



Do Refugee Camps Offer a Refuge From Conflict? A Spatially Explicit Analysis of Conflict Incidence at 1,543 Refugee Camps Across Africa (1997–2020)

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By the end of 2020, 20.7 million refugees worldwide were under the protection of the United Nations High Commissioner for Refugees (UNHCR). Despite the intended role of refugee camps as sanctuaries for people fleeing conflict and persecution, recent empirical research has shown that many refugees continue to experience conflict even after settling in camps. Measuring refugee exposure to conflict, especially recurrent conflict, is important for the design and evaluation of refugee settlement and asylum policies, refugee-host relationships, as well as refugee security and protection. However, existing research is either nationally aggregated or highly localized at a small number of refugee camps and does not consider changes in conflict incidence following refugee arrivals, leaving uncertainty around near-camp conflict dynamics across refugee hosting countries. To address these gaps, we measured conflict event proximity, frequency, and trends around refugee and non-refugee settlements in all refugee-hosting countries in Africa over a 24-year period (1997–2020). We used georeferenced data on 1,543 refugee camps from UNHCR and conflict event data from the Armed Conflict Location Event Database (ACLED), and compared localized conflict incidence at refugee camps to 4,003 non-refugee settlements from the Global Rural-Urban Mapping Project (GRUMP). Our results show that 52% of all refugee camps and 94% of urban refugee camps were within 10 km of at least one armed conflict event after camp establishment. Conversely, only 82% of urban settlements without refugee camps were within 10 km of a conflict event, suggesting that urban refugee camps are subject to nearby conflict at a disproportionately higher rate compared to both rural refugee camps and non-refugee settlements. We also find that conflict events moved an average of 11.2 km closer to refugee camps after camp establishment, indicating a general encroachment of conflict upon camps. Such persistent and widespread conflict challenges the security of camps and the protections afforded to refugees, and merits increased attention from host countries and humanitarian actors.

Keywords: refugees, conflict, Africa, spatial analysis, ACLED, refugee camps

INTRODUCTION

By the end of 2020, there were 20.7 million refugees worldwide under the protection of the United Nations High Commissioner for Refugees (UNHCR), the largest refugee population ever recorded¹. This rise in the global refugee population corresponds to the proliferation of refugee camps; as of 2020, ~6.6 million refugees—22% of the global population—lived in UNHCR refugee camps². Refugee camps are “exceptional spaces” (Turner, 2016) that are often established in remote border regions but also sometimes within cities, and are maintained to shelter those forcibly displaced across international borders by violent conflict or the threat of persecution. However, refugee camps do not always offer refuge from conflict. Many refugees continue to experience conflict such as armed clashes, interpersonal violence, and violent demonstrations after settling in camps, which affects psychological welfare (e.g., Harder et al., 2012; Gladden, 2013; Jabbar and Zaza, 2014; Namakula and Witter, 2014) and livelihood development (e.g., Jacobsen, 2002; Halabi, 2004; Werker, 2007). Such conflict may represent a continuation of the conflict that affected refugees before displacement (e.g., Grabska, 2011; Turner, 2017) or result from novel conditions faced by refugees in the host country (e.g., Loescher and Milner, 2005b). Conflict at or near refugee camps can insidiously shape host country populations’ perceptions of refugee populations (e.g., Loescher and Milner, 2005b; Savun and Gineste, 2019). Even when conflict is not instigated by refugees, conflict near refugee camps can contribute to national governments viewing refugees as a security threat (Loescher and Milner, 2005b). When refugees and refugee camps are securitized, host governments tend to enact exclusionary refugee policies that limit the economic and educational opportunities of refugees, relegate and isolate refugee camps to a country’s ecological and social margins, impacting the well-being of already vulnerable communities (e.g., Kaiser, 2000; Johnson, 2011; Chkam, 2016).

Studies on the relationships between the arrival of refugees and conflict incidence in the host country most often aggregate data on refugee populations and conflict events at the nation-level in order to compare measures of refugee population, demographics, humanitarian aid, or economic conditions (e.g., Salehyan and Gleditsch, 2006; Salehyan, 2008; Böhmelt et al., 2019; Rügger, 2019; Savun and Gineste, 2019). Salehyan and Gleditsch (2006) found that the presence of refugees correlates with increased probability of conflict in host nations, though the vast majority of refugees were never directly involved in conflict events. Proposed mechanisms to explain this increased probability of state-sponsored conflict following refugee settlement include refugee-hosting states engaging in militarized disputes to prevent further refugee movements, refugee-sending states violently pursuing refugees over international borders (Salehyan, 2008), refugee populations exacerbating tensions and tipping power dynamics between politically marginalized co-ethnic groups and host states (Rügger, 2019), and host governments scapegoating refugee

populations and launching retaliatory attacks in response to terrorist attacks and other crises (Savun and Gineste, 2019). Böhmelt et al. (2019) found that even if host states do not actively engage in conflict with refugees, weak state capacity can limit host government responses to non-state conflict between refugees and local populations.

