

The quantitative impact of armed conflict on education: counting the human and financial costs

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Protect Education in Insecurity and Conflict (PEIC) was founded by Her Highness Sheikha Moza Bint Nasser in 2009 to promote and protect the right to education in areas affected by crisis, conflict and insecurity. Based in Doha, Qatar, PEIC is a policy, research, capacity-building and advocacy programme of Education Above All, and brings together practitioners and specialists in education, international law and child protection. PEIC envisions a world where all who wish to learn, teach and research – at all levels of education systems – can do so in peace, security and dignity.

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A statement from PEIC

This study builds on PEIC's goal of protecting and promoting education in situations of insecurity and conflict, including through its concrete support for the preparation and publication of *Education under Attack 2010* (UNESCO) and *Education under Attack 2014* (GCPEA). The study helps us to position attacks on education within the larger picture of the harm that education suffers in times of conflict. The focus on targeted attacks on education serves a valuable purpose by highlighting how students, teachers and education institutions and facilities are in the front line in many situations. This study, however, shows that such attacks are the 'tip of the iceberg' when the full extent of armed conflict's adverse impact on education is taken into account, not least when measured in terms of the millions of children out of school for various reasons in times of insecurity and violence.

By asking critical questions of the available data, the research team has shed fresh light on estimations of the numbers of affected children in sub-national areas where conflict has taken place. Likewise, the team has estimated the impact of conflict and insecurity on education in terms of direct and indirect costs, concluding that economic growth is negatively affected in significant ways. PEIC is grateful for this pioneering effort to frame these complex and essentially tragic issues through an approach that is both carefully argued and empirically rich.

Researchers, policymakers and practitioners are encouraged to take on board the findings and conclusions of the study to inform their own approaches to understanding and addressing the impact of armed conflict on education. It is important to stress not only that direct protective measures are definitely needed but also to recognise that much harm to education from armed conflict arises from widespread disruption of educational processes and general physical destruction and damage. The international community should seek creative ways to address these problems, some of which arise from tensions and conflicts that will not be speedily resolved.



Acronyms and abbreviations

AEPAM Academy of Educational Planning and Management (Pakistan)

ACLED Armed Conflict Location and Event Database

ASER Annual Status of Education Report

BRD Battle-related death

DHS Demographic and Health Survey

DRC Democratic Republic of the Congo

EMIS Education management information system

EPDC Education Policy and Data Center

GCPEA Global Coalition to Protect Education from Attack

GDP Gross Domestic Product

ISCED International Standard Classification of Education

IDMC Internal Displacement Monitoring Centre

IDP Internally displaced person

IPUMS Integrated Public Use Microdata Series

LSMS Living Standards Measurement Survey

MICS Multiple Indicator Cluster Survey

NAR Net attendance rate

NER Net enrolment rate

OOSC Out-of-school children

PEIC Protect Education in Insecurity and Conflict

PRIO Peace Research Institute Oslo

PSLM Pakistan Social and Living Standards Measurement Survey

SSA Sub-Saharan Africa

UCDP Uppsala Conflict Data Program

UIS UNESCO Institute for Statistics

UNESCO United Nations Educational, Scientific and Cultural Organization

UNHCR United Nations High Commissioner for Refugees



Executive summary

Introduction

Recent media reports from Gaza, Nigeria and Syria clearly demonstrate the direct and immediate effects of armed conflict on children's access to school. Schools are destroyed, used by military forces or occupied by displaced people. Teachers and students are killed, kidnapped, injured and traumatised. Even where schooling continues, conflict has a knock-on negative impact on learning and the quality of education received by children.

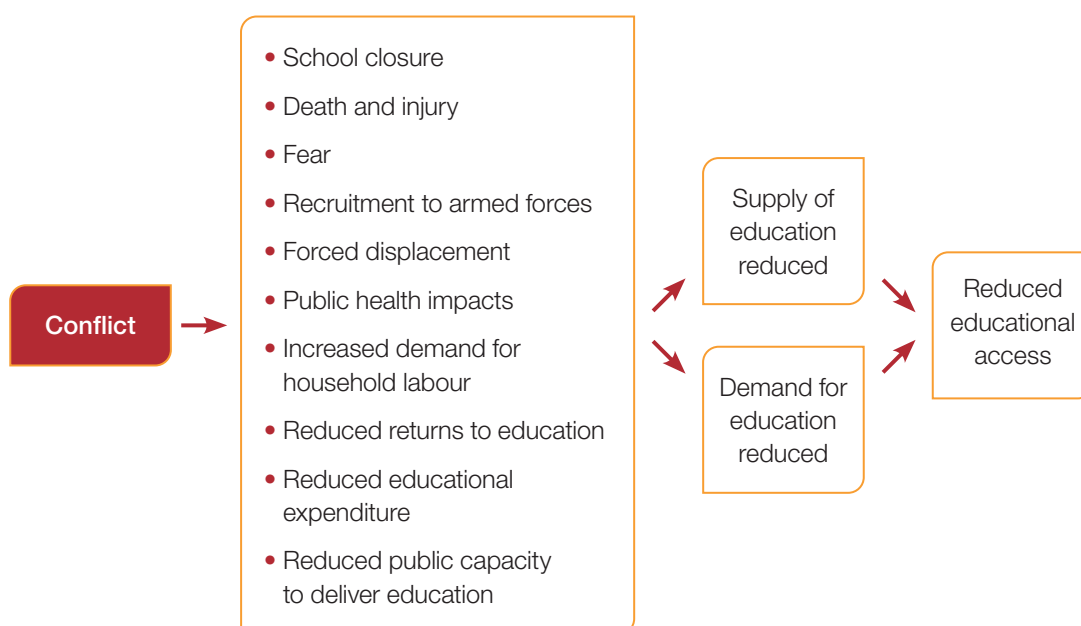
Evidence documented in the *Education under Attack* series of reports demonstrates that several thousands of schools are impacted by targeted attacks each year, with the education of hundreds of thousands of students being interrupted, in some cases permanently. However, the figures for out-of-school children (OOSC) in conflict-affected countries number in tens of millions rather than hundreds of thousands. This study looks at the wider impacts of conflict, including collateral damage and indirect impacts on education, and finds that in quantitative terms, targeted attacks represent only the tip of the iceberg.

Untangling the interrelationship between conflict, state fragility, low economic development and low school enrolment is complex. But the scale of the indirect impact of conflict on education, as a result of reduced or stagnated education development, is likely to be of an order of magnitude greater than the numbers who have had their education interrupted due to the more direct, immediate impacts experienced at the local level.

Section 1: How conflict impacts on education

This study notes ten main channels through which conflict can impact on access to education and learning, shown in the figure below.

Figure 1: Channels through which conflict impacts on education





The first four are direct impacts; the remaining six indirect impacts. The direct impacts include those caused by targeted attacks as well as those due to collateral damage. The categorisation is shown in the diagram that follows.

Figure 2: Impacts of conflict on education



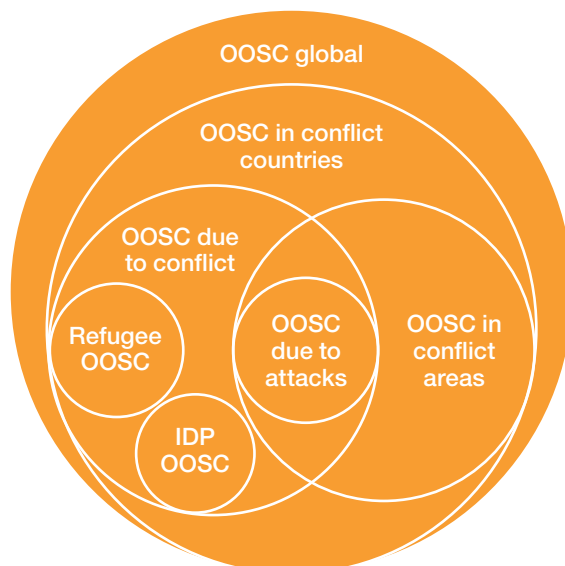
Section 2: The human costs of conflict to education: out-of-school children

In 2012, there were 57 million OOSC of primary school age globally. Most of these (39 million) were living in 33 countries affected by conflict.¹ Of this 39 million, around 11 million were living in sub-national areas directly impacted by armed conflict (OOSC in conflict-affected areas). UNESCO's estimate of 28.5 million OOSC living in conflict-affected countries takes sub-national estimates for four large countries, but national estimates for the remaining 29. In 2012, there were also around 2 to 3 million refugees and internally displaced children out of school. Some of these were living in neighbouring, non-conflict-affected countries, but many refugees were hosted by countries that were themselves conflict-affected.

¹ UNESCO's list of conflict-affected countries includes countries with more than 1,000 battle-related deaths during the past decade, or 200 deaths over the previous two years. In 2012, 33 countries were included in the list.



Figure 3: Typology of OOSC in conflict-affected countries



It should be noted that UNESCO’s estimates for OOSC numbers only include children of official primary school age, as defined by the International Standard Classification of Education (ISCED). In some cases (e.g. Pakistan) this means that children aged 10 or over are excluded from the estimate and in most cases children over 11 years old are excluded, even where it is common for children of the age group to still be in primary school. For every three primary school aged OOSC living in conflict-affected areas there are a further two OOSC of lower secondary school age. **If all OOSC aged between 7 and 14 were included, the figures would be 50% to 100% higher.**

Table 1: Estimates for OOSC living in conflict areas (based on 2012 or most recently available data)

	EMIS data, ISCED definition for school age, primary school aged	Survey data,* age range 7–14	Survey data,* age range 7–14 excluding India
Country totals (33 countries)	39 million	90 million	51 million
Country totals with sub-national estimates for India, Indonesia, Nigeria and Pakistan	28.5 million (UNESCO, 2013)	47.5 million	37.5 million
Global estimate of OOSC living in conflict-affected areas based on sub-national estimates for all 33 countries	11 million	24 million	14 million

* Based on data from the Education Policy and Data Center, with proxies for countries missing data.



In most of the 33 conflict-affected countries, enrolment rates were low prior to the onset of conflict. Estimating the number of children out of school as a result of conflict ('OOSC *due to* conflict') is complex and the results from multi-country regression analyses and other research into the relationship are often inconclusive. Looking at a wide variety of evidence from three case study countries – the Democratic Republic of the Congo (DRC), Nigeria and Pakistan, which together account for around half of the total number of OOSC living in conflict-affected countries (see table below) – **it is clear that the relationship between conflict and education is highly context-dependent and can change rapidly as conflicts escalate or are resolved**. So it would be difficult to arrive at any global estimate of the number of OOSC due to conflict.

Table 2: Estimated numbers of OOSC in three conflict-affected countries

Country	Estimated number of OOSC (UIS definition) 2011	Approximate proportion of OOSC that can be attributed to conflict (from case studies)	Approximate number of OOSC in 2011 due to conflict
DRC	3.5 million	10% to 20%	0.3 to 0.7 million
Nigeria	10.5 million	<5%	<0.5 million
Pakistan	5.4 million	15% to 50%	0.8 to 2.7 million
Total	19.4 million	5% to 20% (of total)	1.1 to 3.9 million

However, the findings indicate that **somewhere up to a fifth² of all OOSC living in conflict-affected countries, potentially as many as 8 million primary school aged children, are out of school as a result (direct or indirect) of the conflict**. This is an order of magnitude greater than the number of children whose schooling is disrupted or ended as a result of targeted attacks on education. The majority of OOSC in conflict-affected countries are out of school due to underlying social, political and economic factors that often predate the conflict, and in some cases may have contributed to the onset of conflict, as opposed to being caused by it.

Section 3: The financial costs of conflict to education

Targeted attacks on education during conflict create real costs to the sector. Schools have to be repaired or rebuilt, furniture and teaching materials restocked and lost personnel replaced. When schools are closed there may also be the cost of paying teachers who are not teaching.

In our three case study countries (DRC, Nigeria and Pakistan), we estimate the capital costs alone from targeted attacks in the period 2009–2012 to total \$57m. Adding to this the cost of replacing teachers and paying wages whilst schools are closed, we estimate the total direct cost to the sector from targeted attacks in 2009–2012 in these three countries as \$133m.

² This proportion is based on the total of 39 million OOSC in conflict-affected countries, not the lower UNESCO figure of 28.5 million which uses sub-national estimates for four countries.



Table 3: Total direct cost of targeted attacks on education, 2009–2012

Cost	DRC	Nigeria	Pakistan
Capital cost	\$24,000,000	\$5,240,000	\$28,125,000
Human resource cost	\$1,934,100	\$493,000	\$73,240,000
Total cost	\$25,934,100	\$5,733,000	\$101,365,000

But the cost to education from conflict extends beyond the direct cost from targeted attacks. As noted above, hundreds and thousands of children are currently out of school because of these attacks and millions more are out of school as an indirect effect of conflict. For many of these OOSC, this will not be a temporary interruption and their efforts to invest in their future will be permanently halted. This represents a lasting impact on levels of human capital which in turn have a long-term impact on economic development and national income levels. Since returns on investment in education tend to be positive, we would expect any impact to the sector to be magnified in its impact on the economy and society.

For DRC and Pakistan, we create a framework for calculating the scale of this impact of conflict *through* the channel of education and show it to be potentially of an order of magnitude greater than the direct cost to the sector of targeted attacks alone.

Table 4: Economic impact of conflict through education (2009–2012)

	DRC	Nigeria	Pakistan
Long-term impact on national income of lost investment (direct costs)	\$32m	\$7.2m	\$117m
Long-term impact on national income of reduced investment (net effect)	\$3.8m	n/a	\$113m
Long-term impact on national income of current OOSC due to conflict	\$53–107m	n/a	\$440m–1.5bn
Long-term impact on national income of reduced human capital accumulation due to conflict	\$470m	n/a	\$2.9bn



Summary of key messages

Key message 1: The relationship between conflict and education is highly context-dependent and can change rapidly as conflicts escalate or are resolved. It is therefore very difficult to arrive at any precise global estimate of the number of OOSC due to conflict.

Key message 2: Findings from three case study countries, which together account for around 50% of OOSC populations in conflict-affected countries, indicate that somewhere up to a fifth of all OOSC living in conflict-affected countries are out of school as a result (direct or indirect) of the conflict.

Key message 3: The number of children out of school as a result of conflict (millions) is of an order of magnitude greater than the number of children whose schooling is disrupted or ended as a result of targeted attacks on education (hundreds of thousands).

Key message 4: OOSC statistics provide only a snapshot in time, and show only whether children are in or out of school. Investigating the impact in terms of the number of years of schooling lost by the school-age population during a conflict is often a more revealing statistic and can be used to estimate the loss in human capital due to missed education.

Key message 5: The direct costs of targeted attacks are real and substantial but represent only a fraction of impacts felt by the sector.

Key message 6: Positive returns to investment in education mean that any impact of conflict on education will be magnified in its effect on the economy. The long-term impact of reduced human capital accumulation is potentially of an order of magnitude greater than that of the direct costs of targeted attacks (billions of dollars for our three case study countries, rather than hundreds of millions).



Introduction

In 2013 UNESCO reported that there were 28.5 million out-of-school children (OOSC) of primary school age in countries affected by conflict, half the total number of OOSC worldwide (UNESCO, 2013). However, this does not tell us about the number of children who are being denied an education as a *result* of conflict, or the impact that conflict has on education systems. This study sets out to quantify this impact and seeks to arrive at estimates of the order of magnitude of the costs of conflict to education: both in terms of the human cost, represented here by the number of OOSC, and the financial cost in terms of physical damage done to education structures and through loss of human capital.

As well as drawing on international evidence from the global literature, the research included case studies of three conflict-affected countries: the Democratic Republic of the Congo (DRC), Nigeria and Pakistan. These three countries were selected because they had the largest numbers of OOSC, and together were home to half of all OOSC living in conflict-affected countries in 2011. Findings from the three case studies are included throughout Sections 2 and 3 of this report. The full detailed case studies are available separately at www.educationandconflict.org

This study uses a range of approaches to quantify the impacts of conflict on education in the three case study countries. Estimates of the costs to education of targeted direct attacks were calculated using a bottom-up approach: taking documented evidence of attacks on schools, staff and students, and using this to calculate the costs. Estimates of the more long-term, indirect impacts of conflict were arrived at using a more top-down approach, drawing on multi-country regression studies and, for the case study countries, analysing enrolment trends over time, comparing enrolment in conflict-affected areas with non-conflict-affected areas and enrolment change during periods of conflict and relative peace.

Section 1 gives an overview of the scale and extent of the impact that conflict has on education. Drawing on the international literature, it identifies ten channels through which conflict damages education, both in terms of access and quality. These include both direct and indirect effects, and the impact both of targeted attacks and of 'collateral damage'. This section then reviews the research so far on the quantitative impact of conflict on education.

Section 2 starts by examining the statistics on OOSC living in conflict-affected countries. It explores the data sources and ways of defining OOSC and 'conflict-affected areas' and considers the implications of these definitions on the global statistics. A range of estimates is given based on the different data sources and definitions. Methodological challenges involved in generating good estimates are discussed. This section then explores the extent to which OOSC numbers can be attributed to conflict, looking at how many of these children are out of school as a result of the conflict, and how many would probably be out of school even in the absence of armed conflict. It considers the findings of international studies and the case studies conducted as part of this research. Given the wide range of conflict and education development histories, and sometimes contradictory findings on the impact of conflict on education, this paper does not attempt to arrive at a global figure for 'number of children out of school due to conflict', but instead uses the case studies to explore the approximate range and order of magnitude that such a statistic might have.

Section 3 analyses the monetary cost of conflict on and through education. Taking *Education under Attack* (GCPEA, 2014) as a starting point, it first examines the monetary cost of targeted attacks on



education by looking at the costs to the sector such as rebuilding schools and replacing personnel. It then investigates impacts on education that do not create a direct financial burden, such as the impact on access and learning. From these estimates it then attempts to quantify the long-term costs of conflict to the economy as a result of reduced levels of educational investment. For each of these impacts, it proposes a framework for quantifying the effects within the country context, and applies it to the three country case studies.



1 Overview of how conflict impacts on education

1.1 The scale and extent of the impact of conflict on education

The direct and immediate effects of armed conflict on children's access to school can be clearly seen in news reports from around the world, including recent reports from Gaza, Nigeria and Syria. Schools are destroyed or occupied by military forces or displaced persons, teachers and students killed, kidnapped, injured or traumatised.

Attacks on schools, colleges, students and staff are thoroughly documented in the *Education under Attack* series of reports (GCPEA, 2014; UNESCO, 2010; and UNESCO, 2007). In the period 2009 to 2012, six countries recorded incidents impacting over 1,000 schools, universities, students and staff. Seven countries recorded over 500 such incidents, and the report includes studies of 17 other countries where numerous attacks have been documented (GCPEA, 2014). The reports acknowledge that defining the exact number of attacks is difficult, given inconsistent reporting, and does not attempt to give a global statistic. But the reports provide strong evidence that globally, several thousand schools are impacted by attacks each year, with the education of hundreds of thousands of students being interrupted, in some cases permanently.

In terms of the wider impact of conflict on children's access to education, these attacks represent only the tip of the iceberg. The *Education under Attack* series focuses primarily on targeted attacks on education. It does not aim to cover 'collateral damage', for example, when school buildings are damaged or education personnel are killed as an unintended result of military combat. It reports on military use of schools, as this can result in schools becoming military targets. But it does not report on cases where schools are just one of a large number of buildings destroyed by bombardment or aerial bombing or when a village is razed to the ground, or where students and teachers are included among civilian casualties and refugees. In high-intensity conflicts, the destruction to schools and overall physical damage done to education systems are far greater than that caused by targeted attacks on education. For example, following the 1998–1999 war in Timor-Leste, 95% of schools required repair or reconstruction. In Iraq, 85% of schools were damaged or destroyed by the fighting during 2003 and 2004 (Buckland, 2005). Similarly, teachers included among civilian casualties and displaced groups often greatly outnumber the victims of targeted attacks on education *per se*. In Rwanda, more than two-thirds of teachers in primary and secondary schools were killed or displaced as a result of the genocide (Buckland, 2005).

