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The impacts of armed conflict on human development: A review of the literature

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ABSTRACT

The detrimental impacts of wars on human development are well documented across research domains, from public health to micro-economics. However, these impacts are studied in compartmentalized silos, which limits a comprehensive understanding of the consequences of conflicts, hampering our ability to effectively sustain human development. This article takes a first step in addressing this gap by reviewing the literature on conflict impacts through the lens of an inter-disciplinary theoretical framework. We review the literature on the consequences of conflicts across 9 dimensions of human development: health, schooling, livelihood and income, growth and investments, political institutions, migration and displacement, socio-psychological wellbeing and capital, water access, and food security. The study focuses on both direct and indirect impacts of violence, reviews the existing evidence on how impacts on different dimensions of societal wellbeing and development may intertwine, and suggests plausible mechanisms to explain how these connections materialize. This exercise leads to the identification of critical research gaps and reveals that systematic empirical testing of how the impacts of war spread across sectors is severely lacking. By streamlining the literature on the impacts of war across multiple domains, this review represents a first step to build a common language that can overcome disciplinary silos and achieve a deeper understanding of how the effects of war reverberate across society. This multidisciplinary understanding of conflict impacts may eventually help to reconcile divergent estimates and enable forward-looking policies that minimize the costs of war.

Contents

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1. Introduction

Not only do civil wars 'kill and maim people long after the shooting stops' (Ghobarah, Huth, & Russett, 2003, p. 1); they force entire populations to relocate, disrupt livelihoods, infrastructure and economic growth, undermine social capital and political institutions, and impair access to water, food, and health services. War is 'development in reverse' (Collier et al., 2003, p. 13).

The impact of armed conflict on human development is well studied: research has investigated the micro-economic impacts of armed conflict on individuals, households and groups (Verwimp, Justino, & Brück, 2019), public health and the spread of diseases (Garry & Checchi, 2020), political institutions (e.g. Sánchez de la Sierra, 2020), social capital (Bauer et al., 2016), food security (George, Adelaja, & Weatherspoon, 2020), and displacement (e.g. Fearon & Shaver, 2020).

However, assessments of conflict impacts across domains can be hard to reconcile. For instance, estimates of the macro-level effect of conflict range from 1 to 4% of GDP per year of conflict (e.g., Collier, 1999; de Groot, Bozzoli, Anousheh, & Brück, 2022; Gates, Hegre, Nygård, & Strand, 2012; Moyer, 2023; Mueller & Tobias, 2016), but such a strong economic impact seems to exceed the sum of micro-level effects identified in studies at the household level (e.g. Justino, Brück, & Verwimp, 2013).

One possible explanation for this inconsistency lies in the cross-sectoral impacts of conflicts: the combined effect of conflict is likely to be much greater than the sum of its individual impacts. For example, armed conflict contaminates freshwater and undermines water supplies; access to clean water and sanitation affects pathogen prevalence and parasite loads, which in turn are associated with economic performance, gender equality, authoritarianism, xenophobia, and armed conflict (Thornhill, Fincher, & Aran, 2009; Varnum & Grossmann, 2016). Studying conflict impacts in isolation may therefore severely underestimate the total damage of war. Yet, research on how the various impacts affect and reinforce each other remains limited (Verwimp et al., 2019).

This article sets the foundation to fill this gap by applying a common, cross-disciplinary theoretical framework to review the literature on conflict impacts across 9 dimensions of human development: health, schooling, livelihood and income, economic growth and investments, political institutions, migration and displacement, socio-psychological wellbeing and social capital, water access and use, and food security. To the best of our knowledge, this is the first review of the impacts of war that crosses disciplinary boundaries.

Employing a simple but consistent theoretical framework, the paper reviews existing knowledge on how war affects a dimension of development, how long these impacts last over time and travel through space, and what individuals or groups are particularly vulnerable to these damages. The application of an overarching theoretical framework enables us to streamline the literature across multiple disciplines, explore what is known about how the impacts of conflicts connect across different dimensions of development, and suggest plausible mechanisms to explain these connections.

This inter-disciplinary approach reveals important gaps in our collective knowledge of how the impacts of armed conflict on different dimensions of development relate, and illuminates the need for more systematic empirical research to understand these cross-sectoral linkages. By summarizing the existing evidence through a unitary language, identifying gaps, and suggesting critical avenues towards a more inter-disciplinary knowledge, the present study constitutes a first step to build a deeper understanding of the overall costs of war on societies. Ultimately, such comprehension may help to reconcile divergent estimates on the effects of war, and support the formulation of forward-looking policies to minimize the human suffering induced by violence.

2. Research design

2.1. Scope of the review and selection of studies

The scope of the review is limited to the impacts of organized political violence, defined according to the Uppsala Conflict Data Program (UCDP) as the use of armed force leading to at least 25 battle-related deaths in a country-year (Davies, Pettersson, & Öberg, 2023).[1] Organized violence encompasses three types of conflict: state-based violence, involving at least one governmental actor; non-state violence between two organized but non-governmental groups, and one-sided violence, or the deliberate use of armed force against civilians (Davies et al., 2023).

A team of inter-disciplinary experts has identified relevant studies based on their expertise, supplemented by a key-word search in disciplinary and inter-disciplinary scholarly platforms. The focus of the review is on peer-reviewed, empirical, quantitative studies investigating the impacts of armed conflict, and specific attention is paid to papers that provide measurable estimates of the effects of conflict on a given societal domain. In addition, relevant comprehensive reviews and meta-studies are included insofar as they can provide added value by summarizing existing evidence and increasing the sample size. As we aim to provide an updated assessment of the recent scientific evidence

[1] To ease the reading, the terms 'conflict', 'armed conflict', 'violence', 'political violence', and 'war' are here used interchangeably.

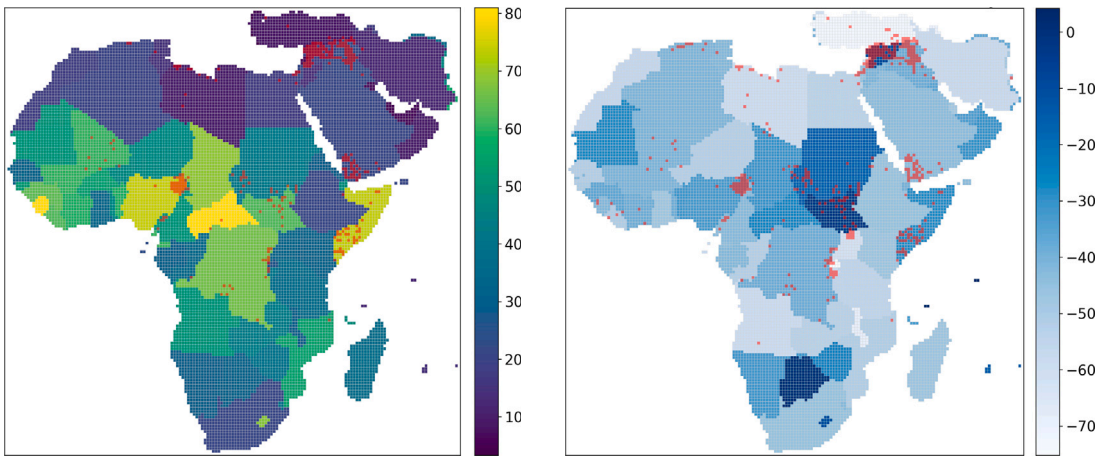

Fig. 1. *Left map*: dark blue (low) up to yellow (high) shades indicate different levels of infant mortality rate (IMR) in 2020 (source: World Bank, 2022, as included in the VIEWS infrastructure (Hegre et al., 2021)), defined as the number of infants dying before reaching one year of age per 1000 live births. Red dots indicate locations that experienced more than 100 battle-related deaths from state-based violence in the previous 5 years, drawn from the geo-referenced version of the UCDP dataset (source: Pettersson et al., 2021; Sundberg & Melander, 2013) as included in the VIEWS infrastructure (Hegre et al., 2021). *Right map*: blue shades indicate the percent change in IMR in 2020 relative to 2000 for each country. Darker shades represent lower improvements in IMR in two decades, lighter shades indicate larger improvements. Red dots signal locations that have experienced more than 100 cumulative deaths related to state-based violence in 2000–2019. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

on conflict impacts, we limit the scope to studies that are published after 2015. However, authors could include seminal articles published before 2015 or unpublished working papers if they believe that these studies marked a considerable contribution and thus could not be left out.

2.2. Theoretical framework

Armed conflicts affect human development both directly and indirectly, and these impacts are felt at the individual, household and societal levels (e.g. Gates et al., 2012; Moyer, 2023). As shown in Fig. 1, countries that have been exposed to conflicts tend to have higher infant mortality rates (IMR) — a commonly used proxy for human development. Despite the generalized improvements in IMR observed throughout Africa and the Middle East over the past two decades, countries exposed to violence in 2000–2019 – such as Sudan, Syria, Nigeria, and Chad – show almost no improvement in infant mortality relative to peaceful or less violent countries (right map, Fig. 1).

Conflicts may impact IMR by destroying health services, restricting movement, and deteriorating access to clean water and food. Violence may also have long-lasting effects on IMR (Wagner et al., 2018) through combined impacts on economic growth, income equality and young female illiteracy — the three strongest predictors of IMR variation (Schell, Reilly, Rosling, Peterson, & Ekström, 2007).

This example illustrates that the effects of armed conflicts on development are complex and multi-dimensional. Conflict impacts are likely to mutually interact and reinforce, such that the overall effect is larger than the sum of its parts. Yet, research on conflict impacts remains siloed, providing useful but piece-meal evidence on the toll of war, while a systemic perspective is lacking. Here, we apply an overarching theoretical framework to summarize war's effects across 9 disciplines. Building on seminal papers by Ghobarah et al. (2003) and Collier (1999), this framework provides a common language that enables us to streamline existing evidence across multiple fields, identify critical gaps, and review how conflict impacts connect across dimensions of development.

The framework is summarized in Fig. 2. We distinguish between six types of impacts: *destruction*, *deterioration*, *disruption*, *diversion*, *devaluation*, and *dissaving*.

Destruction encompasses all damages to people and capital, while deterioration identifies the decline in availability and quality of resources as a result of conflict. These processes affect all dimensions of individuals' wellbeing and development: health, schooling and livelihood (reviewed in Sections 3, 4, 5). Soldiers and civilians are killed and maimed, individuals' property, agricultural production and livestock are stolen and destroyed, and people are forced to flee. Violence reduces access to clean water and food, impairs the provision of schooling and healthcare, and deteriorates labour and productivity.

Disruption identifies the interruption of activities and reduced efficiency of resources that are induced by conflict. The dangers posed by fighting and the imposition of curfews disrupt resources and services (Collier, 1999), as goods cannot be transported or preserved, people cannot go to work, and infrastructure cannot be accessed. War increases costs while reducing the outcome of ordinary activities, thereby decreasing resource efficiency (Ghobarah et al., 2003): violence disrupts economic output and growth, decreases the production of food, limits access to schools, and impairs social capital and cooperation. Widespread fear hinders people's movement, affecting access to water, healthcare, and market places.

Diversion is the reallocation of resources caused by conflicts (Collier, 1999), as government budgets for growth-promoting activities and public goods are reallocated to military expenditures (Ghobarah et al., 2003). Availability, quality, and access to water declines, agricultural production shrinks, and health services and education are curtailed. Shifting pubic spending further compromises societal trust and political institutions, potentially promoting authoritarian drifts.

Widespread fears accompanying violence lead to a third, indirect, impact: devaluation. Devaluation is the decrease in the value of goods and assets driven by the uncertainty and risk associated with conflict, which influence population perceptions. Devaluation is driven by the expectation of violence rather than by the direct exposure to it (Besley & Mueller, 2012; Guidolin & Ferrara, 2010).

