



The impact of terrorism on education: Evidence from the death of Osama bin Laden in Pakistan

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ABSTRACT

This paper investigates the impact of terrorism on educational outcomes following the death of Osama bin Laden in Pakistan. The unexpected death of bin Laden, al-Qaeda's founder and symbolic leader, triggered a significant escalation in retaliatory terrorist attacks. Terrorist groups perceived Pakistan as complicit in the U.S. operation, leading to increased attacks on government, military, and civilian targets, with assaults on educational institutions rising by 50 percent. This surge led to a significant decline in educational attainment, reducing average years of schooling by 0.52 years and lowering primary school completion rates by 5.9 percentage points, with a more pronounced impact on girls. Furthermore, academic performance declined, with math, English, and reading scores falling by approximately 0.1 standard deviations. These findings highlight that the elimination of a terrorist leader can incite retaliatory violence, significantly undermining the educational prospects of children, particularly girls.

1. Introduction

Terrorism has direct economic and human impacts (Collier, 1999; Brodeur, 2018), with terrorists aiming to maximize their influence (Krueger and Malecková, 2002; Brandt and Sandler, 2010; Santifort et al., 2013). To send a powerful message and disrupt societal progress, terrorists often target schools, which serve as symbols of a society's future and development. Attacking these educational institutions generates widespread fear, panic, and media attention. Furthermore, al-Qaeda and various jihadist groups view contemporary educational systems as promoting secularism, liberal values, and Western influence, which they believe are in direct conflict with their interpretation of Islamic teachings, particularly concerning the education of girls. By hindering education, terrorists aim to prevent the emergence of educated individuals who might resist extremist ideologies (Krueger and Malecková, 2002; Alfano and Görlach, 2024; Bertoni et al., 2019). Nobel Peace Prize recipient Malala Yousafzai became a victim of terrorism while riding on a school bus. However, the relationship between terrorism and education remains underexplored. Our study investigates the impact of terrorist attacks that occurred in response to the

unexpected death of Osama bin Laden on the education of children.

Do operations to combat terrorism inadvertently ignite further acts of terrorism, resulting in unintended civilian consequences, particularly on the educational outcomes of children? The death of Osama bin Laden in 2011 dealt a significant blow to al-Qaeda and its affiliated jihadist groups, yet it also triggered a wave of retaliatory attacks against government, military, and civilian targets perceived to be complicit in his killing. Furthermore, his death disrupted the hierarchical structure of al-Qaeda, leading to the decentralization of extremist factions and an escalation of terrorist activities. These anti-terrorism operations and the subsequent rise in terrorist attacks had profound implications for civilian populations. Specifically, militants targeted educational institutions, driven by their opposition to what they perceive as Western-style education, particularly for girls.

To investigate the relationship between counter-terrorism operations and subsequent terrorist activities, we utilize data from the [Global Terrorism Database \(GTD\)](#).¹ To estimate the impact of terrorism on children's educational outcomes, we draw on data from the [Pakistan Social & Living Standard Measurement Survey \(PSLM\)](#)² published by the [Pakistan Board of Statistics \(PBS\)](#). To measure the academic

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¹ The Global Terrorism Database™ (GTD) is an open-source database that includes information on terrorist events around the world from 1970 through 2020.

² The PSLM Survey has been a regular activity of the PBS since July 1, 2015. Before that, it was a PSDP funded project launched in July 2004 and continued through June 30, 2015. It was designed to provide social and economic indicators at the provincial and district levels in alternate years. In total, it covers the years from 2006 to 2020.

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0927-5371/© 2025 Elsevier B.V. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

performance of children, we employ data from the [Annual Status of Education Report \(ASER\)](#)³. This dataset allows for a comprehensive evaluation of educational outcomes, including math scores, English scores, and reading scores, and serves as a supplementary source that corroborates findings from the PSLM dataset.

We first identified >15,000 terrorism events that occurred from 1970 to 2020 and aggregated this data across 573 sub-districts (tehsils)⁴ on a monthly basis. We calculated the monthly number of attacks by target type and normalized these figures per hundred thousand population. We found that the death of Osama bin Laden led to a doubling of total terrorist attacks and an approximate 50 percent increase in attacks targeting educational institutions. Using the unexpected death of Osama bin Laden as an instrument to estimate terrorist attacks, we examined their effect on the educational outcomes of school-aged children. Our findings show that this surge in terrorist attacks against educational institutions led to a reduction in educational attainment, with years of education decreasing by 0.52 years and primary school completion dropping by 5.9 percentage points. Furthermore, we explored the differential impact of terrorism based on individual characteristics and found that the negative effects were more pronounced for girls. In terms of academic performance, the terrorist attacks decreased math, English, and reading scores by approximately a tenth of a standard deviation.

Our paper contributes to several strands of the existing literature. It extends the body of research that measures various causes and consequences of terrorism, including its economic outcomes, educational impacts, and effects on political stability. For instance, such research has identified a significant impact of GDP per capita ([Jetter et al., 2024](#)), poverty ([Berman et al., 2009](#)), inequality ([Salvatore, 2007](#)), unemployment ([Abadie, 2006](#)), inflation ([Caruso and Schneider, 2011](#)), political instability ([Bandyopadhyay et al., 2011](#)), literacy ([Krueger, 2008](#)) and unintended terror financing ([Limodio, 2022](#)) on terrorism. In contrast, a couple of papers have reported no significant effect of GDP per capita ([Abadie, 2006; Krueger and Laitin, 2008](#)), poverty ([Krueger and Maleckova, 2002; Abadie, 2006](#)), inequality ([Abadie, 2006; Kurridl-Klitgaard et al., 2006](#)), unemployment ([Thompson, 1989; Krueger and Maleckova, 2002](#)), inflation ([Kurridl-Klitgaard et al., 2006; Krueger and Laitin, 2008](#)), political instability ([Wade and Reiter, 2007](#)) or literacy ([Krueger and Maleckova, 2002; Krueger and Laitin, 2008](#)) on terrorism. The findings are mixed across different contexts.

Our paper aligns closely with the literature estimating the effect of terrorism on education. Specifically, [Alfano and Görlich \(2024\)](#) examined the impact of a local terrorist group's revenues and its affiliation with al-Qaeda in Kenya, and found that terrorist attacks suppress school enrollment due to families' fears and concerns rather than due to educational supply. Moreover, numerous studies have documented the negative effects of terror and conflict on educational outcomes ([Koppensteiner and Menezes, 2021; Bertoni et al., 2019; Di Maio and Nistico, 2019; Brück and d'Errico, 2019; Brown and Velaquez, 2017](#)). We extend these findings by investigating the unexpected death of Osama bin Laden in Pakistan as an instrumental variable and leveraging extensive individual-level survey data that include years of education, enrollment, dropout rates, child labor rates, child marriage rates, and academic performance. The unique context of Pakistan and our empirical methods, which utilize the unanticipated nature of bin Laden's death at the hands of a U.S. Navy SEAL team, allow us to provide causal evidence as to the relationship between operations targeting terrorist leaders, subsequent retaliatory attacks, and their impact on education.