Armed conflict often leads to forced migration, interrupting the education of millions of children. By April 2014 around 900,000 school-age children were estimated to be living as refugees as a result of the conflict in Syria. Over half of these were not enrolled in any form of education (UNHCR, 2014a).

In contexts like Syria, conflict has led to the interruption or end of education for hundreds of thousands of children. However, in other conflict-affected countries, millions of children have never had the opportunity to attend school in the first place. The barriers to these children attending school include chronic underinvestment, inequitable investment and ineffective investment in education. These barriers often predate the conflict. Conflict can delay progress in overcoming these barriers, keeping children out of school in systems that would otherwise have developed further (Gates et al., 2010). Conflict can stifle national development, impacting negatively on income and human resources at both household (Justino, 2011) and national levels (World Bank, 2011; Gupta et al., 2002; Lai and Thyne, 2007; Collier, 2007), leaving families and governments with fewer resources

to invest in education than would be available otherwise. Untangling the interrelationship between conflict, state fragility, low economic development and low school enrolment is complex. But the scale of the indirect impact of conflict on education, as a result of reduced or stagnated education development, is likely to be of an order of magnitude greater than the numbers who have had their education interrupted or halted due to the more direct, immediate impacts experienced at the local level.

1.2 How conflict impacts on education: identifying the key channels

1.2.1 Targeted attacks on education

There is evidence that schools, students and teachers are increasingly being targeted during conflict (see, for example, Buckland, 2005; GCPEA, 2012 and 2014; and Van Wessel and Van Hirtum, 2013). However, this trend might simply be a result of increased reporting. Some insurgency groups are ideologically opposed to secular education (e.g. Boko Haram in Nigeria and the Taliban in Afghanistan and Pakistan); others attack schools as they are a highly visible extension of the government they are fighting (e.g. in Sierra Leone, rebel forces targeted schools for destruction, see O'Malley, 2011 and Turrent, 2012); other schools are destroyed simply because they provide tactical bases for insurgency and government armed forces. Where opposition is religious or ideological, teachers and students may also be deliberately targeted, leading to death, injury or kidnapping.

Fear of attacks causes the impact to spread beyond the immediate vicinity of schools that are targeted. It can make parents reluctant to send their children to school, teachers reluctant to teach and cause schools to close. In some cases, armed forces may issue directives ordering children to stay away from school, or deter access implicitly. For example, the Taliban in Afghanistan deliver night letters, issue directives and use physical violence to deter girls from attending school;³ the name of the militant Islamic insurgency in Nigeria, Boko Haram,⁴ means 'western education is sinful' and though initial attacks on school were conducted during the night, recent attacks have targeted students and teachers directly. In other cases, conflict intensity and lack of security may mean that the fear of attack or recruitment/abduction whilst at school or on the way to and from school may be such that parents choose to keep their children at home. Where these fears interact with economic pressures, the effect is likely to be greatest.

1.2.2 Collateral damage

Infrastructure and personnel can also be impacted by untargeted attacks, or 'collateral damage'. If a village is razed to the ground, or a school destroyed by indiscriminate bombing of urban areas, the damage done to the school would not count as a targeted attack as documented in the *Education under Attack* series. Even where schools themselves are not directly attacked or damaged, increased insecurity makes it dangerous for children and teachers to travel to school.

Table 5 shows the extent of the damage that conflict has brought to five different education systems. It is likely that these estimates include a mixture of targeted and untargeted attacks on education. Buckland also notes that in many cases it is difficult to differentiate between damage sustained from attacks and damage sustained as a result of years of neglect, either prior to or during the conflict (e.g. in Iraq and Kosovo).

³ Source: <http://www.irinnews.org/fr/report/74690/afghanistan-boys-education-slides-in-helmand>

⁴ The official name of the organisation is 'Jama'atu Ahlis Sunna Lidda'awati wal-Jihad', which translates to 'People Committed to the Propagation of the Prophet's Teachings and Jihad', but they are more widely known as Boko Haram.



Table 5: Physical impact of conflict

Conflict	Percentage of schools requiring repair or reconstruction
Timor-Leste 1998–1999	95%
Iraq 2003–2004	85%
Kosovo 1998–1999	65%
Bosnia-Herzegovina 1992–1995	50%
Mozambique 1977–1992	45%

Source: Buckland (2005)

Teachers and students killed or injured in untargeted attacks away from the school setting are not included in *Education under Attack*, but can constitute a considerable cost to education in terms of losses to the teaching force and missed education due to injury.

1.2.3 Displacement

Displacement is another major cause of reduced access during and after conflict, not only through the loss of teachers but also displacement of students to areas where they do not have access to education. The 2011 *Education for All Global Monitoring Report* reports that disproportionately high numbers of displaced children are out of school (even in comparison to conflict-affected populations in the same country), with enrolment rates in refugee camps across the world averaging 69% for primary school and 30% for secondary school (UNESCO, 2011a, p.154). Globally in 2012, there were estimated to be over 42 million forcibly displaced persons, around half of whom were under 18 (UNHCR, 2013b, p.3).

1.2.4 Recruitment of students and teachers to armed forces

Reliable data on the numbers of teachers and students recruited are not available, but it is commonly reported that the global number of child soldiers is between 200,000 and 300,000, with a substantial minority of these being female.⁵ A few country examples taken from GCPEA (2014, p.106) include:

Colombia: “The Revolutionary Armed Forces of Colombia (FARC) engaged in child recruitment campaigns in schools. In September 2008, they entered a school in the department of Cauca where 800 students were studying and invited the children to join the group.”

DRC: “In April 2012, mutineers under General Bosco Ntaganda rounded up over 30 male students at Mapendano secondary school, in Masisi territory, DRC. The boys and young men were tied up, taken to a military camp and inducted into Ntaganda’s forces.”

Somalia: “Al-Shabaab militants have systematically used schools as recruiting grounds. They have regularly visited schools and forcibly removed children from classrooms, often at gunpoint. They have lined up students, selected those they deem fit to serve as fighters and suicide bombers, and taken them back to their training camps.”

⁵ See, for example, <http://www.unicef.org/emerg/files/childsoldiers.pdf> and <http://www.warchild.org.uk/issues/child-soldiers>

1.2.5 Public health

Conflict impacts on public health levels which in turn impact on access to learning. In 1984, in the midst of multiple armed insurgencies, famine struck Ethiopia resulting in more than 400,000 deaths (de Waal, 1991, p.5). The conflict meant that the famine was used as a weapon of war, coming earlier, harder and further than it otherwise would have done (de Waal, 1991). IRC (2007, p.ii) estimated that during the Congolese war between 1998 and 2004, around 3.9 million people died as a result of the conflict with a large majority of these deaths being due to a higher prevalence of malaria, diarrhoea, pneumonia and malnutrition rather than direct violence. As well as the death of students and teachers, poor health (both physical and mental) and malnutrition can also reduce access to education, through changing household income levels and potential returns to education (see below). It can also reduce learning outcomes through increased absence rates, reduced levels of concentration in class and permanent cognitive impairment.

1.2.6 Changing household income and labour allocation decisions

Conflict can impact on the demand for education. One channel is by changing household labour allocation decisions (Justino, 2011). If conflict impacts on household income, for example, through damage to land and buildings, injury and death of working adults, or economic recession, then parents may be forced to remove children from school in order to contribute to income-generating activities or because they cannot meet the costs of schooling. Even in the absence of such shocks, their mere threat (i.e. income uncertainty) could mean that parents require children to be generating income as a form of insurance, or undertaking more home duties so that parents can work more. Where there are direct costs associated with education (for example school fees, uniforms, materials), these effects will be amplified.

1.2.7 The returns to education

Conflict impacts on the labour market, changing employment prospects of school leavers and the wages that they can expect to earn. It influences the actual and perceived value of education relative to its costs to families, referred to as the private returns to education (Justino, 2011; Santos, 2013). This influences parents' decisions on whether to send their children to school. Destruction of infrastructure and a weakened economy can mean that demand for skilled labour is reduced. This would increase the likelihood of children being removed from school, often with a gender dimension involved.

1.2.8 Public expenditure on education

The 'guns for butter' theory posits that the increased military expenditure that results from conflict leads to reduced expenditure in other parts of the government budget. Whilst this hypothesis has been found to hold for some sectors of government spending, there is mixed evidence as to whether it holds true for education (see for example Ali, 2011; Duval, 2003; Lai and Thyne, 2007; Mintz and Huang, 1991; and Yildirim and Sezgin, 2002). Drawing on analysis of the fiscal impact of conflict in 22 countries, Gupta et al. (2002) find that conflict indeed leads to greater military expenditure, but that this is largely funded by borrowing rather than cuts in basic services such as education.

We might speculate that in countries with long-running conflicts this finding could not hold; that eventually, increased military expenditure must impact on educational expenditure, since military expenditure cannot be financed through borrowing indefinitely. Pakistan, for example, has had some level of conflict ever since its inception in 1947. It has the fourth-largest standing army in the world and is a nuclear state. Whilst Pakistan's current on-budget military spending is not abnormally high, it is likely that at some points in time it has diverted money from other areas of government



spending, education included. In 2010, public spending on education in Pakistan represented only 2.3% of Gross National Product (GNP), down from 2.6% in 1999 (UNESCO, 2014). If this is the case, then this represents a cost to the sector and society. In any case, Gupta et al. (2002) find evidence that conflict depresses growth through the diversion of resources to unproductive activities, which impacts on government revenue and therefore real per capita education expenditure is reduced as a result of conflict. This reduction in educational expenditure will naturally impact on both access and quality of education.

1.2.9 Public capacity to deliver education

As well as the direct impact on the teaching force of targeted attacks and collateral damage, they also impact on individual decisions to join or remain within the teaching profession. For example, the GCPEA (2014) reports that in Balochistan, Pakistan:

“Fear among those who fit the armed nationalist groups’ target profile led to lower teacher recruitment, more transfer requests and lower attendance.” (GCPEA, 2014, p.170)

In Afghanistan, the extended conflict and extremely low enrolment rates, especially during the years of Taliban rule, mean that the output of the secondary system cannot keep pace with increased demand for primary teachers since that sub-sector’s recovery following the collapse of the Taliban regime. In Timor-Leste, it is estimated that 80% of secondary teachers and 20% of primary teachers were lost following Indonesian withdrawal from the country in 1999 (Buckland, 2005, p.18). It is not possible to put a figure on the cost of these impacts, but difficulties in producing and retaining teachers clearly jeopardise educational quality and place a burden on administration.

Buckland (2005) finds that the challenge in most post-conflict settings is not so much in recruiting and retaining teachers as in improving their quality:⁶ teacher development is an early casualty of war, with weak governments unable to maintain pre-service and in-service training. Deliberate targeting, collateral damage, displacement and economic pressures can lead to a haemorrhaging of qualified staff, often replaced by unqualified counterparts, if at all.

As well as the impact on the teaching force, conflict also impacts on educational administration capacity. To use Timor-Leste as an example again, as well as losing a significant proportion of its teaching force, it also lost almost its entire civil service as Indonesian citizens fled the country following independence in 1999 (Buckland, 2005). Although this is an extreme example, this pattern is followed in many situations of regime change. Along with the loss of personnel, there is often the loss of a whole administrative system. In Kosovo, for example, Serbian officials systematically destroyed education records; in Iraq, extensive looting and burning of official buildings had a similar effect (Buckland, 2005).

System management and policy development are also casualties of war, especially in protracted conflicts, leaving outdated policies, inappropriate and inadequate curricula, and neglected and deteriorating infrastructure (Buckland, 2005). Impacts on the capacity to deliver education will clearly have an indirect impact on access and learning.

⁶ In most of the countries studied for Buckland’s *Reshaping the future* report for the World Bank, pupil-teacher ratios were actually lower after conflict than before it, as student access had declined.

1.2.10 Primary channels through which conflict impacts on education

This study notes ten main channels through which conflict can impact on access to education and learning:

Direct impacts on education

- School closure due to targeted attacks, collateral damage, military use of school buildings, and use by displaced populations
- Death and injury to teachers and students
- Fear of sending children to school, and teachers' fear of attending due to targeted attacks, threats of attacks or general insecurity reducing freedom of movement
- Recruitment of teachers and students by armed forces (state and non-state)

Indirect impacts on education

- Forced population displacement leading to interrupted education
- Public health impacts of conflict which reduce access and learning
- Increased demand for household labour
- Reduction in returns to education
- Reduced educational expenditure (public and private) due to overall reduction in resources and shifting priorities
- Reduced public capacity to deliver education

The direct impacts include those caused by targeted attacks as well as those that are due to collateral damage. The categorisation is shown in the diagram on the following page.



Figure 4: Impacts of conflict on education



1.3 Economic impact of conflict through the channel of education

By impacting on education, conflict also has an impact on the positive outcomes of education, such as economic, social and cultural development. The link between educational investment and subsequent economic and social development is recognised in the literature (see, for example, Bird and Higgins, 2011; Boissière, 2004; Majgaard and Mingat, 2012; Mertaugh, Jimenez and Patrinos, 2009; Psacharopoulos and Patrinos, 2004; and UN Millennium Project report, 2005).

One of the main motivations for attending school for many is the belief that investments in education lead to higher earning potential in the future. This is called the economic return to education. Although precise estimates of educational rates of return are often highly debated (e.g. Bennell, 1996a, 1996b and 1998; The Task Force on Higher Education and Society, 2000), the estimates presented in Psacharopoulos and Patrinos's 2004 review of the literature are useful to demonstrate the order of magnitude of the impact that conflict can have through the channel of education. Globally, returns to education are around 10% for each extra year of schooling, but returns tend to be higher in poorer countries (Psacharopoulos and Patrinos, 2004). For the Sub-Saharan Africa region, it is estimated that private returns to education are 38% for primary, 25% for secondary and 28% for higher (Psacharopoulos and Patrinos, 2004, p.114).

These private return estimates do not take into account the total cost of education, i.e. the opportunity cost of foregone earnings plus the cost of providing the education, typically borne by the government. This inevitably reduces the returns to education (Psacharopoulos and Patrinos, 2004, p.13). But there are also benefits to society in educating individuals. Benefits of education can extend from the individual to their community and wider society. For example, the interaction of educated people might result in new ideas, products and processes that have an economic and social benefit



over and above individuals' increased earnings. Another example is that of health. Maternal health is dramatically improved by education (Karlsen et al., 2011), potentially reducing state health bills. These externalities or social benefits, however, are very hard to quantify.

Positive returns mean that for every dollar invested in education, individuals and society gain well over a dollar's worth of value from that education (due to increased earnings and other benefits) over the lifetime of an educated individual. Conversely, financial losses to education systems will also be magnified over the lifetimes of the students they were supposed to educate. So the long-term costs of conflict through lost education, as a result of reduced earnings and social benefits, are likely to be greater than the more immediate costs of conflict to education.

Although there is evidence that economies affected by war can converge to their steady state growth path in the long run (e.g. see Davis and Weinstein's 2002 study on Japan post-WWII), there is also evidence that **conflict can have a lasting impact on GDP**. For example, the work of Akbulut-Yuksel (2009) and Ichino and Winter-Ebmer (2004) shows that Germany and Austria suffered a long-term economic cost from WWII through the channel of education: those whose education was disrupted by the war suffered long-term reduction in labour market earnings which, in turn, it is claimed, has had a long-term impact on German and Austrian GDP.⁷

These shocks to the economy and education system can create **poverty and conflict traps**. The poorer a country, the greater the chance of conflict; the slower economic growth is, the greater the chance of conflict (Collier, 2007). By impacting on growth, conflict therefore makes future conflicts more likely, which in turn further reduces growth prospects, and so on. In his 2004 analysis, Collier found that post-conflict countries had a roughly 50:50 chance of making it through a decade without relapsing into conflict and that half of all civil wars surveyed were post-conflict relapses. Shocks to education can cause these poverty and conflict-traps. A failing education system is seen as one of the key causes of the Sierra Leone civil war (Turrent, 2012); the education system subsequently became a target during the conflict which further undermined education provision. Aware of the risk of a downward spiral, the government and donor community prioritised education in reconstruction efforts (Turrent, 2012). Conversely, there is also evidence that education can contribute towards political and social stability and mitigate against 'fragility' and conflict risk factors (Barakat, Karpinska and Paulson, 2008).

The gender dimension of the impact of conflict on education means that in some cases the costs of poor educational achievement are exacerbated. The gains of improved maternal and child health and decreased fertility that come with basic education for girls are lost, and estimates of the impact on average years of schooling could lead to underestimates of these costs if not broken down by gender.⁸ One can imagine many other capabilities that are developed in formal schooling that would also be foregone due to conflict's impact on education but that are not monetisable.

⁷ Ichino and Winter-Ebner (2004) estimate that German GDP in 1986 was at least 0.36% lower than it would have been had education not been disrupted during the war (they estimate a larger effect for Austria, around 0.67%). Although a fairly small figure for such a devastating war, it must be noted that this is just the statistically identifiable effect, and that it is found 41 years after the end of the conflict.

⁸ See for example, UNESCO, 2006; UN Millennium Project, 2005; and United Nations, 2012.



1.4 Review of global literature on the quantitative impact of conflict on education

The number of OOSC living in countries affected by conflict has been tracked by UNESCO since the publication of the *Education for All Global Monitoring Report 2011: hidden crisis: armed conflict and education* (UNESCO, 2011a), and prior to that by Save the Children UK, through its Last in Line series (Save the Children UK, 2007, 2008, 2009). However, these statistics tell us little about the causal link between conflict and education, or the number of children out of school due to conflict.

1.4.1 Country studies of the impact of conflict on average years of schooling and school participation

A background paper for the 2011 *Education for All Global Monitoring Report* attempts to estimate this impact (UIS, 2010) using descriptive statistics. The authors analyse household survey data from Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) to plot educational attainment⁹ over time for 25 countries, allowing for a comparison of those who were affected by conflict with those who were not (assuming that those aged 15 years old at the time of the conflict were affected). Where firm conclusions cannot be drawn from national data, they break down by gender, household wealth, ethnicity or sub-national region to analyse the differential impact. This 'eye-balling' of the data provides plausible evidence of the impact of conflict on education for some cases. For example, educational access in the Gash-Barka region of Eritrea follows a very different trajectory to access in the rest of Eritrea which could plausibly be because it suffered more from the conflicts with Ethiopia than others. But we cannot ascertain causality from their graphs. Moreover, for many countries the data are simply not clear enough to draw any conclusions. For example, the authors claim that their graphs provide clear evidence that girls' education in North-West Frontier Province in Pakistan is negatively impacted during conflict, despite the fact that variations in access and attainment do not always correspond to periods of conflict.

For some countries, UIS (2010) gives the average change per year in educational outcomes before and during conflicts. Projecting pre-conflict trends forward, the 2011 *Education for All Global Monitoring Report* (UNESCO, 2011a, p.136) creates a counterfactual model for educational development in the absence of conflict. It does this by extrapolating the growth in years of education based on the average growth rate during the decade prior to the war. This is then compared with the actual growth rate during the conflict to estimate the impact of conflict on years of schooling. This method takes a 'best case scenario' for the counterfactual, assuming that high pre-conflict growth rates would have remained high in the absence of conflict. It produces much higher estimates for the years of schooling lost due to conflict than alternative methods used in research on specific country studies (see Tables 6 and 7).

⁹ UIS examines three different educational outcomes: share of population without any formal schooling, average years of schooling and literacy rates.

