



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

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HiCN Working Paper 414

October 2024

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 filling this gap by reviewing the literature on conflict impacts through the lens of an inter-disciplinary theoretical framework. We

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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 systemic 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 war reverberates across society. This multidisciplinary understanding of conflict impacts may eventually help reconcile divergent estimates and enable forward-looking policies that minimize the costs of war.

1 Introduction

Not only do civil wars ‘kill and maim people long after the shooting stops’ (Ghobarah et al., 2003); 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).

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 et al., 2019), public health and the spread of diseases (Garry and Checchi, 2020), political institutions (e.g. Sánchez de la Sierra, 2020), social capital (Bauer et al., 2016), food security (Brück et al., 2019), and displacement (e.g. Fearon and 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 et al., 2012; Gates et al., 2012; Mueller and Tobias, 2016; Moyer, 2023), 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 et al., 2013).

One possible explanation for this inconsistency lies in 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 et al., 2009; Varnum and 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.

The scope of the review is limited to the impacts of organised 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 et al., 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

¹To ease the reading, the terms ‘conflict’, ‘armed conflict’, ‘violence’, ‘political violence’, and ‘war’ are here used interchangeably.

violence, or the deliberate use of armed force against civilians (Davies et al., 2023). A team of inter-disciplinary experts identifies 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 on conflict impacts, we limit the scope to studies that are published after 2015. However, authors can include seminal articles published before 2015 if they believe that older studies marked a considerable contribution and thus cannot be left out.

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 conflict impacts 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 minimise its damages.

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 Figure 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, Figure 1).

FIGURE 1 HERE

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 et al., 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 feed back, 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 Figure 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, by 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 public 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 (Guidolin and Ferrara, 2010; Besley and Mueller, 2012).

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, 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.

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, 5, and 4. 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 fulfillment 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 affect 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 this overarching theoretical framework illustrated above to streamline the literature on conflict impacts on a given specific dimension of development, discusses which groups and individuals are most vulnerable to these impacts of conflict on that dimension, and how long the impacts last over time and spread over space. The sections also review the existing

evidence on how impacts on a given dimension of development intertwine with impacts on other dimensions, and identifies critical gaps in the existing knowledge.

FIGURE 2 HERE

3 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 (Wagner et al., 2018; Jawad et al., 2020, 9 28; Kotsadam and Østby, 2019).

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 (Kadir et al., 2019; Garry and Checchi, 2020). 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. Utilisation of health services decreases with the number and intensity of conflict events, as access to healthcare is preempted or impaired (Ekzayez et al., 2021; Price and 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 utilisation of delivery, antenatal care, and child health services (Amberg et al., 2023; Chukwuma and Ekhatior-Mobayode, 2019; Leone et al., 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 and 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, 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 and Checchi, 2020). For example, the incidence and prevalence of active tuberculosis is doubled in crisis-affected populations relative to the reference population (Kimbrough et al., 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 et al., 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 (Gesese 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) finds 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 and 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 (Dahab et al., 2020; Bendavid et al., 2021; Goto et al., 2021; Makinde et al., 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 (Wagner et al., 2019; Garry and Checchi, 2020). People living with disabilities, children, and pregnant and lactating women are particularly likely to suffer heightened health risks from conflict exposure (Rodríguez Caicedo et al., 2023; Wagner et al., 2019; Garry and Checchi, 2020). 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 and Cohen, 2021).

Children under 5 years of age are also at higher risks of severe and moderate underweight and stunting (Dahab et al., 2020; Bendavid et al., 2021; 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 et al., 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 and 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 et al., 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 et al., 2020; Daw, 2021; Rohan and 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 (Section 11) and mental health conditions akin anxiety, depression, and post-traumatic stress disorder (Section 9).

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 et al., 2022).

4 Schooling and education

Conflict has devastating impacts on a range of educational outcomes. Studies find that violent conflict reduces school enrollment (Bertoni et al., 2019), literacy, attendance (Bharati, 2022), and educational achievement (Brück et al., 2019). Studying the impacts of the Sri Lankan civil war, Ito et al. (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 et al., 2019).

The destruction of school facilities and damages to households' property caused by war diminish educational outcomes (Michaelsen and Salardi, 2020; Ito et al., 2024). However,

Swee (2015) finds a limited effect of the direct destruction caused by the Bosnian war in influencing schooling. Even if school facilities are not destroyed, 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 et al., 2019).