The remainder of the manuscript is organized as follows: [Section 2](#) provides the contextual background of the study, including a literature

review that explores the intersections of terrorism; [Section 3](#) describes the dataset; [Section 4](#) outlines the empirical strategy; [Section 5](#) presents the findings, [Section 6](#) explores the mechanisms through which terrorism affects educational outcomes; and [Section 7](#) concludes with a discussion of policy implications.

2. Background

2.1. Historical background

The Soviet-Afghan war in 1979 catalyzed a transformative period in the region that ultimately caused a significant loss of economic and human resources ([Nizami et al., 2018](#)). This conflict engendered fundamental shifts in Pakistani society, including heightened violence and widespread proliferation of weapons, or what came to be known as 'Kalashnikov culture' and 'Talibanization' ([Wadhwani, 2011](#)). These developments sparked terror, particularly in the province of Khyber Pakhtunkhwa (KP) and the Federally Administered Tribal Areas of Pakistan (FATA). In 2006, the signing of the Waziristan Accord, a peace deal between the government of Pakistan and the Taliban, offered a brief respite from the conflict, but this ended in July 2007 with the Pakistan military's siege of the Red Mosque, a significant inflection point in the region's dynamics.

The Red Mosque Siege: The Pakistan-Afghan border, particularly Waziristan,⁵ became a stronghold of al-Qaeda and its affiliates after 9/11. Osama bin Laden and his deputy Ayman al-Zawahiri⁶ lived in the region from 2003 to 2004. During those years, Pakistan's Army launched its first military operation in Waziristan, the Battle of Wana,⁷ joining the Global War on Terror. Al-Qaeda, in response, devised a plan for Pakistan to be implemented by Saeed al-Masri,⁸ who had historical ties with Bin Laden and had supported him since the Soviet-Afghan war. In collaboration with scholars from the Red Mosque⁹ founded by General Zia ul Haq,¹⁰ al-Masri announced the implementation of Sharia law¹¹ on April 6, 2007. This incident represented a direct challenge to the government's authority and prompted a series of violent

⁵ Waziristan is known as "the wild west" of Pakistan due to its rugged terrain, porous borders, tribal autonomy, and resistance to outside authority. A part of Khyber Pakhtunkhwa province, it has been a focal point for insurgent and militant activities and has served as a safe haven for armed groups including the Taliban, al-Qaeda, and the Haqqani Network.

⁶ An Egyptian-born militant who served as the second general of al-Qaeda from June 2011 until his death in July 2022.

⁷ A March 2004 military engagement targeting members of Osama bin Laden's al-Qaeda near the South Waziristan town.

⁸ Mustafa Ahmed Muhammad Uthman Abu al-Yazid, alias Saeed al-Masri, purportedly served as the financial chief for al-Qaeda. His alleged involvement in the assassination of Egyptian President Anwar Al-Sadat led to his imprisonment.

⁹ Established in 1965, the Red Mosque occupied a strategic position in Islamabad, just 1.5 km from Central Intelligence Agency and Inter-Services Intelligence Agency (ISI) sites. The surrounding area offered clear sightlines of Parliament and the Ministry of External Affairs, and the mosque became a hub of religious and political activities, attracting government officials. During the Afghan-Soviet conflict, it emerged as a waypoint for young people drawn to fight under the banner of Islam in Afghanistan, and global jihadist networks forged connections there. This solidified the mosque's stature, and it hosted influential figures, including Osama bin Laden and Ayman al-Zawahiri. Their presence underscored the mosque's significance as a nexus for Islamist activism.

¹⁰ A Pakistani military officer who orchestrated a 1977 coup amidst escalating social unrest and political discord between the ruling leftist Pakistan Peoples Party (PPP) led by Bhutto and the right-wing Islamist opposition the Pakistan National Alliance, who accused Bhutto of rigging the 1977 general elections.

¹¹ The sermon or fatwa announced that Pakistani soldiers who lost their lives fighting the Taliban and al-Qaeda should not be buried in Muslim cemeteries, and that they neither deserved funeral prayers nor could be called martyrs. The fatwa was spread across Pakistan and was signed by 500 other scholars.

³ ASER is the largest citizen-led, household-based initiative designed to provide reliable estimates of the schooling status of children aged 3 to 16 years residing in both rural and select urban districts of Pakistan. It covers the years 2012 to 2021.

⁴ In Pakistan, a tehsil is an administrative sub-division of a District.

developments, including the takeover of a children's library and attacks on music and movie shops by religious students. On June 24, 2007, a group of students from the Red Mosque, armed with sticks, forcibly abducted staff members of a Chinese massage center. China took a 'zero tolerance' position, advocating for severe punishment of the implicated terrorists. In parallel, General Musharraf¹² declared a state of emergency and besieged the Red Mosque in a raid known as Operation Silence. The climax of the standoff left >100 militants and 11 armed forces personnel dead (Hussain, 2017) and set off a bloody month that saw a barrage of suicide bombings that provided further inspiration for the militants (Aslam, 2010). Following the siege, there was a sharp escalation in terrorist attacks by the Taliban in Pakistan (Kanniainen and Poutvaara, 2018; Jaeger and Siddique, 2018). In the following year, >88 bombings killed 1188 people and wounded 3209 (Aslam, 2010). The government of Khyber Pakhtunkhwa retaliated for the mosque siege, sparking thousands of public protests, which provided an opportunity for al-Qaeda to exploit public sentiment. Numerous attacks followed, which particularly targeted educational institutions. Consequently, the Tehrik-i-Taliban Pakistan (TTP) seized control of the province and FATA.

The Death of Osama bin Laden: After the success of al-Qaeda's plan led by al-Masri, the group made a spectacular resurrection in Pakistan, particularly in Khyber Pakhtunkhwa. Al-Qaeda offered a safe haven to Bin Laden in the country, and it has been reported that he began living in Khyber Pakhtunkhwa following the siege of the Red Mosque (Soherwordi and Khattak, 2011). Meanwhile, the war on terror was approaching its peak. On May 2, 2011, the United States carried out Operation Geronimo, in which a Navy SEAL team assassinated Osama Bin Laden in Abbottabad,¹³ bringing a 15-year manhunt to an end (Soherwordi and Khattak, 2011). His death had a number of implications for relations between Pakistan and the United States, the decentralization of terrorist groups, and the dynamics of terrorism in the region. There was an outpouring of public support for the slain al-Qaeda leader and his successor Ayman al-Zawahiri (Gaibulloev and Sandler, 2019). Funeral prayers for Bin Laden were offered in most areas of Khyber Pakhtunkhwa and FATA, and a huge number of protests against his killing took place (Soherwordi and Khattak, 2011). Extremism and intolerance began to proliferate quickly in the region. It has been suggested that should this trajectory persist, Pakistan's demographic divide will function like a gunpowder magazine. Only a spark and it will explode; resulting in burnt fingers all over Pakistan (Soherwordi and Khattak, 2011). The country's weak economy, like that of Afghanistan in the 1990s, has provided opportunities for terrorists and extremists to operate, threatening Pakistan's security in general, but particularly soft targets such as educational facilities. Although the death of Bin Laden was expected to weaken al-Qaeda's global presence, it did not alleviate Pakistan's internal security concerns, nor did it signify the completion of the mission in Afghanistan. In fact, a significant increase in extremism has been observed since his death, as evidenced by the surge in terrorist attacks. Khyber Pakhtunkhwa has become a battleground between the United States and al-Qaeda. U.S. drone strikes targeting al-Qaeda hideouts have resulted in casualties of Pakistani civilians. Al-Qaeda has struck back, targeting and attacking citizens, military personnel, and paramilitary forces. For instance, the tragic 2014 attack on the Army Public School (APS) in Peshawar, Khyber Pakhtunkhwa, perpetrated by the TTP, resulted in over 140 deaths, predominantly of children.