Table 6: Years of schooling lost due to conflict

Country	Average years of education at start of conflict	Growth rate for years in school ¹⁰		Years of schooling lost due to conflict
		Pre-conflict (%)	During conflict (%)	
Afghanistan (1978–2001)	1.8	5.9	0.4	5.5
Burundi (1994–2006)	2.9	6.6	-0.3	3.4
Cambodia (1967–1978)	3.3	4.0	-1.1	2.3
Iraq (1990–1996)	6.2	2.2	-1.0	1.4
Mozambique (1977–1992)	2.7	7.2	0.7	5.3
Rwanda (1990–1994)	4.9	4.7	0.1	1.2
Somalia (1986–1996)	2.9	4.5	-2.5	2.3

Source: UNESCO, 2011a, table 31, p.136

These figures represent significant losses to educational development. To put it in context, one of the most extensive school building programmes in history, that of Indonesia 1974–1978, led to gains in years of schooling of 0.38 for the affected cohort (Merrouche, 2006, p.16) which is a mere 7 per cent of the magnitude of the losses reported for Afghanistan in Table 6 above. This demonstrates how the damage done by war is sometimes of a much greater (negative) magnitude than positive changes through education interventions, meaning that it could take generations to rebuild the system after conflict.

We cannot, however, assign all these associated education losses to conflict as there would have been many other factors influencing education trends during these periods. In Mozambique, for example, whilst growth in years of schooling fell following the onset of the civil war, it fell further still after cessation of hostilities. The authors argue that the magnitude of the association between conflict and education implies some level of causality, but their assertions have been questioned in some quarters (e.g. Human Security Report, 2012).

There is a growing body of literature, spearheaded by the Households in Conflict Network,¹¹ that attempts to isolate the impact of conflict on education using more sophisticated empirical techniques. Regression analysis offers one avenue of investigation, but finding suitable independent variables (i.e. exogenous) is challenging: there are many factors that might impact on both conflict

¹⁰ All growth rates are compound growth rates.

¹¹ <http://www.hicn.org/>



and education (e.g. poverty, state fragility), meaning that there are often alternative explanations of results. But there is an emerging literature which uses household-level data and variations in conflict intensity to isolate a causal effect of conflict on education. For example, the level of destruction of German cities during World War II can plausibly be claimed to be exogenous from other factors that impact on education; using household data on educational outcomes, and controlling for other factors, we can therefore arrive at causal evidence.¹² A number of these studies look at the impact on years of schooling, and are therefore of particular interest to us as we try to estimate the long-term impact of conflict.

Akresh and de Walque (2008) analyse 1992 and 2000 DHS data for Rwanda. By comparing individuals of school age during the 1994 genocide with those who were adults during the genocide (i.e. those whose schooling was unlikely to be impacted by the conflict), they estimate that the genocide had an average impact of reducing attainment by 0.42 school years.

Oyelere and Warton (2013) find a similar impact (approximately half a school year) for internal displacement as a result of conflict in Colombia.¹³ Dabalen and Paul (2012) look at conflict-affected children in Côte d'Ivoire by analysing district variation in intensity of conflict and educational outcomes. Using a variety of identification strategies, they estimate that the impact of the 2001–2006 conflict on those directly affected was between 0.2 and 0.9 school years. Akbulut-Yuksel (2009) exploits variation in bombing intensity in German cities during WWII to isolate its impact on education, finding an average loss of 0.4 years of schooling for children affected by the bombing, with a 1.2 year loss for the worst-hit cities. Chamarbagwalaa and Morán (2011) find similar impacts amongst those directly affected by the worst period of the Guatemalan civil war, 1979–1984, but only for girls, who experienced an average 0.44 years loss in years of schooling (or 12%), with no statistically significant effect on boys. This impact was borne disproportionately by older girls, who experienced an average 0.64 years loss in years of schooling (or 17%).

Although these studies cover very different countries and very different conflicts, all of them find a negative impact on educational attainment in the region of 0.5 years. This leads us to speculate that in other countries where conflict is at similarly high levels of intensity, the impact on school attainment might be of a similar magnitude. It must be noted that the Rwandan conflict was unusually intense, and that the other studies tried to identify the impact only for those directly affected by conflict. When applying this estimate, therefore, it must only be done in regions where conflict intensity is at similar levels to that during the Rwanda civil war and genocide, or through the identification of individuals particularly affected by conflict (e.g. those displaced, as in the Oyelere and Warton 2013 paper). Although 0.5 years does not seem such a significant impact, considering the devastation that war can bring, to put it in context in Rwanda, for example, average years of schooling in Rwanda were 2.3 at the time of the genocide, so the 0.42 years deficit reported there represents a fall in educational attainment of almost 20% for the generation of children affected by the genocide. Given that the main period of conflict lasted just 100 days, this is a staggering impact.

¹² See Akbulut-Yuksel (2009).

¹³ They also test the impact of simply being in a high-conflict area and find no impact on years of schooling.

Table 7: Impact of conflict on years of schooling – summary of empirical studies

Country	Impact (reduction) on years of schooling	Through what route/ measuring impact on which group?	Dataset/methodology	Authors
25 countries	No hard estimates	Average years of schooling completed and literacy rates	Household survey data from DHS and MICS conducted between 2000 and 2008	UIS (2010)
7 countries	1.2–5.5 (depending on country)	Average years of schooling completed	Household survey data from DHS and MICS conducted between 2000 and 2008	UNESCO (2011a)
Rwanda (1994)	0.42	Average years of schooling completed (children exposed to genocide versus children who completed their education before the genocide)	1992 and 2000 DHS data	Akresh and de Walque (2008)
Colombia	0.5	District variation in intensity of conflict and average years of schooling	The Colombia 2005 Census, the Office for the Coordination of Humanitarian Assistance, United Nations Office on drugs and crime in Colombia's (UNODC) coca survey 2001–2005 and conflict-related data from 2000 to 2005 from the Center for Economic Development Studies, (CEDE), Faculty of Economics, Universidad de Los Andes	Oyelere and Warton (2013)
Côte d'Ivoire (2001–2006)	0.2–0.9	Average years of education for school-going cohort	Two datasets: data on local incidents of conflict taken from the Armed Conflict Location and Event Database (ACLED) ¹⁴ and the 2008 round of Households Living Standards Survey (HLSS) data	Dabalen and Paul (2012)
German cities (World War II)	0.4–1.2 (worst hit city)	Average years of schooling	Combination of German Socio-Economic Panel (GSOEP) with detailed data on allied bombings of German cities during the war	Akbulut-Yuksel (2009)
Guatemala (civil war 1979–1984)	0.44 (girls); 0.64 (older girls)	Average years of schooling	Combination of data from the 2002 National Population Census and the number of victims and human rights violations across 22 departments of the country	Chambarbagwalaa and Morán (2011)

¹⁴ The Armed Conflict Location and Event Database (ACLED) compiles exact locations, dates, and additional characteristics of individual battle events in states affected by civil war. The conflict data for Côte d'Ivoire is available for the period from 1997 to 2010. The ACLED database on Côte d'Ivoire reports a total number of 965 conflict events between 1998 and 2008 (Dabalen and Paul, 2008, p.7).



1.4.2 Country studies of the impact of conflict on school enrolment, attendance and completion

There are a number of other studies that look at the impact of conflict on other educational variables. Looking at the Bosnian war of 1992–1995, Swee (2009) finds that a one standard deviation increase in battle-related deaths (BRDs) is associated with a 4 percentage point decrease in secondary completion, but no decrease in primary completion. Swee speculates that this is because of recruitment of older boys to armed forces and the operation of ‘war schools’ for primary school students.

A similar study to the UIS 2010 paper discussed above, also commissioned as a background paper to the 2011 *Education for All Global Monitoring Report*, tracked gross attendance rates against conflict for 19 countries, comparing the trends in conflict-affected regions with those in other parts of the country (EPDC, 2010a). The study used household survey data from DHS and MICS. It found little evidence of decreases in attendance in conflict-affected areas, compared to other areas. But the lack of data points and lack of comparability between the two types of source limited the conclusions that could be drawn.

Justino, Leone and Salardi (2011) find that boys directly affected by the 1999 conflict in Timor-Leste, through destruction of home and displacement, were 7.4 percentage points less likely to complete primary school, but find less clear effects on girls.¹⁵ Verwimp and Van Bavel (2012) find that exposure to conflict in Burundi resulted in a 6–16 percentage point decrease in primary completion, depending on model specification. For poor households, they find that boys and girls were impacted equally, but for non-poor households they find a much greater impact on boys’ completion rates. Justino et al. (2011, p.3) believe that the main reason boys can be more affected by conflict is by increasing the pressure for income generation, or as they put it, “household investment trade-offs between education and economic survival”. Another route speculated for the gender differential is that boys are more likely to be recruited to armed forces.

Shemyakina (2006), on the other hand, finds that in Tajikistan, the 1992–1998 conflict had no effect on boys, but that exposure to the conflict made girls 12.3% less likely to complete mandatory schooling than older girls who completed schooling before the conflict, and 7% less likely to complete school than girls of the same cohort but in regions relatively unaffected by the conflict. Shemyakina posits the following explanation: greater income uncertainty leads to concentration of education investment in boys, perhaps because of a reduction in expected returns to girls’ education. One might also imagine that increased risk of violence affects girls more.

Bundervoet (2012) finds that educational outcomes in Burundi are also impacted by conflict through the channel of poor health. War-induced early childhood ill health impacts negatively on educational attainment in early adolescence due to both an enrolment effect and a poor school performance effect. For some conflicts, for example the Ethiopian insurgencies of the 1980s and the more recent Congolese wars, we might imagine that this channel is the most important in terms of explaining reduced educational outcomes.

¹⁵ BRDs include validated military and civilian deaths incurred as a direct result of “normal” warfare involving armed forces of warring parties. This includes traditional battlefield fighting, guerrilla activities and all kinds of bombardments of military units, cities and villages etc. See <http://www.pcr.uu.se/research/ucdp/definitions/>

¹⁶ In some models the effects on girls are significant and negative, in others there is no statistically significant effect.

Table 8: Impact of conflict on other educational outcomes – summary of empirical studies

Country	Impact on education	Through what route/measuring impact on which group?	Dataset/ methodology	Authors
Bosnia (1992–1995)	One standard deviation increase in BRDs was associated with a four percentage point decrease in secondary completion, but no decrease in primary completion	Primary and secondary school completion	Data on municipality-level war casualties from the 1991–1995 Bosnian Book of Dead Project, and the individual-level information from the 2001–2004 Bosnian Living Standards Measurement Surveys (LSMS)	Swee (2009)
19 countries	No hard estimates	Gross and net attendance rates	Sub-national data from Household surveys (DHS and MICS) conducted between 2000 and 2008	EPDC (2010a)
Timor-Leste (1999)	Boys were 7.4 percentage points less likely to complete primary school	Level and access to education of boys and girls	Timor-Leste Living Standard Measurement Surveys (LSMS), conducted in 2001 and 2007 (nationally representative household surveys)	Justino, Leone and Salardi (2011)
Burundi (1993–1998)	Exposure to conflict resulted in a 6–16 percentage point decrease in primary completion; for non-poor households much worse for boys	Primary school completion (poor and non-poor, male and female)	Combined a nationwide household survey (DHS) with secondary sources on the location and timing of the conflict	Verwimp and Van Bavel (2012)
Tajikistan (1992–1998)	Exposure to the conflict made girls 12.3% less likely to complete mandatory schooling than older girls who completed schooling before the conflict, and 7% less likely to complete school than girls of the same cohort but in regions relatively unaffected by the conflict	Mandatory school enrolment and completion (ages 7–15)	Data on the past damage to household dwelling from the 1999 Tajik Living Standards Survey and data on exposure to conflict from Tajik newspapers for the 1991–1999 period	Shemyakina (2006)
Burundi (1994–1998)	War-induced early childhood ill health impacted negatively on educational attainment in early adolescence (enrolment effect and poor school performance effect)	School enrolment rates	The Burundi Priority Survey (nationally representative) ¹⁷ and a follow-up which revisited 100 of the 391 baseline sites and re-surveyed 874 households	Bundervoet (2012)

¹⁷ This was a survey which took place between October 1998 and March 1999 with the aim of evaluating the country's socioeconomic situation following five years of civil war.



1.4.3 Gender and sub-sector differences in the impact of conflict on education

Several of these studies found a differential impact on boys and girls. These are summarised below:

- Boys are more likely to be recruited to armed forces (Verwimp and Van Bavel, 2012)
- Boys are more likely to be diverted to income-generating activities (Justino, 2011)
- Boys are more likely to be beneficiaries if education investment is concentrated in fewer offspring¹⁸ (Shemyakina, 2006; Chambarbagwala and Morán, 2008)
- Greater security concerns for girls might prevent them from attending school (Shemyakina, 2006)

Some studies also find a greater impact at higher levels of education:

- Older students are more likely to be recruited to armed forces (Shemyakina, 2006; Swee, 2009)
- Primary education is easier to maintain by the community (Bosnian War schools – see Swee, 2009)
- Higher levels of education are more costly and therefore more likely to be impacted by declining expenditure (Buckland, 2005)
- Older students are more likely to be politically active; universities are therefore often shut down during conflict (Lai and Thyne, 2007)

1.4.4 Multi-country regression studies

Whilst all these studies provide important insights into individual conflicts, it is problematic to generalise their findings to other conflicts. Multi-country regression analyses provide more generalisable findings. Some statistical regressions strongly indicate that conflict leads to reduced enrolment, and hence to additional children being out of school (Lai and Thyne, 2007; Shields and Paulson, 2014; Gates et al., 2010). There is also evidence that the underlying fragility may be the driving cause behind reduced enrolment in conflict-affected countries rather than the armed conflict itself (see Shields and Paulson, 2014; Gates et al., 2010).

Shields and Paulson (2014) use multi-level modelling techniques to analyse the relationship between conflict, fragility and changes in primary net enrolment rate (NER) for 149 countries between 2000 and 2011. Given that the maximum possible growth rate in NER is dependent on the initial starting point, their model controlled for the baseline enrolment of countries in 2000. They found that conflict was significantly correlated to reduced growth in enrolment rates. Based on this analysis, they estimate a reduction in the growth of NER in conflict-affected countries of 1.3% per year for primary and 2.5% per year for secondary.

Gates et al. (2010) conducted a regression analysis on the relationship between the percentage of children completing primary education (attainment rate) and conflict intensity. Using data from 1975 to 2005, they found that a war with 10,000 BRDs was associated with a relative decrease in primary attainment of around 7.5%. However, the correlation was not statistically significant. They also looked at enrolment rates in neighbouring countries and found that having a border with a country in conflict was associated with a reduction in participation in secondary education.

¹⁸ Girls may receive less education when household property is lost and economic resources become scarce. Parents may redistribute scarce resources away from girls, who are more likely to engage in household chores and child-rearing as adults, and towards boys, who as adults are more likely to engage in market work and become sole or principal income earners in their families.

Lai and Thyne (2007) carried out regression analysis on conflict and educational data from around the world. Using an objective measure of conflict status¹⁹ and controlling for other variables such as economic development, regime type and population growth, they found that being in a state of civil war has a significant and negative impact on enrolment at primary, secondary and tertiary levels, with the effect being in the range of a 1.6–1.9% decrease for primary and secondary and a 3.2–3.6% decrease for tertiary. They also tested the impact of the severity of the conflict, with an extra 1,000 BRDs having an impact in the range of 1.4–3.4% on enrolment, with again the largest impact felt at tertiary.

There is a problem of generalising these findings, however, as neither of the two independent variables used (conflict status and BRDs) are comparable across countries. Conflict status tells us nothing about the nature or severity of conflict; using BRDs increases objectivity but is not comparable across countries of different sizes, as the relative intensity will depend on the overall population size. They can only be applied to a theoretical conflict-affected country of average size, or experiencing an ‘average’ level of conflict intensity.

1.4.5 The impact of conflict on education quality and learning

Even if access can be maintained during conflict, there may still be significant impacts on learning. Conflict can lead to poor learning environments, reduced distribution of learning materials and psychological trauma that affects children’s learning (Save the Children, 2013). As discussed above, conflict also impacts on physical health (Bundervoet, 2012) and therefore cognitive development, which in turn impacts on learning. In many cases, this is likely to be the most profound and lasting impact of conflict on education:

“The legacy of dropout and repetition, disrupted attendance, and overage students greatly outlasts the frequently quite rapid recovery of enrolment rates. Outdated and inappropriate curricula, inadequately prepared teachers, collapsed teacher training, support and supervision services, and poor alignment of the system to the development needs of the country continue to undermine the quality of learning for many years after the problems of access have been addressed.” (Buckland, 2005, p.20–21)

We did not find any studies that quantify the impact of conflict on learning outcomes. But we did find evidence of the effects in the form of drop-out and repetition rates and learning outcomes in conflict and post-conflict countries (see, for example, Bundervoet, 2012; Justino, 2011; and Oyeler and Wharton, 2013, which cite evidence from their own analyses and from other studies in the countries they analyse).

In order to give an idea of the potential magnitude of this channel of impact, the 2013/14 *Education for All Global Monitoring Report* (UNESCO, 2014) estimates that 250 million children are not learning the basics of literacy, representing a leakage of 10% of global education budgets, or \$129 billion per year; 37 countries are wasting at least half the amount they spend on primary education this way (UNESCO, 2014, p.192). Data disaggregated by country are not presented so we cannot say how this situation plays out in conflict-affected countries. However, given that roughly half of OOSC are from conflict-affected countries, we can speculate that they represent a similar proportion of the learning crisis, i.e. around 125 million children at a cost of \$65 billion. However, this does not tell us how much is wasted as a *result* of conflict.

¹⁹ Lai and Thyne used two datasets, the Correlates of War dataset and the Uppsala-PRIO dataset. In the latter, an armed conflict is defined as: “a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths in one calendar year.” See <http://www.pcr.uu.se/research/ucdp/definitions/> Uppsala-PRIO categorises armed conflicts into three groups: war and minor conflicts, non-state conflicts and one-sided violence.



2 The human costs of conflict to education: out-of-school children

2.1 The number of OOSC in conflict-affected areas

Even in peacetime, the challenges to gathering reliable, internationally comparable datasets on OOSC are considerable (see Omoeva et al., 2013). In conflict-affected situations, the challenges are magnified, as education management information systems (EMIS) are often weak; providers of education are multiple and disconnected; and access to communities to conduct household surveys is limited by insecurity. OOSC figures give a snapshot in time, and do not capture the dynamic nature of changing conflicts and the complex, often fractured educational histories of children. The population of OOSC includes delayed entrants, dropouts, children who may be temporarily out of school and children unlikely ever to join school. For these reasons, the figures given in this paper are very rough estimates, exploring the approximate range in which the ‘actual’ number, a highly transitory statistic, might lie.

In 2013, UNESCO reported that there were 28.5 million OOSC living in countries affected by conflict, which constituted half of the global OOSC total of 57 million (UNESCO, 2013). According to the UNESCO Institute for Statistics (UIS), OOSC are defined as all children of primary school age not enrolled in primary or secondary school. In most cases, the data are derived from national management data, often referred to as EMIS. School enrolment numbers are subtracted from school-aged population estimates based on the most recent census. Children of primary school age attending preschool are generally categorised as out of school.

2.1.1 Age range of OOSC

UNESCO’s headline figure for the number of OOSC, as reported by UNESCO’s 2013/14 *Education for All Global Monitoring Report*, refers only to OOSC of primary school age, as defined by the International Standard Classification of Education (ISCED) system. OOSC of lower secondary school age are referred to as “out-of-school adolescents”. This latter statistic gives the number of children of lower secondary school age, as defined by ISCED, not attending primary or secondary school.