More spatially explicit sub-national studies on conflict-refugee relationships have helped to elucidate some of the contextual factors that influence conflict likelihood. In an early study, Loescher and Milner (2005a) explicitly investigated the role of refugee camp location on nearby conflict, working with camp-level case studies in Africa and Asia. They argued that the isolated locations typical of refugee camps made it easier for militant groups from refugee origin countries to infiltrate a given camp. This infiltration contributed to securitized perceptions of refugee camps; countries hosting refugee camps may be concerned about militant groups gaining a hold in the host country, and combatants from refugees’ home countries may view refugee camps as shelters for militants. In a separate study, Loescher and Milner (2005b) found that isolated refugee camps have increased risk of both conflict between refugees and host-government forces, as well as cross-border conflict with militants from refugees’ home countries. More recently, Fisk (2019) found higher rates of communal conflict in regions hosting large encamped refugee populations, corroborating nation-level studies that link refugee populations and conflict. Additional work by Fisk (2016) highlighted the directionality of this conflict by showing that refugee-hosting regions experienced more conflict events targeting civilians, including refugees. Johnson (2011) also directly linked conflict events to individual refugee camps and determined that the likelihood of attack on a refugee camp was associated with the number of male refugees, the age of residents, and the size of the settlement. These results suggest that the increase in conflict often measured near refugee camps is driven by attacks targeting refugees. While valuable, these studies do not systematically examine the spatial relationships between conflict events and refugee camps nor do they consider the ways in which conflict patterns near refugee camps may change over time.

The goal of this descriptive study is to measure the proximity of conflict events and refugee camps, and determine whether conflict events encroach upon refugee camps in the years following refugee camp establishment and the initial arrival of refugees. Measuring refugee exposure to conflict at or near refugee camps, especially recurrent conflict, is important for the design and evaluation of refugee settlement and asylum policies, supporting refugee-host relationships, as well as refugee security and protection³. We used georeferenced datasets of 1,543 UNHCR refugee camps across Africa that were in operation between 1997 and 2020 (UNHCR Geoservices, 2021) and conflict events recorded in the Armed Conflict Location and Event Database (ACLED) Project dataset (Raleigh et al., 2010). With these data, we measured the count and proximity of conflict

¹ Figures at a Glance: <https://www.unhcr.org/en-us/figures-at-a-glance.html>.

² Refugee Camps Explained: <https://www.unhcr.org/en-us/africa.html>.

³ UNHCR policy on refugee protection and solutions in urban areas: <https://www.unhcr.org/en-us/protection/hcdialogue%20/4ab356ab6/unhcr-policy-refugee-protection-solutions-urban-areas.html>.

events around African refugee camps as well as the change in conflict event proximity after a camp's establishment. For comparison, we measured conflict proximity around non-refugee settlements from the Global Rural-Urban Mapping Project (GRUMP) Settlement Points dataset (CIESIN et al., 2017), and stratified comparisons between UNHCR refugee camps and non-refugee GRUMP settlements by rural/urban settings, border proximity, and whether a conflict event was fatal. Our results offer the first systematic and spatially explicit assessment of the proximity and persistence of conflict events around refugee camps in Africa. Our findings have broad value for host countries and humanitarian actors who seek to protect refugees from conflict or develop more conflict-sensitive approaches to refugee settlement and planning.

METHODS AND DATASETS

Study Area and Period

We focus on refugee camps across the African continent because almost two-thirds of UNHCR refugee camps are in Africa and almost 30% of the world's refugees lived in Africa in 2020, more than any other continent⁴, and previous studies have recorded the highest levels of armed attacks on refugee camps in Africa (Muggah and Mogire, 2006). The study is inclusive of the 47 African countries hosting UNHCR refugee camps in 2020. The 23-year study period of 1997–2020 saw widespread creation of refugee camps due to escalated frequency and duration of civil conflicts in many countries, resulting in forced displacement and asylum claims. The study period is also framed by the availability of ACLED conflict event data, described below, which were not available in Africa before 1997.

Datasets

UNHCR Refugee Camps

There is no official, legal UNHCR definition of a refugee camp, though Jacobsen (2000) cites a 1958 UNREF document describing a refugee camp as “a group of dwellings of various descriptions ... which, mainly because of the poor conditions of the dwellings but also for other reasons, are meant to provide temporary shelter.” In this study, we considered 1,543 refugee camp and settlement locations across Africa, which we collectively refer to as ‘camps’ for simplicity, established between 1966 and 2020 (Figure 1A). UNHCR data include the name and geographic coordinates of each camp (WGS84 coordinate reference system), as recorded in the field using GPS or through document analysis, as well as an establishment date for each camp, which is often just recorded as a year, and a closure date when applicable.