2.2. Terrorism

Terrorism has its roots in a nexus of political instability, economic disparity, societal division, and intricate international dynamics. It reflects societal weaknesses. Governmental repression, ethnic tensions, economic woes and minority grievances form a perfect storm, ready to destroy at the slightest provocation (Frey et al., 2007; Freytag et al., 2011; Krieger and Meierrieks, 2011). The term terrorism remains contentious due to the political and ideological perspective-taking it entails, exemplified by the adage "*One man's terrorist is another man's freedom fighter*" (Sick, 1990; Ayres, 2000; Europol, 2007, 2010, 2013; Bruckberger, 2018).

A growing literature has begun to examine the socioeconomic determinants of terrorism, identifying a significant impact of GDP per capita (Fearon and Laitin, 2003; Collier and Hoeffer, 2004; Bloom, 2005; Freytag et al., 2011; Ali and Li, 2016; Jetter et al., 2024), poverty (Gurr, 1970; Friedman, 2002; Moghaddam, 2005; Berman et al., 2009), inequality (Turk, 1982; Midlarsky, 1988; Salvatore, 2007), unemployment (Abadie, 2006; Harrison, 2006; Kalyvas, 2006; Berman et al., 2009), inflation (Coomer, 2003; Caruso and Schneider, 2011), political instability (Kis-Katos et al., 2011; Bandyopadhyay et al., 2011), literacy (De Mesquita, 2005; Krueger, 2008) and unintended terror financing (Limodio, 2022) on terrorism. Conversely, several studies have found no significant effect of GDP per capita (Abadie, 2006; Krueger and Laitin, 2008; Sambanis, 2008), poverty (Krueger and Malecková, 2002; Abadie, 2006; Piazza, 2011), inequality (Abadie, 2006; Kurrild-Klitgaard et al., 2006), unemployment (Thompson, 1989; Krueger and Malecková, 2002), inflation (Kurrild-Klitgaard et al., 2006; Krueger and Laitin, 2008), political instability (Wade and Reiter, 2007) or literacy (Krueger and Malecková, 2002; Krueger and Laitin, 2008) on terrorism. The debate persists, with different studies yielding different results across different contexts. Ismail and Amjad (2014) have investigated the determinants of terrorism, finding that in the short term, inflation, repression, GDP per capita, and poverty significantly influence terrorism rates, while inequality, literacy, and unemployment do not show any significant effects. The study suggests that in the long term, literacy, GDP per capita, poverty, and inflation become significant determinants of terrorism, while repression, inequality, and unemployment have little impact.

Stringent governmental measures imposed on terrorist groups sometimes result in backlashes (Rosendorff and Sandler, 2004; Siqueira and Sandler, 2007; Arce and Sandler, 2010; Rosendorff and Sandler, 2010; Dugan and Chenoweth, 2012; Gaibulloev and Sandler, 2019), a heretofore empirically unexplored subject. Terrorists seek to induce governments to overreact to their brutal attacks, with the aim of recruiting more terrorist sympathizers (Houfman, 2006; Enders and Sandler, 2011), an outcome that did indeed occur after the siege of the Red Mosque and the death of Bin Laden. Drone strikes were carried out in Khyber Pakhtunkhwa following 9/11 (Fair, 2010). Rosendorff and Sandler (2004) and Bloom (2005) argue that drones are locally unpopular and cause backlashes that facilitate terrorist recruitment, especially in the context of Pakistan. Additionally, Jaeger and Siddique (2018) find evidence of a vengeance or backlash effect during the initial week following a successful drone strike against Taliban or al-Qaeda assets. Other scholars, as noted by Johnston and Sarbahi (2016), have utilized geocoded data to examine the relationship between drone strikes and terrorist activities within Pakistan, finding a different result. Employing a spatial panel methodology at the district-week level of analysis, they observed a reduction in terrorist attacks and resulting casualties immediately following a drone strike. However, they found that the elimination of militant leaders did not result in a statistically significant decrease in terrorist attacks or their associated consequences. An intriguing additional finding was the absence of an apparent transference externality; that is, the short-term decrease in terrorism did not lead to an increase in terrorism in neighboring regions. The killings of militant leaders may provoke further violence through a backlash

¹² Pervez Musharraf served as President of Pakistan from 2001 to 2008 after rising to prominence as the primary orchestrator of a 1999 military coup.

¹³ The operation approved by President Barack Obama was launched from about 120 miles (190 km) away in Afghanistan, and the United States did not inform the government of Pakistan in advance (Soherwordi and Khattak, 2011).

([Gaibulloev and Sandler, 2019](#)). [Benmelech et al. \(2015\)](#) demonstrate that precautionary demolitions of terrorists' houses resulted in a backlash in the form of an increase in suicide attacks. This message resonates with findings from [Fearon and Laitin \(2003\)](#), who suggest that countermeasures must be discriminating to be effective ([Rosendorff and Sandler, 2004](#); [Zussman and Zussman, 2006](#); [Jacobson and Kaplan, 2007](#)).

[Fisher and Becker \(2021\)](#) suggested that the death of Osama bin Laden had varying effects on global terrorism patterns, with some countries experiencing no change in terrorism levels after his death. Certain proactive policies, such as the targeted killing of militant leaders in order to disrupt terrorist plots or the infiltration of extremist groups, may be effective in practice ([Gaibulloev and Sandler, 2019](#)) despite the scarcity of corroborating evidence in the literature. However, on a broad scale such repression has either had no effect or has led to increased terrorism, consistent with the notion of backlash ([Dugan and Cheno-weth, 2012](#)). Evaluating the effectiveness of these strategies is difficult due to the lack of a comprehensive global dataset documenting such interventions ([Gaibulloev and Sandler, 2019](#)). Consequently, our understanding of these efforts has been gleaned from episodic information rather than rigorous empirical investigation, constraining the ability to precisely assess the overall impact ([Gaibulloev and Sandler, 2019](#)). In this study, we leverage data from the Global Terrorism Database and implement a rigorous quasi-experimental design to offer evidence as to the effect of such incidents on terrorism. The siege of the Red Mosque and the death of Bin Laden serve as a clear treatment in a specific region, prompting us to designate Khyber Pakhtunkhwa as the treatment group.

2.3. Terrorism and education

Terrorism engenders uncertainty and disrupts both physical and human capital ([Abadie and Gardeazabal, 2019](#)), including education. The mechanisms include damage to school infrastructure ([Akbulut-Yuksel, 2014](#)), injury to, killing of or recruitment of teachers by terrorists ([Javeid et al., 2023](#)), displacement or migration from conflict-prone areas ([Javeid et al., 2023](#)), disruption of travel to school ([Shemyakina, 2011](#)) and the intimidation of civilians, including increasing fear via kidnappings ([Khan and Seltzer, 2016](#)). Terrorism has been found to have negative effects on educational attainment ([Khan and Seltzer, 2016](#); [Alfano and Görlach, 2024](#); [Javeid et al., 2023](#); [Shany, 2023](#)). The July 2005 London terrorist attacks exerted a detrimental influence on the educational aspirations of Muslim adolescents, resulting in a diminished likelihood of intending to pursue non-compulsory full-time education among this demographic group ([Astorga-Rojas, 2023](#)). In Israel, fatal terror attacks before exams adversely affect students' academic performance, but the effect is temporary and does not impact the quality of the diploma earned ([Shany, 2023](#)).