Additionally, conflict disrupts children’s ability to attend school, as educational activities are interrupted and impaired. Conflict disrupts 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 et al., 2019). The deterioration of pupils’ psychological wellbeing also impedes education (Brück et al., 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 and Salardi, 2020).

The expectation of violence affects education through devaluation, by decreasing the perceived value of schooling: individuals’ shift in the perception of risks after exposure to conflict may alter their educational demands. Studies find that uncertainty and fear associated with terrorism increase school absenteeism (Alfano and Görlach, 2024), which is partly transmitted by media coverage (Alfano and Görlach, 2023).

War-induced losses in human capital lower the long-term productive capacity of an economy (Égert and De la Maisonnette, 2024), resulting in the diversion of resources away from education. At the household level, conflict forces children out of school and into child labour, reducing lifetime earning, as happened in Rwanda (Chin et al., 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 et al., 2019). These short-term impacts increase with geographic proximity to and intensity of violence (Michaelsen and Salardi, 2020; Ito et al., 2024), and vary depending on the type of conflict event and the timing of exposure (Swee, 2015; Ajogbeje and Sylwester, 2024). 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 reduce the human capital of children born after the war (Aizer et al., 2016; Akresh et al., 2012a) and even of their children (Akresh et al., 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 et al., 2019), and can yield an educational peace dividend at the end of hostilities (Prem et al., 2021).

The impacts of violence on education differ depending on the vulnerability of children and households in (and close to) conflict areas. Shemyakina (2011) found that violent conflict impacted girls but not boys in Tajikistan. Guariso and Verpoorten (2019) reported 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 effect 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 and Kis-Katos, 2023). The effects also vary 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) shows 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 and 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) finds 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 and Kis-Katos, 2023). In turn, the education losses driven by conflict – as children are forced out of school and into child labour (Büttner et al., 2022) – may have long-term implications on their income and livelihood (Chin et al., 2023; Shemyakina, 2015). Conflict impacts on education are likely to be correlated with health-related impacts: for example, rebels targeting schools may also be likely to target healthcare infras-

structure. 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 Income and livelihood

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

Simultaneously, conflict affects productivity through deterioration. Deterioration and devaluation negatively impact output and productivity, 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 et al. (2023) show that conflict decreases revenues of firms located within a 10km radius, and that 10 additional conflict events decrease revenues by 1.4%. This effect is driven by conflict-induced reduction in 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 et al., 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 et al., 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 et al., 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 et al., 2016). Exposure and intensity of bombing in Vietnam increases inter-generational child labor outcome (Churchill et al., 2022) with detrimental impact on wages, particularly for women (Shimizutani and Yamada, 2024). Rural areas are particularly vulnerable to these impacts as violence lowers agricultural production (George et al., 2021; Adejala and George, 2019). However, Abay et al. (2023) show that farming activities remain resilient in the short-term.

Although most aspects of life continue during conflict (Verwimp et al., 2019), violence has indirect impacts on livelihood and income through other developmental dimensions. For example, violence shifts individual risk preferences and triggers behavioural changes: Callen et al. (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 become more likely to engage in risk-averse behaviors (Brück et al., 2016), such as saving more, diversifying income sources, conducting informal activities or subsistence farming (Brück et al., 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 et al., 2019). Conflict exposure and economic hardships can also foster privately violent behaviours, including intimate partner violence (Brück and 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 et al., 2022; Mercier et al., 2020; Moya and 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 et al., 2017). However, the ability to rigorously estimate the causal impacts of conflict on micro-level economic behavior 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 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 et al., 2017; Petrova et al., 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 et al. (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 and 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 behavior. 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 et al., 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 et al., 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 (Willard et al., 1995; Zussman and Zussman, 2006; Besley and Mueller, 2012). Recent work on macro forecasting by Diakonova et al. (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 et al., 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 the conflict induced macro-economic deterioration and the 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 (Collier, 1999; Bloom, 2014): armed conflict fosters uncertainty, leading actors to postpone investment decisions, and further exacerbating damages on growth and investments (Baker et al., 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 et al. (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 et al., 2023). Additionally, bordering countries and those that severely sanctioned Russia's invasion are particularly affected (Boungou and 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 health-care (Tapsoba, 2022), increase malnutrition (George et al., 2020), and deteriorate water availability (Zeitoun and Talhami, 2016; Schillinger and Özerol, 2024) by diverting resources away from peaceful activities. Low macroeconomic income and unstable governments decrease the incentives to invest in state capacity, which in turn deteriorates health and education services (Besley and 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 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 macro-economic cost estimates through these cross-channels are still not well understood (Rohner and Thoenig, 2021).