Finally, the uncertainty and fear characterizing war induce dissaving, i.e. the expatriation of mobile capital – financial and/or human – away from conflict zones (Collier et al., 2003). The out-migration of financial assets and people to safer areas may slow or halt productivity, deteriorating livelihoods. As people and capital move from conflict-exposed locations, the impacts of conflict diffuse through space, exposing refugees and host populations to diseases, altering collective dynamics of trust and cooperation, destabilizing political institutions, and demanding adjustments in the economic structure of receiving communities. In this review, we are particularly concerned with dissaving induced by the out-migration of human capital.

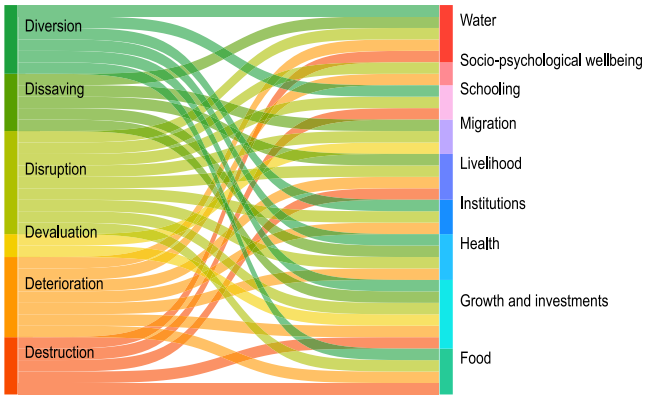

Fig. 2. Theoretical framework applied to review the literature on conflict impacts across disciplinary domains and dimensions of development: health, livelihood and income, education and schooling, growth and investments, political institutions, socio-psychological wellbeing and social capital, migration and displacement, access to water, and food security. Each type of effect (left) has an impact on different dimensions of development (right), as reviewed in this article.

This classification of impacts enables us to study the impacts of violence across 9 dimensions of development. First, the destruction, deterioration, disruption, devaluation, diversion and dissaving caused by conflicts have end-level consequence on the wellbeing of affected individuals. Here, these 'end-level' consequences encompass the three main dimensions of the Human Development Index (UNDP, 1990): health, education, and livelihood, reviewed in Sections 3, 4, and 5. Second, these impacts affect other macro-level dimensions of development: growth and investments (Section 6), political institutions (Section 7), migration and displacement (Section 8), socio-psychological capital and wellbeing (Section 9), and access to water (Section 10) and food (Section 11). Together, these dimensions of development encapsulate the social, political, economic and environmental pillars of society that broadly influence population welfare, progress, and opportunity to lead life with fulfilment and contentment under decent living standards.

These impacts can be short-term – ceasing soon after conflict ends, such as the immediate destruction of capital and infrastructure – and long-term, extending years beyond the cessation of violent hostilities, such as the enduring influences on economic growth and political institutions. Conflict impacts also vary over time and across space, largely depending on the *vulnerability* of affected populations, i.e. their propensity to be adversely impacted (Pörtner et al., 2022). Individuals may be more or less negatively affected by a conflict of the same type and intensity depending on their pre-existing health conditions, age, gender, socio-economic class, access to resources, and the group they belong to. Similarly, the effect upon societies depends on pre-conflict structural and macro-level factors that condition their ability to recover from violence. Each of the following sections applies the overarching theoretical framework illustrated above to streamline the literature on conflict impacts on a specific dimension of development, discusses which groups and individuals are most vulnerable to the effects of conflict on that dimension, and how long these consequences last over time and spread over space. The following sections also review the existing evidence on how conflict impacts on a given dimension of development intertwine with impacts on other dimensions, and identifies critical gaps in the existing knowledge.

3. Impacts of conflict on health

Destruction induced by war has immediate detrimental effects on people's health and lives, resulting in deaths, injuries and disabilities. Studies find that armed conflict is positively associated with maternal, child and all-cause mortality, with the intensity of conflict, rather than the actors involved, being the most important determinant of mortality (Jawad, Hone, Vamos, Cetorelli, & Millett, 2021-09-28; Jawad et al., 2020; Kotsadam & Østby, 2019; Wagner et al., 2018).

The deterioration and disruption of healthcare infrastructure and service, as well as the diversion of funds away from healthcare, are other important causes of morbidity and mortality (Garry & Checchi, 2020; Kadir, Shenoda, & Goldhagen, 2019). In a study of Africa, Wagner et al. (2019) show that 10% of all conflict-attributable deaths among women are due to maternal mortality, likely resulting from deteriorated health infrastructure.

Conflict affects health by disrupting the provision of and access to healthcare and treatments. Utilization of health services decreases with the number and intensity of conflict events, as access to healthcare is preempted or impaired (Ekzayez, Alhaj Ahmad, Alhaleb, & Checchi, 2021; Price & Bohara, 2013). The disruption of antenatal and maternal services increases the risk of adverse outcomes during pregnancy, including the risk of death for mother and child. Several studies find a decrease in utilization of delivery, antenatal care, and child heath services (Amberg, Chansa, Niangaly, Sankoh, & De Allegri, 2023; Chukwuma & Ekhator-Mobayode, 2019; Leone, Alburez-Gutierrez, Gandour, Coast, & Giacaman, 2018; Sato, 2019). However, other studies find that in locations where health services are poor prior to the conflict, antenatal care improves during and after the conflict — likely driven by the success of international health interventions (Price & Bohara, 2013).

Disrupted treatments and delayed diagnoses in conflict settings aggravate cancers, diabetes, and other chronic diseases (Caglevic et al., 2022; Jawad et al., 2020). Locations exposed to conflict are associated with an increase in mortality from chronic or non-communicable diseases (Aebischer Perone et al., 2017), as wars 'raise the exposure of the civilian population to conditions that increase the risk of disease, injury, and death' (Ghobarah et al., 2003, p. 192). Other health protecting factors are further disrupted, including access to safe water, electricity, financial stability, and routine vaccination services (Bendavid et al., 2021; Garry & Checchi, 2020). For example, the incidence and prevalence of active tuberculosis is doubled in crisis-affected populations relative to the reference population (Kimbrough, Saliba, Dahab, Haskew, & Checchi, 2012). Relatedly, some studies report an increase in the incidence and prevalence of active tuberculosis, while others show a decrease, likely due to missing notifications from disrupted health services (Gebreyohannes, Wolde, Akalu, Clements, & Alene, 2024).

The impacts are aggravated by the diversion of public funds away from healthcare. For example, healthcare provision in Tigray has decreased to a minimum, leaving large parts of the population without access (Gesesew et al., 2021). In conflict settings, the diversion of funds away from basic services leads to reduced healthcare quality and availability, and increased malnutrition, which in turn are associated with higher infant mortality (Tapsoba, 2022).

Access to healthcare and management of public health are further hampered by dissaving, as capital is expatriated and individuals migrate. Medical staff often move away from conflict-affected locations, reducing the provision of services, while conflict simultaneously impedes their education and training (Bdaiwi et al., 2023).

Health-related impacts of conflict extend beyond directly exposed individuals and persist after violence ends. For example, neighbouring armed conflict significantly increases the probability of death for women of childbearing age and infants before reaching the age of one in Africa (Wagner et al., 2019). From 1995 to 2015 the number of indirectly conflict related infant deaths was 3.2–3.6 times higher than deaths directly linked to violence (Wagner et al., 2018). Conflicts have long-term impacts on children's health and developments: Wagner et al. (2019) find that neonatal mortality increases even when the conflict occurred the year before birth, while exposure to conflict in the first trimester of pregnancy increases the incidence of low birth weight (Le & Nguyen, 2020). Similarly, violence exposure between

conception and the first year increases infant mortality by around 1% in Ivory Coast and Uganda (Tapsoba, 2022). Research shows that armed conflict exposure of mothers and children is associated with increased malnutrition of infants and children and delayed early childhood development (Bendavid et al., 2021; Dahab, Bécares, & Brown, 2020; Goto, Frodl, & Skokauskas, 2021; Makinde, Olamijuwon, Mgbachi, & Sato, 2023).

As these studies illustrate, women and children are particularly vulnerable to health-related impacts of conflict. Broadly, individuals that were vulnerable pre-conflict are even more vulnerable during and after conflicts (Garry & Checchi, 2020; Wagner et al., 2019). People living with disabilities, children, and pregnant and lactating women are particularly likely to suffer heightened health risks from conflict exposure (Garry & Checchi, 2020; Rodríguez Caicedo, León-Giraldo, González-Uribe, & Bernal, 2023; Wagner et al., 2019). Mothers exposed to a high risk of violence during their pregnancy are highly vulnerable due to their limited access to basic healthcare (Tapsoba, 2022). Women and children also face high risks of rape and sexual exploitation, which are prevalent in conflict settings and frequently used as weapons of war (Kadir et al., 2019; Nordås & Cohen, 2021).

Children under 5 years of age are also at higher risks of severe and moderate underweight and stunting (Bendavid et al., 2021; Dahab et al., 2020; Goto et al., 2021; Makinde et al., 2023), as conflicts decrease food security and lower dietary diversity. Conflicts may further deteriorate populations' health through its indirect impacts on other dimensions of development. Poorer access to water and sanitation increases the risk of disease outbreaks and infection spreading (Chirgwin, Cairncross, Zehra, & Waddington, 2021). Conflict-induced displacement and migration increase exposure to disease outbreaks, as crowded living conditions with poor sanitation lead to increased risks of diarrhoeal incidence, respiratory infections, measles and tuberculosis (Garry & Checchi, 2020). Exposure to violence is associated with stress-related behavioural responses that are conducive of poorer health status, such as higher consumption of alcohol and tobacco. Increased consumption of alcohol and tobacco may contribute to the observed increases in systolic blood pressure in conflict settings (Jawad, Vamos, Najim, Roberts, & Millett, 2019) as well as the heightened mortality from other diseases including ischemic heart disease (Aebischer Perone et al., 2017; Jawad et al., 2019). Decreased economic growth and investments and lower state capacity due to political instability may also contribute to poorer health outcomes. Conflict impacts on societies lower their capacity to manage disease outbreaks, as demonstrated by cholera outbreaks in Yemen and Somalia, the Ebola outbreak in the Democratic Republic of Congo (DRC), or COVID-19 and conflict affected areas of Libya, Syria and Yemen (Bendavid et al., 2021; Blackburn, Lenze, & Casey, 2020; Daw, 2021; Rohan & McKay, 2020; Wells et al., 2019). In turn, increased exposure to disease outbreaks, together with poorer living conditions, displacement of conflict-exposed populations, and decreased access to food and clean water may exacerbate malnutrition and mental health conditions akin anxiety, depression, and post-traumatic stress disorder.

Yet, these cross-sectoral impacts of conflict remain poorly understood. More research and better data on health conditions in conflict settings are needed to disentangle these impacts. Present gaps in our collective knowledge are exacerbated by poor health monitoring in conflict areas. Populations affected by conflict are inadequately covered by demographic surveillance (Dahab et al., 2020), such that obtaining crisis-wide estimation of population morbidity and mortality remains a challenge. National health surveys can give important information of trends over time (Boerma et al., 2019), and initiatives such as the early warning system for disease outbreaks (EWARN) established in the late 1990s can partially fill the surveillance gap (Asghar, Abubakar, Buliva, Tayyab, & Elnossery, 2022).

4. Impacts of conflict on schooling and education

Conflict has devastating impacts on a range of educational outcomes. Studies find that violent conflict reduces school enrollment (Bertoni, Di Maio, Molini, & Nistico, 2019), literacy, attendance (Bharati, 2022), and educational achievement (Brück, Di Maio, & Miaari, 2019). Studying the impacts of the Sri Lankan civil war, Ito, Li, Usoof-Thowfeek, and Yamazaki (2024) find that household exposure to intense violence when a child is school-aged reduces educational attainment by 3.49 years. Exposure to conflict also decreases the probability of passing final academic year examinations and university admittance (Brück, Di Maio, & Miaari, 2019).