We subset the refugee camps data in two ways. First, to tease out potentially different conflict patterns around urban and rural camps, we subset refugee camps into rural and urban subgroups based on the GRUMP Urban Extend Grid. Second, we subset refugee camps based on their proximity to the nearest national border considering the potential importance of cross-border

violence identified by Salehyan (2008). Using Natural Earth administrative boundaries (<https://www.naturalearthdata.com>), we divided refugee camps into two subgroups: those greater than 50 km from a national border and those less than or equal to 50 km from a border.

GRUMP Settlements

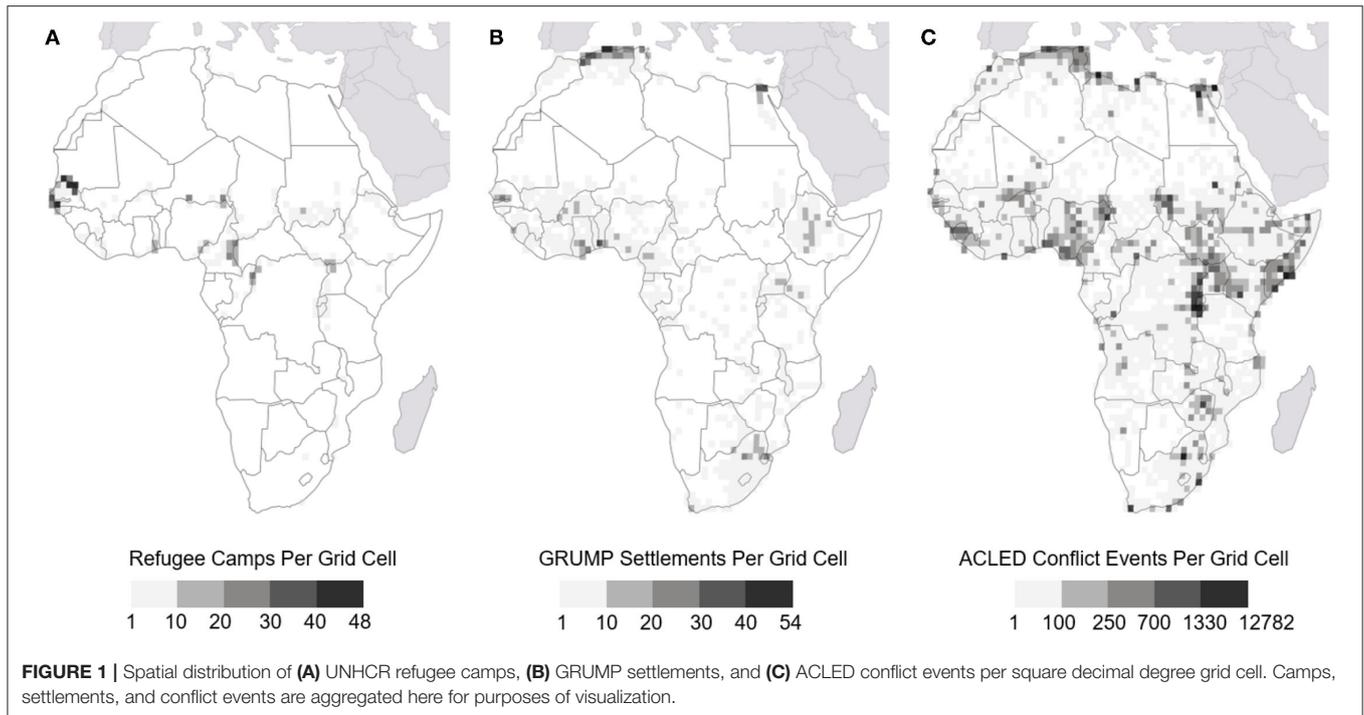
As a complement to UNHCR refugee camps, the Global Rural-Urban Mapping Project settlement points dataset (GRUMP; CIESIN et al., 2017) was used to represent the geographic distribution of non-refugee settlements. The GRUMP dataset is global in scale and includes cities and towns with populations of at least 1,000 persons as of 2000. In Africa, GRUMP includes 4,396 geocoded settlement centroids (Figure 1B) with associated location names, classification as being urban or rural, and population estimates for 1990, 1995, and 2000 derived from a 30-arcsecond-resolution dataset primarily based on national census data. There has never been an explicit assessment of whether refugee camps are included in the GRUMP dataset but it is likely that most camps considered in this study are excluded since the vast majority were established after the GRUMP dataset was created. Because the majority of refugees live in urban settlements rather than refugee camps, it is likely that some GRUMP settlements are inhabited by urban refugees; however, there is no continent-wide data available to characterize the presence, population, or arrival timing of urban refugees.

In order to avoid overlap between refugee camps and GRUMP settlements as much as possible, we removed any GRUMP settlement within 10 km of a UNHCR camp from the analysis. In total, 393 (9%) GRUMP settlements were within 10 km of UNHCR camps; these were predominantly urban (327 settlements vs. 66 rural settlements) and within 50 km of the nearest national border (283 settlements vs. 110 settlements farther than 50 km from a border). Working with the remaining 4,003 GRUMP settlements allowed us to define non-refugee hosting settlements more confidently and thus create a more reliable control for comparison with refugee camps. As above with ACLED data, we subset GRUMP settlements into urban/rural subgroups as well as by proximity to the nearest national border.