7 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 Hegre, 2014; Fjelde et al., 2020). 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 and 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 (Tilly, 1990; Queralt, 2019; Goenaga and von Hagen-Jamar, 2018), 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 associated with a diminished fiscal capacity due to the deterioration of tax revenues when 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 et al. (2021) study 49 sub-Saharan African countries from 2000-2015, and find that civil war has a clear negative relationship on fiscal capacity.

The 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 and Persson, 2010). The devaluation induced by the expectation of violence can also shape the type and duration of political regime. For instance, Eibl et al. (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. von Borzyskowski et al., 2022; Godefroidt, 2023). Consistently, studying autocracies across 1900-2015, Lachapelle et al. (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. Armev 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 et al., 2008; Davenport and Inman, 2012). Armev and McNab (2015) examine 96 countries from 1970 to 2004, and find indications that civil wars hamper subsequent democratization. Similarly, Aguirre (2016) find 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 and Gleditsch, 2013; Garcia-Ponce and Wantchekon, 2022), and that violence during democratic transitions leaves long-lasting negative effects on the institutional qualities of these regimes (Cervellati and 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 (Przeworski, 2009; Aidt and Jensen, 2014; Scheve and Stasavage, 2010; Rasmussen and Knutsen, 2022). 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 and 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., Gurses and Mason, 2008; Fortna and Huang, 2012). However, effects do not persist in the long term and negotiated settlements might also be associated with more regime repression (Keels, 2002). 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 et al., 2022). Moreover, a growing

body of research brings attention to the lasting legacies of war-time 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 et al. (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, insofar 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 et al., 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 impact economic growth and investments. Kešeljević and Spruk (2024) studies the effect of the Syrian civil war on economic growth and suggests 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 studies explicitly considering 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., Rød et al., 2020; Coppedge et al., 2022).²

8 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).⁴⁵

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 and 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 and Shaver, 2021). In the context of Nigeria, Sani Ibrahim et al. (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 and Ibáñez, 2007).

Conflict impacts migration decisions by disrupting the provision of and access to community-level services. Engel and Ibáñez (2007) finds that households with access to education and

²Insofar 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 et al., 2022).

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

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

⁵While 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).

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 affect 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 and Nugent, 2019).

Most studies on 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 and Öberg, 2007), independently of the actor directing these threats (Davenport et al., 2003). Fear and perceived insecurity induce devaluation, as the costs of staying increase relative to the costs of leaving. For example, 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 and Steele, 2016). 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 and 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 et al., 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 et al. (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 et al. (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 Schon, 2015; Echevarria-Coco and Gardezabal, 2021). The geography of violence can further influence decisions on whether to move internally or cross-border. Turkoglu (2022) find 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, where the first actor type is 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) finds support for the major role of state repression in driving international displacement. Schutte et al. (2021) similarly shows 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 coun-

tries offer (see for example Turkoglu, 2022; Conte and Migali, 2019). While 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 (Engel and Ibáñez, 2007; Bohra-mishra and Massey, 2011; Adhikari, 2013), 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 (Erdal and Oeppen, 2018; Carling and Schewel, 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 et al. (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) finds 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 be directed to shed light 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 conceptualisation and operationalisation of displacement, make comparison and interpretation of substantive effects of conflict impacts challenging.

9 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 behaviors, and pro-sociality.