Several studies highlight that the destruction of school facilities and damages to households' property caused by war diminish educational outcomes (Ito et al., 2024; Michaelsen & Salardi, 2020). By contrast, a study of the Bosnian war finds a limited effect of violence on education via direct destruction of school infrastructure (Swee, 2015). Even if school facilities are not destroyed, however, school infrastructure and provision of education deteriorate. In the West Bank, exposure to conflict increased the average number of students per square meter in a classroom, thus decreasing the probability of passing examinations, and accounting for 23% of the total effect of conflict intensity on education (Brück, Di Maio, & Miaari, 2019).

Additionally, conflict disrupts children's ability to attend school, as educational activities are interrupted and impaired. Conflict lowers educational achievement by reducing the number of school days and increasing student and teacher absenteeism — although severe data limitations invite caution when interpreting this evidence (Brück, Di Maio, & Miaari, 2019). The deterioration of pupils' psychological well-being also impedes education (Brück, Di Maio, & Miaari, 2019). Acute psychological stress disrupts capacities to consolidate learning objectives and may explain the short-term effects of conflict on education, and especially on exam performance (Michaelsen & Salardi, 2020).

The expectation of violence affects education through devaluation, i.e. by decreasing the perceived value of schooling: individuals' shift in the perception of risks after exposure to conflict may alter their educational demands. For example, studies find that uncertainty and fear associated with terrorism increase school absenteeism (Alfano & Görlach, 2024), which is partly transmitted by media coverage (Alfano & Görlach, 2023). At the household level, conflict forces children out of school and into child labour, thereby reducing lifetime earning, as happened in Rwanda (Chin, Cunningham, & Van, 2023). At the macro-level, the out-migration of teachers may negatively affect learning through dissaving, although Swee (2015) finds little support for this mechanism in the context of Bosnia.

Overall, conflict has short and long-term impacts on education. In the short-term, violence reduces educational outcome: the effect of direct exposure to armed conflict on exam pass rates is highest for conflict events occurring shortly before the exam date (Brück, Di Maio, & Miaari, 2019). These short-term impacts increase with geographic proximity to and intensity of violence (Ito et al., 2024; Michaelsen & Salardi, 2020), and vary depending on the type of conflict event and the timing of exposure (Ajogbeje & Sylwester, 2024; Swee, 2015). Beyond short-term effects, conflict may also have long-lasting impacts on educational achievements. These long-term impacts may begin with in utero conflict exposure, which reduces the human capital of children born after the war (Aizer, Stroud, & Buka, 2016; Akresh, Bhalotra, Leone, & Osili, 2012) and even of their children (Akresh, Bhalotra, Leone, & Osili, 2023). While these effects are well documented for other domains like health, sometimes the timing of violence (for example during school holidays) may prevent these enduring impacts (Gutiérrez-Romero, 2024) and some evidence points to the possibility that such adverse effects are overcome during a lifetime (La Mattina, 2018). Some studies also find that the incidence or expectation of violence may have a positive effect on education in the long-term: the risk of conflict may rise the supply of education, especially in democracies (Aghion,

Jaravel, Persson, & Rouzet, 2019), and can yield an educational peace dividend at the end of hostilities (Prem, Vargas, & Namen, 2021).

The impacts of violence on education differ depending on the vulnerability of children and households in (and close to) conflict areas. Shemyakina (2011) finds that violent conflict impacted girls but not boys in Tajikistan. Guariso and Verpoorten (2019) report that girls' school attendance is more negatively affected by conflict compared to boys', and that children from poorer households and with less-educated parents are more likely to be kept out of school during conflict. Similar variations by gender and poverty status are found for Colombia (Grueso, 2024). By contrast, a study of the Bosnian war finds that the impact of violence on the likelihood of school completion is stronger for males than for females due to the effect of military draft (Swee, 2015). Conflict impacts on education also vary according to contextual factors such as political regime, with weak states exhibiting higher risk of negative impacts (Unfried & Kis-Katos, 2023). Lastly, the effects of violence differ across education levels: Swee (2015) finds that war impacts secondary but not primary school likelihood of completion.

Education impacts may be exacerbated through other dimensions of development. In a study of Mexican drug-related conflict, Padilla-Romo and Peluffo (2023) show that violence generates spillover effects beyond direct exposure, via out-migration from violence-affected areas and peer exposure to violence. Conflict increases stress levels of parents and children, indirectly affecting educational achievements (Michaelsen & Salardi, 2020). Swee (2015) finds that the impact of conflict on school completion is driven by a substantial deterioration of mental and physical health induced by violence. Political institutions also shape impacts; for example, Unfried and Kis-Katos (2023) find that high-intensity conflicts on average reduce local educational attainment, but this effect is not significant in strong autocracies. Human capital loss due to conflict is mostly felt in weak states, highlighting the mediating effect of state capacity (Unfried & Kis-Katos, 2023). In turn, the education losses driven by conflict – as children are forced out of school and into child labour (Büttner, Grimm, & Soubeiga, 2022) – may have long-term implications on their income and livelihood (Chin et al., 2023; Shemyakina, 2015). Lower educational outcomes contribute to war-induced losses in human capital, with long-term impacts on the productive capacity of an economy (Égert & De la Maisonneuve, 2024). Conflict impacts on education are also likely to be correlated with health-related impacts: for example, rebels targeting schools may also be likely to target healthcare infrastructure. Although disentangling the relative contributions of such partial pathways is hard due to methodological issues including endogeneity and data limitations, disregarding their interrelations may affect estimates of total conflict impact.

5. Impacts of conflict on income and livelihood

Violent conflict destructs capital stock and livelihood, as businesses are destroyed or looted during fighting (Naudé, Amorós, & Brück, 2024). Attacks on property, such as theft or destruction of assets and livestock, are detrimental to properties and livelihood (Kaila & Azad, 2023). This effect is short-lived and tends to cease after the fighting stops.

Simultaneously, conflict affects productivity through deterioration and devaluation, as firms lack access to the necessary financial, economic, and material resources for production, while investments cease or shrink. By combining data on firms and conflict events from Libya, Del Prete, Di Maio, and Rahman (2023) show that 10 additional conflict events decrease revenues of firms located within a 10 km radius by 1.4%. This effect is driven by conflict-induced reduction in the availability as well as in the value of inputs used by firms in productive processes (Del Prete et al., 2023). As productivity and revenues decline, unemployment soars and households' income plummets.

Dissaving and disruption affect livelihood and income, as entrepreneurs move capital and businesses out of conflict areas (Naudé et al., 2024), and the labour force is sub-optimally re-allocated or displaced. In conflict settings, the total labour force participation decreases and the structure of the labour force changes: female employment grows relatively to male labour, forcing a gendered reallocation of informal workers from rural and conflict affected areas – where men are largely employed in farming – to safer urban areas, where women work in domestic services (Bozzoli, Brück, & Wald, 2013). Disruptions of labour markets obstruct structural transformations, with long-term implications for households' income. Evidence from Colombia shows that exposure to conflict disrupts labour markets long after the fighting stops, as violence restricts the transition of labour to more productive sectors (Fergusson, Ibáñez, & Riano, 2020).

At the household level, violence exposure forces to divert income away from peaceful activities. In protracted and desperate conflict situations, households can adopt risky livelihood strategies to cope, including borrowing or buying food on credit, selling their assets, accepting risky jobs, or enforcing child labour (Churchill, Smyth, & Trinh, 2022).

The impacts of these changes are long-lasting and vary according to the vulnerability of exposed populations. A study from Cambodia shows that exposure to conflict in early childhood leads to lower labour productivity at a later stage (Islam, Ouch, Smyth, & Wang, 2016). Exposure to and intensity of bombing in Vietnam increase inter-generational child labour outcome (Churchill et al., 2022) with detrimental impact on wages, particularly for women (Shimizutani & Yamada, 2024). Rural areas are particularly vulnerable to these impacts as violence lowers agricultural production (Adejala & George, 2019; George, Adelaja, & Awokuse, 2021). However, Abay, Tafere, Berhane, Chamberlin, and Abay (2023) show that farming activities remain resilient in the short-term.

Moreover, violence can have indirect impacts on livelihood and income through other developmental dimensions. For example, violence shifts individual risk preferences and triggers behavioural changes: Callen, Isaqzadeh, Long, and Sprenger (2014) and Jakiela and Ozier (2019) find that conflict increases risk aversion, even though the effect is not permanent (Moya, 2018). Households exposed to violence thus become more likely to engage in risk-averse behaviours (Brück, Justino, Verwimp, Avdeenko, & Tedesco, 2016), such as saving more, diversifying income sources, conducting informal activities or subsistence farming (Brück, d'Errico, & Pietrelli, 2019). As a result, conflicts increase discount rates (Voors et al., 2012) and depress investments, with long-term consequences on economic output and productivity beyond directly affected areas (Arias, Ibáñez, & Zambrano, 2019). Conflict exposure and economic hardships can in turn foster privately violent behaviours, including intimate partner violence (Brück & Stojetz, 2023) and forced child marriage (Bartels et al., 2018), and precipitate vulnerable households into a conflict-driven poverty trap with inter-generational impacts (Efendic, Kovac, & Shapiro, 2022; Mercier, Ngenzebuke, & Verwimp, 2020; Moya & Carter, 2019).

Overall, the literature on micro-economic impacts of violent conflict has grown rapidly in the past ten years, propelled by the increasing availability of survey data from conflict areas, improved measurements of micro-level conflict exposure (Brück et al., 2016), and an increase in the assessment of peacebuilding, development and humanitarian intervention in conflict settings (Puri, Aladysheva, Iversen, Ghorpade, & Brück, 2017). However, the ability to rigorously estimate the causal impacts of conflict on micro-level economic behaviour and welfare remains hard, due to methodological challenges including reverse causality (e.g. poorer communities are at higher risk of violence), selection bias (e.g. wealthier households are able to leave), and attribution bias (e.g. difficulty to isolate confounding effects of conflict such as climatic and economic shocks).

6. Impacts of conflict on economic growth and investments

Conflict destroys human and physical capital, reducing the current and future growth potential of countries and regions.

Looking at GDP per capita growth – a good proxy for reductions in poverty levels (Moyer, 2023) – estimates based on panel data suggest that the damage caused by conflict ranges from 1.5 (Costalli, Moretti, & Pischedda, 2017; Petrova, Olafsdottir, Hegre, & Gilmore, 2023) to 4.4% per year (Mueller, 2016). One possible reason for this variation comes from the use of different battle-related deaths thresholds to define conflict, and the choice of the spatial unit of analysis. Further, these estimates are attributed to experiencing one year of conflict; however, conflict duration can vary substantially, such that damages can accumulate over longer time horizons. Considering duration as well, Bove, Elia, and Smith (2017) find that the direct effects of civil war lead to an average drop in GDP levels by 9.1%, whereas Gates et al. (2012), Mueller (2012) find average contractions of 15%–18%. These largely inconsistent macro-economic contractions remain a puzzle. A main driver of GDP collapse is the destruction of physical infrastructure and means of production caused by conflicts. However, the destruction of infrastructure does not seem to have long-lasting effects (see for instance Miguel & Roland, 2011's study of US bombings in Vietnam).

The mechanism linking conflict to a decline in economic growth is therefore likely to be more subtle. In their review, Rohner and Thoenig (2021) discuss three channels: the impact of war on institutions and the social fabric, the destruction of human capital, and the impact on health and behaviour. Here, we focus on complementary mechanisms which could explain the differing magnitudes of conflict-related impacts on growth and investments: disruption of production networks and asset prices, devaluation and diversion induced by the expectation of violence, and uncertainty-driven dissaving.