There is considerable variation across countries in the intake age and duration of primary school, as defined by ISCED, and hence there is considerable variation in the age ranges of children included in the OOSC statistics. Starting ages vary between five and seven years old; duration of the primary cycle varies from three to seven years; and the upper age limit of primary school varies between nine and twelve years of age. It is therefore difficult to make a meaningful comparison between, for example, the number (or proportion) of OOSC in Pakistan, which encompasses children aged between five and nine years old, and Ethiopia, where children aged between seven and twelve are included.

In some school systems, the ISCED definition of primary school does not match the local definition. For example, in countries with primary cycles of eight years (such as Somalia, South Sudan and Sudan), only the first six years are recognised as being part of primary education according to the ISCED system. Other countries do not have a discrete cycle of education corresponding to primary education. Libya and Syria have education systems with a nine-year basic education cycle, and Palestine has a ten-year cycle of basic education. Under the ISCED classification, only the first four years of schooling are referred to as primary education in Palestine and Syria, and the first six years in Libya.



Many children included in the OOSC statistics are late entrants: children of school age who were not enrolled in school when they reached school age, but likely to be enrolled soon afterwards. For example, in Thailand the official age of school entry changed from seven to six in 2001. Even a decade later, there was still some confusion over the official entry age, and the vast majority of the 550,000 OOSC were six- or seven-year-olds who had not yet started school, but were likely to enter the following year (UNICEF, 2012). OOSC statistics include children of primary school age who are attending preschool. In Russia, 63% of 'out-of-school' children were enrolled in preschool and in Colombia 38% (UIS, 2009 data).

Whilst young children, many of whom may be attending preschool, are included in the UIS OOSC numbers, OOSC above the ISCED age range for primary – many of whom will have dropped out before completing the national primary/basic cycle of education – are not included. In systems where late enrolment, repetition and/or temporary interruption of schooling are common, the 'typical' age range for primary school enrolment may extend well beyond the official ISCED age range; hence the UIS OOSC figures can miss many older children who are not receiving a full primary education.

To address these issues, the Education Policy Data Center (EPDC),²⁰ a research unit of the organisation FHI360, uses the age range 7–14 across all countries when measuring the numbers of OOSC. The age range was chosen to capture the majority of compulsory basic education cycles in most countries, and the upper age limit of 14 was selected to convey the normative international frameworks set by the Convention on the Rights of the Child and supported by the International Labour Organization's Minimum Age Convention (Omoeva et al., 2013). The EPDC estimates therefore cover a wider age range than most UNESCO statistics (seven years, as opposed to six or less in most cases), so are generally larger than the UNESCO estimates. Where there is a high rate of school dropout among children aged around 12 to 14 (i.e. above the ISCED age range for most primary systems, but within the EPDC age range), the out-of-school numbers according to the EPDC definition are significantly greater than those included in the UNESCO definition. In Ethiopia, India, Mali and Niger, for example, there are over twice as many OOSC measured under the EPDC definition, as compared to the UNESCO definition. Across the conflict-affected countries which have data for both sources,²¹ the EPDC estimate is, on average, 1.7 times higher than the UNESCO estimate. However, part of the variation is also due to difference in data sources, as discussed below.

2.1.2 Data sources and age of data

The UNESCO Institute for Statistics derives its data on OOSC from management data (EMIS) on age-specific enrolment and population census data. An alternative source is to use household surveys such as the DHS and MICS. However, these surveys are not conducted annually. The sources of error in the two broad types of data are documented in Omoeva et al. (2013). The key sources of error are summarised below:

Sources of underestimate of OOSC

- Household surveys miss children not living in traditional households (e.g. street children, children's homes, orphanages) and may miss areas of low security.
- Management data may include 'ghost' students, and students who are officially enrolled but not attending.²²
- Population underestimates (e.g. lack of extrapolation for population growth).

²⁰ See <http://www.epdc.org/>

²¹ Excluding India which is an extreme case, with the EPDC estimate over 20 times higher than the UIS estimate.

²² In Afghanistan, for example, students remain on school registers for up to three years after their last attendance. See Save the Children (2009).

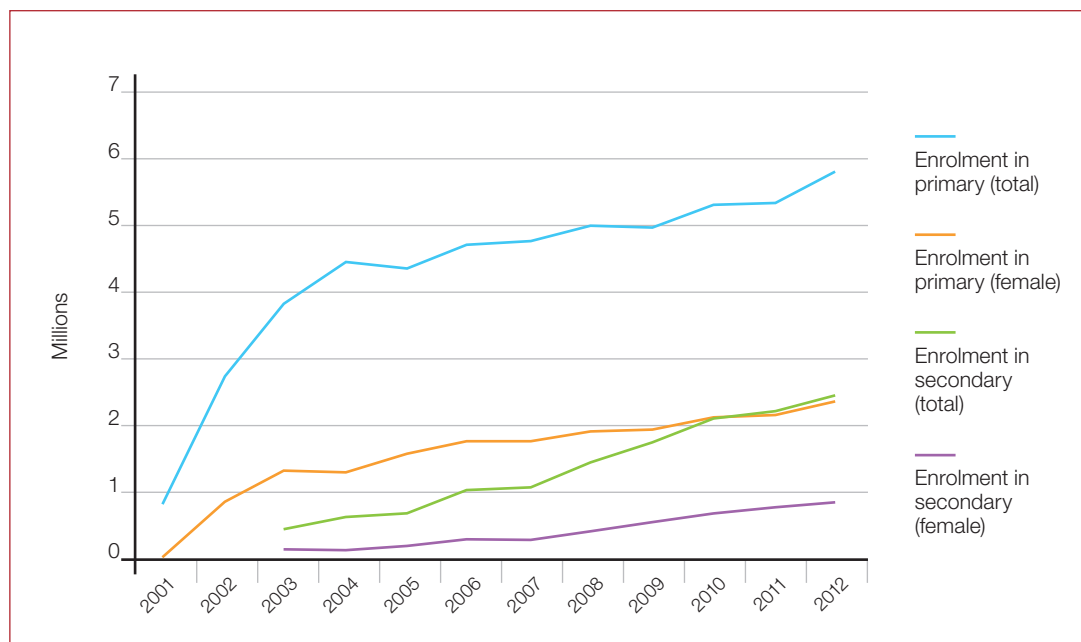


Sources of overestimate of OOSC

- Management data do not tend to include non-formal/non-registered schools, and may miss children in emergency/refugee/alternative basic education programmes. Enrolment in private schools is often under-reported.
- Overestimates of overall population (e.g. migration not taken into account).

Rates of school participation in conflict-affected countries can be subject to unusually rapid change: with the onset of conflict leading to large numbers of children suddenly losing access to school (as in the case of Syria) or with recovery programmes, often with large amounts of donor support, leading to rapid increases in access. For example, in Afghanistan there was a dramatic increase in enrolment following the overthrow of the Taliban at the end of 2001 (see Figure 5 below). In South Sudan, primary enrolment increased four-fold, by over one million, during the years immediately following the signing of the 2005 peace agreement (UNESCO, 2011b). Because of this high rate of change, statistics on school participation quickly become out of date. DHS data, for example, whilst being a reliable source on the situation at the time of data collection, are often several years out of date. Reliable, validated EMIS data may also be out of date. In some cases, an inaccurate estimate that is recent may give a truer picture of the current situation than a more accurate and reliable, but out-of-date statistic.

Figure 5: School enrolment in Afghanistan 2001–2012



Source: UIS

2.1.3 Geographic coverage: defining 'conflict-affected'

In terms of geographic coverage, the 28.5 million figure calculated by UIS is for 32 countries that each experienced 1,000 or more BRDs between 2001 and 2011, or over 200 deaths in any one year between 2009 and 2011. These countries are listed in Table A1.1 in Annex 1. Data on BRDs are taken from the Peace Research Institute Oslo (PRIO) and the Uppsala Conflict Data Programme (UCDP). For four large countries with localised conflicts (India, Indonesia, Nigeria and Pakistan), only conflict-affected areas are included. However, in most conflict-affected countries there are large areas that remain relatively unaffected by the direct impact of armed conflicts, and OOSC from those areas are included in the 28.5 million figure. Estimates of the proportion of OOSC living in conflict-affected areas within countries have been calculated by EPDC (see EPDC, 2010a). Further estimates were calculated for this research to cover all conflict-affected countries with over 500,000 OOSC. Conflict-affected areas within countries were identified using the PRIO and UCDP datasets, considering the areas that had experienced conflict during the 2001 to 2011 period. Where possible, sub-national OOSC data were used, but in two cases (Thailand and Yemen) these were not available, so estimates were based on overall sub-national populations. This could lead to an underestimate if the conflict-affected areas have higher out-of-school rates than the rest of the country, which is likely.

It should be noted that the method used takes only the highest level of sub-national geographic division (e.g. state, province or region) into account. This leads to relatively high estimates in countries with large sub-national divisions. For example, in Uganda, the EPDC study looked only at the four regions (Northern, Western Central and Eastern) and included two of these regions as conflict-affected; whereas for Afghanistan, the estimate was based on analysis of 34 provinces, of which only three were classified as conflict-affected. In many cases, particularly in the larger countries, some of the areas included have experienced only very low levels of conflict during the decade under review. The estimates of the proportion of OOSC living in conflict-affected areas in India and the Philippines, for example, are relatively high because the violence is spread across a number of states/provinces, although it has been generally of low intensity. As noted in a study in Pakistan (EPDC, 2010b), the direct effects of conflict on education are often highly localised and the impact can only be fully understood by analysis of highly localised data. In India, for example, the state of Bihar accounts for 17% of OOSC nationally. The conflict between the state and the Maoists is occurring in parts of Bihar, but not in the whole state, so the estimate based on state-level data is still an overestimate to some extent. In Ethiopia, there has been a very minor ongoing conflict in the Oromia region with around 25 BRDs each year between 2001 and 2011. However, Oromia is a vast region and accounts for 44% of all OOSC in Ethiopia. Because of the very low level of conflict, it has not been included in the estimate. On average, it was estimated that around a third (33%) of OOSC in conflict-affected countries live in areas that have experienced the direct effects of conflict over the decade from 2001 to 2011. This average was used as a proxy for countries with missing data.

2.1.4 Global estimates for OOSC living in conflict-affected areas

Table 9 below gives a range of different ways that the number of OOSC in conflict-affected areas can be calculated, taking different age ranges, data sources and areas of geographical coverage, with very rough estimates provided. As noted above, proxies have been used in cases where data are not available. EPDC estimates that there are nearly 39 million OOSC in India, based on the 2006 DHS, extrapolated for 2012 (Omoeva et al., 2013). But the extrapolation does not take into account the rapid increase in access to basic education that India has seen since 2006 (see UNESCO, 2014). The estimates from survey data for the age 7 to 14 age range are dominated by India, even when the sub-national estimates are used, so are also presented with India excluded.



Table 9: Estimates for OOSC living in conflict areas (based on 2012 or most recently available data)

	EMIS data, ISCED definition for school age, primary school aged	Survey data, age range 7–14 (from EPDC estimates with proxies* for missing countries)	Survey data, age range 7–14 excluding India (based on EPDC data)
Country totals	39 million	90 million	51 million
Country totals with sub-national estimates for India, Indonesia, Nigeria and Pakistan	28.5 million (UNESCO, 2013)	47.5 million	37.5 million
Global estimate of OOSC living in conflict-affected areas based on sub-national estimates of OOSC in areas experiencing armed conflict**	11 million	24 million	14 million

* Proxies were calculated by multiplying the UNESCO estimate by 1.7, the mean ratio between the two estimates for countries where both sources have data. They account for less than 10% of the total.

** These are based on the numbers of OOSC in provinces/states that have experienced conflicts between 2001 and 2011, based on EPDC (2010a) estimates or alternatives, as documented in Table A1.2.

For children of lower secondary school age, UIS estimated that 20 million of the 69 million out-of-school ‘adolescents’ globally lived in conflict-affected countries (UNESCO, 2013). Comparing the two estimates for primary and lower secondary aged students, both of which were calculated using the same methodology, this indicates that for every three primary school aged OOSC living in conflict-affected areas there are a further two OOSC of lower secondary school age.

In summary, the majority of the 57 million OOSC of primary school age in 2012 were living in countries affected by conflict, as indicated by data from UNESCO (39 million OOSC in conflict-affected countries) and other analyses of out-of-school statistics (Omoeva et al., 2013). Of this 39 million, around 11 million were living in sub-national administrative areas directly impacted by armed conflict in part or all of their geographic expanse (OOSC in conflict-affected areas).

2.2 Developing a typology of OOSC and conflict

A proportion of the estimated 11 million primary-aged OOSC living in conflict-affected areas within countries are out of school as a direct result of damage caused to schools and personnel by armed conflict (OOSC directly due to conflict). Much of this destruction can be considered ‘collateral damage’, but a proportion is due to targeted attacks on education (OOSC due to attacks), as reported in *Education under Attack*.

As discussed in Section 1, the impact of conflict on education extends beyond the direct impact of attacks and other destruction of schools as part of collateral damage. The indirect, macroeconomic effects of conflict can extend into areas of a country that are not directly affected by conflict. The diagram below shows how the population of OOSC living in conflict-affected countries can be categorised according both to where the children live in relation to the conflict and whether or not children are out of school due to conflict. It includes these wider, indirect impacts of conflict.

Figure 6: Typology of OOSC in conflict including indirect effects



2.3 The impact of forced migration on school participation

According to a survey by the ICRC (2009), over half of those living in conflict-affected areas leave their homes to escape the violence. Many move across borders to become refugees. However, most of those displaced by conflict seek refuge in other parts of their own countries. This group is referred to as Internally Displaced Persons (IDPs). The field of refugee/IDP education statistics is complex, and difficult to estimate. Detailed analysis of forced migration and access to education is discussed elsewhere (Dryden-Peterson, 2011; Ferris and Winthrop, 2010; and UNESCO, 2011a). Whilst this is an area that deserves further research, and greater investment in monitoring systems, a detailed analysis of the topic goes beyond the scope of this study.

In terms of the global figures for OOSC affected by conflict, the effect of taking refugees into account could lead to a lower overall estimate for OOSC (where refugee/IDP education programmes are not included in national EMIS figures of school enrolments and – for refugee populations – refugees are not included in overall population figures), or a higher estimate, if school participation rates within refugee populations are lower than in the host country and the refugee population is taken into account. Also, the absolute population of refugee children will impact on population estimates on which OOSC statistics are based. In order to get an estimate of the overall scale of the problem, and to compare this with the global numbers of OOSC, we give some very rough, order-of-magnitude level estimates on the following page.

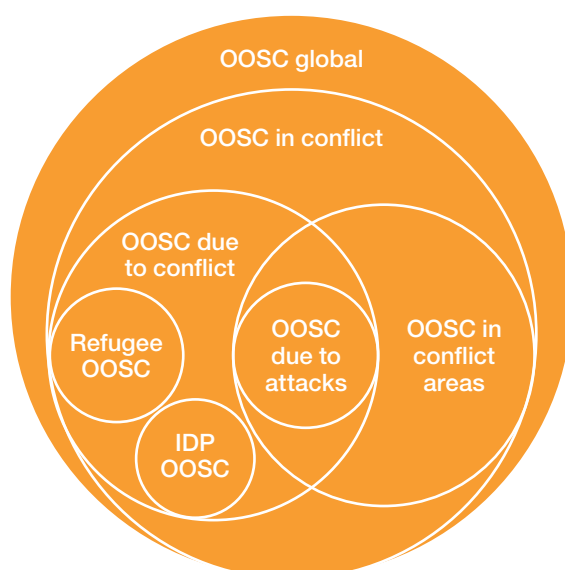


In 2011 there were estimated to be 42.5 million forcibly displaced people²³ including 15.2 million refugees²⁴ and 26.4 million IDPs (UNHCR, 2011). Around half (46%) of these were under 18, so there were approximately 19 million refugees and IDPs under the age of 18. Assuming a six-year primary education cycle, around a third of these would be primary school aged, i.e. 6 to 7 million displaced children. Primary school participation in UNHCR camps is 69% (UNESCO, 2011a), but tends to be lower for other forcibly displaced groups, for example those living in urban settings (Dryden-Peterson, 2011). In 2008, the Internal Displacement Monitoring Centre (IDMC) identified 12 countries in which the majority of IDP children had no access to schooling (IDMC, 2009). This indicates that globally there are around 2 to 3 million refugee and IDP children out of primary school. Whilst this is a very large number, it represents around 10% of the overall number of OOSC living in countries affected by conflict.

UNHCR estimates that there are a further 12 million stateless persons (UNHCR, 2011). However, reporting on this is very limited since most remain ‘under the radar’. Within this population there may be around 2 million primary school aged children (assuming a similar demographic profile as for refugees), and a significant proportion of these are likely to be out of school since they will lack any proof of citizenship, which is often a requirement for enrolment.

Many OOSC among refugee populations are living in countries that are not directly affected by conflict, so these children are not included in the ‘OOSC in conflict-affected countries’ category, even though they may be out of school as a result of conflict. However, often refugees are hosted by countries that are themselves experiencing conflict, for example, refugees from Afghanistan hosted by Pakistan. Similarly, when looking at the sub-national level, OOSC among IDP populations may be living outside of conflict-affected areas within countries, but can be considered to be out of school due to conflict. The diagram below takes refugees and IDPs into account.

Figure 7: Typology of OOSC in conflict including children displaced by conflict



²³ By 2013, this figure had risen to 51.2 million (UNHCR, 2014), but this section uses 2011 data to align with the OOSC data period.

²⁴ Includes 4.8 million Palestinian refugees registered with UNRWA.



Table 10: IDPs in case study countries

Country	Time period	Displaced children temporarily out of school (primary school aged)
DRC	2012	160,000 – 540,000
Nigeria	2010–2014	600,000
Pakistan	2008–2010	1,000,000

It should be noted that the schooling status of displaced children prior to their displacement is often not reported. In all three case studies, the displaced populations came from areas with relatively low enrolment rates; for example, Borno state, the origin of many families displaced due to conflict in Nigeria, had a primary net enrolment rate of only around 21% in 2010.

2.4 To what extent does conflict cause low enrolments?

As discussed in Section 1, the number of children out of school as a direct result of attacks on education is somewhere in the hundreds of thousands. The number of children out of school as a consequence of forced migration is around 2 million. This leaves tens of millions of children living in conflict-affected areas who are out of school. To some extent these children may be out of school as an indirect consequence of the conflict; but many other contributing factors are involved, some of which are linked both to low enrolments and increased likelihood of conflict. So we cannot claim that all of these children are out of school because of conflict.

Estimating a number of OOSC *due to* conflict is complex, and the results from multi-country regression analyses and other research into the relationship are often inconclusive (see Section 1.3 above). Two broad methodologies can be used: comparing enrolment changes in conflict-affected areas with the changes experienced elsewhere, and comparing the rate of enrolment change over time, mapped against the period of conflict. Ideally, for strong evidence of causality, both methods should be combined, looking at changes in education access prior to, during and following a conflict in both the conflict-affected area and in neighbouring areas. However, reliable longitudinal datasets with enrolment broken down by sub-national regions are often difficult to find. Additional evidence can be drawn from surveys that ask the parents of OOSC their reasons for not enrolling or withdrawing their children from school.

It should be noted that the number of OOSC does not always provide the best statistic against which to map the impact of conflict on education. As discussed above, OOSC statistics provide only a snapshot in time, and show only whether children are in or out of school. They do not show the likelihood that those children have of entering or completing school, and do not show the impact of conflict on the education trajectories of children, which may be delayed, interrupted or truncated by conflict. Investigating the impact in terms of the number of years of schooling lost by the school age population during a conflict (see Section 1.3 above) is often a more revealing statistic and can be used to estimate the loss in human capital due to missed education.