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

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 and 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 et al., 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 et al., 2004), and with increased feelings of revenge and lower support for reconciliation among former Congolese and Ugandan child soldiers (Bayer et al., 2007). More recently, Haer et al. (2021) shows 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 behavior, increasing ingroup bias and reducing altruism (Canevello et al., 2022), as well as to devalue trust in political institutions (Hall and Werner, 2022). However, traumatic experiences can sometimes promote 'posttraumatic growth' (Tedeschi and 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 et al., 2019). Refugees from Iraq and Syria reporting higher levels of posttraumatic growth displayed more altruism, although primarily toward 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 and Avrahamzon, 2017) and thereby reducing support for peaceful compromise in the long term (Canetti et al., 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 toward 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 et al., 2014; Cecchi et al., 2016; Mironova and Whitt, 2016; Whitt et al., 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 and 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 centered 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 et al., 2012). Prolonged conflicts may exacerbate this devaluation of outgroup members, as they become increasingly associated with threat, further disrupting social cohesion and amplifying ingroup favoritism.

War exposure may increase outgroup prosociality due to 'altruism born of suffering' (Staub and Vollhardt, 2008; Vollhardt and 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 and Morse, 2020), and Syrians with greater war exposure were more willing to host internally displaced persons from the Kurdish minority (Hartman et al., 2021). In both studies, outgroup members were portrayed as particularly vulnerable and non-threatening, potentially eliciting greater empathy. Hall et al. (2021) found 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 war ends, individuals with greater violence exposure exhibit more retributive attitudes, particularly in ethnically segregated settings (Hall et al., 2018). Exposure to war has been found to erode political tolerance (Kijewski and Rapp, 2019) and amplify negative bias towards ethnic outgroups (Mironova and Whitt, 2018), and these attitudes can be transmitted to future generations, perpetuating the cycle of conflict (Bar-Tal et al., 2017; Medjedovic and 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., 3 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 et al., 2012) in which the deterioration of mental health, disruption of social capital, and intergroup conflict feed and magnify each other.

10 Water

War impacts water access and provision both directly and indirectly (Zeitoun and Talhami, 2016; Schillinger et al., 2020).

War has immediate effects on water quality, quantity, access, and provision via the delib-

erate targeting and destruction of water infrastructure during armed conflict (Francis, 2011; Weinthal and Sowers, 2019; Schillinger et al., 2022; Sowers and Weinthal, 2021; Talhami and Zeitoun, 2020; Tabor et al., 2023). 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 (Tignino and Irmakkesen, 2020; Tignino, 2023; Grech-Madin, 2021). Wars similarly deteriorate 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 waste-water treatments pose critical dangers (Zeitoun and 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 et al., 2018). Power outages can lead to siltation and increased contamination from industrial facilities or treatment structures (Sowers and Weinthal, 2021), which undermine water quantity and quality. Yet, post-war water management, such as institutionalized cooperative solutions, might explain positive conflict impacts (Owsiak and Mitchell, 2017; Döring, 2020; Bernauer and Böhmelt, 2020).

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 (Zeitoun and Talhami, 2016; Schillinger and Özerol, 2024). 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 et al., 2018; Aw-Hassan et al., 2014). In long-lasting conflicts, military construction projects often neglect guidelines on environmental protection, with impacts on water-catchment areas (Chan et al., 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 et al., 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 refugees 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. ls face a disproportionate burden from water scarcity (Kadir et al., 2019; Blanchet et al., 2017), not only be with 80% of global households water supply relying on them to fetch their water (UNICEF-WHO, 2017) in addition to societal taboos that may make women reluctant to bring attention to sanitation issues (Mafuta et al., 2021). In areas affected by armed conflict, women with long distances to obtain water may also be subject to gender-based violence (Pommells et al., 2018; Mafuta et al., 2021).

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 wellbeing (Kangmennaang and 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 (Connolly et al., 2004; Chirgwin et al., 2021; Cooper et al., 2021; Tabor et al., 2023; Tarnas et al., 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 and Mosler, 2019). Extended time to fetch water can also increase dis-

putes both within households and between communities (Mott 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 (Mohamed et al., 2020; Eklund et al., 2022): for example, the normalized difference water index (NDWI) has been used to identify conflict-induced surface water change (Hasan et al., 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 (Ricaud et al., 2021).

11 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 (Brück et al., 2019).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

⁶Food 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 and Ecker, 2013).