Studies find that disruption in production networks play a key role in micro- and macro-economic conflict impacts. Amodio and Di Maio (2018) show that 70% of the fall in output value of Palestinian firms in high conflict districts during the Second Intifada can be accounted for by import substitution. Export markets suffer from declines in production and loss of workers, as in the case of Kenyan post-electoral violence (Ksoll, Macchiavello, & Morjaria, 2021). Supply networks lead to a diffusion of conflicts' effects outside the conflict zone: the Maoist insurgency resulted in an average aggregate output loss of 1.9%, of which 73% is explained by the disruption of production network and its propagation (Couttenier, Monnet, & Piemontese, 2022).

Armed conflicts also disrupt markets by destabilizing asset prices. Studies find that asset and house prices react to critical junctures like battles or ceasefires, but also to changes in expectations beyond violence itself (Besley & Mueller, 2012; Willard, Guinnane, & Rosen, 1996; Zussman & Zussman, 2006). Recent work on macro forecasting by Diakonova, Molina, Mueller, Perez, and Rauh (2022) suggests that violence expectations and resulting asset price disruptions are useful when predicting GDP. This implies that the disruption caused by the expectations of violence on asset prices and GDP may linger long after the war is over: the economy will fully recover only when peace is regarded as stable.

The expectation of violence further amplifies macro-economic costs of conflict through diversion of investments and currency devaluation. De Roux and Martinez (2021) document that the supply of credit to farmers in Colombia was suppressed even before the government and the FARC rebels entered the peace agreement. A study of the Russian–Ukraine war (Xu, Khan, & Cao, 2023) finds that the conflict negatively impacted the exchange rate and led to a rapid currency depreciation. Michail (2021) shows that civil wars are particularly detrimental to exchange rates and that this effect is driven by conflict induced macro-economic deterioration and a tendency of investors to over-discount war impacts. In turn, fluctuations of the exchange rate can affect the country's trade balance, triggering negative feedback mechanisms with long repercussions for developing economies (Michail, 2021).

The negative impacts of violence and its expectation are amplified by the dissaving effect induced by uncertainty and fear. The role of uncertainty for decision-making of economic actors is largely stressed in the economic literature (Bloom, 2014; Collier, 1999): armed conflict fosters uncertainty, leading actors to postpone investment decisions, and further exacerbating damages on growth and investments (Baker, Bloom, & Davis, 2016). As the fear of violence spreads, uncertainty leads to a diffusion of armed conflict impacts which can last long after the conflict ends. In a study of Ivory Coast and Uganda, Tapsoba (2022) shows that the effect of fear on economic agents and their behaviours is so strong that cohorts of children exposed to high risk of violence suffer major health setbacks even when this risk does not directly materialize.

Moreover, the effects of war spread beyond national borders through trade, food, and energy markets: Liadze, Macchiarelli, Mortimer-Lee, and Sanchez Juanino (2023) estimated that the Russian–Ukrainian war would lead to a 1% decrease in global GDP. The magnitude of these effects, however, depends on countries' vulnerability. European countries are more vulnerable than the US to the impacts of the Russian–Ukrainian war due to their higher dependence on energy imports (Cui, Yue, Nghiem, & Duan, 2023). Additionally, bordering countries and those that severely sanctioned Russia's invasion are particularly affected (Boungou & Yatié, 2022).

As the above example illustrates, the impacts of conflict on growth and investments have important implications on other dimensions of development. Economic shocks disrupt healthcare (Tapsoba, 2022), increase malnutrition (George et al., 2020), and deteriorate water availability (Schillinger & Özerol, 2024; Zeitoun & Talhami, 2016), by diverting resources away from peaceful activities. Low macroeconomic income and unstable governments decrease the incentives to invest in state capacity, thereby deteriorating health and education services (Besley & Persson, 2011). Dissaving and devaluation deteriorate micro-economic outputs and productivity, lowering households' livelihood. Lack of economic opportunities spur migration and displacement, while lower economic growth and development may indirectly affect political institutions. Conversely, the effect of conflict on health, water, food and education may exacerbate the economic growth declines associated with violence, generating long-term impacts after the fighting ceases. However, these cross-sectoral impacts induced by conflict remain under-researched. One challenge in empirically testing these mechanisms is that not all costs of conflict on growth and investments might be observable by standard econometric tools. The effect of conditions such as state-capacity, expectations and the existence of conflict traps is now well-established, yet the repercussions for macroeconomic cost estimates through these cross-channels are still not well understood (Rohner & Thoenig, 2021).

7. Impacts of conflict on political institutions

War represents severe challenges to state authority and political order. A well-established literature explicates how political institutions influence the risk of armed conflict (for reviews, see Fjelde, Knutsen, & Nygård, 2020; Hegre, 2014). However, quantitative research on the consequences of conflict on political institutions remains limited. Although some specific questions – such as how war endings and international interventions shape post-conflict political trajectories – have received attention (e.g. Fortna & Huang, 2012), others remain understudied. Here, we consider the impacts of conflicts on two main political institutional concepts: state capacity and democracy.

War, or the threat thereof, impacts state formation and strength by deteriorating tax revenues and fiscal capacity. The material destruction, deterioration of infrastructure and resources, and disruption induced by war all contribute to weaker fiscal capacity. While interstate wars, under certain conditions, may incentivize state building (Goenaga & von Hagen-Jamar, 2018; Queralt, 2019; Tilly, 1990), civil wars have different effects, as both actors prey on the same (declining) revenue base. Studies find a strong negative correlation between civil war

and state capacity (Sobek, 2010; Thies, 2010), mostly driven by a diminished fiscal capacity due to the deterioration of tax revenues, as economic activity declines and state control over territory is weakened. Studying Latin American countries, Thies (2005) identifies a negative effect of civil war on fiscal capacity, especially during the 20th century. Babajide, Ahmad, and Coleman (2021) study 49 sub-Saharan African countries from 2000–2015, and find that civil war has a clear negative effect on fiscal capacity.

Uncertainty about the future distribution of power brought about by conflicts leads to devaluation and dissaving, reducing incentives for investment in state capacity (e.g., Besley & Persson, 2010). The devaluation induced by the expectation of violence can also shape the type and duration of political regimes. For instance, Eibl, Hertog, and Slater (2021) find evidence that regional rebellions increase the likelihood of military rule. Devaluation affects citizens' incentives to defer to autocrats. Individuals' desire to mitigate perceived insecurity shape their evaluation of costs and benefits, making them more willing to accept curtailment of civil and political rights, and providing popular underpinnings of autocratization (e.g. Godefroidt, 2023; von Borzyskowski, Daxecker, & Kuhn, 2022). Consistently, studying autocracies across 1900–2015, Lachapelle, Levitsky, Way, and Casey (2020) propose that autocracies emerging from violent social revolutions are more likely to form strong and cohesive regime parties (and loyal security apparatuses), which contributes to making them more durable. In Southeast Asia, the threat of violent internal contention has served to forge broad elite coalitions around the tightening of centralized control and enhancement of the state's infrastructural power, thus underpinning more durable authoritarian rule (Slater, 2010).

Armed conflict may affect political regimes through the diversion of public resources into military activities and coercive institutions. Armey and McNab (2019) find that civil war is associated with increased levels of military spending in the short-term and post-war. Such processes may lead to a centralization of power and a build-up of garrison states, with increased reliance on repression (Gurr, 1988). Consistently, armed challenges to the state are associated with increases in state violation of civil rights (Chen, Loayza, & Reynal-Querol, 2008; Davenport & Inman, 2012). Armey and McNab (2015) examine 96 countries from 1970 to 2004, and find indications that civil wars hamper subsequent democratization. Similarly, Aguirre (2016) finds that the risk of conflict leads to a weakening of executive constraints. Generally, cross-national evidence suggests that whereas non-violent mass mobilization may promote democracy in the short and long-term, violent uprisings do not (Celestino & Gleditsch, 2013; Garcia-Ponce & Wantchekon, 2022), and that violence during democratic transitions leaves long-lasting negative effects on the institutional qualities of these regimes (Cervellati & Sunde, 2014).

Whereas this literature highlights negative impacts on democracy from conflict, both in the immediate and the long term, some theorization and evidence suggest that armed conflict, under certain conditions, can enhance democracy. Studying inter-state wars, Knutsen et al. (2019) assess relationships between ongoing war or past war participation and changes in democracy in a global sample across 1817–2006. They find that electoral aspects of democracy are positively related to having experienced war in the past five years. This echoes findings from the literature on the violent origins of voting rights, where suffrage expansions have been linked to mass mobilization in large-scale interstate wars or violent revolutions abroad and related domestic revolutionary threats (Aidt & Jensen, 2014; Przeworski, 2009; Rasmussen & Knutsen, 2022; Scheve & Stasavage, 2010). Intrastate conflict may also sometimes be associated with democratization: South African and Mozambican experiences show how the mobilization of economically and politically excluded and marginalized groups can push authoritarian institutions towards liberalization (Wood, 2001). Similarly, Leonard (2004) notes how civil war stalemates might provide a democratic window of opportunity.

Yet, in quantitative analysis, aggregate effects of civil war on institutional changes related to democratization are mixed, depending on the time window used (Fortna & Huang, 2012), as well as conflict size, duration, or outcome. Some studies indicate that settled solutions may be more conducive to post-conflict democratization, at least in the short term (e.g., Fortna & Huang, 2012; Gurses & Mason, 2008). However, effects do not persist in the long term and negotiated settlements might also be associated with more regime repression (Keels, 2018). Still, war endings have been associated with different power-sharing arrangements, often under the auspices of the international community, leaving formerly excluded population groups with greater access to political power (Cederman, Hug, & Wucherpfennig, 2022). Moreover, a growing body of research brings attention to the lasting legacies of wartime governance on the rebel side. Huang (2016), for example, finds that armed conflict where rebel groups rely on broad-based civilian mobilization see enhanced democratic standings post-conflict.

Given the mixed patterns and contingent relationships, it is unsurprising that sensitivity analyses assessing the aggregate relationship between conflict and regime change find non-robust results: in their sensitivity analysis covering 171 countries from 1960–2015, Rød, Knutsen, and Hegre (2020) find few robust results for democratizing transitions and even less robust results for the relationship between conflict and democratic breakdowns.

We speculate that such results may underestimate the adverse effects of civil war on democracy, as researchers typically control for factors such as GDP per capita that represent potential mediators, thereby blocking off relevant indirect effects. Insofar as good macroeconomic outcomes help stabilize democracies (e.g., Przeworski, Alvarez, Cheibub, & Limongi, 2000), conflict may indirectly destabilize democratic regimes through deteriorating economic performance. Likewise, conflict may destabilize regimes or reduce chances of democratization via the adverse effects on health and education. In turn, the impacts of conflict on political stability and state capacity can indirectly affect economic growth and investments. Kešeljević and Spruk (2024) study the effect of the Syrian civil war on economic growth and suggest that the erosion of rule of law, rise of corruption, and deterioration of political stability induced by the war create an environment that stifles economic investment and growth. The weakening of regulatory institutions and government effectiveness further impedes economic progress. Unfortunately, we lack empirical analyses that explicitly consider the broad cross-sectoral impacts of conflict on and through institutions, although there are studies documenting the different parts of these potential causal chains (on the various economic developmental and other determinants of democracy, see, e.g., Coppedge, Edgell, Knutsen, & Lindberg, 2022; Rød et al., 2020).[2]

8. Impacts of conflict on migration and displacement

Conflict severely impacts the mobility patterns of individuals and households. Focusing on conflict induced-migration,[3] the impacts of violence are most commonly quantified in terms of refugees, asylum seekers and internally displaced people (IDPs).[4][5]

[2] Insofar as specific types of conflict also directly affect democratic institutions, one might even expect further downstream effects on, e.g., economic and human development outcomes, as institutions linked to democracy are associated with several such outcomes (e.g., Gerring, Knutsen, & Berge, 2022).

[3] For a discussion about the challenges of focusing solely on the coercive aspect of 'forced' migration, see for example Erdal and Oeppen (2018).