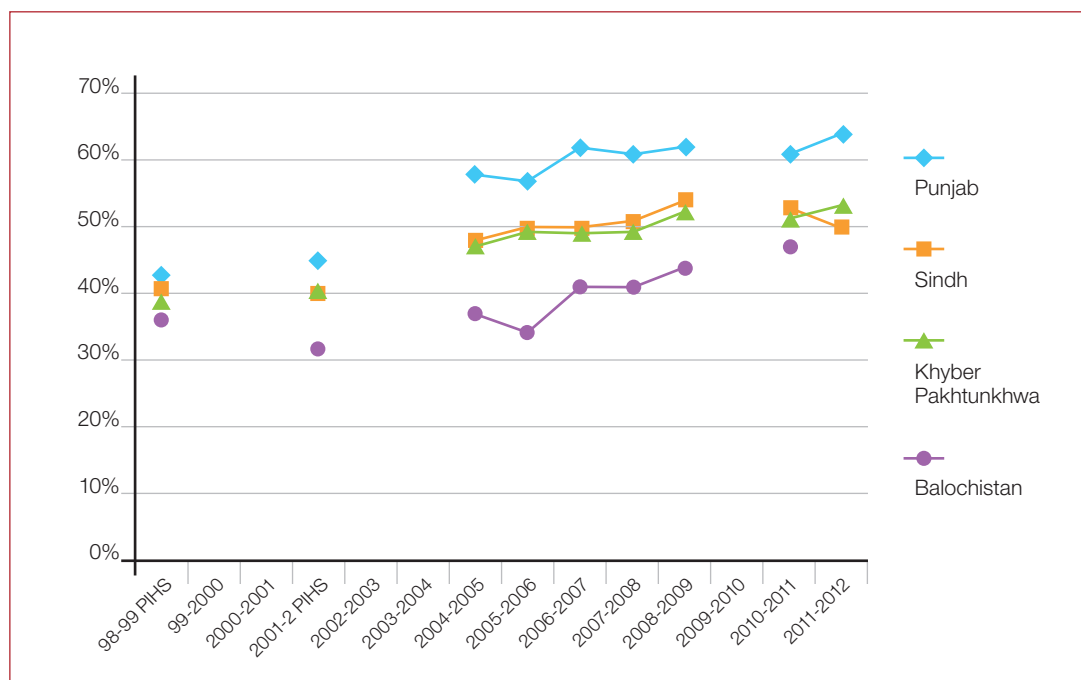


2.4.1 Enrolment in conflict-affected areas compared to non-conflict-affected areas

It is clear that the out-of-school rate tends to be much higher for countries experiencing or recovering from conflict: in 2011, conflict-affected countries were home to 22% of the 652 million primary school aged children worldwide, but home to 50% of all OOSC (UNESCO, 2013; UNESCO, 2014). This means that a child in a conflict-affected country had a 20% chance of being out of school, compared to a child in a non-conflict-affected country, who had only a 6% chance of being out of school.²⁵ So a child living in a conflict-affected country was three to four times more likely to be out of school than a child living elsewhere. However, baseline enrolment rates of conflict-affected countries at the turn of the millennium were on average much lower than the enrolment rates of non-conflict-affected countries (Shields and Paulson, 2014), so this group of countries has a far lower starting point than the rest of the world. There are a disproportionate number of low-income and lower-middle-income countries among those experiencing conflict. Over three-quarters of conflict-affected countries are low or lower middle income, compared to around 40% of countries globally.

In Pakistan, the primary enrolment rate in Khyber Pakhtunkhwa, the province that experienced most conflict between 2001 and 2011, was around 51% in 2011, similar to that of Sindh, which has been relatively unaffected by conflict. Balochistan had the lowest primary enrolment rate of the four provinces covered (44%). This province has experienced a low level of minor conflict, a scale that is much lower than in Khyber Pakhtunkhwa. The overall trends in primary enrolment appear to be similar for all three provinces, despite different experiences of conflict. However, it should be noted that the most highly conflict-affected areas were not included in the data collection for security reasons (Jones and Naylor, 2014c).

Figure 8: Primary NERs in Pakistan by province from household surveys

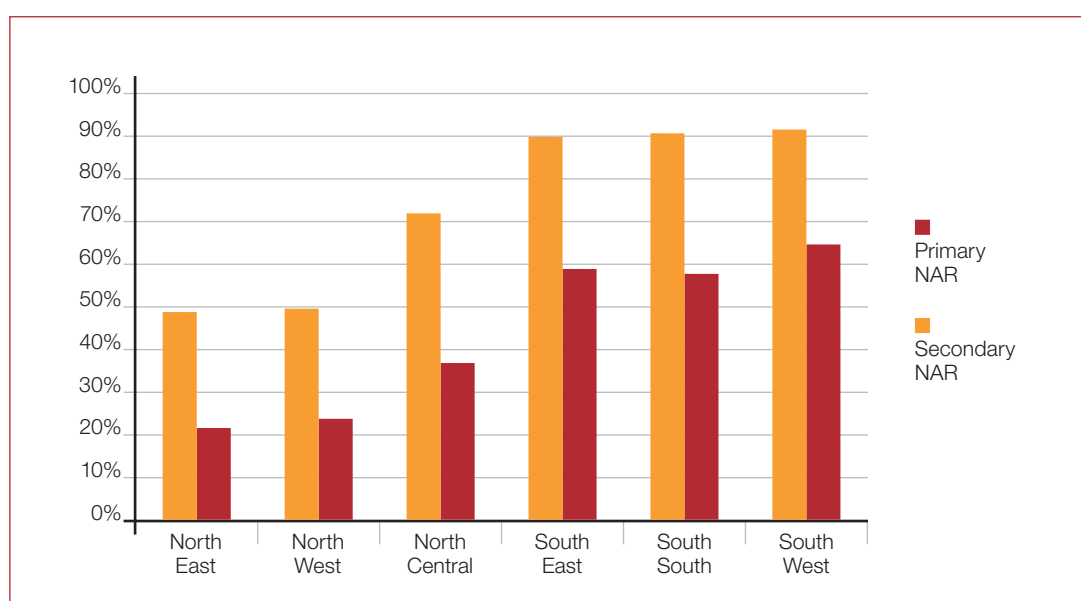


²⁵ Estimated rates of OOSC are based on primary school aged population estimates of 509 million for non-conflict-affected countries and 143 million for conflict-affected.



The conflict with Boko Haram in Nigeria has mainly taken place in the north east zone. The north eastern states have some of the lowest enrolment rates in Nigeria. However, states in the north west had very similar low levels of school attendance rates (see Figure 9). And the relatively low enrolment rates of the north east predate the conflict there.

Figure 9: Net attendance rates (NARs) in Nigeria by geographical zone (MICS, 2011)



In the DRC, the most conflict-affected provinces are Katanga, North Kivu, Orientale and South Kivu. In 2007, NERs for the conflict-affected provinces were 43% compared to 57% in the non-conflict-affected provinces (EPDC, 2010). However, a survey conducted by UNICEF in 2013 (OOSCI, 2013) found that the average rate for OOSC (6–11 year olds) for these four provinces was only 7% above the national average. Breaking down by province, only two were significantly over the national OOSC rate: North Kivu at 40% and Katanga at 34%, compared to the national rate of 26%. For the other two, South Kivu and Orientale, OOSC rates are 2% below and 3% above the national rate, respectively.

2.4.2 Enrolment changes mapped against conflict history

Some conflict-affected counties experience falling enrolment rates, and/or growing numbers of OOSC.²⁶ The 2013/14 *Education for All Global Monitoring Report* (UNESCO, 2014) lists the ten countries that have seen the largest proportionate increase in out-of-school populations over the period 2006 to 2011. Five of these are conflict-affected (Colombia, Liberia, Nigeria, Thailand and Yemen). If data were available for all conflict-affected countries, several more may be included in this list. However, the remaining five in the list have not experienced extensive conflict in recent years. Some countries that are classified as conflict-affected, such as Ethiopia and India, have seen a dramatic reduction in the number of OOSC over the same five-year period. India has reduced its out-of-school population from over 6 million to below 2 million and Ethiopia has cut its out-of-school population from nearly 4 million to less than 2 million. Primary enrolment in Afghanistan has increased dramatically in spite of ongoing conflicts (see Figure 5).

²⁶ In contexts with high population growth, it is possible for the out-of-school population to increase, even when the net enrolment rate is increasing.



Shields and Paulson (2014) estimate that over the last decade, the increase in enrolment rate in **Pakistan** was significantly lower than in other countries starting from a similar baseline, that were not conflict-affected. Based on their estimates, had the growth in enrolment rates followed the path of a non-conflict-affected country, the NER in 2011 would have been around 84%, rather than 72%. This implies that around 12% of primary school aged children (2.3 million children) are out of school largely as a result of the conflict whilst 16% (3.1 million) are out of school due to other reasons.

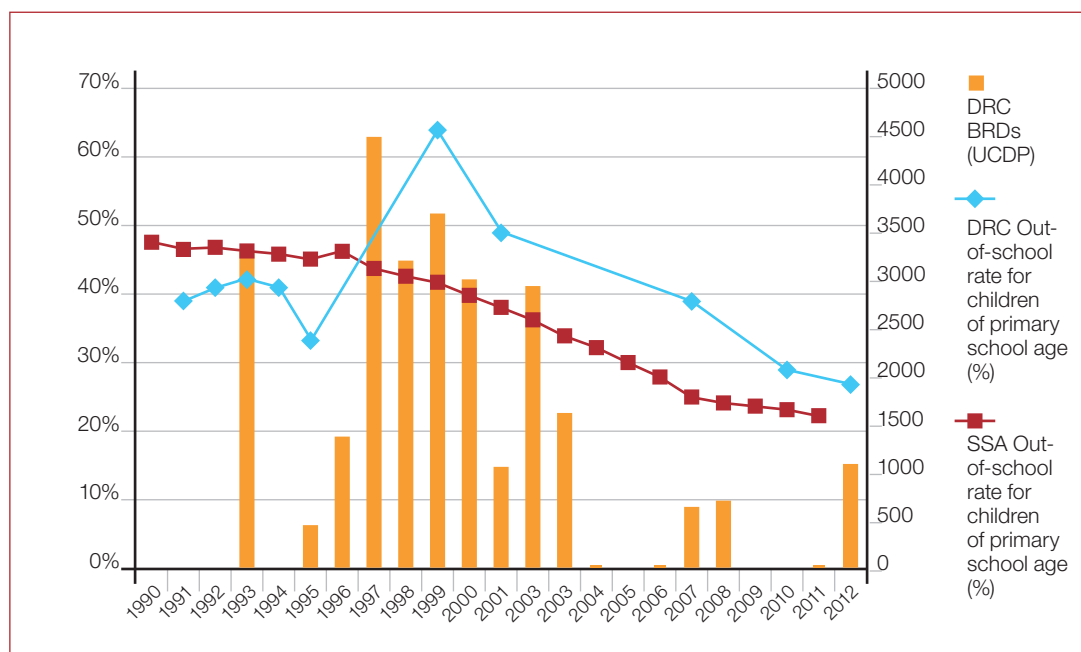
Lai and Thyne (2007) conducted a regression analysis of international conflict and education data, controlling for economic development and population growth. Based on global data from 1980 to 1987, they estimate that an increase of around 1,000 BRDs leads to a reduction in primary enrolment of 1.4% to 3.4%. Between 2007 and 2012, there were, on average, 3,500 BRDs in Pakistan (UCDP, 2014), which would mean a net reduction in enrolment, against a background of overall increasing enrolment, of around 5–12% a year.

Extrapolating the national enrolment trend prior to the conflict with the Taliban with the trend since the onset of conflict also indicates a 5–14% depression in enrolment rates as a result of the conflict (see the accompanying Pakistan case study, Jones and Naylor, 2014c). Based on these reductions in enrolment increase, we could estimate that somewhere between 15% and 50% of OOSC in Pakistan could be considered to be out of school as a result of conflict.

In DRC there was a clear peak in the OOSC rates (and corresponding dip in enrolment rates) during the most intense period of conflict (1996 to 2003). Comparing this to the Sub-Saharan Africa (SSA) average, the DRC OOSC rate was below the average pre-conflict, significantly higher during the conflict, and is now converging to a similar rate. If we assume that the difference between the OOSC rate for DRC and SSA since 1997 was due to the conflict in DRC, this would give estimates of **1.7m OOSC at the peak in 1999** and an **average of 1m OOSC each year 1997–2011** due to conflict. Using this method, the estimate for 2011 is **5% of 6–11 year olds out of school due to the aftermath of the Congo War and current conflicts, representing 506,000 children.**²⁷

²⁷ School age population in DRC 2012 was 10.8m.

Figure 10: DRC OOSC rates and conflict history, compared with OOSC rates for SSA



Source: UCDP, UIS

In Nigeria, there was a decrease in primary enrolment rates between 2006 and 2010, but this decrease preceded the escalation of violence in the north east, and took place during a relatively peaceful period, as measured by the number of BRDs. Lack of recent enrolment data meant that it was not possible to estimate the impact that the recent conflict with Boko Haram has had on enrolment in the affected areas.

2.4.3 Reasons for drop-out given by parents: evidence from survey data

In a household survey on education in Pakistan (ASER, 2014), “law and order” was given as a cause of drop-out in 14% of rural cases (and 9% of urban cases), compared to only 2% of cases where flooding was cited as the reason. The most common cause given for drop-out was poverty. With around 800 to 900 schools destroyed or damaged by militant activity between 2009 and 2013 (GCPEA, 2014), it is likely between 100,000 and 200,000 children will have had their education interrupted as a direct result of these attacks, and will have been out of school, at least temporarily. However, this constitutes only a very small proportion of the 11.8 million children aged between five and twelve not enrolled in school in 2012, and far lower than the proportion citing law and order as the cause for drop-out in the ASER survey.

When parents of children who had never attended school in Nigeria were asked about their reasons for their children not going to school, 16% of parents cited fears over safety for their children travelling to school as one of the reasons for non-enrolment. North east Nigeria had one of the highest rates of reporting lack of safety travelling to school as a barrier to access (21.5%), but the south west had the same high rate for this response and is one of the least conflict-affected regions of Nigeria, presumably reflecting a wider sense of insecurity. For school drop-outs, concerns over safety



were only given as a reason for drop-out in a small minority of cases (2.6%) (NPC and RTI, 2011). It should be noted that these data were collected before the Boko Haram campaign against schools intensified.

A survey in the DRC on reasons for non-enrolment and drop-out for 6–17 year olds included the response “fear of crime and conflict” (OOSCI, 2013). Whilst this was not the main reason in any province, it was significant in the two worst-affected provinces, North and South Kivu, with “fear of crime and conflict” being the primary reason for drop-out for 16% in South Kivu and 8% in North Kivu compared to 4% nationally, and the primary reason for non-enrolment for 10% in South Kivu and 15% in North Kivu compared to 5% nationally. This translates to a total of approximately 180,000 primary school aged children currently out of school because of fear of violence. The three main reasons for drop-out were “money”, “family constraints” and “no school/teacher”. Looking at the channels listed in the introduction, we can see that conflict has the potential to interact with all three of these. According to a Save the Children survey on barriers to education in North Kivu:

“Children and parents acknowledge that conflict is the basis for the poverty they experience and the resulting economic problems that prevent access to education.”
(Dryden-Peterson, 2009, p.13)

2.5 Gender, conflict and access to education

In most conflict-affected countries for which UIS sex-disaggregated data are available, the rate²⁸ of OOSC among girls is greater than for boys. However, in some cases boys are more likely to be out of school. Data were missing for 10 countries.

²⁸ NB: this section compares the rate of OOSC rather than absolute numbers, as most populations of school-aged children are not evenly split between male and female.



Table 11: Gender and likelihood of being out of school

Countries where girls are more likely to be out of school	Countries with similar OOSC rates for boys and girls	Countries where boys are more likely to be out of school
Afghanistan	Burundi	Indonesia
Algeria	Colombia	Philippines
Central African Republic	Liberia	Russian Federation
Chad	Palestine	Uganda
Côte d'Ivoire	Sri Lanka	
Ethiopia		
Mali		
Nepal		
Niger		
Nigeria		
Pakistan		
Thailand		
Timor-Leste		
Turkey		

In terms of the quantitative impact of conflict on gender parity in education, the findings are unclear. Countries affected by conflict tend to have wider gender gaps in enrolment than elsewhere, but these gaps do not appear to widen as a result of conflict (Gates et al., 2010). In some contexts, conflict has been found to have a greater impact on boys' education than on girls'. This was found to be the case in Timor-Leste (Justino et al., 2011), and Burundi (Verwimp and Van Bavel, 2012). Recruitment of boys into armed forces and pressure to enter paid employment are possible reasons for why boys may be more likely to drop out of school during conflict (Justino et al., 2011). In other cases, the effect was greater for girls, for example in Pakistan (EPDC, 2010a; EPDC, 2010b) and Tajikistan (Shemyakina, 2006).



Box 1: Gender, schooling and conflict in Pakistan

In Pakistan, gender clearly plays a major role in parents' decisions to educate their children. In a survey of adolescents aged 10 to 18, for girls, the most commonly cited reason for never having attended school was "parents did not allow". For boys in this age group, cost was given as the primary cause for non-enrolment (Government of Pakistan, 2013). There is also gender inequity in the supply of education. In Khyber Pakhtunkhwa in 2011, there were almost twice as many boys' primary schools as girls' primary schools and in Balochistan there were over three times as many (AEPAM, 2013).

The conflict with the Taliban has exacerbated this inherent gender disparity as it led to targeted attacks on girls' schools and made parents afraid to send their daughters to school (GCPEA, 2014). In Swat, over 200 schools, almost all of them girls' schools, had been destroyed by the end of 2008 (IDMC, 2010). Across the province of Khyber Pakhtunkhwa as a whole, girls' schools suffered a far higher rate of closure than boys' schools, with 22% of all girls' schools in the province closed, compared to less than 2% of all boys' schools (EPDC, 2010a).

In some cases (for example, Afghanistan, Mali, Nigeria and Pakistan), armed opposition groups involved in the conflict are openly opposed to girls' education. In these contexts, girls' education is often directly targeted, or those involved threatened with violence (GCPEA, 2014). The atmosphere of fear that this creates can extend far beyond the sites of attacks, reducing household demand for girls' education.

Sexual violence associated with armed conflict can lead to psychological and physical trauma of victims that may curtail education for some girls. Fear of sexual violence limits girls' mobility and can result in them being unable to attend school (UNESCO, 2011a). Conflict and fragility have also been linked to increased prevalence of child marriage, with parents using early marriage as a strategy to protect girls from sexual violence and/or early pregnancy out of wedlock (World Vision, 2013).

Box 2: Kidnapping of female students in Nigeria

In the attacks on education by Boko Haram, most of the students who have been killed are males. In the attack on Buni Yadi in February 2014, Boko Haram killed around 50 male students but told female students to go away, get married and abandon their education. Since then, Boko Haram has kidnapped a number of girls from high schools. Kidnapping of women and young girls is an emerging tactic of Boko Haram, used increasingly since 2013 (Zenn and Pearson, 2014). At the time of writing, Boko Haram were holding over 200 girls kidnapped from a high school in Chibok, Borno state (Jones and Naylor, 2014c).



2.6 Summary

UNESCO's headline figure of 28.5 million OOSC only includes young children of primary school age and would be approximately twice as large if it included OOSC aged 7–14. Given that school children in conflict-affected countries are often older than the official school age, UNESCO's figure under-represents the number of children missing out on a full primary education in these contexts. However, it should also be noted that it includes millions of OOSC living in areas within countries that have not directly experienced conflict. If only children living in sub-national areas directly affected by conflict were included, the total would be considerably less, around 11 million, or lower if smaller sub-national areas were used as the basis for measurement.