ACLED Conflict Event Data

The Armed Conflict Location and Event Data Project (ACLED) records geographically disaggregated conflict events across Africa, South Asia, Southeast Asia, and the Middle East (Raleigh et al., 2010). ACLED is a human-reported conflict event dataset based on reports from people, generally journalists or human rights defenders, situated within a conflict (Eck, 2012). ACLED was selected for this study because of its rigorous, standardized, and well-defined protocol for conflict event documentation, its broad temporal duration, and its geographically disaggregated record of conflict events. Though datasets devoted exclusively to conflict events perpetrated by and against refugees are available, such as POSVAR (Gineste and Savun, 2019), they are not sufficiently geographically disaggregated for the goals of this study.

⁴Where we work: Africa. United Nations High Commissioner on Refugees: <https://www.unhcr.org/en-us/africa.html>.



Between 1997 and 2020, ACLED recorded 229,071 geocoded conflict events across Africa (**Figure 1C**) with an increasing annual rate of conflict over most of the study period (**Figure 2**). ACLED codes geoprecision on an ordinal scale where “1” indicates that an exact town or location is associated with the event; “2” indicates that a local region or neighborhood is associated with the event; or “3” where an event is coded to a provincial capital lacking any more detailed information (Raleigh et al., 2010). We used ACLED events with all three geoprecision levels in this study; 77% of ACLED events had a geoprecision of 1, and 20% and 3% of events had a geoprecision of 2 or 3, respectively. In a comparative study, Eck (2012) found that geographic imprecision can lead to spatial inaccuracy, especially for events occurring in rural or otherwise remote locations where geographic coordinates were less likely to be reported. However, in our analysis, the inclusion of less precise event location data did not significantly change conflict event proximity or frequency measurements.

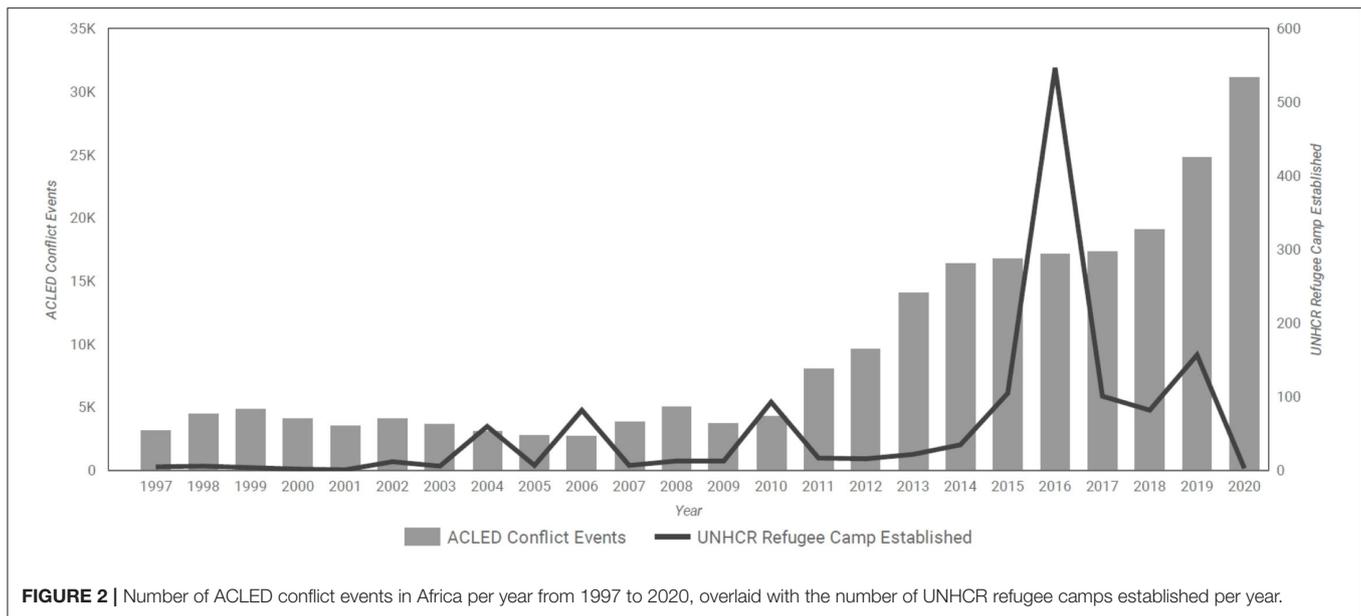
ACLED also records the event date, the instigating group(s), the targeted group(s), an event type category (e.g., “Violence Against Civilians” or “Riots/Protests”), the number of resulting fatalities, and a notes field including a brief description of the event. 917 ACLED events include the word “refugee” in their descriptions, e.g., “Aniak attack Sudanese Dinka refugees” and “Eritrean refugees demonstrate against Eritrean regime” (Raleigh et al., 2010). Of these, 305 events include the phrase “refugee camp” in their event descriptions, but surprisingly only 53% (162) of “refugee camp” events are within 10 km of UNHCR camps. The remainder of “refugee camp” conflict events tended to occur far from camp locations and were associated with protests in state capitals, government buildings,

etc. advocating for policies related to treatment of refugees. Given these thematic limitations, ACLED event descriptions were only used to contextualize conflict, not to identify relevant conflict events for analysis.