[4] Refugees and asylum seekers include people who cross country borders, unlike internally displaced people who do not (UNHCR, 2022).

[5] While this article only reviews previous work estimating the impact of conflict on increased mobility, it is important to note that the majority of people affected by conflict remain in situ (see Schewel, 2020 for a discussion on the prevalence of the 'migration bias' in existing literature).

The destruction caused by war directly affects peoples' decisions to migrate or relocate. Displacement and migration are driven by the exposure to killing, injury, or abduction (Fearon & Shaver, 2021). Examining refugees and asylum seeker out-flows between 1990 and 2017, Fearon and Shaver (2021) estimate an average of 31 refugees per battle-related death. These estimates vary widely within and across conflicts, ranging from 6 refugees per death at the 25th percentile to 41 refugees per death at the 75th percentile.

Violence also affects migration by deteriorating livelihood (Fearon & Shaver, 2021). In the context of Nigeria, Sani Ibrahim, Ozdeser, Cavusoglu, and Abdullahi Shagali (2021) find that increased migration to rural areas takes place due to livestock loss resulting from cattle raids. Similarly, loss of land and property is an important driver of displacement in Colombia (Engel & Ibáñez, 2007).

Conflict impacts migration decisions by disrupting the provision of and access to community-level services. Engel and Ibáñez (2007) find that households with access to education and health and connection to public utilities are less likely to relocate. The diversion of funds away from these services can thus increase the propensity of individuals to migrate. The provision of services in the host country also influence the decision to migrate. A study of the Syrian civil war finds that the provision of healthcare and security in Turkey increases the decision of Syrians to relocate amidst conflict, and decreases their propensity to return to their homeland (Balcilar & Nugent, 2019).

Most studies of migration emphasize the role of direct exposure to violence at the individual, family or community level. However, the *perceived* security threat is a sufficient driver to relocate (Melander & Öberg, 2007), independently of the actor directing these threats (Davenport, Moore, & Poe, 2003). Fear and perceived insecurity induce devaluation, as the costs of staying increase relative to the costs of leaving. Schon (2019) finds that conflicts trigger 'narrative ruptures' that change the exposed individuals' perceptions of the cost versus benefits of leaving their homes. Consistently, fear of reprisals was a major driver of migration in the Spanish and Colombian civil wars (Balcells & Steele, 2016). Similarly, the fear induced by the death of a family member is a more significant driver of migration out of Syria during the war than the direct destruction of houses (Balcilar & Nugent, 2019). In the context of the Lebanese civil war, while direct violence exposure such as torture and sexual violence pushes victims to flee the country, the terror induced by shelling is sufficient to increase the likelihood of relocating within the country (Braithwaite, Cox, & Ghosn, 2020).

The effects of violence on the decision to relocate depend crucially on the distance to violence, both over space and time, as well as on the type of violence and the conflict actors (see also Steele, 2019). In the context of Afghanistan, Tai, Mehra, and Blumenstock (2022) find that the odds of leaving a district are highest ten days after violence occurs. Similarly, Zens and Thalheimer (2024) observe a maximum average 3% increase in internal displacement per battle-related death within the same week when studying the conflict in Somalia. Schutte, Vestby, Carling, and Buhaug (2021) find that the influence of armed conflict on the predicted number of asylum seekers is dependent on the number of fatalities, and increases substantially after crossing a threshold of 500 deaths. Melander and Öberg (2007) estimate 9 times more forced migrants when ethnic conflicts spread from 10% to more than 50% of the country area (see also Echevarria-Coco & Gardeazabal, 2021; Schon, 2015). The geography of violence can further influence decisions on whether to move internally or cross-border. Turkoglu (2022) finds that one standard deviation increase in government violence is associated with shy of 40,000 additional refugees, while a similar increase in rebel violence leads to over 25,000 refugees. However, there is no significant effect of government violence on IDPs. Esparza et al. (2020) point towards varying effects stemming from the involvement of different types of conflict actors – such as paramilitaries, rebel groups or the state – on the number of people fleeing during the Colombian civil war, and to paramilitaries' involvement as a particularly strong predictor of IDPs.

Decisions to migrate may also be affected by war through socio-economic and political impacts in conflict-affected areas. Replicating empirical studies of migration, Shaver et al. (2024) find support for the major role of state repression in driving international displacement. Schutte et al. (2021) similarly show that the deterioration of basic civil rights is a strong predictor of asylum migration. The impacts of violence on migration depends on its psychological other than material effects: violence triggers terror and trauma responses and it decreases trust, thereby influencing the decision and timing of migration (Schon, 2019). Decisions to migrate also depend on a number of 'pull' factors in potential host countries, such as the economic opportunities and the socio-political institutions that the receiving countries offer (see for example Conte & Migali, 2019; Turkoglu, 2022). Although more research is needed on estimating the cross-sectoral impacts of conflict on mobility, micro-level studies propose that economic capital and opportunities influence the decision-making process of conflict-exposed individuals and households in multiple ways. Economic and social capital can change the cost-and-benefit analyses of staying versus leaving (Adhikari, 2013; Bohra-mishra & Massey, 2011; Engel & Ibáñez, 2007), and make it easier to translate motivations to leave into opportunities to do so (Schon, 2019). The extent to which there is room for human agency building on such decision-making processes varies largely depending on the type of conflict and the vulnerability of exposed individuals and groups (Carling & Schewel, 2018; Erdal & Oeppen, 2018).

Gender and age can influence the timing of migration, whereby women and children are often more likely to flee first. Women are also likely to experience different types of violence than men, which may impact their decisions to become mobile (Ghosn et al., 2021). Hagen-Zanker, Rubio, and Erdal (2024) find, however, that young women in Afghanistan and Nigeria are less likely to consider migrating in the first place. Migration aspirations and decisions to leave can also be informed by group-level vulnerability: in the context of low-level violence during the 2017 presidential elections in Kenya, Ruhe (2021) finds that migration aspirations and decisions are partly formed as anticipatory responses to potential risks of violence based on affiliations with specific ethnic groups. Similarly, Balcells and Steele (2016) show that group affiliations affect levels of displacement not only in ethnic but also in ideological civil wars. Vulnerability to migration-related impacts also changes along a rural–urban continuum: Tai et al. (2022) find that rural, non-capital areas of Afghanistan are more vulnerable to the impacts of violence on migration than urban or peri-urban districts.

Further attention needs to focus on how the impacts of conflict on health and wellbeing, access to water and food, or economic growth and institutions, affect decisions and opportunities to migrate. Research on the relationship between conflict and migration has advanced by relying on better data and a broader understanding of the complexity of migration decisions in the context of conflict. However, this complexity, as well as differences in the conceptualization and operationalization of displacement, make comparison and interpretation of substantive effects of conflict impacts challenging.

9. Impacts of conflict on socio-psychological wellbeing and social capital

The detrimental impacts of armed conflict go beyond physical health, affecting socio-psychological outcomes such as social capital, cooperative behaviours, and pro-sociality.

Early research suggests that war may pervasively deteriorate social capital — the trust, norms, networks, and interpersonal relations that facilitate coordinated action (Collier et al., 2003; Putnam, Leonardi, & Nanetti, 1994).

War impacts socio-psychological wellbeing and social capital by deteriorating mental health. War exposure is associated with disproportionately high rates of depression, anxiety, stress-related mental illness,

and severe psychiatric disorders (Charlson et al., 2019; Hoppen & Morina, 2019; Priebe et al., 2013). The negative impact of mental health conditions on psychosocial functioning in the general population is well documented, with typical symptoms including social withdrawal, apathy, mistrust, and irritability (Clayborne, Varin, & Colman, 2019; Maercker et al., 2022; Yang et al., 2022). However, only a limited number of studies have investigated mental illness as a mechanism linking war exposure to social outcomes in conflict settings.

Early research finds that PTSD is associated with reduced desire for reconciliation and interdependence in Rwanda (Pham, Weinstein, & Longman, 2004), and with increased feelings of revenge and lower support for reconciliation among former Congolese and Ugandan child soldiers (Bayer, Klasen, & Adam, 2007). More recently, Haer, Scharpf, and Hecker (2021) show that war-related deterioration of mental health negatively affected social capital and community participation among Burundian refugees in Tanzania. Among refugees from Syria and Iraq residing in Turkey, PTSD was found to disrupt prosocial behaviour, increasing ingroup bias and reducing altruism (Canevello, Hall, & Walsh, 2022), as well as to devalue trust in political institutions (Hall & Werner, 2022). However, traumatic experiences can sometimes promote 'posttraumatic growth' (Tedeschi & Calhoun, 2004), leading to personal development and improved relations with others. Research in Sri Lanka suggests that the relational component of posttraumatic growth is associated with increased political tolerance (Rapp, Kijewski, & Freitag, 2019). Refugees from Iraq and Syria reporting higher levels of posttraumatic growth displayed more altruism, although primarily towards their ingroup (Canevello et al., 2022).

War exposure also affects social capital by disrupting inter-group relations, cementing prejudices and grievances that lie at the conflict's root (Bar-Tal & Avrahamzon, 2017) and thereby reducing support for peaceful compromise in the long term (Canetti, Elad-Strenger, Lavi, Guy, & Bar-Tal, 2017).

Conflicts impact socio-psychological wellbeing and social capital by changing individual perceptions of their peers, and diverting cooperative, prosocial behaviour away from perceived threatening groups while preserving or amplifying it towards more vulnerable outgroups and ingroup members. The experience of war enhances in-group or "parochial" norms and preferences (see Bauer et al., 2016), as exposure to violence increases pro-sociality within social groups rather than between them (e.g., Bauer, Cassar, Chytilová, & Henrich, 2014; Cecchi, Leuveld, & Voors, 2016; Mironova & Whitt, 2016; Whitt, Wilson, & Mironova, 2021). A recent study of Syrians living in Turkey shows that war exposure decreased empathy and altruism towards rival outgroups, but not towards outgroups that are perceived as non-rival (Hall & Kahn, 2020).

Violence thus leads to a devaluation of threatening/rival outgroup members relative to the ingroup. Exposure to war activates a coalitional psychology, contributing to the emergence of a conflict ethos centred around security concerns. Individuals more exposed to violence tend to express greater endorsement of such ethos of conflict, which in turn decreases support for reconciliation (Canetti et al., 2017). The ethos of conflict shifts individuals' priorities and pushes for a devaluation of the adversarial outgroup as opposed to the ingroup where they belong (Bar-Tal, Sharvit, Halperin, & Zafran, 2012). Prolonged conflicts may exacerbate this devaluation of outgroup members, as they become increasingly associated with threat, further disrupting social cohesion and amplifying ingroup favouritism.

War exposure may increase outgroup prosociality due to 'altruism born of suffering' (Staub & Vollhardt, 2008; Vollhardt & Staub, 2011), if outgroup members are portrayed as vulnerable and non-threatening. For example, Liberians exposed to greater war violence were more likely to host Ivorian refugees belonging to ethnic outgroups (Hartman & Morse, 2020), and Syrians with greater war exposure were more willing to host internally displaced persons from the Kurdish minority (Hartman, Morse, & Weber, 2021). In both studies, outgroup members were portrayed as particularly vulnerable and non-threatening, potentially eliciting greater empathy. Hall, Kahn, Skoog, and Öberg (2021) find that, in a sample of Syrian and Iraqi refugees in Turkey, elderly people, women, and ingroup members were perceived as less threatening and shown more altruism compared to young people, men, and members of a rival outgroup.

The impacts of war on socio-psychological wellbeing and social capital are long-lasting: even after the war ends, individuals with greater violence exposure exhibit more retributive attitudes, particularly in ethnically segregated settings (Hall, Kovras, Stefanovic, & Loizides, 2018). On the other hand, exposure to war has also been found to erode political tolerance (Kijewski & Rapp, 2019) and amplify negative bias towards ethnic outgroups (Mironova & Whitt, 2018), and these attitudes can be transmitted to future generations, perpetuating the cycle of conflict (Bar-Tal, Diamond, & Nasie, 2017; Medjedovic & Petrovic, 2021; Štambuk et al., 2020).