However, in highly affected countries such as Kenya, terrorism alters the demand for education by changing its perceived risks and returns, with media access reinforcing the negative effects of terrorism on schooling ([Alfano and Görlach, 2024](#)). In addition, [Alfano and Görlach \(2024\)](#), exploiting exogenous variation in a local terrorist group's revenues and its alignment with al-Qaeda, discern a suppression in school enrollment beyond anticipated levels and identify fears and concerns as the mechanisms underlying the observed impact, thus deviating from conventional explanations centered on the dynamics of educational supply. Pakistan is another heavily affected region, and the extant research underscores the impact of terrorism within its borders. [Ali et al. \(2016\)](#) collected data from 200 children in District Swat, Khyber Pakhtunkhwa, using a stratified random sampling technique implemented via an interview schedule, and found that militancy and terrorism have multiple diverse impacts on students' academic achievements and learning performance, including schooling years, marks attainment, enrollment, and behavior. [Syed et al. \(2017\)](#), using data from 200 students aged 14–16 years in a school in Peshawar, found that the terrorist attack on December 16, 2014 had a severe effect on students' mental

health and academic performance. In a qualitative data analysis of seven in-depth semi-structured interviews from each of Swat's seven tehsils, [Khattak \(2018\)](#) found that women's education in Swat Valley was greatly affected during periods of terrorism, which primarily targeted women's educational institutions. [Rafique and Yasmin \(2020\)](#) collected data from 48 students and 29 teachers at Government College University, Faisalabad, and through focused group discussions found an effect of terrorism on the emotional and psychological well-being of the university students. [Nawab et al. \(2021\)](#) investigate the factors that cause militancy and its effects on education in Mohmand Agency, a district of FATA. Through interviews with 250 respondents from selected villages, they found that unemployment, poverty, drone attacks, and border issues were key factors contributing to militancy, which significantly disrupted primary and secondary education. [Ullah \(2022\)](#) utilizes the "garrison state" theory and the concept of "fragmented hegemony" to analyze the control of violence and the maintenance of state hegemony. The most relevant study by [Javeid et al. \(2023\)](#) uses data from the GTD and PSLM from 2006 to 2015 to investigate the effect of terrorist incidents on parents' decisions whether to continue their children's education. Using lagged terrorist attacks as an instrument, they find that an increase in terrorist incidents reduces the number of children who continue their education at the primary school level. Despite these studies, there is still a paucity of research concerning the impact of terrorism on education within the Pakistani context. Specifically, studies employing rigorous econometric methodologies to assess the ramifications of terrorism with regard to educational outcomes have been scant. Consequently, the extent to which terrorism has affected education in Pakistan remains unclear.

3. Data

Terrorist Attacks: We collected data on terrorist attacks from the Global Terrorism Database curated by the National Consortium for the Study of Terrorism and Responses to Terrorism (START) as of 2020. It provides systematic data on terrorist incidents, including over 15,000 events in Pakistan. Leveraging this extensive dataset, we constructed two balanced panels for analysis. First, a sub-district (tehsil)-level panel was developed, encompassing 573 tehsils and 612 month-year periods from 1970 to 2020. Secondly, a district-level panel was created, comprising 170 districts tracked over the same time range.

In Fig. 1, we show the distribution of terrorist incidents across Pakistan over distinct chronological periods. The timeline is divided into three significant intervals: the period preceding the Red Mosque Siege, from September 19, 2003, to July 11, 2007; the period between the Red Mosque Siege and the death of Osama bin Laden, from July 12, 2007 to May 1, 2011; and the post-bin Laden era from May 2, 2011 to February 21, 2015. These intervals allow for a comprehensive comparative analysis of the temporal patterns of terrorist incidents, providing insight into the evolution of terrorism dynamics in Pakistan over the course of these key historical events. Specifically, terrorism began increasing in response to the Red Mosque siege and saw a significant rise in both frequency and intensity following the death of Osama bin Laden.

Administrative Units: Pakistan's administrative structure comprises three primary levels: 4 provinces, 170 districts, and 573 tehsils. In our endeavor to tally the occurrences of attacks and to facilitate mapping preparations, we utilized administrative boundary data from the OCHA Field Information Services Section (FISS).

To examine the impact of pivotal events such as the Red Mosque siege and Bin Laden's death on terror-related outcomes, we merged tehsil-month-level data with tehsil-level population data after rectifying and aligning the names of each tehsil. This allowed us to compute the average number of attacks experienced by each tehsil per month and per person across the dataset. Since individual-level data, such as the Pakistan Social and Living Standards Measurement and the Annual Statistics of Education Report, are captured at the district level, we also undertook the task of harmonizing the names of each district across the