ACLED’s definition of a conflict event includes direct violence, such as armed clashes between militaries and extremist groups; cultural violence, such as politically motivated vandalism, destruction of crops, theft of livestock, etc.; and political protest, such as demonstrations and riots. We subset ACLED conflict events into two subgroups—fatal and non-fatal events—to account for the potentially different spatial relationships with refugee camps between fatal events that cause loss of life and non-fatal events that may still significantly impact refugees’ health and economic security, and influence the securitization of refugee camps (e.g., Jacobsen, 2002; Halabi, 2004; Jabbar and Zaza, 2014).

Measuring Spatial Relationships Between Conflict Events and Refugee Camps Nearby Conflict Event Incidence

For a given camp, we measured the count of ACLED events within 10 km of any refugee camp that took place during or after the year that the camp was established. We also calculated the proportion of camps with one or more conflict events within 10 km. A radial distance of 10 km was selected following Spröhnle et al. (2016) to estimate the range of movement by refugees outside of camps to access surrounding land resources. Even though the conflict events may not occur within a refugee camp, conflict proximity may nonetheless degrade refugee welfare or camp-based livelihoods or contribute to anti-refugee stigma that affects refugee-host relationships (e.g., Halabi, 2004). We measured similar counts of conflict events within 10 km for



locations in the GRUMP dataset, however, we assumed that GRUMP settlements were populated for the entire study period (1997–2020) and thus compared them to all ACLED events, without regard to date. We measured the counts of fatal and non-fatal conflict events separately from each other and, as described above, made similar calculations for GRUMP settlements as well as for subsets of camps and settlements based on rural/urban designations and national border proximity.

Proximity of Nearest Conflict Event to Refugee Camps

We measured conflict-settlement proximity as the distance from each UNHCR refugee camp or GRUMP settlement to the nearest ACLED conflict event, and again only consider ACLED events that occurred in the same year as the camp's establishment or later. This analysis was repeated for GRUMP settlements, measuring the distance from each settlement to the nearest ACLED event, though we used the entire ACLED dataset (events from 1997–2020), assuming that GRUMP settlements were populated for the entire study period. As above, separate measurements were made based on fatal/non-fatal outcomes of conflict events as well as rural/urban and border proximity of refugee camps and GRUMP settlements.

Changes in Conflict Proximity Following Refugee Camp Establishment

As the above measures only consider conflict events after camp establishment, we also examined temporal relationships by assessing whether camp-conflict proximity changed in the years after a camp's establishment. We calculated the distance from each refugee camp to the nearest ACLED conflict event before and after a camp's establishment where the conflict event year was measured relative to the camp's establishment year, e.g., Year -3 and Year $+3$, representing three years before or after a given camp's establishment, respectively, regardless of

the specific year when an individual camp was established; by using relative dating, changes in conflict event patterns could be compared across all camps established between 2000 and 2017. The *before-camp-establishment* distance was calculated as the average minimum distance of ACLED events to a given camp in Year -3 and Year -2 , and the *after-camp-establishment* distance was calculated as the average of Year $+2$ and Year $+3$ minimum distances. The *during-camp-establishment* distance was also calculated using the average minimum distance of conflict events from each camp in Year -1 , Year 0 (i.e., the year of camp creation), and Year $+1$; this three-year range was used to mitigate the effect of varying months of establishment between camps. As above, separate measurements were made based on fatal/non-fatal characteristics of conflicts as well as rural/urban and border proximity characteristics of camps and GRUMP settlements.

RESULTS

Conflict Event Incidence and Proximity

In total, we recorded 58,587 conflict events within 10 km of study refugee camps after camp establishment (Table 1), amounting to an average of 38 conflict events per refugee camp. We found that 52% (809) of refugee camps had at least one conflict event within 10 km of the camp that took place after camp establishment and 36% (558) of refugee camps had at least one fatal conflict event within 10 km, though many conflict events involved multiple fatalities. For example, the description from the ACLED dataset for one high-fatality event was: "FNL [National Forces of Liberation, an ethnic Hutu rebel group in Burundi] raided a United Nations refugee camp and killed 189 Banyamulenge. FNL claimed the camp was a hideout for Burundi army soldiers and Congolese tribal militiamen. Most of the victims appeared to be women and children"

TABLE 1 | Summary of non-fatal (0 fatalities) and fatal (>0 fatalities) conflict event incidence within 10 km of UNHCR camp and GRUMP settlement locations and proximity to nearest conflict event.