The indirect impacts of conflict on social capital can also affect other domains relevant for post-war development, such as economic stability and educational outcomes. For instance, mental health issues can lead to the deterioration of productivity and economic growth (Christensen et al., 2020), disrupt educational attainment (Wickersham et al., 2021), and impair post-war community resilience (Haer et al., 2021; Yigzaw et al., 2023-03-16). Research gaps remain in understanding these interactive and indirect impacts, highlighting the need for further studies to explore how conflict-induced changes in one domain may reverberate across others. Overall, the available evidence points to the risk of societies entering 'loss spirals' (Heath, Hall, Russ, Canetti, & Hobfoll, 2012) in which the deterioration of mental health, disruption of social capital, and intergroup conflict feed and magnify each other.

10. Impacts of conflict on water

War impacts water access and provision both directly and indirectly (Schillinger, Özerol, Güven-Griemert, & Heldeweg, 2020; Zeitoun & Talhami, 2016).

War has immediate effects on water quality, quantity, access, and provision via the deliberate targeting and destruction of water infrastructure during armed conflict (Francis, 2011; Schillinger, Özerol, & Heldeweg, 2022; Sowers & Weinthal, 2021; Tabor et al., 2023; Talhami & Zeitoun, 2020; Weinthal & Sowers, 2019). For instance, the most targeted water infrastructures in the current war in Ukraine are dams, reservoirs, urban water supplies and wastewater treatment facilities (Shumilova et al., 2023). This occurs despite multiple international declarations, including International Humanitarian Law, establishing water as a basic human right and prohibiting the disruption of access to water services or destruction of infrastructure (Grech-Madin, 2021; Tignino, 2023; Tignino & Irmakkesen, 2020). Wars similarly impair water quality by destroying and deteriorating water pipes and pumping, causing water treatment plant deterioration or failure due to disruptions and maintenance issues, and contaminating surface and groundwater bodies through explosives or military equipment. Even outside of combat zones, damaged water pipes or dysfunctional wastewater treatments pose critical dangers (Zeitoun & Talhami, 2016). Water services are also disrupted by damages to the grid supply: in Southern Syria, access to piped water supply decreased from more than 90% to about 15% within one year (Sikder, Daraz, Lantagne, & Saltori, 2018). Power outages can lead to siltation and increased contamination from industrial facilities or treatment structures (Sowers & Weinthal, 2021), which undermine water quantity and quality. Yet, post-war water management, such as institutionalized cooperative solutions, might explain positive conflict impacts (Bernauer & Böhmelt, 2020; Döring, 2020; Owsiak & Mitchell, 2017).

Conflicts heighten water scarcity by diverting resources away from infrastructure maintenance and reducing resource management efficiency, which increase salination and pollution. Especially in protracted conflicts, the destruction and disruption of water infrastructure can take

decades to be restored. For example, 65% of the population in conflict-ridden Sudan and Somalia remain without access to safe water and sanitation (ESCWA, 2021). In Syria, the ICRC estimates a decline of up to 40% in drinking water a decade after the war started (ICRC, 2021).

Warfare further harms water supply systems through disruption and dissaving, by impacting the personnel who maintain services, decreasing the availability of consumables such as fuel for pumping, and deteriorating water infrastructure (Schillinger & Özerol, 2024; Zeitoun & Talhami, 2016). Dissaving can manifest in the form of deregulated water use, and disinvestment in water infrastructure and maintenance. The decline in water supplies induced by war leaves a vacuum likely to be filled by unregulated, informal water provision businesses, which can lead to over-exploitation of available water resources and potentially increase water pollution. In Yemen and Syria, informal tanker markets have been linked to falling groundwater tables (Abu-Lohom, Konishi, Mumssen, Zabara, & Moore, 2018; Aw-Hassan, Rida, Telleria, & Bruggeman, 2014). In long-lasting conflicts, military construction projects often neglect guidelines on environmental protection, with impacts on water-catchment areas (Chan, Ruwanpura, & Brown, 2019; Francis, 2011). These impacts can be long-lasting. While lakes or rivers can be directly polluted, groundwater is mostly affected through contaminated soil (Rawtani, Gupta, Khatri, Rao, & Hussain, 2022). Pollution can have lingering impacts on aquifers and can severely endanger ecosystems, as observed in the Iraqi peatlands (Lawler, 2005). An increased amount of toxins and other pollutants was also found in Ukrainian freshwater reservoirs (Rawtani et al., 2022).

Several groups are especially vulnerable to the impact of war on water. Displaced persons in protracted conflicts particularly suffer from water-related illness, parasites, and respiratory problems as a result of water scarcity (Behnke et al., 2020). A recent study on the impact of the war in the Ethiopian Tigray region found armed conflict to diminish access to water for washing by 24% in rural areas (Abay et al., 2022). Reviews of refugee camps find that the available water quantities can range from 1 to 40 liters/person/day (lpd), far below the minimum needs of about 2 lpd for drinking water alone or 40–60 lpd for hygiene (Behnke et al., 2020; Cooper et al., 2021). Falling below these thresholds for prolonged periods is defined as extreme water scarcity. Women and girls face a disproportionate burden from water scarcity (Blanchet et al., 2017; Kadir et al., 2019), not only because 80% of global households rely on them to fetch their water (UNICEF-WHO, 2017), but also because of societal taboos that may make women reluctant to bring attention to sanitation issues (Mafuta, Zuwarimwe, & Mwale, 2021). In areas affected by armed conflict, women with long distances to obtain water may also be subject to gender-based violence (Mafuta et al., 2021; Pommells, Schuster-Wallace, Watt, & Mulawa, 2018).

Deterioration of water quality and quantity in turn affects agricultural output, and can damage entire ecosystems with potential ripple effects on other economic and societal sectors. Poor water access in conflict settings can have detrimental impacts on health and well-being (Kangmennaang & Elliott, 2021; White et al., 2022). Direct consequences from lack of water are particularly evident in the water, sanitation, and hygiene sector (WASH). Deficient access to WASH increases the risk of several diseases and preventable infections (Chirgwin et al., 2021; Connolly et al., 2004; Cooper et al., 2021; Tabor et al., 2023; Tarnas, Al-Dheeb, Zaman, & Parker, 2023): for example, handwashing with soap has been shown to decrease diarrhoea episodes by 27% (Connolly et al., 2004). Some health studies provide estimates of water quality in conflict settings, including measuring the levels of coliform bacteria as proxies for various outcomes (Blanchet et al., 2017). Warfare can deprive households from access to safe water sources or significantly increase the distance to fetch water, which is shown to increase mental-health burdens (Slekiene & Mosler, 2019). Extended time to fetch water can also increase disputes both within households and between communities (MacDonald, 2005), potentially feeding a vicious cycle of conflict-induced water scarcity and increased risk of tensions.

Work within humanitarian actions highlights the importance of safeguarding water access in conflict zones, but there is still little systematic research on conflict impact on water resources, especially for longer-term societal outcomes (Schillinger et al., 2020). Even the magnitude of impacts on water remains largely unknown. Remote sensing data can be one valuable tool for analysing land cover changes (Eklund et al., 2022; Mohamed, Anders, & Schneider, 2020): for example, the normalized difference water index (NDWI) has been used to identify conflict-induced surface water change (Hasan, Moody, Benninger, & Hedlund, 2018). Particularly for the study of WASH outcomes, surveys have been widely used, including in-situ sampling for water quality. Yet, inconsistencies in survey design and data reporting often hamper cross-study comparison (Ricau, Lacan, Ihemezue, Lantagne, & String, 2021).

11. Impacts of conflict on agricultural production and food security

The relationship between armed conflict and food insecurity has been widely studied. Previous research suggests a negative impact of violence on food access and availability.[6] According to the Food and Agricultural Organization (FAO) (FAO, 2021), around half of people who are undernourished and 80% of stunted children reside in countries experiencing armed conflict or widespread violence.[7]

Violence can undermine food security by reducing food production and output. Armed conflict destructs and deteriorates human and physical capital, infrastructure, livestock, and crops, and is associated with theft and the destruction of land properties (Adejala & George, 2019; Verpoorten, 2009). Appau, Churchill, Smyth, and Trinh (2021) find that a 10% increase in bombing during the Vietnam War decreased agricultural productivity by 3%, with households closer to violence experiencing a reduction of cassava and sorghum production respectively by 21% and 28% relative to the sample mean. In a study on conflict risk and agricultural portfolios in Northern Uganda, Rockmore (2020) finds that holdings of cattle and sheep fell by roughly 80% when comparing those with highest versus those with lowest risk of violence.

Farming production, livelihood, and income are constrained by violence-induced disruptions to the supply of inputs, such as seeds, fertilizers, and tools (Baliki, Brück, Al Daccache, & Weiffen, 2022). The inability to access land and other natural resources additionally impact agricultural production (Jaafar, Zurayk, King, Ahmad, & Al-Outa, 2015). Changes to labour force participation, driven by the destruction and deterioration of infrastructure and resources in addition to the displacement of workers induced by violence, further reduce agricultural output and employment (see, for example, Baumann, Radeloff, Avedian, & Kuemmerle, 2014).

Conflicts not only destruct and disrupt agricultural production, they also introduce logistical challenges for producers to deliver food to markets, and restrict opportunities for consumers to travel to purchase food. This disruption increases food prices, leading to poorer diets and higher undernourishment. Examining the effect of armed conflict on food insecurity in Afghanistan, D'Souza and Jolliffe (2013) find that households in provinces with higher levels of war exposure experience food insecurity via increasing food prices, likely due to reduced access

[6] Food security is defined as a state where 'all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life' (FAO, 2008). Although broad, the definition encompasses the classes of indicators that are most commonly used in the literature: calorie deprivation, monetary, dietary diversity, and subjective indicators (Headey & Ecker, 2013).

[7] For reviews on violence and food insecurity, see, for example, Martin-Shields and Stojetz (2019), Shemyakina (2022), Sassi and Thakare (2022) and Rudolfsen (2020).

to food markets (see also Adong, Kornher, Kirui, & von Braun, 2021 and Tranchant, Gelli, Bliznashka, Diallo, Sacko, Assima, Siegel, Aurino, & Masset, 2019) . Comparing pre-war and post-war household data in Cote d'Ivoire, Dabalen and Paul (2014) find that households in the most war exposed areas and individuals who were direct victims of violence had lower dietary diversity. Gates et al. (2012) show that battle deaths increase the share of people below the level of minimum recommended dietary consumption, and that a conflict with 2500 battle deaths is estimated to increase undernourishment by an additional 3.3%. The disruption induced by conflict operates beyond direct exposure to violence. In a study of the consequences of the Russian invasion of Ukraine, Rudolfsen, Bartusevičius, van Leeuwen, and Østby (2024) find that both direct exposure to violence by military troops and indirect attacks (on family members, acquaintances, and municipality of residence) predict lower levels of food consumption among civilians.

Wars affect food production by diverting resources to non-agricultural or less agriculturally intense activities, as land becomes more challenging and hazardous to cultivate. Studying Colombia, Arias et al. (2019) find that violent shocks influence agricultural production preferences, as farmers lack the resources to invest in crops that would lead to greater yields and reallocate income to less productive farming with short-term yields. Armed conflicts in Iraq and Syria are associated with the expansion of cropland into previously uncultivated areas, abandonment of existing cropland, and reduction in high-intensity cropland use (Eklund, Degerald, Brandt, Prishchepov, & Pilesjö, 2017). Cropland abandonment and reallocation can have long-lasting repercussions on food production. In their study of civil conflict in Rwanda, Serneels and Verpoorten (2015) find that returns to factors of production after the war depend on past conflict experience, and that returns to land are lower in conflict intense areas.