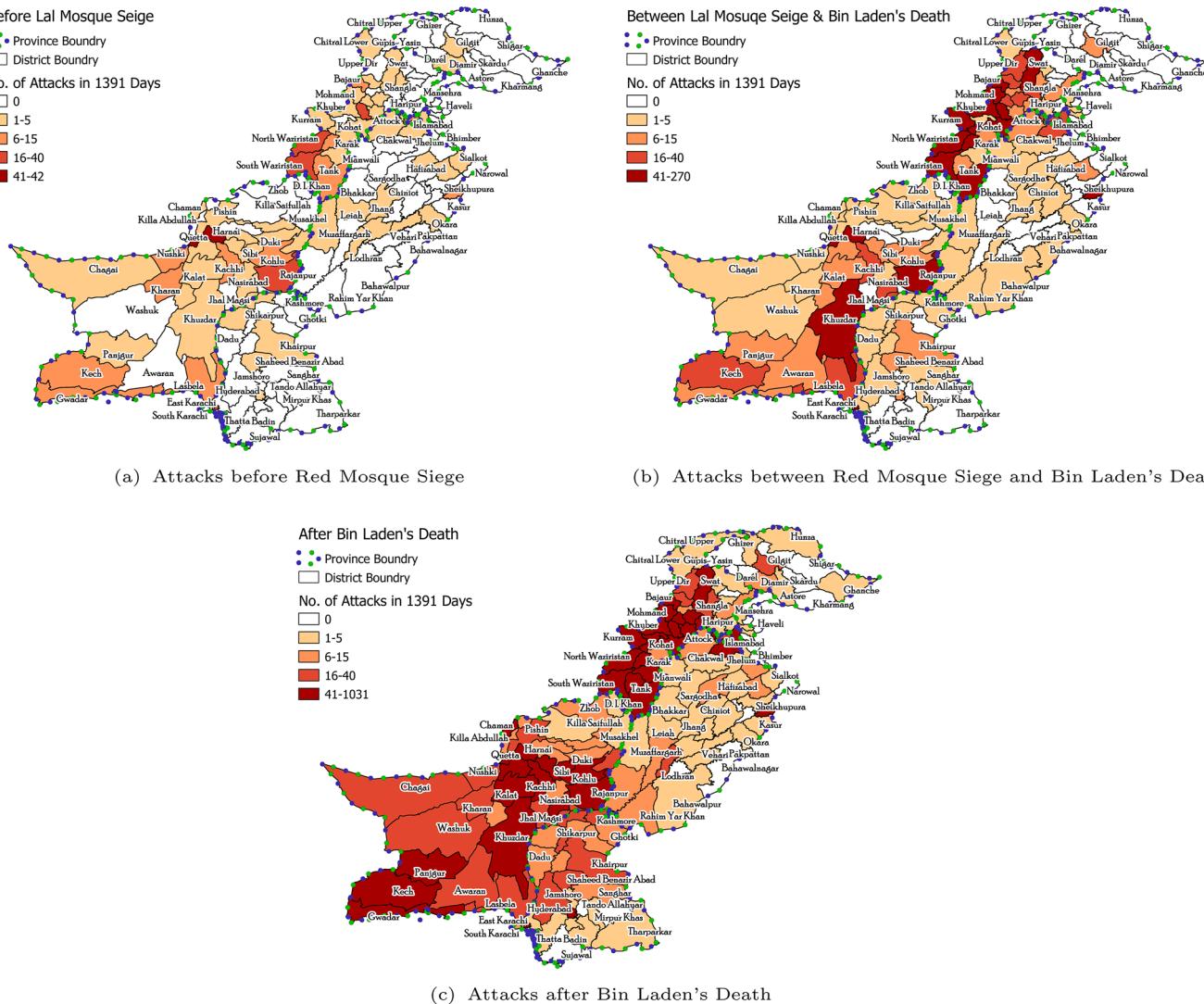


Fig. 1. Terrorism in Pakistan.

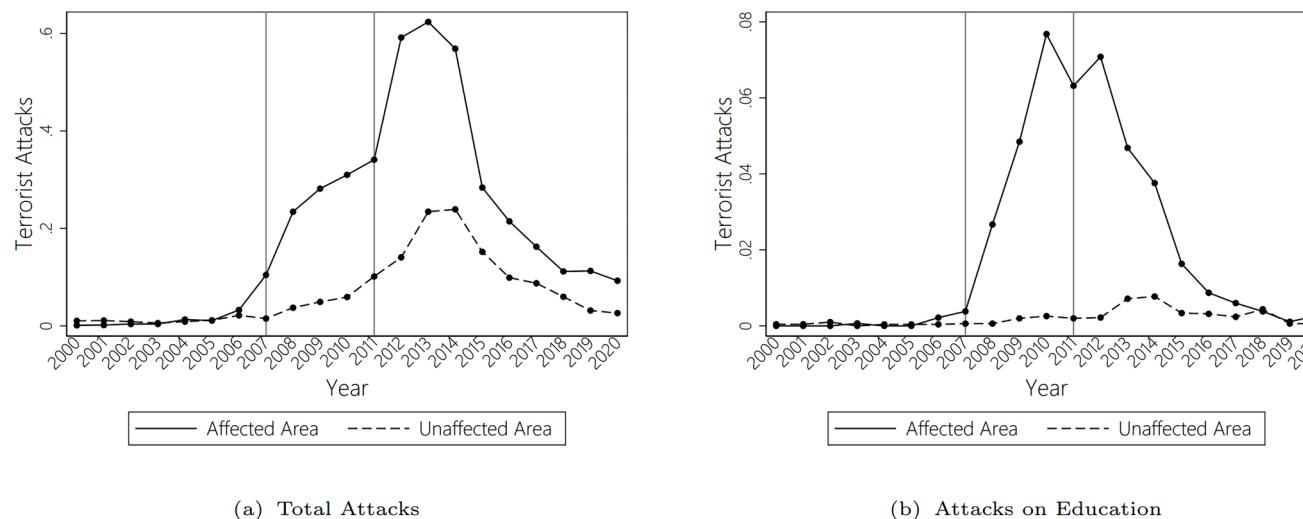
Notes: The presented figures delineate the distribution of terrorist incidents across Pakistan, presented into distinct chronological periods. The prior to the Red Mosque Siege spans from September 19, 2003, to July 11, 2007. Following this, between the Red Mosque Siege and the death of Osama bin Laden consist of the period from July 12, 2007, to May 1, 2011. Lastly, the post-bin Laden era extends from May 2, 2011, to February 21, 2015. All figures covers 1391 days across the before, between and after intervals, providing a comprehensive comparative analysis.

datasets. Subsequently, we calculated the number of attacks per district for each year and divided it by the population of the district. For the year 2020, we merged data by considering the commencement year of schooling for each child. This enabled us to calculate the total number of attacks experienced by individuals during the years they were of school age, from age 5 to 18.

In our difference-in-differences analysis, the treatment region is the province of Khyber Pakhtunkhwa, where retaliation and mass public protests were observed following the Red Mosque siege and where Osama bin Laden was found and killed. Terrorist attacks escalated following both of these events. There was a significant increase in attacks on educational facilities in Khyber Pakhtunkhwa, underscoring the retaliatory nature of the violence. Fig. 2 illustrates that the siege and bin Laden's death significantly increased the frequency of terrorist attacks. The patterns and dynamics observed across the affected and unaffected regions provide evidence supporting the validity and relevance of our identification strategy, which relies on the parallel trend assumption. The trends in the affected and unaffected regions did not diverge before the Red Mosque siege or the death of bin Laden, reinforcing the credibility of our methodology.

To standardize the event counts, we utilized population data from two censuses within the scope of our analysis, specifically from 1997 to 2017. Integrating these census data with the GTD panel necessitated a meticulous harmonization process, particularly regarding the names of tehsils (sub-district units). Given the potential variations in the recording of tehsil names in different datasets, including multiple spellings due to the transliteration from Urdu to English and the possibility of erroneous entries, we undertook a detailed review and revision process to ensure the consistency and accuracy of the data alignment.

Education: To estimate the impact of terrorism on education, we leverage two nationally representative datasets. First, we utilize individual-level data from the Pakistan Social and Living Standards Measurement survey, covering the period from 2006 to 2020. The PSLM, conducted annually, is a comprehensive household survey that provides nationally representative data, including five survey rounds that took place within our study window. To account for potential temporal variation and to ensure the robustness of our analysis, we segment the data into ten-year intervals based on the interview year. This segmentation facilitates a true estimation of the impact over time, incorporating variations in parental education, household economic status, industry

**Fig. 2.** Dynamics of terrorism in regions.

Notes: The affected area encompasses the Khyber Pakhtunkhwa province, the region where Osama bin Laden was found and killed in 2011. The unaffected areas comprise Azad Kashmir, Balochistan, Gilgit Baltistan, Punjab, and Sindh provinces.

classification, and exposure to the treatment. Second, we employ data from the Annual Status of Education Report, which spans the years 2012 to 2021 and includes a sample of school-aged children between 3 and 16 years old. This dataset reports the academic performance of school-aged children who took tests in subjects such as math, reading, and English. However, it is important to note that no data is available before 2012, and the ASER only reports the academic performance of the children who took the tests in each survey year.