The three countries included as case studies together had 19.4 million OOSC of primary school age in 2011, around half of the total number of OOSC living in conflict-affected countries (see Table 12, following). By including the conflict-affected countries with the largest populations of OOSC, the case studies provide a very approximate guide to the proportion of OOSC that could be considered to be out of school globally due to conflict. But they also illustrate that the impact of conflict on education is very context-dependent and that it is very difficult to generalise the findings to different countries. It is also very time-dependent. In DRC, for example, the study estimated that at the height of the conflict in 1999, there may have been as many as 2 million OOSC due to the conflict (41% of all OOSC). But estimates for 2012 put the figure closer to 0.5 million (15% of all OOSC). The estimates for children out of school due to conflict in Nigeria in 2011 are relatively low but are likely to have risen significantly since then.

Table 12: Estimates of children out of school due to conflict

Country	Estimated number of OOSC (UIS definition) 2011	Approximate proportion of OOSC that can be attributed to conflict	Approximate number of OOSC in 2011/12 due to conflict
DRC	3.5 million	10% to 20%	0.3 to 0.7 million
Nigeria	10.5 million	<5%	<0.5 million (2011 data)
Pakistan	5.4 million	15% to 50%	0.8 to 2.7 million
Total	19.4 million	5% to 20% (of total)	1.1 to 3.9 million

For the three countries studied, the total number of OOSC who could be considered as 'out of school *due* to conflict' is somewhere in the region of 1.1 million to 3.9 million. This represents 5–20% of all OOSC living in these three countries. If the proportion of OOSC due to conflict was in a similar range in other conflict-affected countries, this would mean that the global number of children of primary school age out of school due to conflict is in the region of 2–8 million children.²⁹ If children of lower secondary school age were included, the estimates would be in the range of 4–13 million OOSC. The broad range covered by this estimate is due to the methodological challenges in confirming a causal link between conflict and children being out of school. And, given the differences between the contexts seen even within the three large conflict-affected countries included in the case studies, any extrapolation of the findings to other countries can only be treated as a very rough order-of-magnitude estimate of the numbers of children involved.

²⁹ Based on the global estimate of 39 million OOSC in conflict-affected countries.



These rough estimates put the figures for the number of children out of school due to attacks on schools into perspective. For every child denied an education as a result of targeted attacks, dozens of others are denied an education as a result of the wider impacts of conflict on education: on schools, systems, households and the economy. At the other end of the scale, the findings indicate that of the 39 million OOSC of primary school aged children living in countries affected by conflict, somewhere up to a fifth could be said to be out of school as a result of conflict if indirect effects are also taken into account. In relation to UNESCO's figure of 28.5 million OOSC in conflict-affected countries, which takes sub-national estimates for four large countries, the finding indicates that up to a quarter of these may be out of school due to conflict. However, this comparison is more problematic, since the indirect impacts of education can extend beyond the conflict-affected sub-national regions. The majority of OOSC living in conflict-affected countries are out of school due to underlying social, political and economic factors that often predate the conflict, and in some cases may have contributed to the onset of conflict, as opposed to being caused by it.

3 The financial costs of conflict to education

As noted in Section 1, conflict impacts on education in ways that have a direct cost to the sector, as well as more indirectly through reducing demand and/or supply of education. This inevitably impacts on national capabilities and human capital accumulation and therefore on social and economic development.

Direct attacks and collateral damage create clear costs for the sector in terms of rebuilding schools and replacing personnel, and it is relatively straightforward to generate some rough estimates of the costs of these attacks to the education system wherever they are reported. But the impact that conflict has on access to learning also represents a cost to society, both in itself and through the loss of the potential contribution of educated individuals to society and the economy in the future. These impacts are much harder to monetise, but there is a growing body of literature on the quantitative impact of conflict on education to draw upon.

Taking descriptions of attacks to education from *Education under Attack 2014* (GCPEA, 2014) as a starting point, we examine the financial cost of direct attacks on education for 2009–2012. Evidence on the impact of collateral damage is also considered. We then attempt to quantify other impacts on education that do not create a direct financial burden, such as the impact on access and learning. We then take these quantitative estimates of the impact on education and attempt to quantify the long-term costs of conflict to the economy as a result of reduced levels of education.

For each of these impacts, we propose a framework for costing within the country context, and apply the frameworks to the three country case studies.

3.1 Direct monetary cost of conflict to education

3.1.1 The costs of targeted attacks on education, 2009–2012

GCPEA (2014) aggregates evidence of deliberate targeting of education systems during conflict in 30 countries for the period 2009–2012. Evidence is presented on **damage to physical infrastructure, attacks on teachers and students**, as well as the **impact on access and attendance**. Targeted attacks are defined as any that involve the deliberate use of force, or threat of force, to impact on access to and enjoyment of education. They also include military use of schools and any other known damage to education infrastructure or personnel (for example, by bombing an adjacent building).

Some of the descriptions are quite precise, some provide estimates, and others give a far less tangible idea of impacts. The quotes below, all referring to Pakistan, give an idea of the varying strength and level of detail of evidence detailed in the report.

“[Human Rights Watch reported that] The BLA [Baloch Liberation Army] claimed responsibility for the murder on 5 November 2009 of Kurshid Akhtar Ansari, the head of library sciences at the University of Balochistan and for the 27 April 2010 murder of Nazima Talib, a professor at the same institution.” (GCPEA, 2014, p.173)

“The Human Rights Commission of Pakistan (HRCP) reported 505 schools damaged or destroyed in 2009 alone.” (GCPEA, 2014, p.169)



“In August 2013, The Guardian published evidence that children in Afghanistan were being sent to madrassas in Pakistan to be trained as suicide bombers.” (GCPEA, 2014, p.172)

We take these accounts as an evidence base on which to develop estimates of the direct cost to the education sector of attacks on education, 2009–2012. Clearly this evidence base does not enable us to determine the exact number and nature of attacks on education in a particular country: in order to use the data, we have to make a number of assumptions. For example, where a school was attacked, what was the extent of damage? Did the school have to be completely rebuilt or simply repaired? Where educational personnel have been killed, injured or kidnapped, we have to make an assumption about whether they need to be replaced.

After making assumptions on the degree of damage caused by attacks, we apply unit cost estimates to arrive at a total cost of the attack. If a school was destroyed we estimate the construction cost for rebuilding the school. If it was damaged, we estimate how much it would cost to repair the damage. If a teacher was lost from service due to death, displacement or injury, we estimate how much it costs to train a new teacher. In some countries, these cost estimates are readily available from planning documents or the output of public expenditure reviews and project evaluation reports. For others, estimates need to be derived from alternative sources.

Below is a list of the types of impact and our proposed method of cost estimation.

Table 13: Types of costs for direct attacks on education

Type of cost	Method of estimation
Destruction of building	Number of buildings destroyed x average cost of school building construction
Damage to building	Number of buildings damaged x estimate of extent of damage ³⁰ x average cost of school building construction
Destruction and looting of equipment	Estimate of cost of replacing lost equipment
Replacement of teaching force due to death, disablement, trauma, displacement and recruitment to armed groups	Number of teachers lost due to death, disablement, trauma, displacement and recruitment to armed groups x cost of teacher training
Pensions for teaching force due to disablement, trauma	Number of teachers lost due to death, disablement and trauma x cost of teacher pension (where applicable)
Compensation to teachers or their families due to death, disablement, trauma	Number of teachers lost due to death, disablement and trauma x cost of teacher compensation (where applicable)
Lost teaching time	Estimate of number of lost teaching days x average teacher salary/day

³⁰ This will be estimated on a scale of 0–100%, with 100% being total destruction.



3.1.2 Case study findings

Findings from the case studies are presented below. More detail can be found in Annex 2. Detailed case study reports also accompany this paper.

In **DRC**, there were around 800 attacks on schools reported in the period 2009–2012. (GCPEA, 2014). Rather than deliberate destruction, however, most of these attacks took the form of occupation and looting by armed groups. In addition, reports indicated that at least seven education personnel and seven students were killed, nine students were injured, one raped and over 80 forcibly recruited to armed forces.

In **Nigeria**, the number of attacks reported during the period was fewer, but where they did occur, they tended to be the result of a deliberate targeting of education, often by Boko Haram. Depending on the sources used, between 13 and 69 schools were reported to have been destroyed, and at least 16 schools and one university building damaged. At least eight educational personnel were killed including school headteachers, university staff and a madrassa cleric; and 12 were kidnapped. Fifty students were killed, at least seven injured and 15 kidnapped. At least 5,000 students were denied access to education from January to March 2012. It should be noted that the frequency and intensity of attacks on education in Nigeria increased considerably in 2013, after the reporting period, but for reasons of consistency we use the same reporting period for all three countries.

Of the three case studies, the education system in **Pakistan** was under the greatest pressure from targeted attacks for the period 2009–2012, as the scale of violence was high and there was religious opposition to secular education. There were at least 838 militant attacks on schools over the reporting period, as well as at least 40 cases of armed forces occupying schools. At least 61 education personnel were killed and ten injured, at least 53 students were killed and 97 injured, and at least 138 education personnel and students were kidnapped. At least 130,000 students were prevented from attending school as the Taliban issued directives against girls' education in the north west of the country and the level of violence in Balochistan prevented the effective functioning of education.

In order to cost the impact of these attacks, we investigated the costs of providing education in the three countries.

3.1.2.1 Capital costs

Classroom construction costs vary greatly by size, location and materials used. A community-built classroom in rural DRC is likely to cost far less than a government-built classroom in central Lagos, Nigeria. We assume that reconstruction costs will be borne by the government and therefore take government estimates where possible. Where unavailable, we seek to estimate standard construction costs for concrete classrooms.

The 2012 Interim Plan for Education in **DRC** assumes a standard classroom construction cost for a primary school of \$50,000 (MoE, 2012, p.104). The only cost estimate for **Nigeria** accessed (DFID, 2014) puts classroom construction costs at approximately \$12,500. The same source provides an estimate of \$3,835 per classroom for **Pakistan**. In-country INGO sources estimated that construction costs are \$10,000. We use an estimate at the lower end of the range, of \$5,000 per classroom. In order to turn classroom estimates into whole school cost estimates, an assumption on the number of classrooms per school is needed. For Nigeria, we assume an average of eight classrooms per school (one for each of the six primary grades plus two additional buildings); for



Pakistan seven (one for each of the five primary grades plus two additional buildings). This leads to estimates of \$100,000 for Nigeria and \$35,000 for Pakistan. The difference between these two estimates highlights the levels of variance in construction costs and the uncertainty that surrounds all of our cost estimation.

In Nigeria, accounts of attacks tended to state whether a school was damaged or destroyed. In DRC, where attacks were mainly occupations and lootings, we assume that schools were damaged rather than destroyed. In Pakistan, where education was deliberately targeted in a number of attacks, it is assumed that half the attacks resulted in the destruction of a school and half in damage. In all cases, it is assumed that the cost of repairing a damaged school is half that of replacing one destroyed.

Attacks on schools also lead to the destruction of school furniture, learning materials and other school equipment. No estimates for the cost of these were accessed so we assume an average cost of \$5,000 per school in each country and apply to estimates of the number of schools attacked.

From these approximate data and assumptions we can generate an estimate for the total capital cost of targeted attacks on education, 2009–2012, as outlined in Table 14. Despite lower construction costs, the scale and severity of attacks on education 2009–2012 in **Pakistan** lead to the highest estimate for capital cost of \$28m. In **DRC**, schools were targeted not for ideological reasons, but the scale of impact means that the estimated total capital cost is still high, at \$24m. In **Nigeria**, schools were deliberately targeted but the lower intensity during the reporting period means that the estimate is considerably lower at \$5.2m.

Table 14: Capital cost of targeted attacks on education, 2009–2012

Cost	DRC	Nigeria	Pakistan
Cost of replacing destroyed and damaged infrastructure	\$20,000,000	\$4,950,00	\$23,625,000
Cost of replacing damaged and looted equipment	\$4,000,000	\$290,000	\$4,500,000
Total capital cost	\$24,000,000	\$5,240,000	\$28,125,000

3.1.2.2 Human resourcing costs

In addition to the great personal loss suffered by the families of teachers killed, kidnapped or injured in attacks on education, it also represents a burden to the education sector. In order to cost this impact, it is assumed that all affected personnel will need to be replaced.³¹ Since *Education under Attack 2014* documents attacks on different kinds of educational personnel, we make the further assumption that the average cost of replacing these personnel is equivalent to the cost of replacing a standard primary school teacher.

³¹ In the case of Pakistan, we assume that kidnapped personnel do not need to be replaced; this is a simplifying assumption as the number of kidnapped personnel is not known.



Table 15: Number of personnel to be replaced as a result of targeted attacks on education, 2009–2012

	DRC	Nigeria	Pakistan
Personnel to be replaced	7	20	71

Reliable data on teacher training costs were not readily available for any of the three countries. In **DRC**, there is a two-year pedagogy stream following secondary school. Assuming that the cost of this for the government is the same as that of secondary school,³² and given that 90% of school costs in DRC are borne by the individual/community (de Herdt and Poncelet, 2010), we arrive at an estimate of \$300 per teacher training graduate. For **Nigeria**, a World Bank publication of 2008 cited teacher training costs as approximately \$900. Assuming some inflation since then, we can round this to \$1,000. For **Pakistan**, we take the average of cost from four different teacher training institutions 2003-2004 documented in UNESCO (2006) and assume 280% inflation 2004–2013 (World Development Indicators database), resulting in an estimate of \$1,620 per teacher training graduate.

Potentially an even greater cost to education than the direct damage is the restriction of access that conflict-related **school closures** mean. Attacks on schools and military use of buildings mean disruption to school schedules for weeks, months or even years. In Pakistan, the Taliban issued announcements prohibiting girls from attending school, and even when these bans were lifted, many parents were too afraid to send their daughters back to school (UNICEF, 2014). In Nigeria, attacks by Boko Haram have had a similar effect. In DRC, lootings and occupation of schools for military use have also restricted access to education.

As well as denying access to education for students, school closure also represents extra expenditure if teachers continue to be paid during the period of closure. By collating evidence for the three countries and making assumptions on the average length of school closure (100 days unless otherwise stated), average size of school (200 students) and pupil-teacher ratios,³³ we arrive at the estimates of lost teaching days presented in Table 16.

Table 16: Lost teaching days as a result of targeted attacks on education, 2009–2012

	DRC	Nigeria	Pakistan
Lost teaching days	460,000	47,333	3,750,000

In none of the three countries was evidence found that compensation was paid to teachers' families in the case of murder or kidnap during attacks on education, nor pensions paid to teachers in the case of injury. We therefore assume zero cost for this.

From these estimates and assumptions it is possible to generate an estimate for the total human resource cost of targeted attacks on education, 2009–2012, as outlined in Table 17. Higher unit costs in Pakistan, along with the scale of conflict and its deliberate targeting of education make it the country bearing the greatest impact, with an estimated human resource cost of \$73m. Substantially lower unit costs, particular for teacher salaries, mean a much smaller cost in DRC and Nigeria, estimated at approximately \$2m and \$0.5m, respectively.

³² \$15/year (DFID, 2014).

³³ DRC: 35:1 (World Bank, 2014); Nigeria: 30:1 (UNESCO, 2014); Pakistan: 32:1 (AEPAM, 2013).



Table 17: Human resource cost of targeted attacks on education, 2009–2012

Cost	DRC	Nigeria	Pakistan
Cost of replacing lost teaching force	\$2,100	\$20,000	\$115,020
Cost due to lost teaching time	\$1,932,000	\$473,330	\$72,125,020
Total cost	\$1,934,100	\$493,330	\$73,240,020

3.1.2.3 Total direct cost of targeted attacks on education, 2009–2012

Estimates for the total direct cost of targeted attacks on education are presented in Table 18. In DRC, where education was not attacked for ideological reasons, we estimate a total cost of \$26m and find that the impact of lootings and military occupation of schools had a bigger impact than that of replacing teachers and school closure. In Nigeria, where schools were deliberately targeted, but on a relatively smaller scale prior to 2013, we estimate a total cost of around \$5.7m, again mainly as a result of the capital cost of replacing and repairing schools. In Pakistan, where education was deliberately targeted in multiple ways, we estimate a total cost of \$101m, with the cost of paying teachers during school closure the biggest element of this.

Table 18: Total direct cost of targeted attacks on education, 2009-2012

Cost	DRC	Nigeria	Pakistan
Capital cost	\$24,000,000	\$5,240,000	\$28,125,000
Human resource cost	\$1,934,100	\$493,330	\$73,240,020
Total cost	\$25,934,100	\$5,733,330	\$101,365,020

All these estimates are approximate. Estimates of scale and severity of attacks are based solely on the evidence presented in *Education under Attack 2014*. As these are confirmed reports, they are likely to contain an underestimation bias as some attacks go unreported in the chaos and confusion of insecurity and conflict. Our unit cost estimates and other assumptions represent a ‘best guess’ given lack of detail on severity and impact of attacks and poor cost data availability for the three case studies.

Our estimates are not, therefore, designed to be the definitive answer to the question ‘What is the direct cost to the education sector of targeted attacks on education?’ But the estimates give an indication of the scale of impact wrought in these three countries, with governments, communities and individuals left to pick up the bill.

3.1.2.4 The direct cost of targeted attacks on education in 2013

Attacks in all three countries continued into 2013 and 2014. *Education under Attack 2014* provides some accounts of attacks on education for 2013, but as the reporting does not follow the same methodology as that of 2009–2012, we present the data separately. As attacks on education in Nigeria escalated in 2014, we also include evidence from a different source for the first two months of that year. To cost these impacts we made the same assumptions and cost estimates as before.



Table 19: Direct cost of targeted attacks on education, 2013–2014³⁴

Cost	DRC, 2013	Nigeria, 2013–Feb 2014	Pakistan, 2013
Cost of replacing destroyed and damaged infrastructure	\$1,450,000	\$2,800,000	\$105,000
Cost of replacing damaged and looted equipment	\$195,000	\$275,000	\$20,000
Cost of replacing lost teaching force	\$900	\$30,000	\$11,340
Cost due to lost teaching time	\$46,800	\$560,000	\$48,750
Total cost	\$1,692,700	\$3,161,000	\$185,090

The escalation of violence in Nigeria since the start of 2013 has created a huge burden on the education sector which is likely to far exceed that of the previous four-year period, should trends continue. On the other hand, it appears there has been a significant reduction in attacks on education in Pakistan and DRC. It must be noted, however, that *Education under Attack 2014* does not attempt to represent a comprehensive list of attacks for this period.

3.1.3 The costs of collateral damage to education

GCPEA (2014) only reports on deliberate targeting of education, whilst noting that data sources do not always make the attackers' intentions clear. Infrastructure and personnel are also impacted by untargeted attacks, or 'collateral damage'. In order to estimate this impact, therefore, we must turn to other sources.

3.1.3.1 Collateral damage to the teaching force

During the Rwandan genocide, more than two-thirds of the teaching force in primary and secondary schools were either killed or fled; in Timor-Leste, almost all secondary teachers fled the country during the war; in Cambodia, the conflict left the country with almost no trained or experienced teachers at all (Buckland, 2005). In such extreme cases, it may take generations to rebuild the teaching force, at a cost running into millions or even billions.

In countries where there has been no study into the impact on the teaching force, we can infer the number of teachers killed by collateral damage by taking estimates of civilian casualties in conflict and multiplying by the proportion of teachers in the population. For example, we can use estimates generated by the Armed Conflict Location & Event Data Project (ACLED)³⁵, which aims to document all deaths due to conflict in a number of African countries.

In **DRC**, an IRC (2007) survey attempted to estimate the excess number of deaths caused by conflict, i.e. the difference between the number of deaths observed and the number expected had no conflict taken place (based on historical peacetime observations). For the period August 1998 to April 2007, the authors estimate that there were 5.4m excess deaths in DRC, largely as a result of malnutrition and disease brought on by conflict. Although this estimate has been challenged in some quarters, its order of magnitude has not.