Food security is also impacted via dissaving — the movement of capital and labour out of the country. Studies suggest that food insecurity increases due to forced displacement, reducing the quantity and quality of the food consumed (Kondylis, 2010; Marchesi & Rockmore, 2023). Verwimp and Muñoz-Mora (2018) find that internally displaced persons who returned home after the Burundian civil war had 6% less calorie intake and 5% less food expenses than the average Burundian.

Reduced food consumption and poor dietary variation have a detrimental effect on the nutritional status of the population, whose intensity and duration depends on the vulnerability of affected groups. Children and pregnant women are particularly vulnerable (Corley, 2021). Studies of the effect of conflict exposure on child nutritional status often apply anthropometric indicators, including wasting, stunting and underweight, and largely find an association between conflict exposure and malnutrition (Acharya, Luke, Naz, & Sharma, 2020; Akresh, Lucchetti, & Thirumurthy, 2012; Arcand, Rodella-Boitreaud, & Rieger, 2015; Brown, Grace, Billing, & Backer, 2021; Dahab et al., 2020; Kinyoki, Moloney, Uthman, Kandala, Odundo, Noor, & Berkley, 2017; Tranchant, Justino, & Müller, 2020). Studying the armed conflict in Côte d'Ivoire, Minoiu and Shemyakina (2014) find large health setbacks for children exposed to conflict, with height-for-age z-scores on average between 0.2 and 0.4 standard deviations lower for children living in conflict regions compared to same-age children living outside conflict regions. Akresh, Caruso, and Thirumurthy (2022) investigate the link between war exposure and child health in Ethiopia and Eritrea, and find that conflict-exposed children have significantly lower height-for-age. Children that live nearest to conflict bear the brunt of impacts, experiencing a decrease in the height-for-age ratio that vary from 0.72 (in Ethiopia) to 1.37 standard deviation (in Eritrea). In a study of 56 developing countries, Le and Nguyen (2022) find that children exposed to conflicts are on average 6.6% shorter for their age, 11% thinner for their height, and 9% thinner for their age compared to unexposed children.

The impacts of conflict on children's food security persist after the conflict end, with long-term physical and mental consequences (Alderman, Hoddinott, & Kinsey, 2006). Focusing on the Nigerian civil war, Akresh et al. (2012) identify long-term impacts four decades after the war. They find that individuals exposed to war in early life have reduced stature in adulthood, reduced life expectancy and lower earnings compared to those not exposed to conflict early in life. Studies show that maternal stress and health is an important pathway linking armed conflict to negative health impacts on children that were exposed to war in utero or in early childhood (Camacho, 2012; Mansour & Rees, 2012). Also, there is robust support for the negative impacts of nutritional inefficiencies on both short and long-term physical and cognitive development, influencing factors such as height and schooling (Akresh et al., 2012, 2022).

As these examples illustrate, conflict impacts on food security may be amplified by interactions across multiple developmental dimensions. For example, armed conflicts lead to the destruction of farmland and loss of livelihoods (Kafando & Sakurai, 2024). This, in turn, can lower income and increase poverty, as farming becomes less efficient or impossible, while transactional costs of maintaining land and selling agricultural products increase (Adejala & George, 2019). Loss of livelihoods heightens barriers to produce food and earn an income to buy it (d'Hôtel et al., 2023). Loss of income opportunities may force households to sell assets as a short-term coping strategy, but also leads to long-term impoverishment and reduces households' ability to purchase food in the future (Rockmore, 2020). Armed conflict are also conducive of lower investments, market closures and reduced trade, which cause spikes in food prices. Lack of available goods leads to inflation, making food unaffordable for many (Brück, d'Errico, & Pietrelli, 2019).

Violence can lead to large-scale displacement, creating refugee populations who are dependent on humanitarian aid, and whose ability to produce or access food in a new environment is limited (Bozzoli, Brück, & Muhumuza, 2016; Ruiz & Vargas-Silva, 2013). Displacement also has long-term impacts on consumption. Studying calorie intake among Burundian refugees, Verwimp and Muñoz-Mora (2018) find that it would take 8–10 years for the gap between displaced and non-displaced households to close. Lastly, conflicts erode state institutions, which in turn disrupts agricultural policies, food security programmes, and social safety nets designed to support food-insecure populations (Justino, 2012).

Over the past years, quantitative research on food and conflict has expanded rapidly across disciplines. However, there is considerable theoretical and empirical room for a better understanding of multiple underlying and context-specific mechanisms linking conflict to food insecurity. Causally identifying these processes is vital to better inform policy making and to tackle the mounting challenges of increasing food insecurity levels on a global scale.

12. Discussion

12.1. Cross-sectoral impacts of violence on development

The present review of the impacts of armed conflict on nine dimensions of human development suggests that these impacts are not isolated but deeply intertwined and mutually reinforcing. These cross-sectoral interactions highlight the systemic nature of conflict effects, where the harm inflicted in one area often spills over into others, lowering the collective capacity to respond to other conflict-induced impacts, and amplifying the overall damage to societies and individuals.

and Fig. 3 summarize a range of plausible indirect impacts of conflict across two dimensions of development; yet these impacts can occur simultaneously and propagate across more than two sectors. For instance, conflict has a substantial negative effect on both mental and physical health. In turn, health has long-term impacts on income growth and status in adult populations (Mayer, 2001), and longer and more frequent disease outbreaks, common in war zones, increase poverty and depress socio-economic development (Ardington, Bärnighausen, Case, & Menendez, 2014).

Concomitantly, reduced access to clean water impact mental health, social integration (Devoto, Duflo, Dupas, Parienté, & Pons, 2012; White et al., 2022) and livelihood. For instance, people in Southern Syria spent at least 20% of their income on water alone (Sikder et al., 2018).

The impacts of conflict on economic conditions and growth may further deteriorate populations' health by depressing income, worsening individuals' social position, and lowering educational attainment — among the major determinants of health (Braveman & Gottlieb, 2014). Further, destabilized labour markets and limited job opportunities, common consequences of conflicts, may contribute to internal migration (Morrison & Clark, 2011). The detrimental impacts of conflict on water provision and food production may further stir internal displacement, as the lack of fuel for groundwater pumping, damaged water pipes, or dysfunctional waste-water treatment pose serious challenges for local populations (ICRC, 2015). Temporary shelters hosting conflict refugees and IDPs can expose communities to new disease vectors, increase the likelihood of sexual exploitation, and limit access to healthcare (Garry & Checchi, 2020). The inflow of displaced people in receiving communities can also destabilize the existing ethnic composition, decrease social cohesion, and exacerbate economic competition (Baloch, Shah, Noor, & Lacheheb, 2017; Salehyan & Gleditsch, 2006).

Conflict-driven structural changes in the national economy, including lower per-capita income, decreased openness to trade, and widespread uncertainty that depresses growth (Collier, 1999; Magee & Massoud, 2011), can influence political institutions, decrease social capital, and adversely affect stability and security, thereby increasing the risk of conflict in the future (Acemoglu, Johnson, Robinson, & Yared, 2008; Boix, 2008; Gat, 2005).

Social cohesion, stability, and trust are in turn paramount determinants of socio-economic development (Foa, 2011), institutional quality, and political regimes (Easterly, Ritzen, & Woolcock, 2006; Heller, 2009). Changes in political regime, which may arise from violence, have repercussions on economic growth (Hausmann, Pritchett, & Rodrik, 2005), with particularly sharp and long-lasting effect after the death of a political leader (Jones & Olken, 2005). Social cohesion also affects mental health (Browne & Leckey, 2022), and deprived and socially excluded individuals exhibit lower levels of mental and material wellbeing (Bellani & D'Ambrosio, 2011; Foa, 2011).

From a systemic perspective, the impacts of conflict may be further reinforced by a feedback loop from the individual level to the broad macroeconomic development of societies. Standard macroeconomics models predict that the speed of recovery depends on the type of capital that is destroyed, with a slower recovery if human capital is destructed (Barro & Sala-i Martin, 2004). Numbers by Akresh et al. (2012), León (2012) on the long term impact of exposure to conflict on education and health can therefore be viewed as a permanent labour productivity loss for the exposed individuals. From a macro perspective, in the years following onset of intense conflicts, cohorts of treated individuals will progressively enter into the labour force in substitution of older workers. As individuals that were exposed to conflict before adulthood enter the labour market, the aggregate productivity loss of the country continues to hinder recovery. This aggregate effect vanishes completely only when none of them belongs to the labour force anymore. Mueller, Piemontese, and Tapsoba (2017) use the numbers by Akresh et al. (2012) to derive ballpark estimates of labour productivity loss in the countries that suffered from intense conflict and derive an average loss of 15%.

Other cross-cutting channels from individual experience to the macro level operate through trust between groups, which affects internal trade (Rohner, Thoenig, & Zilibotti, 2013) or the long-lasting impact of conflicts on political institutions and state capacity (Besley & Persson, 2010). Overall, the total impacts of conflict on human wellbeing and development are potentially much larger than the sum of the sectoral impacts, which might explain why micro- and macro-level estimates of conflict costs are hard to reconcile.

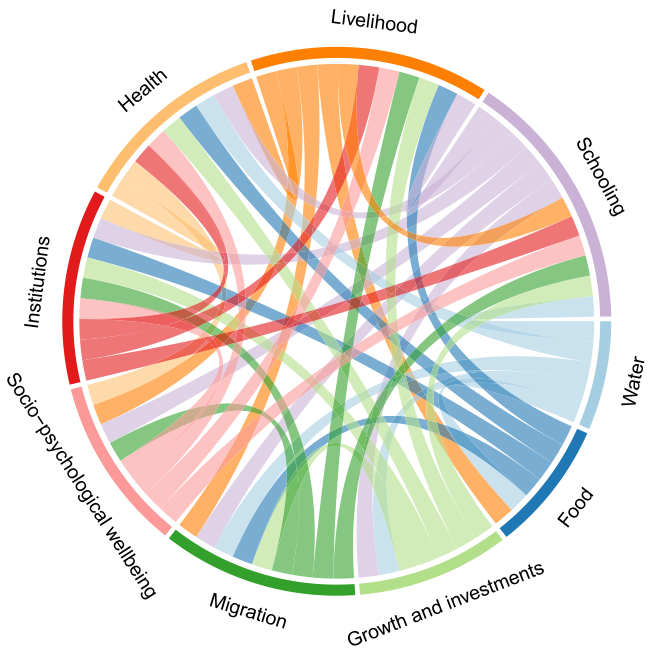

Fig. 3. Interactions across dimensions of development that can exacerbate the overall impacts of armed conflict. An interactive version of this figure can be found in the Supplemantary Material.

12.2. Future research avenues

As this review has clarified, there is still limited knowledge of how the impacts of conflict interact and mutually reinforce across domains, and of how the macro-level processes feed into the individual-level impacts across different contexts. While we document plausible indirect and cross-cutting impacts, few studies have investigated empirically how these impacts interact and mutually reinforce in situations of conflict. The majority of the existing literature examines how different dimensions of development affect each other, but does not explicitly account for changes induced by conflict ().

To achieve this, it may be beneficial to employ methodological approaches suited to handling complexity. For instance, complex systems approaches can be used to understand how impacts spread across different societal dimensions and scales. Agent-based and integrated assessment modelling could investigate how shocks in one sector propagate to others, simulating how individuals or groups respond to amplified risks. Additionally, structural equation modelling may help identify causal links between conflicts and multiple societal dimensions.

Shedding light on how these impacts interact is crucial to inform effective policies that can help prevent and mitigate human suffering in crises settings, as well as to exploit potential positive feedback loops in peace building and development policies. For example, education programmes could mitigate the negative impact of conflict on education if children are exposed to these interventions during school age, with long-lasting impacts on their level of development and income. By exploiting interactions across sectors and leveraging the positive externalities of one target intervention on other domains, post-conflict and peace-building programmes may trigger ripple positive effects throughout several dimensions of development. Further research is thus needed to understand the cross-sectoral implications of peacebuilding policies and aid programmes.