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

Violence can undermine food security by reducing food production and accessibility. Armed conflict destructs and deteriorates human and physical capital and infrastructure, reduces livestock, crops and land access, and is associated with theft and the destruction of land properties (Adejala and George, 2019; Verpoorten, 2009; Kemmerling et al., 2022). Appau et al. (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 risk and 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 et al., 2022). The inability to access land and other natural resources additionally impact agricultural production (Jaafar et al., 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 et al., 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 to food markets. Comparing pre-war and post-war household data in Cote d'Ivoire, Dabalén 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 increases 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, Rudolfson et al. (2024) find that both direct exposure to violence by military troops and indirect attacks (on family members, acquaintances, and an individual's municipality) predict lower levels of food consumption among civilians.

Wars affect food production through diversion of 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 et al., 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, reduc-

ing the quantity and quality of the food consumed (Kondylis, 2010; Marchesi and Rockmore, 2022). Verwimp and Muñoz-Mora (2018) find that internally displaced persons who returned home after the Burundian civil war had 5% less calorie intake and 6% 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 (Arcand et al., 2015; Akresh et al., 2012b; Acharya et al., 2020; Brown et al., 2021; Kinyoki et al., 2017; Dahab et al., 2020; Tranchant et al., 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 et al. (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 et al., 2006). Focusing on the Nigerian civil war, Akresh et al. (2012a) identify long-term impacts four decades later. 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 and Rees, 2012). Also, there is robust support for the negative impacts of nutritional inefficiencies for both short and long-term physical and cognitive development, influencing factors such as height and schooling (Akresh et al., 2012a, 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 and 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 and 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 et al., 2019).

Violence can lead to large-scale displacement, creating refugee populations who are depen-

dent on humanitarian aid, and whose ability to produce or access food in a new environment is limited (Ruiz and Vargas-Silva, 2013; Bozzoli et al., 2016). 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. Conflicts erode state institutions, which in turn disrupts agricultural policies, food security programs, 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 review of the impacts of armed conflict on nine dimensions of human development reveals that these impacts are not isolated but deeply intertwined and mutually reinforcing. Across the thematic sections, the interaction between different dimensions highlights the systemic nature of conflict's effects, where the harm inflicted in one area often spills over into others, amplifying the overall damage to societies and individuals. These interactions are visualized in Figure 3 and summarized in Table 1.

FIGURE 3 HERE

The impacts of conflicts on the various societal dimensions reviewed in this paper can interact and propagate in a self-reinforcing loop, where the adverse effects of violence in one sector lower collective capacity to respond to other conflict-induced impacts.

TABLE 1 HERE

Table 1 and Figure 3 summarise a range of plausible cross-sectional impacts across two dimensions, yet these impacts can occur simultaneously and propagate across various 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 et al., 2014).

Concomitantly, reduced access to clean water impact mental health and social integration (Devoto et al., 2012; White et al., 2022). 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 and Gottlieb, 2014). For instance, people in Southern Syria spent at least 20% of their income on water alone (Sikder et al., 2018).

Further, destabilized labour markets and limited job opportunities, common consequences of conflicts, may contribute to internal migration (Morrison and Clark, 2011). The detrimental impacts of conflict on water provision and food production contribute to fuel 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 and Checchi, 2020). The inflow of displaced people in receiving communities can also destabilize the existing ethnic composition, decrease social cohesion, and exacerbate economic competition (Salehyan and Gleditsch, 2006; Baloch et al., 2017).

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 and Massoud, 2011), can all contribute to changes in political institutions, lower social capital, and adversely affect stability and security, thereby increasing the risk of conflict in the future (Gat, 2005; Boix, 2008; Acemoglu et al., 2008).

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

At a systemic level, 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 and Sala-i Martin, 2004). Numbers by León (2012); Akresh et al. (2012a) 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 the 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 et al. (2017) use the numbers by Akresh et al. (2012a) to derive ballpark estimates in the countries that suffered from intense conflict and derive an average labour productivity loss of 15% for these countries.

Other cross-cutting channels from individual experience to the macro level operate through trust between groups, which affects internal trade (Rohner et al., 2013) or the long-lasting impact of conflicts on political institutions and state capacity (Besley and 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.

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 (Table 1).

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 programs 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 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 et al., 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 programs 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, 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. These impacts are both immediate and long-lasting, and they are felt beyond locations and individuals that are directly exposed to violence. These effects 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 infrastruc-

ture, health and schooling suffer from the diversion of funds away from their maintenance with long-term effects 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 minimise human suffering, and preempt conflicts from escalating into a humanitarian disaster.