³⁴ 2013 data covers to September only. 2014 data only covers January and February and is only considered for Nigeria. 2014 data is from Amnesty International (2014).
³⁵ <http://www.acleddata.com/data/version-4-data-1997-2013/>



According to UIS (2014) data, there were around 630,000 teachers in DRC, which constitutes about 1% of the population.³⁶ We can therefore speculate that of the 5.4m excess deaths, around 54,000 were teachers. As stated above, in addition to the great personal loss suffered by their families and communities, this also represents a massive burden to the education sector. A lower boundary of the cost of losing these teachers is the cost of training their replacements. Applying the teacher training cost of \$300 estimated above, we generate an estimated cost to the sector of \$16,200,000. For the period 2009–2012, ACLED recorded 11,000 deaths due to conflict. This translates into around 110 teacher deaths, at a minimum replacement cost of \$33,000. This is a much more significant cost than the three teacher deaths reported in GCPEA (2014) for this period.

In **Nigeria**, the Council on Foreign Relations (CFR, 2014) estimates that there have been around 18,600 deaths due to violent conflicts (including sectarian violence) in Nigeria between May 2011 and March 2014. Adding to the estimate of 1,200 BRDs for 2009 and 2010 recorded by UCDP, this gives an estimate of around 19,800 deaths. According to Amnesty International (2014), at least half of the deaths in the conflict with Boko Haram were civilians killed by Boko Haram. Estimating that 50% of all conflict deaths were civilians, this results in approximately 9,400 civilian deaths due to conflict during the period 2009–2014. The teaching force of Nigeria is approximately 0.5% of the population.³⁷ We can therefore speculate that the number of teachers killed as ‘collateral damage’ from communal violence and the conflict with Boko Haram is around 50 teachers. This would imply a lower bound cost to the sector of \$50,000. This is the same as, but in addition to, the number of teachers killed or kidnapped in targeted attacks documented for this period.

3.1.3.2 Collateral damage to education infrastructure

Infrastructure is clearly also damaged during conflict to an extent beyond that of targeted attacks alone. For example, if a village is razed to the ground, the damage done to the school would not count in GCPEA’s definition of targeted attacks. In urban warfare, where whole neighbourhoods can be subject to aerial and/or artillery bombardment, schools will inevitably suffer extensive damage. In some conflicts, such as that in Gaza in 2014, it can seem that they suffer disproportionately as they become hosts to military or civilian targets.

In Syria, it is estimated that at least 3,800 schools were damaged or destroyed in conflict from 2011 to March 2013, representing a cost of around \$500m (Hammad, 2013). A survey of schools in Iraq in 2004 found that 700 primary schools had been destroyed or damaged by bombing, and 200 burned since 2003 (Government of Iraq/UNICEF, 2005). In a World Bank funded school reconstruction project, the rehabilitation costs were around \$300,000 per school (World Bank, 2013). At this rate, the costs of reconstructing schools in the primary sector alone would have been at least \$270m.

These figures are far higher than those estimated for capital costs of targeted attacks in our case study countries (a combined total of around \$60m). We did not find estimates of collateral damage to the built environment for any of the three case study countries. The conflicts in the case study countries did not involve large-scale urban bombardment to the same magnitude as the Iraq or Syria conflicts and school construction costs in the case study countries were considerably lower. However, it is likely that the costs of repairing collateral damage to schools in these countries were of a similar (if not larger) scale to the costs estimated for targeted attacks.

³⁶ DRC has a population of approximately 66m (UIS databank).

³⁷ According to UNESCO 2014, there are around 850,000 primary and secondary school teachers in a population of around 170 million. No figures for pre-primary and tertiary teachers are available.

3.2 Broader impacts of conflict on education

The estimates given above only provide a very approximate idea of the cost of conflict to education. As mentioned above, the evidence from GCPEA (2014) is not always detailed enough to lend itself to precise accounting. Estimates derived from GCPEA alone are also prone to an underestimation bias. In the fear and confusion of war and insurgency, it is likely that there are more attacks on schools and teachers that go unreported. By including the costs of collateral damage we can arrive at a truer idea of the cost of conflict on education, but conflict also impacts on education in ways that do not have a direct monetary cost.

Student deaths are not included in this framework, nor is the restriction in access that collateral damage to education infrastructure and personnel brings. These non-monetary impacts on education have knock-on effects if they lead to a permanent impact on educational outcomes, human capital and personal capabilities. The rest of this paper explores how we might incorporate these wider impacts into our analysis.

3.2.1 Impact on access, learning and human capital accumulation

As well as the direct costs to education, conflict also impacts on access to education and learning. Section 1 outlined the main channels through which conflict impacts on access to education. Whilst we will consider the impact of some of these channels individually, in intense and/or long conflicts, the combination of all these factors – and their interaction with other barriers to education such as poverty and weak governance – can have a significant impact on educational achievement for a whole generation. Where this is the case, it could represent a cost to education far greater than the direct costs of rebuilding schools and training teachers.

As noted above, students have been targeted in attacks on education. Whilst this does not represent a direct cost to the education sector, it reduces the potential human capital stock of a country. For the reporting period, 2009–2012, it is estimated that reported attacks on education resulted in seven student deaths in DRC, 50 in Nigeria and 53 in Pakistan. In addition, it is estimated there were nine students injured in DRC, seven in Nigeria and 97 in Pakistan; “dozens” of students kidnapped in DRC, 127 in Pakistan and 15 in Nigeria; “at least” 850 children recruited to armed forces in DRC and 1,500 in Pakistan (no reports in Nigeria).

In addition to these impacts from targeted attacks, many children are denied access to education as a result of displacement. In Section 2, it was estimated that in 2012 between 160,000 and 540,000 primary-aged children in DRC were out of school due to displacement. The estimate for Nigeria was 600,000 (2010 to 2014) and for Pakistan was 1 million (2008 to 2010). The dates of the estimates vary due to the different conflict histories and different data sources. Children are also denied access to schooling due to conflict through the other, indirect channels discussed in Section 1. In Section 2, it was estimated that the total number of primary-aged children out of school due to conflict in 2012, taking all channels into account, was 0.3–0.7 million in DRC, less than 0.5 million in Nigeria (2011 data) and 0.8–2.7 million in Pakistan.

It is likely that in many cases this restriction of access to schooling can lead to a **permanent reduction in educational attainment** (and therefore the human capital stock), either through permanent drop-out at the time of the conflict or failure to catch up on lost schooling. For example, where economic pressures mean that the decision to send children to school is marginal, disruption of attendance during conflict can permanently swing the decision in favour of income generation. Even if children go back to school once the disruption is over, if they have lost substantial learning



time they may never catch up. This will have an impact on ultimate years of schooling and competency levels at the aggregate level.

Section 1.3 noted the growing literature investigating the impact of conflict on educational outcomes, in particular on average years of schooling. Estimates for Colombia, Côte d'Ivoire, Germany, Guatemala and Rwanda have tended to identify a reduction of 0.5 years of schooling for those particularly impacted by conflict (e.g. displaced communities in Colombia and German cities that were targeted by the allied bombing campaign in World War II). This leads us to speculate that in other countries the effect might be of a similar magnitude, either for areas of intense fighting, or for communities particularly impacted by conflict.

In **DRC**, we might speculate that this is the case in North and South Kivu, the two regions bordering Rwanda and Burundi that have seen intense fighting during our reporting period. These regions account for 20% of DRC's school-age population (OOSCI, 2013, p.121). If this population suffered a 0.5 year reduction in total years of schooling, the impact of the current conflicts in DRC would reduce national educational attainment by an average of 0.1 school years for affected cohorts.

In **Nigeria**, given that the levels of conflict in the north since 2011 categorise the conflict as a civil war, we might speculate that a similar impact on educational attainment for children would be found in the three worst affected states, Borno, Yobe and Adamawa. These regions account for 7.4% of Nigeria's school-age population (OOSCI, 2012). We can therefore speculate that the impact of the current conflict in Nigeria will be to reduce educational attainment by a national average of 0.04 school years.³⁸ However, it must be noted that Borno and Yobe had very low levels of access even before the escalation of violence in 2011 and so this may be an overestimation of the potential of conflict to further impact on access.

In **Pakistan**, levels of violence in Khyber Pakhtunkhwa, Federally Administered Tribal Areas and Balochistan during the reporting period 2009–2012 were at very high levels. These regions account for approximately 23% of Pakistan's school-age population (AEPAM, 2013); we can therefore speculate that the impact of the current conflicts in Pakistan is to reduce national educational attainment by an average of 0.1 school years.

Even if access can be maintained during conflict, there may still be significant impacts on learning. Conflict can lead to poor learning environments, reduced distribution of learning materials and psychological trauma that affects children's learning (Save the Children, 2013). These impacts are very difficult to quantify but represent a significant cost to education.

3.2.2 The impact of conflict on education expenditure

Conflict has the potential to impact on the amount of funds available to education (see Section 1.2.8). Conducting cross-country analysis, Lai and Thyne (2007) found that being in a state of civil war reduced educational expenditure by 3.1–3.6% per year.³⁹ Lai and Thyne also used this dataset to test the impact on educational expenditure of the severity of conflict, finding that an increase in 1,000 BRDs per year leads to a reduction in educational expenditure of about 2–2.7%.

However, as noted in Section 1.3, there are problems with generalising from Lai and Thyne's findings: simply stating whether a country is in conflict or not says little about the intensity of the conflict. For example, the relatively intense conflicts in Pakistan are likely to have a much larger effect than the relative minor conflicts in India. And 1,000 BRDs in a country with a population as large as India's is

³⁸ 7.4% multiplied by 0.5 school years.

³⁹ Note: they do not find evidence that this is as a result of increased military expenditure.



very different to 1,000 BRDs in a country with a population as small as Rwanda's. Lai and Thyne's findings are therefore only applicable to the average country they study in terms of conflict intensity.

With these caveats in mind, we apply Lai and Thyne's findings to data from our case study countries, and calculate the financial cost based on 2012 GDP figures published by the World Bank.⁴⁰ In **DRC**, application of Lai and Thyne's results lead to an estimate of a reduction in education spending of 0.6% (\$3.8m) per year for the 2009–2012 period but potentially as high as 3.6% (\$25m) in 2012 when there was a spike in the level of conflict. In **Nigeria** it gives estimates of a reduction in education spending of 2–6%.⁴¹ In **Pakistan**, it gives a range for the reduction in education spending of 3.1–11.4%, or around \$190–690m per year.⁴² Given that the case study countries are larger than average, with large populations relatively unaffected by conflict, Lai and Thyne's model will tend to overestimate the impact of conflict on expenditure. So the actual reduction in expenditure is likely to be at the lower end of the ranges given.

3.2.3 Impact of conflict on teaching force and administration

As well as a direct impact of targeted attacks on the current teaching force, they also impact on individuals' **decisions to join or remain within the profession**. In a video statement made in July 2013, Boko Haram leader Abubakar Shekau explicitly threatened teachers, saying *"School teachers who are teaching Western education? We will kill them! We will kill them!"* (GCPEA, 2014, p.167). In 2013, the Nigerian Teachers Union reported that over 1,000 teachers had fled the north since 2012 (Amnesty International, 2013). As the conflict has since escalated, we should expect this number to be far greater now.

Taking 1,000 teachers as our lower boundary, and applying the teacher training cost of \$1,000 estimated above, the impact of this to the northern state education systems is costed at **\$1m**, though the national net cost may be zero if these teachers fill teacher shortages in other states.

These impacts are summarised in Table 20.

⁴⁰ <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>.

⁴¹ No data on absolute educational expenditure were accessed for Nigeria.

⁴² These ranges encompass Lai and Thyne's estimates based both on civil war status and conflict intensity.



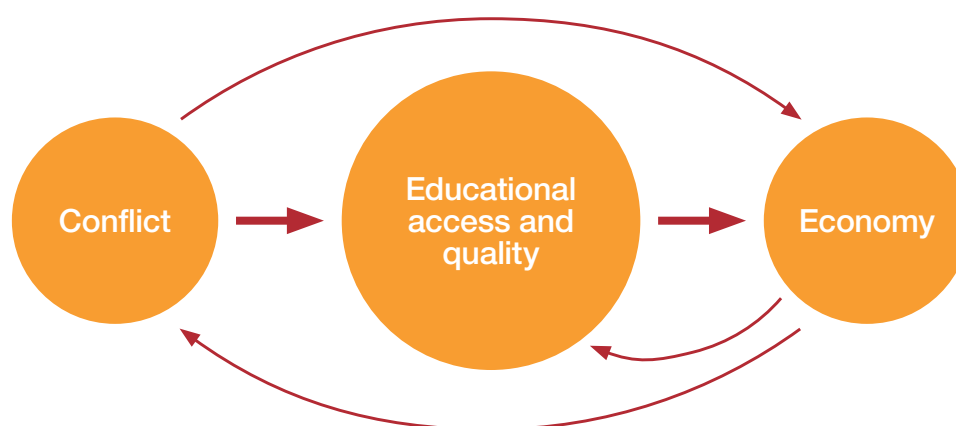
Table 20: Summary of other impacts of conflict on education 2009–2012

Impact	DRC	Nigeria	Pakistan
Lost student days	16 million	1.4 million	120 million
Students killed	8	100	59
Students injured	7	163	163
Students kidnapped	“Dozens”	Number unknown	127
Displaced students	162,000-540,000	1.1 million 6–17 year olds (2010–2014)	2 million students affected
Recruitment of students to armed forces	At least 850 cases of abduction during the reporting period but around 30,000 during height of conflict	No evidence	1,500 boys abducted, others volunteered
Number of children out of school because of conflict (2011/12)	0.3–0.7 million	<0.5 million	0.8–2.7 million
Impact of conflict on national average years of schooling	0.1 years	0.04 years	0.1 years
Impact on learning	Not quantifiable	Not quantifiable	Not quantifiable
Impact on educational expenditure	0.6% – 3.6% (\$3.8–25m) per year	2% – 3.6% per year	3.1% – 11.4% (\$188–291m) per year
Impact on teaching force and administration	Not known	Cost of replacing 1,000 teachers fleeing conflict: \$1m	Not known

3.3 Indirect cost of conflict through missed education

Economic returns on investment in education are generally positive (see Section 1.3). This means that the impact that conflict has on education investment (e.g. infrastructure and personnel), as well as on future educational investments (e.g. education budgets and household expenditure on education), will be magnified over the lifetime of the children whose education was disrupted. In other words, positive returns to education mean that the long-term cost *through* the channel of education will be greater than the short-term cost to education.

Figure 11: The cost of conflict through the channel of education



Basing assumptions of returns to education on the Psacharopolous and Patrinos (2004) review of the literature, Table 21 presents estimates of the long-term economic impact of physical damage to the education system.

Table 21: Economic impact of damage to education system (2009–2012)

	DRC	Nigeria	Pakistan
Assumption on education return on investment	25%	25%	15%
Direct cost to the education sector of targeted attacks, 2009–2012	\$26m	\$5.7m	\$101m
Long-term negative impact on national income of lost investment, 2009–2012 (current prices)	\$32m	\$7.2m	\$117m



Section 3.2.2 discussed the reduction in educational budgets as a result of conflict. Although this represents a saving in current terms, in the longer term it represents a cost to society by reducing economic growth prospects. By calculating the economic impact of this reduced investment, we can estimate the net long-term impact (note: no education expenditure data were available for Nigeria).

Table 22: Economic impact of a reduction in economic expenditure (2009–2012)

	DRC	Pakistan
Assumption on education return on Investment	25%	15%
Reduction in educational expenditure, 2009–2012 (based on lower end of estimate range in Table 20)	\$3.8m per year	\$188m per year
Long-term negative impact on national income of reduced investment,	\$4.8m per year of conflict	\$217m per year of conflict
Net long-term cost of reduced educational investment due to conflicts over the four year period 2009–2012 (current prices)	\$3.8m	\$113m

As outlined in Section 3.2, conflict’s impact on education is much broader than the monetisable impacts to the sector. Conflict results in a reduction in access that has the immediate impact of children being out of school and in the long term impacts on the national average years of schooling. Burnett et al. (2013) calculate the potential long-term impact of both these phenomena for two of our case study countries, DRC and Pakistan. Using their calculations and applying these to our own estimates of the impact that conflict has on OOSC numbers and average years of schooling, it is possible to speculate about the long-term impact of conflict on the economy through these channels (Table 23; case study reports provide more detail on these calculations).

Table 23: Economic impact of conflict through missed education (2009–2012)

	DRC	Pakistan
Economic impact of current OOSC		
Negative economic impact of children being out of school (Burnett et al., 2013)	\$327m	\$3bn
Proportion of OOSC due to conflict	10–20%	15–50%
Long-term negative impact on national income of current OOSC due to conflict	\$53–107m	\$440m–1.5bn



	DRC	Pakistan
Economic impact of reduced educational attainment		
Estimated reduction in national average years of schooling due to conflict (Jones and Naylor 2014a,c)	0.1 years	0.1 years
Increase in income per capita for increase of one year in average years of schooling (Burnett et al., 2013)	17%	13%
Long-term negative impact on national income of reduced educational attainment due to conflict	\$470m (1.7% GDP)	\$2.9bn (1.3% GDP)

Although these are highly speculative calculations, the numbers serve to demonstrate the potential magnitude of impact that conflict can wield on affected economies through the channel of missed education. For the two countries to which we apply these calculations, we estimate the costs through this channel are of an order of magnitude larger than the direct cost to the sector.

Table 24: Summary of economic impact of conflict through lost education (2009–2012)

	DRC	Nigeria	Pakistan
Long-term impact on national income of lost investment (direct costs)	\$32m	\$7.2m	\$117m
Long-term impact on national income of reduced investment (net effect)	\$3.8m	n/a	\$113m
Long-term impact on national income of current OOSC due to conflict	\$53–107m	n/a	\$440m–1.5bn
Long-term impact on national income of reduced human capital accumulation due to conflict	\$470m	n/a	\$2.9bn

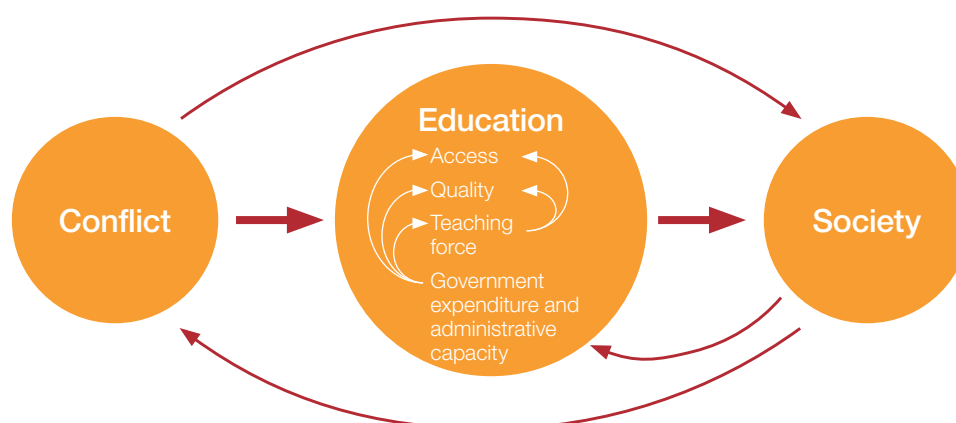
3.4 Summary

This section has set out a framework for calculating the cost of armed conflict on and through education, outlining three layers of effects:

- Direct monetary cost of conflict to education systems
- Broader impacts of conflict on education
- Indirect cost of conflict through missed education and reduced investment

Figure 12, below, presents this framework graphically. The impact of conflict on education includes the direct costs outlined in Table 18 as well as non-monetisable impacts outlined in Section 3.2. The impact of conflict through education is the indirect long-term effect of reduced education on the economy and society outlined in Section 3.3.