A final research avenue is to improve understanding of what individual and group-level characteristics exacerbate or moderate conflict impacts, and what policies and interventions may mitigate them. Our review suggests that children and (pregnant) women are particularly vulnerable to the impacts of violence. However, the role of more

Table 1
Cross-sectoral impacts of violence on each dimension of development (row), through another dimension (column). Diagonal cells summarize direct impacts of conflict. Due to limited research on cross-sectoral impacts, the majority of the studies reported here focus on the impact of a given dimension of development on another, without necessarily accounting for the change induced by conflict.

On→ Through ↓	Health	Income	Education	Water	Food	Econ. Growth	Soc. capital	Migration	Institutions
Health	war increases risk of disease, injury, death; lowers health services availability/access, degrades mental health (Garry & Checchi, 2020)	ill health leads to impoverishment and again an increased risk of ill health (Bdaiwi et al., 2023)	long-lasting disease outbreaks that are common in conflict areas may hinder education (Buonsenso et al., 2021)		increase of communicable diseases and poor health, prevalent in conflict settings, increase malnutrition (Connolly et al., 2004)	poor health decreases economic output through reduced labour productivity (Mukherjee, 2015)	mental illness reduces social capital (Haer et al., 2021)	trauma and disabilities influence migration decisions and resettlement processes (Schon, 2019)	poor health reduces active participation and inclusiveness of institutions (Gidengil & Wass, 2024)
Income	lower income is linked to poorer health (Churchill et al., 2022)	war curtails households' livelihood activities, contributing to lower income (Abay et al., 2022)	income uncertainty reduces educational outcomes (Kazianga, 2012)	poorer income lowers water access (Mahama, Anaman, & Osei-Akoto, 2014)	income decline impairs food consumption and reduces adaptive capacity (Brück, d'Errico, & Pietrelli, 2019; Minoiu & Shemyakina, 2014)	poorer income due to conflict can impair economic growth, as individuals' income relates to aggregate output (Mankiw, 2001)	decline in income reduces trust (Ananyev & Guriev, 2019)	income shocks can increase aspiration to migrate but also decrease mobility (Bohra-mishra & Massey, 2011)	lower income reduces the durability of democratic regimes (Przeworski & Limongi, 1997)
Educat.	education of medical staff is hampered by conflict (Bdaiwi et al., 2023), with negative impacts on healthcare provision	violence-induced lower educational attainments disrupt labour markets (Shemyakina, 2015)	wars reduce school enrollment, attendance and literacy (Bertoni et al., 2019)		lower education is associated with lower agricultural productivity (Asadullah & Rahman, 2009)	losses to education may lower economic growth, as education is associated with GDP (Li, Xue, Wei, & He, 2024)	school dropouts can lower social capital (Huang, Maassen van den Brink, & Groot, 2009)	lower education levels may reduce aspirations to migrate (Müller-Funk, 2023)	lower education levels are linked to fewer pro-democracy protests and lower probability of democratization (Dahlum, 2019)
Water	disruption/destruction of water supply increases risk of disease outbreaks (Garry & Checchi, 2020; Marou et al., 2024-04) and harms mental health (Kimutai et al., 2023)	water scarcity is associated with lower household income (Rahut, Ali, Imtiaz, Mottaleb, & Erenstein, 2016)	reduced water access increases school absenteeism (Hunter et al., 2014)	conflicts impair water access, quality, and quantity (Schillinger et al., 2020)	limited access to water and sanitation increases risk of stunting (Mudadu Silva et al., 2023)	changes in water availability hinder economic growth (Russ, 2020)	drought reduces pro-sociality towards antagonistic outgroups (Döring & Hall, 2023)	water availability shapes patterns of migration (Xu & Famiglietti, 2023)	water scarcity affect political stability (Bernauer & Böhmelt, 2020)
Food	food scarcity drives malnutrition among vulnerable groups, increasing child mortality (Corley, 2021)	decline in food production deteriorates farming income (Nillesen, 2016)	malnutrition hinders children's academic performance (Akresh et al., 2022)		wars deteriorate food security (Martin-Shields & Stojetz, 2019)		food scarcity reduces trust (Agneman, Palco, Exaud, & Selejio, 2023)	food insecurity encourages migration (Saddidin, Cattaneo, Cirillo, & Miller, 2019)	food price hikes and food scarcity increase unrest and political instability (Rudolfsen, 2020)

(*continued on next page*)

Table 1 (*continued*).

On→ Through ↓	Health	Income	Education	Water	Food	Econ. Growth	Soc. capital	Migration	Institutions
Econ. Growth	conflict-induced budget cuts, diversion of public funds away from health and expatriation of economic resources harm healthcare (Garry & Checchi, 2020)	macro-economic shocks lower household wealth and income through effects on expectations (Besley & Mueller, 2012)	falling tax revenues divert public expenditures away from education (Chami, Espinoza, & Montiel, 2021)	lack of investment in the water sector contributes to the deterioration of water infrastructure and provision (Zeitoun et al., 2017)	economic shocks hinder agricultural production and land-based investments (Adelaja et al., 2023)	war destroys human and physical capital; reduces current and future growth and investments (Chami et al., 2021)	negative economic shocks increase risk aversion (Malmendier & Nagel, 2011)	economic crises promote outmigration (Gröger & Zylberberg, 2016)	economic decline increases chances of democratic breakdown (Przeworski & Limongi, 1997)
Soc. capital		lower social capital is associated with decreased income (Shen & Bian, 2018)	social capital affects the likelihood of school dropouts (Winding & Andersen, 2015)	communities' trust in institutions shape the effectiveness of water interventions (Cain, 2014)	social capital disruption and loss of community networks worsen food security (Corley, 2021)		war increases in-group favouritism vs threatening outgroup (McDonald, Navarrete, & Van Vugt, 2012)	social capital in host countries serves as strong pull factor for migrants (Conte & Migali, 2019)	loss of social connections decreases governmental accountability (Asante, 2019)
Migrat.	conflict-induced migration leaves people more vulnerable to diseases (Makinde et al., 2023) and mental health issues (Mesa-Vieira et al., 2022)	refugee inflows can harm income in host communities (Morales, 2018) but effects are heterogeneous (Coniglio, Peragine, & Vurchio, 2023)	minority refugees face several barriers to learning (Ndibalema, 2024)	migration of skilled workers during conflict contributes to a decline in water services (Zeitoun et al., 2017)	refugees are at higher risk of food insecurity (Gingell, Murray, Correa-Velez, & Gallegos, 2022)	refugees can impact local economic growth but the effects are heterogeneous (Coniglio et al., 2023)		conflict is a major determinant of migration (Schutte et al., 2021)	migrants can boost institutional transformations; migrants' remittances can weaken state capacity (Kapur, 2014)
Institut.	decline in democracy is deleterious for public health (Coppedge et al., 2022)	democratic decline may increase between-group income inequality (Knutsen, 2015)	decline in democracy reduces educational enrollment (Dahlum & Knutsen, 2017)	breakdown of central authority harms access to water in crises settings (Zeitoun et al., 2017)	institutions shape food insecurity in conflict contexts (Sanch-Maritan & Verdine, 2019)	democratic decline lowers openness to trade and growth (Gerring et al., 2022)		state repression and political instability are major drivers of migration (Shaver et al., 2024)	conflict affects state capacity, regime type and duration (Lachapelle et al., 2020; Slater, 2010; Thies, 2010)

structural factors in driving the vulnerability of individuals and groups exposed to violence is less known. Members of minority ethnic groups or the LGBT community are likely to be particularly vulnerable to the impacts of violence, as discrimination and exclusion may hinder their access to resources and preempt their recovery after the conflict ends. However, current research on how political and structural factors affect vulnerability is lacking (Tschakert, van Oort, St. Clair, & LaMadrid, 2013). Gaining insight on which individuals and groups may be most vulnerable to the impacts of conflict is needed to design post-conflict policies and relief programmes that target populations' actual needs. As the literature on foreign aid abounds of projects that were designed based on false assumptions or not accounting for the need of exposed populations (Cain, 2014), an improved understanding of the beneficiaries and the impacts of relief programmes is paramount to minimize human suffering.

13. Conclusions

This paper has reviewed the literature on the impacts of armed conflict on health, schooling, livelihood and income, macro-economic growth, political institutions, migration and displacement, socio-psychological wellbeing and capital, water access, and food security.

This study suggests that conflicts affect development not only through the material destruction and deterioration of resources, but also by disrupting social connections, infrastructure and services, diverting investments and resources away from ordinary activities, and reducing the value of assets, capital, and savings. The impacts are felt beyond locations and individuals that are directly exposed to violence: the expectation of violence, beyond its actual realization, is sufficient to trigger negative effects on individuals' health, income, livelihood, education, and choices to migrate, as well as on countries' economic growth and political institutions.

The effects of conflict go beyond the immediate short-lived destruction and devastation caused by fighting: the health and development of mothers and children suffer from long-lasting effects that perpetrate the shock of violence throughout generations; water infrastructure, health and schooling suffer from the diversion of funds away from their maintenance with long-term impacts on the provision and quality of basic services; economic growth and investments are unlikely to recover before the prospect of peace is stable and certain, and the breakdown of political stability coupled with the emergence of an 'ethos' of conflict may contribute to an increased risk of authoritarian drifts. All these impacts, in turn, may make societies more vulnerable to conflict traps and re-occurrence.

The review suggests that the overall effect of violence is likely to be greater than the sum of its domain-specific impacts, due to rippling effects where the impacts on one outcome propagates on a multitude of societal dimensions. However, further research and more rigorous empirical testing is needed to understand how the effects of war mutually reinforce across different societal domains, and what conditions make individuals and groups more or less vulnerable to those impacts. An increased understanding of the factors and conditions that worsen or moderate the impacts of violence may help inform anticipatory actions and prevention strategies to minimize human suffering, and preempt conflicts from escalating into a humanitarian disaster.

CRediT authorship contribution statement

Paola Vesco: Conceptualization, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Ghassan Baliki:** Writing – original draft, Writing – review & editing, Investigation. **Tilman Brück:** Conceptualization, Writing – original draft, Writing – review & editing, Investigation. **Stefan Döring:** Conceptualization, Visualization, Writing – original draft, Writing – review & editing, Investigation. **Anneli Eriksson:** Writing – original draft, Writing – review & editing, Investigation. **Hanne Fjelde:** Writing – original draft, Writing – review & editing, Investigation. **Debarati Guha-Sapir:** Supervision, Validation. **Jonathan Hall:** Writing – original draft, Writing – review & editing, Investigation. **Carl Henrik Knutsen:** Writing – original draft, Writing – review & editing, Investigation. **Maxine R. Leis:** Writing – original draft, Writing – review & editing, Investigation. **Hannes Mueller:** Writing – original draft, Writing – review & editing, Investigation. **Christopher Rauh:** Writing – original draft, Investigation. **Ida Rudolfsen:** Writing – original draft, Writing – review & editing, Investigation. **Ashok Swain:** Supervision. **Alexa Timlick:** Writing – review & editing, Investigation. **Phaidon T.B. Vassiliou:** Writing – original draft, Writing – review & editing, Investigation. **Johan von Schreeb:** Supervision. **Nina von Uexkull:** Conceptualization, Investigation, Validation, Writing – review & editing. **Håvard Hegre:** Conceptualization, Funding acquisition, Supervision, Writing – original draft.

Declaration of competing interest

The authors are not aware of any conflict of interest.

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Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.worlddev.2024.106806.

Data availability

No data, other than the reviewed articles reported in the References, was used for the research described in the article. Data to produce the maps in Figure 1 are openly available through the UCDP (https://ucdp.uu.se/, Pettersson et al., 2021) and the WDI (https://databank.worldbank.org/source/world-development-indicators, World Bank, 2022) websites.

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