Table 1 presents the summary statistics for the key variables from each dataset that were utilized in this study. Panel A provides an overview of the number of terrorist attacks, with the unit of observation being tehsil-months from 1970 to 2020. However, there are instances of missing months where no terrorist activity occurred within the administrative boundary. The variable Total Attacks encompasses the aggregate count of attacks targeting various entities, including educational institutions, businesses, government bodies, law enforcement agencies, telecommunication facilities, tourists, citizens' properties, non-state actors, food and water supplies, and maritime entities. The remaining variables in Panel A delineate the individual counts of attacks categorized by target type. In addition, the variables capturing the number of deaths, injuries, and the extent of property damage encompass all incidents resulting from various types of attacks and their respective targets. Panel B provides the summary statistics derived from the PSLM survey dataset from 2006 to 2020. The variables female, rural, single, drop-out, enrollment, and employed are binary variables that take a value of 1 if the named characteristic applies to the individual. The remaining variables are continuous in nature. The household asset index is computed based on the potential assets present within a household, reflecting its wealth status. Years of education signifies the cumulative years of formal schooling completed by individuals. Panel C presents the summary statistics from the ASER data from 2012 to 2021. Tutoring is a binary variable indicating additional educational support outside of regular school hours, such as private tutoring or extra classes. Math scores range from 1 to 7, while English & Reading scores range from 1 to 5. Each score represents a learning level, with the first category being the lowest and the last being the highest.

4. Empirical strategy

To measure the impact of terrorist attacks on educational attainment, we utilize data from the 2020 PSLM survey, leveraging individuals' locations and birth years to determine their exposure to these attacks.

Table 1
Descriptive Statistics.

Variables	Mean (1)	SD (2)	Observations (3)
<i>Panel A. Global Terrorism Database (GTD)</i>			
Total Attacks	0.0607	0.7796	241,806
Attacks on Education	0.0041	0.0895	241,806
Attacks on Government	0.0005	0.0243	241,806
Attacks on Law Enforcement	0.0169	0.2377	241,806
Attacks on Citizen	0.0153	0.3058	241,806
Attacks on Non-State Actors	0.0015	0.0459	241,806
Deaths	0.1038	1.8093	241,806
Injuries	0.1846	3.6506	241,806
Properties Damages	0.0299	0.4294	241,806
Number of Sub-Districts			573
<i>Panel B. Pakistan Social and Living Standards Measurement (PSLM)</i>			
Age	23.3363	18.3623	2,879,130
Female	0.4847	0.4998	2,879,130
Rural	0.7018	0.4575	2,879,130
Single	0.5930	0.4913	2,879,130
Household Assets Index	1.4633	1.3711	2,889,309
Employed	0.3633	0.4809	2,071,209
Enrollment	0.3957	0.4890	1,819,305
Years of Education	6.6226	4.2474	1,243,472
<i>Panel C. Annual Status of Education Report (ASER)</i>			
Age	8.8423	3.7813	2,132,565
Female	0.4396	0.4963	2,131,298
Enrollment	0.7118	0.4529	2,139,788
Years of Education	3.8873	2.8545	1,482,225
Tutoring	0.1742	0.3793	1,161,449
Math	3.2678	1.9231	1,684,468
English	2.9042	1.6908	1,683,816
Reading	2.9780	1.6581	1,671,737

Notes: The table provides an overview of terrorist attacks in Pakistan in panel A, leveraging data sourced from the Global Terrorism Database covering the time period from 1970 to 2020. The dataset, originally structured on an event-based framework, was transformed into a panel format and disaggregated at the monthly and sub-district (tehsil) levels. The unit of observation is specified as the count of attacks per tehsil per month. Panel B represents the key summary statistics of PSLM data from 2006 to 2020. Likewise, panel C represents the summary statistics of the data from ASER covering the years from 2012 to 2021. For each variable, the table presents the mean in column (1), standard deviations (SD) in column (2), and the number of observations in column (3).

Specifically, we identify each individual's birthplace, current residence, birth year, and years of education from the survey. Our analysis is restricted to individuals who have remained in their birthplace, ensuring that their birthplace matches their current residence, thereby excluding migrants from the main sample. In Pakistan, children typically attend school from ages 5 to 18; thus, those within this age range during the attacks would have been directly affected.

There is variation in the intensity of terrorist activities targeting educational institutions, not only across birth cohorts but also across different regions. This variability has largely been attributed to key events such as the death of Osama bin Laden. These differences across birth cohorts and geographical regions allow us to examine the impact of terrorist attacks on educational achievements through the following regression analysis.

$$y_{ijt} = \beta_0 + \beta_1 \text{attacks}_{jt} + \theta_j + \tau_t + \epsilon_{ijt} \quad (1)$$

where y_{ijt} represents the outcome for individual i from district j born in year t . The term attacks_{jt} quantifies the total number of terrorist attacks experienced by individuals in district j during their schooling years, ages 5 to 18. For instance, an individual born in 1985 would potentially have been exposed to terrorist attacks from 1990 (when they were 5 years old) until 2003 (when they were 18) during their schooling years. Therefore, $\text{attacks}_{j,1985}$ for an individual born in 1985 in district j is the number of terrorist attacks within district j from 1990 through 2003. District fixed effects, θ_j , account for the time-invariant initial characteristics that may vary across different districts, and year fixed effects, τ_t , capture common shocks affecting all districts in a given year. Standard errors are clustered at the district level. In the specification, the coefficient of interest, β_1 , examines the effect of terrorist attacks on educational attainment.

One concern with our empirical strategy is the potential endogeneity of terrorist attacks, as terrorists may specifically target certain regions rather than selecting locations at random. To address this issue, we employ the death of Osama bin Laden as an instrumental variable. The operation that led to bin Laden's death was unforeseen; it was conducted in the utmost secrecy and came as a shock to many, including terrorist groups. Following this event, there was a significant spike in terrorist attacks in the region where he was killed. We leverage this unexpected incident as an instrumental variable to predict the incidence of terrorist attacks. The first-stage regression is as follows.

$$\text{attacks}_{jt} = \alpha_0 + \alpha_1 kp_j \times \text{post}_t + \theta_j + \tau_t + \epsilon_{jt} \quad (2)$$

where kp_j denotes whether district j is located in the province of Khyber Pakhtunkhwa, the location of significant events such as the response to bin Laden's death. Our main analysis focuses on his death, but we also consider the Red Mosque siege as a robustness check. The variable post_t indicates whether individuals born in year t were of school age at the time of Osama bin Laden's death. For example, individuals born in the year 2000, who were 11 years old in 2011 when bin Laden was killed, have post2000 assigned the value of 1. In contrast, those born in 1990, who were 21 in 2011 and thus not of school age, have post1990 set to 0. Consequently, individuals born in Khyber Pakhtunkhwa province from 1993 to 2006, who were between the ages of 5 and 18 at the time of the incident in 2011, were directly affected during their schooling years.

There are two major reasons why KP province is expected to have witnessed stronger retaliation to the Red Mosque siege and the death of Osama bin Laden than occurred in other provinces. First, KP's population has historically exhibited heightened sensitivity to religious and extremist narratives. Events such as the Red Mosque siege and bin Laden's death were framed by terrorist groups as religiously motivated grievances, which may have resonated more deeply in KP, leading to greater sympathy for or reduced resistance to extremist activity. Second, KP shares a long border with Afghanistan, a known hub for various terrorist networks. This geographic proximity has made KP a logistical base and operational zone for such groups.