Figure 12: Conflict's impact on and through education



Calculating the direct cost of attacks and collateral damage is relatively straightforward given evidence of the attacks and some basic assumptions. Calculating the broader, indirect impacts is much harder. Empirical analysis which isolates the impact of conflict is nascent and has only been carried out in a few countries, but offers the best hope of obtaining robust estimates. We have used these early findings to generate rough estimates of the impact in our case study countries, but caution must be used when generalising from any particular context.

Since investment in education normally yields positive returns, any impact of conflict on education will mean that the long-term impact on development is greater in magnitude than the initial impact on education. Globally, returns to education are estimated at 10%, but typically range between 10 and 40% for developing countries (Psacharopoulos and Patrinos, 2004), meaning for every dollar of lost investment in education (by individuals, communities and the state; through direct damage, reduction in budgets, or reduced access), the economy would be expected to be \$1.10 to \$1.40 worse off over the lifetime of individuals whose education has suffered from the underinvestment.



Table 25: Summary of economic impact of OOSC due to conflict 2009–2012

Impact	DRC	Nigeria	Pakistan
Direct cost to the education sector of targeted attacks on education, 2009–2012	\$26m	\$5.7m	\$101m
Impact on educational expenditure	\$3.8–25m per year (0.6–3.6%)	n/a	\$188–690m per year (3.1–11.4%)
Opportunity cost of lost and reduced expenditure (long-term impact of the above two impacts)	\$36m	\$7.2m (cost of attacks only)	\$230m
Opportunity cost of current out-of-school children due to conflict	\$53–107m	n/a	\$440m–1.5bn
Opportunity cost of reduced educational attainment due to conflict	\$470m (1.7% GDP)	n/a	\$2.9bn

Table 25 summarises findings for our three case studies. In each of the countries, the direct cost to the education sector is substantial, though for Nigeria the reporting period of 2009–2012 means that the estimates do not take into account the recent escalation in attacks by Boko Haram. Given an assumption of positive returns to education in each of these countries, these direct costs will have an indirect impact in the long term of even greater magnitude.

In our case studies, we only found limited data on which to base estimates of the direct costs of collateral damage to education systems. The scale of these costs, relative to the scale of costs due to targeted attacks, is highly context-dependent. For example, in Nigeria, where Boko Haram has openly targeted teachers, the estimate of teacher deaths due to collateral damage (e.g. teachers caught in the crossfire) is of a similar scale to the number killed in targeted attacks, whereas in DRC the numbers of teachers lost due to collateral damage is far greater.

In wars such as those in Gaza, Iraq and Syria, the costs of repairing school infrastructure damaged as a result of the conflict are far greater than in our three case studies. This is due to greater use of aerial bombardment, a higher degree of urban warfare and higher school construction costs. In these types of conflict, the cost of collateral damage to education is far greater than the damage done through targeted attacks on education.

For our three case studies, the impact of lost years of schooling is far more costly in the long term than the immediate damage to bricks, mortar and personnel. Just in terms of current OOSC due to conflict, this impact could mean up to a \$107m reduction in national income levels in DRC and \$1.5bn. for Pakistan. Assuming a long-term impact on educational levels from current conflicts, these



figures could rise to almost \$470m and \$2.9bn, respectively. We cannot conclude that the ratio between long-term economic impact and immediate construction costs is as large as this in all conflicts.

The impact of conflict on access to schooling, the degree of damage to infrastructure and the costs of rebuilding schools are highly context-dependent. But even in cases such as Syria, where repairing school infrastructure will cost hundreds of millions of dollars, the longer-term economic impact of a generation that has had its schooling interrupted and often curtailed as a result of the conflict could be greater still.



4 Conclusion

This study set out to investigate the impact that conflict has on education, and to account for this quantitatively by looking firstly at the number of OOSC and secondly by monetising the damage done to national education systems, both in terms of material damage and loss of human capital. In order to do this, the study has looked at the macro-level econometric data alongside detailed case study evidence that considers the local context and dynamic nature of conflict. It has considered both the immediate, direct costs and the longer-term, more indirect costs that can only be determined by looking at changing enrolment and conflict trends over periods of time.

The first step was to map the various channels through which conflict impacts on education. The most visible of these – the ones that make the newspaper headlines, and are documented by the UN and GCPEA – are targeted attacks on education, resulting in destruction and closure of schools and the death, injury and kidnapping of teachers and pupils. But schools, teachers and students are also victims of collateral damage, suffering as the result of indiscriminate violence, bombing and destruction. Accounting for this damage is difficult and it is often not documented until after a conflict is over.

Even more difficult to account for are the numerous indirect channels through which conflict impacts on education, including forced displacement, losses to household and national economies, and negative impacts on public health. In Section 1, we speculated that the targeted attacks are just the visible ‘tip of the iceberg’, and that the vast majority of the costs of conflict to education are incurred through the less measurable, more indirect channels.

To investigate the costs in terms of numbers of OOSC, we first looked at the ways in which the statistics are derived and at the absolute numbers of OOSC living in conflict-affected countries. UNESCO’s figure of 28.5 million is based on some of the most reliable data available and measured according to precise definitions of ‘OOSC’ and ‘conflict-affected countries’, enabling UNESCO to track the changes of this statistic over time. However, it should be noted that the officially defined age range is generally quite young, and that in some cases children as young as 10 are excluded from the figures. This study also highlighted that conflicts do not generally cover the whole of a country, and that many of the OOSC in conflict-affected countries live in areas that are not exposed to the direct effects of conflict. The UNESCO estimate takes sub-national estimates for four large countries, but if sub-national estimates were used for all the countries the figure would be considerably lower, with only around a third of all OOSC in conflict-affected countries included. However, even when the statistics are narrowed down to the geographies directly affected by conflict, it cannot be assumed that all of these children are out of school as a result of conflict.

Based on the evidence documented in *Education under Attack 2014* (GCPEA, 2014), we estimate that the number of children temporarily or permanently out of school specifically as a result of targeted attacks on education is in the region of several hundred thousand. However, taking collateral damage and the indirect impacts of conflict into account, evidence for the three large case study countries indicates that several million children are out of school worldwide as a result of conflict – perhaps as many as one fifth of all OOSC living in conflict-affected countries. The study shows that targeted attacks do indeed represent the tip of the iceberg. But at the same time, it would be a very large overestimate if one assumed that all children living in conflict-affected countries were out of school as a result of conflict.



Looking at the scale of the impact in terms of financial costs, a similar conclusion emerges: that the costs of targeted attacks represent only a fraction of the losses incurred to education, and as a result of missed education.

In countries where anti-government forces are driven by religious or ideological opposition to aspects of government education systems, as is the case in Nigeria and Pakistan, the impact of targeted attacks is high relative to damage and deaths caused by collateral damage. But in other cases, as exemplified by the DRC case study, targeted attacks make up only a tiny proportion of teacher deaths (and probably school destruction). Most of the direct damage done to the education system in DRC since 1996 was not due to attacks on education, or even collateral damage in the strict sense of the phrase. The chaos that conflict brought, wrecking the economy and any capacity to provide basic services, led to millions of deaths, largely through malnutrition and disease.

The case studies show that the impacts of conflict on education, in terms of access to education and financial costs, are highly context-dependent and the findings cannot be generalised to other conflicts. In the case study contexts, the costs of missed schooling were far greater than the costs of rebuilding damaged infrastructure. In contexts such as the largely urban wars of Gaza and Syria, and the 2003 conflict in Iraq, the extent and cost of damage to educational infrastructure is far higher than in the three case study countries. In these contexts, the costs of lost schooling may also be much higher. But further research to examine the numbers of children out of school due to conflict and the economic costs of missed schooling would be needed to investigate this.

These impacts represent not only costs to the sector but also investment foregone, since efforts to rebuild infrastructure and replace personnel will divert other investment. Since education generally exhibits positive returns on investment, this reduced investment will have an impact of greater magnitude in the long term through reduced national income. Not only that, reduced access to education also represents a foregone investment as children miss out on the opportunity to accumulate human capital. Section 2 set out the scale of this impact on current levels of OOSC; but this is just a snapshot hinting at the long-term impact of conflict on educational access. In Rwanda, a 100-day genocide led to a long-term reduction in average years of schooling of 20%. In conflict-affected parts of DRC and Pakistan, we can imagine that the years of conflict impacting on education might be having a similar effect, particularly when we take into account the impact that conflict also has on the state capacity to deliver education. In Nigeria, Boko Haram's intensive campaign against education means that emerging data may soon show a similar situation in Borno, Yobe and Adamawa states. The case of Syria, although not included in our analysis, has alerted the international community to the potential disaster of a 'lost generation', and the long-term implications of the denial of education on a massive scale. The size of the conflict-affected regions of DRC, Nigeria and Pakistan, along with the intensity of the targeted campaigns against education in Nigeria and Pakistan, mean that the impact there could be just as devastating.

Annex 1: OOSC data tables

Table A1.1: Data sources for OOSC number estimates

Country	Primary school age based on ISCED		'Best estimate' based on ISCED age range: recent UIS data or best alternative		EPDC estimate from DHS/ MICS extrapolated to 2012 OOSC ages 7–14 (millions)	
	Entry age	Duration	OOSC	Source	OOSC	Source
Afghanistan	7	6	1,900,000	based on UIS estimates (2011) of NER and school age population		
Algeria	6	5	71,430	UIS (2011)		
Burundi	7	6	160,000	based on UIS estimates (2011) of NER and school age population	250,000	DHS (2010)
Central African Republic	6	6	214,350	UIS (2011)	340,000	MICS (2006)
Chad	6	6	770,000	UIS (2011) estimate from NER	1,140,000	
Colombia	6	5	435,106	UIS (2011)		
Côte d'Ivoire	6	6	1,160,732	UIS (2009)	1,590,000	MICS (2006)
DRC	6	6	3,500,000	2012 household survey (UNICEF)	3,020,000	MICS (2010)
Ethiopia	7	6*	1,702,685	UIS (2011)	5,800,000	DHS (2011)
India	6	5*	1,673,997	UIS (2010)	38,800,000	DHS (2006)
Indonesia	7	6	262,148	UIS (2011)		
Iran (Islamic Republic of)	6	5	7,800	UIS (2011)		
Iraq	6	6	7,000	UIS (2011) estimate from NER		
Liberia	6	6	385,726	UIS (2011)	390,000	DHS (2007)
Libya	6	6*	11,000	very rough estimate based on MICS (2003) (1.6% OOSC rate)		
Mali	7	6	849,651	UIS (2011)	1,900,000	DHS (2006)



Country	Primary school age based on ISCED		'Best estimate' based on ISCED age range: recent UIS data or best alternative		EPDC estimate from DHS/MICS extrapolated to 2012 OOSC ages 7–14 (millions)	
	Entry age	Duration	OOSC	Source	OOSC	Source
Myanmar	5	5	430,000	NAR MICS (2009)		
Nepal	5	5	333,824	UIS (2012)	590,000	DHS (2011)
Niger	7	6	957,170	UIS (2012)	2,280,000	DHS (2006)
Nigeria	6	6	10,542,105	UIS (2010)	9,200,000	DHS (2008)
Occupied Palestinian Territory	6	4*	45,812	UIS (2011)		
Pakistan	5	5	5,435,834	UIS (2011)	9,100,000	DHS (2006)
Philippines	6	6	1,460,431	UIS (2009)	1,270,000	
Russian Federation	7	4	220,707	UIS (2009)		
Somalia	6	6*	1,500,000	EPDC calculation from MICS (2006)	1,480,000	MICS (2006)
South Sudan			n/a		1,200,000	IPUMS (2008)
Sri Lanka	5	5	125,347	UIS (2011)		
Sudan (pre-secession)	6	6*	2,600,000	IPUMS (2008)	2,300,000	IPUMS (2008)
Syrian Arab Republic	6	4*	8,229	UIS (2011)		
Thailand	6	6	611,222	UIS (2009)		
Turkey	6	5	68,456	UIS (2010)		
Uganda	6	7	439,143	UIS (2011)	720,000	DHS (2011)
Yemen	6	6*	948,934	UIS (2011)		

* In these countries the duration of primary school according to ISCED is shorter than the length of cycle referred to as 'primary' or 'basic' education at the national level.

Table A1.2: Estimates of proportion of OOSC living in areas directly affected by conflict

Country	Estimate of proportion of OOSC living in areas directly affected by conflict	Source
Afghanistan	15%	EPDC (2010a)
Chad	19%	
Colombia	40%	
DRC	41%	
Iraq	100%	
Myanmar	24%	
Pakistan	25%	
Philippines	34%	
Somalia	100%	
Sudan (pre-secession)	34%	
Uganda	67%	
Côte d'Ivoire	12%	Based on MICS 2006 data for Nord region, but does not take into account 2011 conflict
Ethiopia	8%	DHS 2011 taking proportion of OOSC for Somali and Tigray
India	26%	DHS 2006 taking states affected by the conflict with Maoist insurgents (Bihar, Jharkhand, Chattisgarh), western states (Assam, Nagaland and Manipur) and Jammu and Kashmir
Niger	2%	Based on OOSC population in Agadiz, MICS 2006
Nigeria	25%	DHS 2008, north east region only
Thailand	5%	% of population in affected provinces (4 out of 76 provinces)
Yemen	25%	% of population in former North Yemen (NB: conflict has since spread to former South Yemen but OOSC data predates this)



Annex 2: Summary of targeted attacks on education, as reported in *Education under Attack 2014*

Table A2.1: Targeted attacks on education in DRC, 2009–2012

Dates	Schools damaged/ destroyed	Impact on students/ teachers	Notes
2009	41 attacks on schools (EUA documents some attacks in 2008 – estimate reduced based on assumption equal number of attacks in each month)		
2009– 2012		Students recruited to armed forces; schools closed due to this threat	
June 2009		1 girl raped	Congolese army colonel, South Kivu (allegedly)
2010	At least 14 schools attacked		
2011	27 attacks on schools (EUA documents attacks on schools and health centres – half are assumed to be schools)		
January 2011	“Several” buildings looted or burned	3 university students killed	Clashes with police at University of Kinshasa
October 2011		7 education workers killed	“Ethnically-driven attack” by Mai Mai Yakutumba fighters, South Kivu
2012	At least 561 incidents of looting and damage to schools (548 primary and 13 secondary)		Mostly due to fighting between FARDC and M23
	64 schools occupied		Due to fighting between Mai-Mai and FARDC, Katanga

2012	42 schools occupied by armed groups; desks and chairs used for firewood	1,100 children prevented from attending school	Congolese Army, North Kivu, South Kivu
January 2012	2 schools attacked		“Alleged LRA elements”, Haut-Uélé district
April 2012		“At least” 32 boys recruited to armed forces	M23, Mapendano secondary school
April–May 2012		“At least” 48 boys recruited to armed forces	M23, Masisi, North Kivu
November 2012		4 primary school students killed, and 9 others injured	Shots fired by security forces in Kantine during a student march
Estimated total impact	Over 724 schools damaged	7 education personnel killed; 7 students killed, 9 injured, 1 raped and over 80 forcibly recruited to armed forces	



Table A2.2: Targeted attacks on education in Nigeria, 2009–2012

Dates	Schools damaged/ destroyed	Impact on students/ teachers	Notes
July 2009	1 or 57 destroyed (depending on reports)	Temporary closure, not all schools rehabilitated a year later	Maiduguri, Borno state (Boko Haram)
2010–2012		6 university personnel kidnapped, one killed	Various universities, mainly in the south
September 2010		Kidnappings of 15 young students	Abia state (extortion)
October 2010		Kidnapping of a headteacher	Eket, south-east (extortion)
October 2010		Muslim cleric and his student killed	(Boko Haram)
December 2011	1 school damaged	At least 7 students injured	Reprisals against Muslims
April 2011		4 students and 1 lecturer killed	Nuhu Bamalli Polytechnic, Kaduna state (mob supporting former military leader Mohammadu Buhari, who backed the imposition of sharia law)
July 2011	1 school damaged		Rocket fired at Muslim school
July 2011		2 lecturers killed	Maiduguri University, Borno state (Boko Haram)
January – March 2012	12 schools destroyed	“At least” 5000 students denied access	Maiduguri, Borno state (Boko Haram)
January- October 2012		7 university staff members kidnapped, 1 died in custody	Federal College of Education, Rivers state
April 2012	1 university building damaged	20 students killed	Bayero University, Kano state; Gombe University, Gombe state (Boko Haram)

May 2012	2 schools damaged		Kano state (Boko Haram)
May – November 2012	“At least a dozen” schools damaged		Borno state (Boko Haram)
October 2012		25 people killed, mostly students	Mubi, Adamawa state (Boko Haram)
October 2012		1 headteacher killed	Potiskum, Yobe State (perpetrators and motives unknown)
Estimated total impact	13 or 69 schools destroyed; at least 16 schools damaged and 1 university building damaged	12 university staff kidnapped, 5 killed; 1 Muslim cleric killed; 2 headteachers killed; 50 students killed, at least 7 injured and 15 kidnapped; at least 5,000 students denied access to education	



Table A2.3: Targeted attacks on education in Pakistan, 2009–2012

Dates	Schools damaged/destroyed	Impact on students/teachers	Notes
2009–2012	“... at least 838 and could be as high as 919”; “505 schools damaged or destroyed in 2009 alone”	“proponents of female education... killed” At least 30 children killed in attacks on schools and school transport and more than 97 were injured. At least 138 school students and staff kidnapped	Areas affected by Taliban militancy
2009–2012		20 pre-tertiary teachers killed and at least 8 were injured. A further 4 education personnel, comprising 1 provincial education minister, 2 school bus drivers and a security guard, were killed and 2 more were injured	Areas affected by Taliban militancy
2008–2010		At least 22 teachers and other education personnel killed	Balochistan
2009–2012	“At least” 40 cases of schools being used by the military, six incidences of militants based in schools, and one case of the police being billeted right next to a school	Use of schools as military bases in Swat prevented the education of around 10,000 students	Nationwide
January 2009		Taliban “bans” girls’ education, forcing 900 schools to close or stop female enrolment. 120,000 girls and 800 female teachers stopped attending school in Swat	Areas affected by Taliban militancy; fear preventing the return of students and teachers even after Pakistan military regained control

October 2009		5 university students killed	Taliban suicide bomb attack on International Islamic University in Islamabad
November 2009		2 university staff killed	Balochistan Liberation Army attack on University of Balochistan
2010		6 university professors murdered	Taliban
October 2010		1 teacher killed	Assassination at Jamia Binoria Alamia University
December 2010		5 university students injured	Bomb attack on Karachi University targeting the Imamia Students Organisation
June 2011		7 university students injured	Islami Jamiat Talba student organisation at Punjab University attack on fellow students
November 2011		6 seminary students killed	
Estimated total impact	At least 878–959, excluding threats of damage	At least 61 education personnel killed and 10 injured; at least 53 students killed and 97 injured; at least 138 education personnel and students kidnapped; at least 130,000 students prevented from attending school	



Annex 3: Unit cost estimation

Table A3.1: Unit cost estimates

	DRC	Nigeria	Pakistan	Notes
Cost of school construction	\$50,000 (based on MoE, 2012)	\$168,000 (based on DfID, 2014)	\$35,000 (based on DfID, 2014 and INGO reports)	For Nigeria and Pakistan, school costs are based on classroom construction estimates, assuming one classroom for each primary grade plus two other buildings of same cost
Cost of repairing damaged school	\$25,000	\$84,000	\$17,500	We assume half the cost of construction
Cost of replacing damaged and looted equipment	\$5,000	\$5,000	\$5,000	Assumption
Cost of teacher training (per graduate)	\$300 (based on DFID, 2014; de Herdt and Poncelet, 2010)	\$1,000 (based on World Bank, 2008)	\$1,620 (based on UNESCO, 2006)	
Cost of daily teacher wages whilst schools closed	\$4.2 (based on MoE, 2012)	\$10 (based on DFID, 2014)	\$19.50 (based on DFID, 2014)	Assuming 200 teaching days per year

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