Location type	ACLED conflict event type	ACLED conflict events within 10 km of locations	Percent of locations with conflict events within 10 km (count)	Minimum distance from location to nearest conflict event (km)		
				Mean	Median	Std Dev
UNHCR camps (1,543 in total)	All conflicts	58,587	52% (809)	16.4	9.0	22.4
	Non-fatal conflicts	72% (42,466)	48% (733)	18.5	10.8	25.0
	Fatal conflicts	28% (16,121)	36% (558)	30.6	16.1	37.4
GRUMP settlements (4,003 in total)	All conflicts	84,810	76% (3,034)	8.6	1.5	19.3
	Non-fatal conflicts	75% (63,482)	72% (2,876)	10.2	1.8	21.0
	Fatal conflicts	25% (21,328)	52% (2,092)	20.5	7.3	36.5

Note that minimum location-conflict distance measurements are calculated regardless of the 10 km distance threshold. Std Dev is the standard deviation.

TABLE 2 | Summary of conflict event incidence within 10 km of urban and rural UNHCR camp and GRUMP settlement locations and proximity to nearest conflict event.

Location type	Location setting	Percentage of locations with conflict events within 10 km (count)	Minimum distance from location to nearest conflict event (km)		
			Mean	Median	Std Dev
UNHCR camps (1,543 in total)	Urban (18%; 276)	94% (259)	4.0	1.0	13.5
	Rural (82%; 1,267)	43% (545)	19.1	11.9	23.1
GRUMP settlements (4,003 in total)	Urban (77%; 3,089)	82% (2,533)	6.1	1.2	13.0
	Rural (23%; 1,307)	56% (732)	18.1	7.7	31.7

Std Dev is the standard deviation.

(Raleigh et al., 2010). Of the remaining 72% (42,466) of conflict events within 10 km of a refugee camp that were non-fatal, these were predominantly either non-violent protests, e.g., “Army sent to restore peace in Forchana refugee camp after riots and failed negotiations. 13 Sudanese, 2 Chadians and 1 Saudi arrested,” or non-violent but coercive actions by militant groups, e.g., “FDLR [Democratic Forces for the Liberation of Rwanda—an ethnic Hutu rebel group] recruiting fleeing Hutu refugees, working within DRC” (Raleigh et al., 2010).

In comparison, we measured 84,810 conflict events within 10 km of GRUMP settlements yielding 19 conflict events on average for GRUMP settlements, which is half of the average number of conflict events recorded within 10 km of refugee camps. A greater proportion (76%) of non-refugee GRUMP settlements saw at least one conflict event within 10 km compared to refugee camps (48%). However, note that all ACLED events from 1997 or later were considered for GRUMP settlements with the assumption that GRUMP settlements were settled before 1997, which likely leads to overestimates of actual conflict event incidence and proximity. While the relative proportions of non-fatal and fatal events near refugee camps (72 and 28%, respectively) and GRUMP settlements (75 and 25%, respectively) were very similar, GRUMP settlements also experienced higher rates of non-fatal (72%) and fatal (52%) conflict events within 10 km compared to refugee camps. These results show that refugee camps tend to have higher nearby conflict incidence on average (38 events per camp) compared to GRUMP settlements (19 events per settlement) but these conflict events were more

localized at a smaller proportion of refugee camps (52%) compared to GRUMP settlements (76%). We also found that the median minimum distance of conflict events from refugee camps and non-refugee settlements was 9.0 km and 1.5 km, respectively, indicating that conflict events were more often much closer to non-refugee GRUMP settlements than refugee camps. Note that these median distances fall within the 10 km threshold used in measuring nearby conflict event incidence.

We also examined the potential difference in conflict incidence between urban and rural settings for UNHCR camps and compared to GRUMP settlements. UNHCR camps are by and large located in rural settings (82%) while GRUMP settlements tend to be urban (77%). Raleigh (2015) showed that conflict events in Africa became increasingly urbanized from 1997–2013, a similar time period as this study, and so we would expect a greater proportion of urban camps and settlements to have nearby conflict compared to those in rural settings. Indeed, we see that 94% of urban UNHCR camps had at least one conflict event within 10 km during the study period, which is markedly higher than the 82% of urban GRUMP settlements with nearby conflict (Table 2). Meanwhile, 43% of rural UNHCR camps had nearby conflict compared to 56% of GRUMP settlements. We found that conflict events tended to be slightly closer to urban refugee camps (median: 1 km) than urban GRUMP settlements (median: 1.2 km) but farther from rural refugee camps (median: 11.9 km) than rural GRUMP settlements (median: 7.9 km). Urban refugee camps thus not only have higher conflict incidence compared to rural refugee camps and urban

non-refugee settlements, conflict events also tend to be closer to urban refugee camps than other locations considered here.

