstate conflict, we did not apply our operationalization of armed conflict. We used ACLED data (Raleigh et al. 2023). The map (Figure 10) displays all conflict events resulting in at least one fatality on Ukraine/Russia territory.<sup>12</sup>

The visualization demonstrates how visually representing data can help challenge singular narratives supporting propaganda messaging. The Russian government’s framing of the war as a “special military operation” launched to protect the Donetsk People’s Republic and the Luhansk People’s Republic in Eastern Ukraine was disseminated through controlled media, shaping public discourse. During the first year of the invasion, Russian media parroted the narratives of Eastern Ukraine’s liberation from Nazism and hardly acknowledged Russian-induced explosions and remote violence in changing locations in the rest of the country that put Ukrainian civilians at risk (Mozur et al. 2022). This does not mean that Russian citizens uniformly accepted the state narrative. People interpret information through diverse lenses—even in authoritarian contexts. Still, when safely accessible, IDMs can offer a tool for visualizing alternative perspectives on spatial violence, opening space for non-state and subaltern narratives without assuming passivity or naivety.

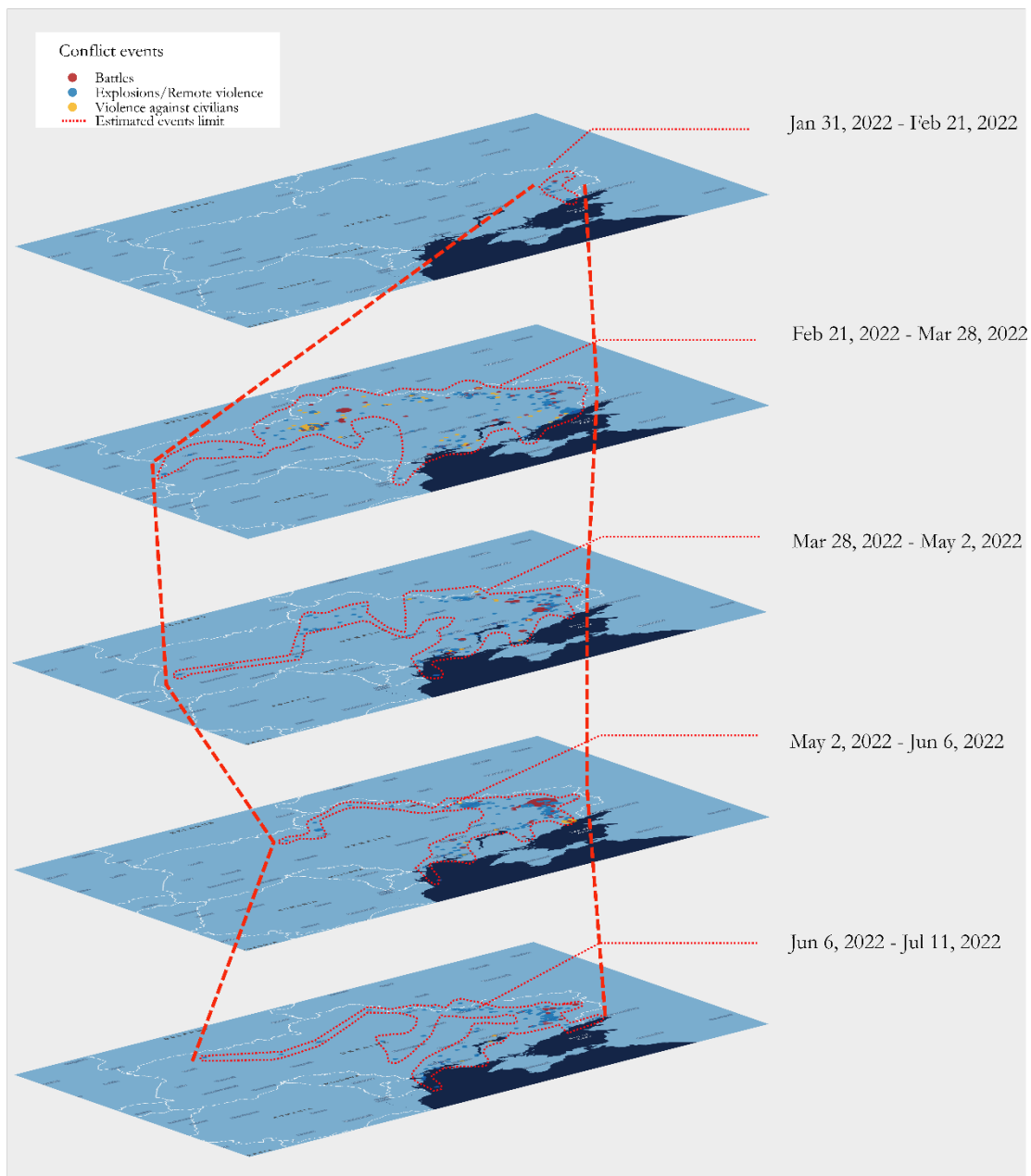
The IDMs differ from the Russian government’s narrative. Figure 10 shows battles clustered in the east and instances of remote violence, e.g., missile strikes hitting civilian targets, in large parts of Ukraine. Certainly, government restrictions to accessing information may include IDMs. Yet IDMs are easy to share and hard to manipulate once online. Providing room for multiple interpretations, their inherent ambiguity makes circumventing censorship easier.