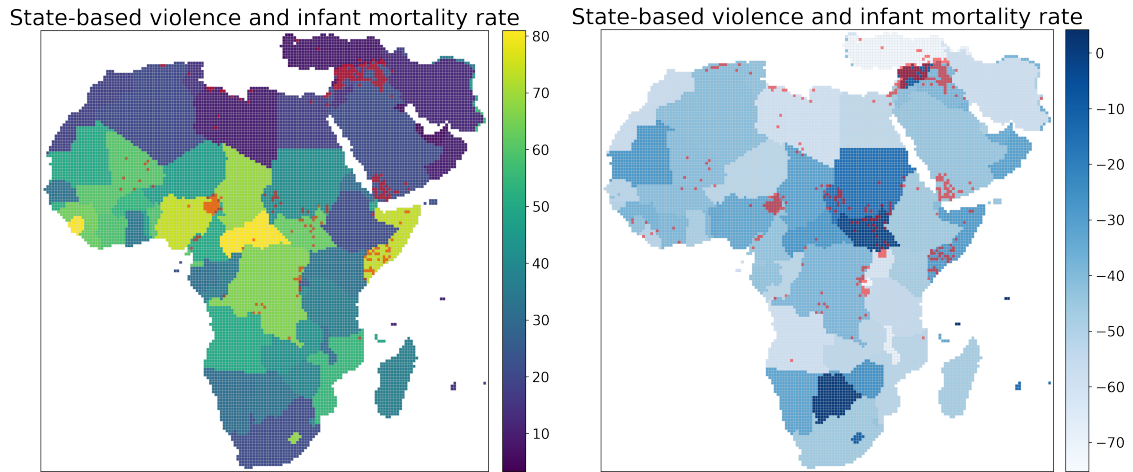


Figure 1. *Left map:* dark blue (low) up to yellow (high) shades indicate different levels of IMR in 2020 (source: World Bank, 2022), defined as the number of infants dying before reaching one year of age per 1000 live births. Red dots indicate locations that experienced more than 100 battle-related deaths from state-based violence in the previous 5 years (Pettersson 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 period 2000-2019.

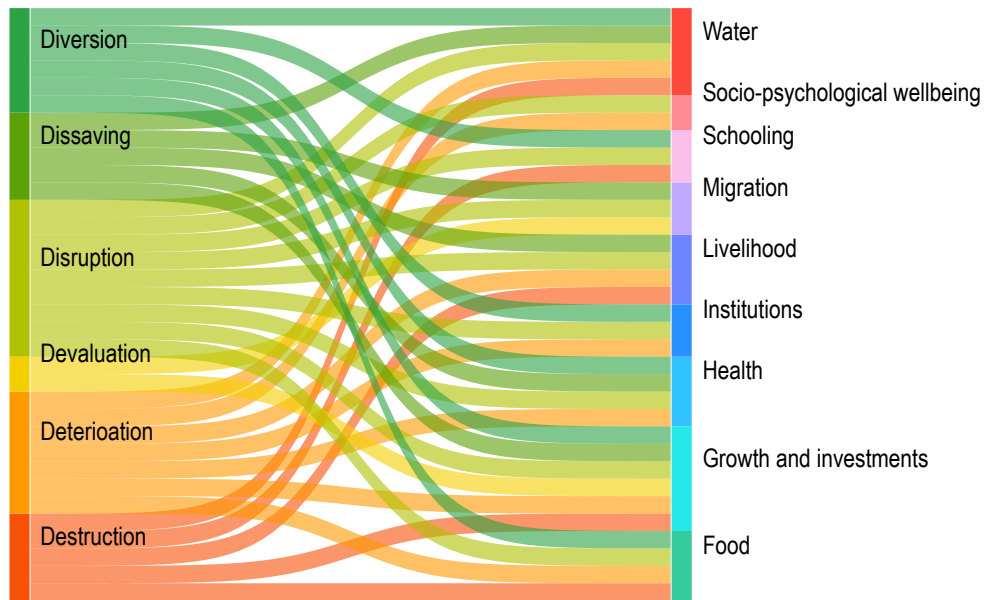


Figure 2. Theoretical framework applied to review the literature on conflict impacts across disciplinary domains and dimensions of development: health, livelihood, education/schooling, growth and investments, political institutions, socio-psychological wellbeing, migration, water, food. Effects of conflict on societal wellbeing and development. Each type of effect (left) has an impact on different dimensions of development (right) that are reviewed in this article.