We considered whether there was a difference in nearby conflict incidence for refugee camps within 50 km of the nearest national border and those that were farther away. Due to refugees so often seeking asylum across the nearest national border, 79% of UNHCR camps have been established within 50 km of national borders. Settling in refugee camps close to the national border is logistically pragmatic for asylum-seeking populations but being so close to a border often leaves refugees within reach of the violence that they fled (e.g., Jacobsen, 2000). Loescher and Milner (2005b) stated that geographical isolation, especially in border regions, contributed to the likelihood of cross-border attacks, however we did not find a large difference in conflict incidence for camps located within 50 km of a border (54%) compared to camps farther from a border (47%) (Table 3). Moreover, conflict incidence was far higher for GRUMP settlements compared to refugee camps regardless of whether the settlement was near (79%) or farther (74%) from the nearest national border, and tended to be much closer as well.

Changes in Conflict Proximity Following Camp Establishment

Above, we used the distance threshold of 10 km in measuring nearby conflict event incidence and also summarized distances between conflict events and camps and settlements. Here, we examined whether the proximity of conflict events to a given location changed in the years after refugee camp establishment for camps established between 2000 and 2017. We found that conflict encroached upon 52% of refugee camp locations after camp establishment, with an average movement of 11.2 km toward camps (Table 4). Moreover, on average, all subsets of UNHCR camps (rural, urban, greater and less than 50 km from national borders) and ACLED events (zero fatalities and at least one fatality) experienced movement of conflict events toward refugee camps after their establishment. The largest movement toward camps was detected when comparing all UNHCR camps to ACLED events with at least one fatality. Fatal conflict events moved on average 23.6 km closer to UNHCR camps and 66% of camps experienced encroachment of fatal conflict events. UNHCR camps further than 50 km from a border experienced the next largest change in conflict proximity, with conflict

events moving an average of 20.9 km closer in the *after camp establishment* period; this movement of conflict events toward refugee camps was detected in 49% of camps further than 50 km from a border. 53% of both rural UNHCR camps and camps less than 50 km from a border experienced encroachment of conflict events, though on average, conflict events only moved 11.5 km and 9.0 km closer, respectively. Conversely, 30% of urban UNHCR camps experienced no change in average distance of conflict events in the periods before and after camp creation.

DISCUSSION

This study shows that conflict events are frequently close to refugee camps and also that conflict tends to follow refugees after they settle in camps whether in rural or urban settings. Specifically, we found that 52% of refugee camps have had at least one conflict event within 10 km after establishment, that a greater percentage of refugee camps in urban settings or within 50 km of the nearest national border had nearby conflict compared to rural camps or those farther from a national border, respectively, and that conflict around 52% of all refugee camps were closer (mean: 11.2 km) after camp establishment. Refugee camps in all contexts (i.e., urban and rural, near and farther from a national border) saw encroachment of conflict events toward the camp with camps in rural regions and those >50 km from a national border seeing the largest reduction in conflict proximity. The spatial precision afforded by measuring conflict incidence at the camp-level helps to illuminate security threats in refugee camps across Africa (Savun and Gineste, 2019) and may also shed light on refugee concerns over land use and wage seeking movements beyond the camp (Jacobsen, 2002).

Our Africa-wide results provide broader context for case study findings on conflict incidence at specific refugee camps such as Dadaab and Kakuma in Kenya (Crisp, 2000; Loescher and Milner, 2005a; Rawlence, 2016). Our results also echo country-level results reported in other scholarship, most notably Gineste and Savun's (2019) who compiled POSVAR, a dataset of violent conflict events between 1996 and 2015 either enacted by or against refugees, which is aggregated at the country-level. Globally, Gineste and Savun (2019) found that violence against refugees was much more prevalent than violence perpetrated by refugees, with ~50% of refugee-hosting countries experiencing

TABLE 3 | Summary of conflict event incidence within 10 km of UNHCR camp and GRUMP settlement locations close to (within 50 km) and farther from (50 km or more) the nearest national border.

Location type	National border proximity	Percentage of locations with conflict events within 10 km (count)	Minimum distance from location to nearest conflict event (km)		
			Mean	Median	Std Dev
UNHCR camps (1,543 in total)	50 km or less (1,212; 79%)	54%	14.6	8.7	18.6
	More than 50 km (331; 21%)	47%	22.8	11.2	32.1
GRUMP settlements (4,003 in total)	50 km or less (1,504; 38%)	79%	7.2	1.4	15.0
	More than 50 km (2,499; 62%)	74%	10.0	1.7	22.6

Std Dev is the standard deviation.

TABLE 4 | Summary of change in conflict event proximity to UNHCR refugee camps after camp establishment (2000–2017).