This example demonstrates that IDMs are valuable tools for a variety of different conflict types (intra-state and interstate). It further demonstrates the flexibility with using different types of underlying data (in this case ACLED data instead of UCDP data), allowing for varied use depending on the line of inquiry one wishes to pursue.

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<sup>12</sup> For the interactive visualization and the underlying data contact the authors.

a)



b)

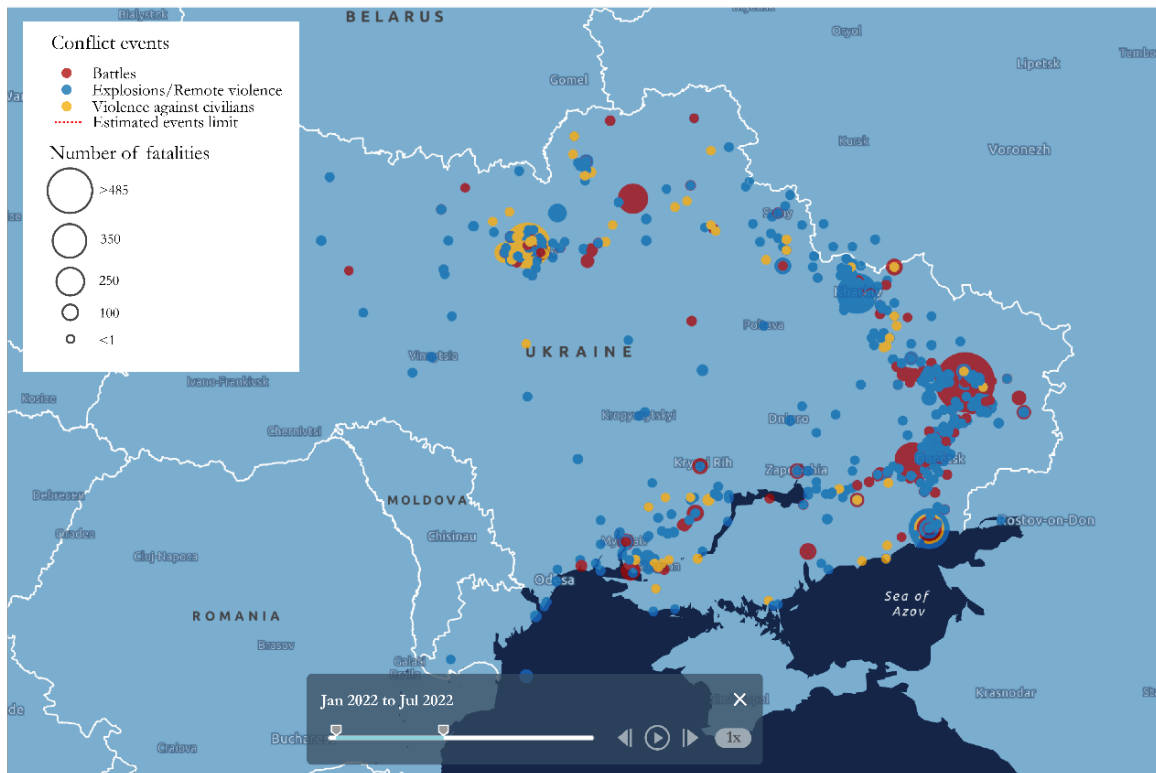







Figure 10. IDMs of the Russian invasion in Ukraine. a) Spatial change of conflict events and the conflict's scope as per estimated events limit. b) All conflict events. Data: ACLED<sup>13</sup> (Raleigh et al. 2023).

<sup>13</sup> Data accessed 10/07/2022 at <https://acleddata.com>.






## List of Figures and QR Codes for IDMs


Article: IDMs and QR codes

Figure	Description	QR
1	IDM of spatial change of conflict events and the conflict's scope as per estimated events limit in Syria/Iraq. Source: The Changing Character of Conflict Platform, URL: <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a> . Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
2	IDMs of conflict dynamics in the Horn of Africa. a) Spatial change of conflict events, terrorist attacks, and the conflict's scope as per estimated events limit. b) Conflict dynamics in 2013 and 2014, zoomed in on the Shabelle River. Source: The Changing Character of Conflict Platform. <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a> . Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
3	IDMs of conflict dynamics in Colombia. a) Spatial change of conflict events and the conflict's scope as per estimated events limit. b) Spatial change of conflict events between 2005 and 2022. Source: The Changing Character of Conflict Platform. <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a> . Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
4	IDMs of conflict dynamics in Myanmar. a) Conflict events and narratives from the Myanmar forum. b) IDM of spatial change of conflict events and the conflict's scope as per estimated events limit in Myanmar. Source: The Changing Character of Conflict Platform. <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a> . Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
5	IDMs of conflict dynamics in the Lake Chad region. a) Spatial change of conflict events and the conflict's scope as per estimated events limit. b) Conflict events in 2016. c) Zoomed view of the region near Maiduguri. Source: The Changing Character of Conflict Platform. <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-</a>	