In the first-stage regression above, we utilize individual-level data from the PSLM survey, categorized by district and birth year. To refine our analysis of the causal relationship between bin Laden's death and terrorist attacks, we use the Global Terrorism Database to analyze data at the tehsil (sub-district) level and by month-year, aligned with the calendar year. This approach leverages the most granular administrative and temporal details, offering a direct pathway to understanding the impact of bin Laden's demise on terrorist activities. However, this method is not applicable to the first-stage regression in the instrumental variable analysis due to the mismatch in geographical and temporal levels.

Following the method used in Duflo (2001), we assess the impact of terrorist attacks on educational outcomes across different age cohorts. For instance, individuals born in 2004, who were 7 years old (the young cohort) at the time of Osama bin Laden's death in 2011, were significantly impacted, as a large portion of their schooling occurred during and after this event. Conversely, individuals born in 1994, who turned 17 in 2011 when the incident occurred, may have been affected, but to a lesser extent, since their schooling was nearly complete at that time. Moreover, individuals born in 1984, who were 27 years old at the time of the event in 2011, were not impacted, as their schooling had already been completed by 2011. Therefore, we take into account the age of individuals during the incident in 2011 to explore the varying degrees of effects terrorist attacks have had on their educational outcomes. Specifically, we implement the following event-study regression model.

$$y_{ija} = \alpha + \Sigma \beta_a \text{attacks}_j \times \text{age_dummy}_{ia} + \theta_j + \tau_a + \epsilon_{ija} \quad (3)$$

where attacks_j represents the total number of attacks in district j , or an indicator of whether district j falls within Khyber Pakhtunkhwa. We analyze the impact using each variable and present the OLS and reduced-form coefficients, respectively. The variable age_dummy_{ia} is an indicator for whether individual i was of age a at the time of the incident in 2011, specifically considering ages between 5 and 32 years. Consequently, the coefficient β_a captures the effect of terrorist attacks on educational outcomes for individuals who were age a during the incident in 2011. The model includes district fixed effects, θ_j , and cohort fixed effects, τ_a , to control for unobserved heterogeneity.

We first examine the number of terrorist attacks during the pre-treatment period across different treatment statuses. Table 2 compares the incidence of terrorist attacks across the treatment region and other regions during this period. The insignificant coefficients suggest that, prior to the Red Mosque siege and the death of Osama bin Laden, there were no initial differences in the incidence of terrorist attacks between Khyber Pakhtunkhwa and other provinces. Except for one specific category of attacks targeting Law Enforcement, comprising armed forces, police, and other security agencies, terrorist activities were similar across regions before these two key events. The joint p-value further supports this baseline similarity.

5. Results

5.1. Impact on terrorist attacks

Table 3 examines the relationship between Osama bin Laden's death and subsequent terrorist attacks, as outlined in Eq. (2). On average, his death led to an increase of 0.09 in the total number of monthly attacks per hundred thousand population in column (1), doubling the average monthly rate based on the mean of the dependent variable. Specifically, the impact on attacks targeting educational facilities is also significant, with an increase of 0.0032 attacks in column (2), which corresponds to a 50 percent rise. With the exception of attacks on government facilities, the frequency of all types of terrorist attacks escalated following Bin Laden's death.

As a result, the surge in terrorist attacks following Osama bin Laden's death led to significant human and economic losses. Specifically, the

Table 2
Terrorism during the Pre-Treatment Period.

Variable	Treatment (1)	Control (2)	Difference (3)	p-value (4)
Total Attacks	0.0085 (0.3176)	0.0062 (0.2426)	-0.0023 [0.0018]	0.1949
Attacks on Education	0.0003 (0.0297)	0.0001 (0.0168)	-0.0002 [0.0002]	0.3400
Attacks on Government	0.0001 (0.0085)	0.0001 (0.0041)	-0.0000 [0.0000]	0.6546
Attacks on Law Enforcement	0.0026 (0.1476)	0.0011 (0.0620)	-0.0015 [0.0008]	0.0449
Attacks on Citizen	0.0023 (0.0811)	0.0026 (0.1317)	0.0003 [0.0006]	0.5816
Attacks on Non-State Actors	0.0000 (0.0034)	0.0001 (0.0220)	0.0001 [0.0001]	0.4084
Deaths	0.0178 (0.6103)	0.0160 (0.8492)	-0.0018 [0.0040]	0.6592
Injuries	0.0274 (0.9311)	0.0281 (1.2843)	0.0007 [0.0061]	0.9073
Properties Damages	0.0028 (0.1150)	0.0059 (0.1994)	0.0031 [0.0008]	0.0002
Joint p-value				0.1923
Observations	8,874	24,360		

Notes: This table employs a t-test between a treatment and control group. The data consist of years from 1970 to 2006, considering the Red Mosque Siege in 2007 and the death of Osama bin Laden in 2011. Where the unit of observation is per tehsil per month. The results, as presented in the table, highlight statistically insignificant differences in terrorism between the treatment and control groups before the treatment. The joint p-value of 0.1923 suggests an overall similarity in means across all categories. The first two columns (1-2) display means and standard deviations in parentheses within the treatment and control groups, respectively. Column (3) indicates mean differences coupled with standard errors in brackets between treatment and control groups, while column (4) shows the p-value from a two-sided t-test assessing the equivalence of means.

average monthly death toll per hundred thousand people rose by 0.14, almost a 7-fold increase, as shown in column (7). Furthermore, there was considerable damage to property in the aftermath. The number of properties damaged per hundred thousand population increased by 0.0426, a 70 percent increase, as shown in column (9).

As a robustness check, we use the Red Mosque siege as an instrumental variable to predict the incidence of terrorist attacks. Table A1 depicts the significant positive relationship between the Red Mosque siege and the number of terrorist attacks that occurred afterward. When we consider both the Red Mosque siege and Osama bin Laden's death together, as demonstrated in Table A2, this positive relationship persists. These incidents occurred in Khyber Pakhtunkhwa in 2007 and 2011,

respectively, allowing us to explore the dynamic effects of these incidents on terrorist activities within the province. Fig. 3 presents the coefficients corresponding to respective years. It shows a significant increase in terrorist attacks in Khyber Pakhtunkhwa following both the Red Mosque siege and Osama bin Laden's death, with educational targets experiencing a notable increase in attacks. The presence of insignificant coefficients prior to these events supports the validity of the instrumental variable approach.

Furthermore, we explore heterogeneity by attack type and terrorist group. Table A3 shows a significant increase in bombings and assassinations—two of the most violent forms of terrorism—while other types of attacks (e.g., unarmed assaults, facility attacks, hijackings, and hostage situations) remained unchanged or decreased. This indicates a shift toward more lethal tactics, consistent with retaliatory behavior. Columns 8 to 10 categorize attacks by the perpetrating group: (i) Al-Qaeda, (ii) Other groups, and (iii) Unknown. We find a significant rise in attacks attributed to al-Qaeda and unidentified groups, while attacks by other known groups decreased. In addition, Table A4 shows the incidence of attacks on U.S. entities. Columns 1–3 present the attacks against non-U.S. targets, and Columns 4–6 the attacks against U.S. targets. We find no significant increase in attacks against U.S. entities, but a marked rise in attacks on non-U.S. targets. Specifically, deaths and injuries increased, while hostage-taking decreased, again suggesting a shift toward more violent forms of terrorism. Together, these results support the hypothesis of retaliatory escalation in the aftermath of Bin Laden's death.