Refugee camp type (count)	Conflict event type	Percentage of camps with closer conflict after establishment	Percentage of camps with farther conflict after establishment	Percentage of camps with no change in conflict proximity after establishment	Mean change in minimum conflict distance (km)
All (1,135)	All conflicts	52%	38%	10%	–11.2
	Non-fatal conflicts	66%	33%	2%	–23.6
	Fatal conflicts	54%	38%	7%	–12
Urban (223)	All conflicts	50%	20%	30%	–9.4
Rural (912)	All conflicts	53%	43%	5%	–11.5
50 km or less to a national border (931)	All conflicts	53%	39%	8%	–9.0
More than 50 km to a national border (204)	All conflicts	49%	33%	18%	–20.8

The change in conflict incident proximity was measured using the mean minimum camp-conflict distance in the 2 and 3 years before and after the camp establishment. Negative values for mean change in conflict distance indicate a decrease in mean distance measured in the periods before and after camp establishment.

violence against refugees and fewer than 20% experiencing violence enacted by refugees. Within Africa, they found similarly low levels of violence perpetrated by refugees. These findings align with our qualitative review of ACLED conflict event descriptions described above: of the 917 ACLED events that include the word “refugee” in their event description field, refugees were alternately described as targets of the conflict or as participants in non-violent protest but were not listed as instigators of any conflict events.

Refugee camps had nearly twice the number of conflict events compared to GRUMP settlements on average, but we found that urban refugee camps are the only subgroup of refugee camps considered in this study that show a higher percentage of nearby conflict event incidence at 94% compared to reference GRUMP settlements (82%). Conflict events tend to also be slightly closer to urban refugee camps (median: 1.0 km) compared to urban GRUMP settlements (median: 1.2 km). The frequency and proximity of conflict events around urban refugee camps is concerning since increasingly more refugees live in urban regions and, according to our results, are thus exposed to higher rates of nearby conflict compared to rural camps, which seem to offer a buffer from conflict according to our results.

Non-refugee GRUMP settlements tend to show higher conflict frequency and proximity than refugee camps, but there are several notable differences between UNHCR refugee camps and GRUMP settlements that impact this comparison. First, there are almost three times as many GRUMP settlements as refugee camps across the continent (4,003 GRUMP settlements vs 1,543 refugee camps), and this inevitably results in higher event counts around GRUMP settlements, especially because the annual rate of conflict also increased over the study period. Second, as of 2000, GRUMP settlements in Africa had an average population of 55,647, whereas, in 2016, African refugee camps had an average population of 4,342 (UNHCR, 2017). The relatively large populations of cities and other urban areas contributes to the measurably high frequency with which cities and other urban areas were targets of conflict during civil wars (e.g., Beall, 2007; Raleigh and Hegre, 2009; Sampaio, 2016) and skews the distribution of conflict frequency around non-refugee

settlements. Though population data for individual camps were not available, a population-normalized comparison of conflict around GRUMP settlements and UNHCR camps would have been valuable for understanding the effect of population density on conflict patterns. Third, this study could not account for the establishment year of GRUMP settlements and so GRUMP settlements were assumed settled by the start of the study in 1997. This assumption likely contributes to overestimation of conflict incidence at GRUMP settlements measured over the entire 1997–2020 study period.

Explanations for the variation in conflict patterns between refugee camps requires further investigation. This research cannot comment on why specific refugee communities or camps experience more or less conflict nor the various socio-spatial factors that contribute to conflict event likelihood (e.g., Fisk, 2016; Rügger and Bohnet, 2018; Böhmelt et al., 2019). Such information would be helpful in identifying specific refugee camps at the greatest risk of localized conflict and in need of additional support. Similarly, this research did not examine the characteristics of conflict events in detail, such as the actors involved in fatal or non-fatal conflict events at refugee or non-refugee settlements, nor whether actors undertook cross-border attacks at refugee camps, for example. In the longer term, an improved understanding of why certain camps experienced more conflict could lead to preventative policies and guide camp planning to decrease the likelihood of conflict for camps that are yet to be established. Though ACLED data are recorded daily, this study did not examine the intra-annual timing of conflict events, which may have a bearing on the socioeconomic or food security costs of conflict events that occur at key moments during the agricultural harvest. Additionally, research examining the motivations that drive certain groups and state forces to target refugees and refugee camps would be welcome. Developing an inclusive conceptualization of the conditions and short- and long-term effects of frequent, nearby conflict on refugees living in camps would be extremely valuable for improving protections of refugees living in camps as well as holding perpetrators accountable.

CONCLUSION

As the population of refugees in Africa grows and refugee camps continue to proliferate, this study offers a new, spatially-explicit understanding of conflict surrounding refugee camps. This study is the first to describe and quantify this movement of conflict toward refugee camps, an important step in elucidating the relationship between refugee camps and conflict. In particular, this study shows that urban refugee camps are disproportionately exposed to conflict and conflict events encroach upon refugee camps following establishment. The threat of conflict at many refugee camps remains significant especially given the overarching vulnerability of refugees living in camps that are ill-equipped to protect refugees. The findings of this study underscore the need for greater support and protection of the growing refugee population settled in camps in rural and urban regions alike.

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DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

AUTHOR CONTRIBUTIONS

FF and JV contributed to conception and design of the study. FF performed the spatial analysis. Both authors wrote the first draft of the manuscript, contributed to manuscript revision, read, and approved the submitted version.

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