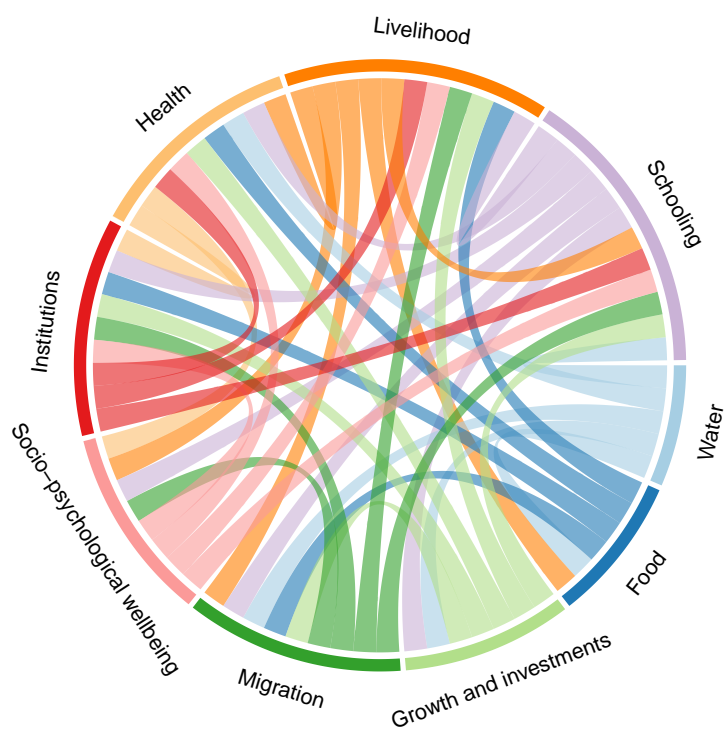


Figure 3. Interactions across dimensions of development that can exacerbate the overall impacts of conflict.

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 and 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 and 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 lower water access (Mahama et al., 2014)	income decline impairs food consumption and reduces adaptive capacity (Brück and d'Errico, 2019; Minoiu and 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 and Guriev, 2019)	income shocks can increase aspiration to migrate but also decrease mobility (Bohra-mishra and Massey, 2011)	lower income reduces the durability of democratic regimes (Przeworski and Limongi, 1997)
Educat.	education of medical staff is hampered by conflict (Bdaiwi et al., 2023)	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 and Rahman, 2009)	losses to education may lower economic growth, as education is associated with GDP (Li et al., 2024)	school dropouts can lower social capital (Huang et al., 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 (Marou et al., 4 04; Garry and Checchi, 2020) and harms mental health (Kimutai et al., 2023)	water scarcity is associated with lower household income (Rahut et al., 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 toward antagonistic outgroups (Döring and Hall, 2023)	water availability shapes patterns of migration (Xu and Famiglietti, 2023)	water scarcity affect political stability (Bernauer and 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 and Stojetz, 2019)		food scarcity reduces trust (Agneman et al., 2023)	food insecurity encourages migration (Saddidin et al., 2019)	food price hikes and food scarcity increase unrest and political instability (Rudolfsen, 2020)
Econ. Growth	conflict-induced budget cuts, diversion of public funds away from health and expatriation of economic resources harm healthcare (Garry and Checchi, 2020)	macro-economic shocks lower household wealth and income through effects on expectations (Besley and Mueller, 2012)	falling tax revenues divert public expenditures away from education (Chami et al., 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 and Nagel, 2011)	economic crises promote outmigration (Gröger and Zylberberg, 2016)	economic decline increases chances of democratic breakdown (Przeworski and Limongi, 1997)
Soc. capital		lower social capital is associated with decreased income (Shen and Bian, 2018)	social capital affects the likelihood of school dropouts (Winding and 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 favoritism vs threatening outgroup (McDonald et al., 2012)	social capital in host countries serves as strong pull factor for migrants (Conte and 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 et al., 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 et al., 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 and 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 and 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 (Thies, 2010; Lachapelle et al., 2020; Slater, 2010)

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.

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