	platform. Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
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Supplementary Files: IDVs and QR Codes

Figure	Description	QR
1	IDM of conflict events in the Lake Chad region in 2015. Source: The Changing Character of Conflict Platform, URL: <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a> . Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
3	IDVs of the armed conflict in Colombia. a) Total number of fatalities per year caused by conflict events where only conflict actors are involved. b) Hotspots and spatio-temporal changes of the conflict. c) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform. <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a> . Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
4	IDVs of the armed conflict in the Lake Chad region. a) Violent engagements of conflict actors, illustrating the conflict's multi-sided character. b) Hotspots and spatio-temporal changes of the conflict. c) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform. <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a> . Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
5	IDVs of the armed conflict in the Horn of Africa. a) Hotspots and spatio-temporal changes of the conflict. b) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform. <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a> . Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).	
6	IDMs of the armed conflict in Myanmar. a) Hotspots and spatio-temporal changes of the conflict. b) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform. <a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-</a>	

	platform. Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013)	
7	<p>IDVs of the armed conflict in Syria/Iraq. a) Total number of fatalities per year caused by conflict events where only conflict actors are involved. b) Hotspots and spatio-temporal changes of the conflict. c) Conflict intensity measured by number of fatalities resulting from conflict events. Source: The Changing Character of Conflict Platform.</p> <p><a href="https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform">https://www.globalsecurity.pmb.ox.ac.uk/projects/conflict-platform</a>. Data: UCDP GED (Pettersson et al. 2021; Sundberg and Melander 2013).</p>	

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