5.2. Impact on educational attainment

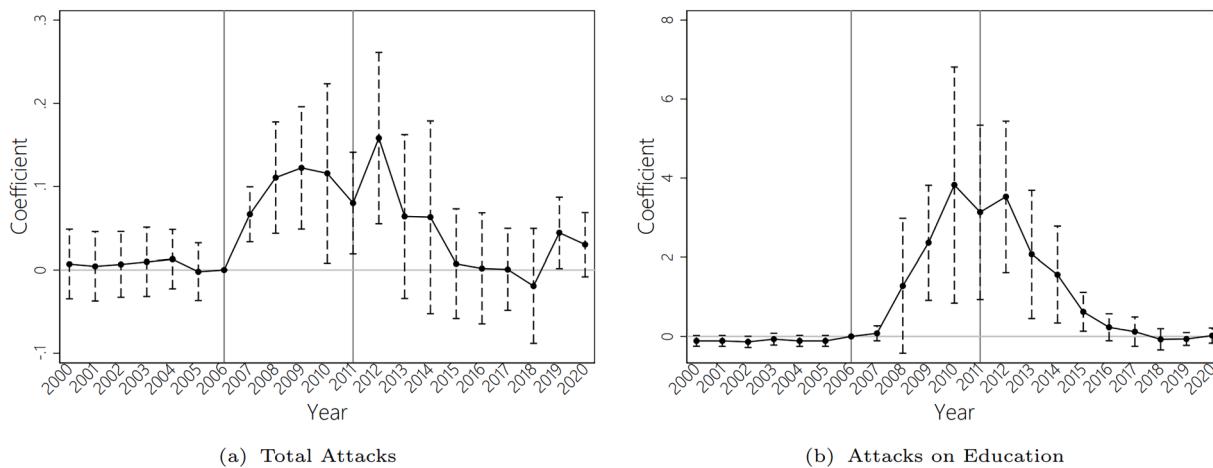
Table 4 explores the impact of terrorist attacks on educational attainment, employing the instrumental variable method as detailed in Eqs. (1) and 2. On average, terrorist attacks on educational targets led to a decrease of 0.52 in years of education, as indicated in column (1), a 5.8 percent reduction relative to the mean of the dependent variable. The subsequent columns assess gender-specific effects, revealing significant disparities. For girls, terrorist attacks resulted in a significant decrease of 0.93 years of education (10.4 percent), whereas boys' years of education were not affected. Based on the average number of terrorist attacks on educational targets following Osama bin Laden's death (0.2), these estimates suggest a decline of 0.13 years of education (1.4 percent) for all children and 0.34 years of education (3.8 percent) for girls specifically.

Column (4) shows that terrorist attacks reduced the rate of primary school completion by 5.9 percentage points, a 8.6 percent decrease from the mean of the dependent variable. The gender disparity extends to the completion of primary education as well; terrorist attacks decreased the

Table 3
Impact of the Death of Osama bin Laden on Terrorist Attacks.

Dependent Variable	Number of Attacks						Human and Economic Damages		
	Total (1)	Education (2)	Government (3)	Law Enforcement (4)	Citizen (5)	Non-State Actors (6)	Deaths (7)	Injuries (8)	Properties Damage (9)
Bin Laden's Death	0.0900 (0.0266)	0.0032 (0.0013)	0.0002 (0.0002)	0.0367 (0.0108)	0.0070 (0.0043)	0.0067 (0.0017)	0.1407 (0.0402)	0.1581 (0.0471)	0.0139 (0.0088)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0672	0.0207	0.0136	0.0434	0.0391	0.0098	0.0192	0.0232	0.0626
No. of Tehsils	573	573	573	573	573	573	573	573	573
Observations	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592
Dep. Var. Mean	0.0407	0.0021	0.0001	0.0125	0.0095	0.0009	0.0621	0.0847	0.0201

Notes: Utilizing the DID model, this table presents the effect of the death of Bin Laden on terrorist attacks, human and economic losses. The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011, when the US Navy killed Bin Laden; otherwise, it takes the value of 0. Columns (1–6) present the average number of monthly attacks per tehsil per hundred thousand people, while columns (7–9) depict the average number of monthly deaths, injuries, and property damages per tehsil per hundred thousand people. The unit of data is monthly at the tehsil level, which is the lowest administrative boundary in Pakistan. The analysis covers the period from 1970 to the year 2020, covering 573 tehsils and 612 months. The data on terrorism and human economic losses were sourced from GTD. The census data on population for every tehsil has been taken from the PBS. In the regression model, time-fixed effects consist of month-year fixed effects and area-fixed effects, accounting for the province, district, and tehsil-specific fixed effects. Standard errors, shown in parentheses, are clustered at the tehsil level.

**Fig. 3.** Time-varying effect on terrorist attacks.

Notes: This figure presents the coefficients of the event study model. The sub-figures illustrate the coefficients of total terrorist attacks in the Khyber Pakhtunkhwa province relative to the other provinces over the period from 2000 to 2020. The upward trend post-2007 and post-2011 indicates a significant impact of the Red Mosque Siege and the death of Bin Laden, respectively. The bars around each observation represent the 95 % confidence interval. Standard errors are clustered at the sub-district (tehsil) level, and the empirical specification includes area-fixed effects consisting of tehsil, district, and month and time-fixed effects include month-year fixed effects.

Table 4
Impact of Terrorism on Education.

Dependent Variable	Years of Education			Primary Education Completion		
	Full Sample (1)	Girls (2)	Boys (3)	Full Sample (4)	Girls (5)	Boys (6)
<i>Panel A. Instrumental Variable Estimation</i>						
Attacks on Education	-0.5198 (0.1364)	-0.9295 (0.1887)	-0.1609 (0.1844)	-0.0587 (0.0169)	-0.0945 (0.0265)	-0.0277 (0.0192)
<i>Panel B. Dependent Variable: Attacks on Education</i>						
Bin Laden's Death	0.6373 (0.1472)	0.6235 (0.1434)	0.6542 (0.1521)	0.6373 (0.1472)	0.6235 (0.1434)	0.6542 (0.1521)
F-statistics	15.4481	11.7705	17.8119	15.4481	11.7705	17.8119
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	142,995	59,858	83,137	142,995	59,858	83,137
Dep. Var. Mean	8.9040	8.9099	8.8998	0.6807	0.6636	0.6930

Notes: Utilizing the instrumental variables 'Death of Bin Laden', this table represents the repercussions of attacks on attained years of education and completion of grade 5 during the schooling age between 5–18. The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011, when the US Navy killed Bin Laden; otherwise, it takes the value of 0. The independent variable in this model is the average number of terrorist attacks on education per hundred thousand people per district. The outcome variables are measured for every individual during their school age. Columns 1–3 represent the attained years of education, while columns 4–6 contain the dummy variable if an individual has completed grade 5. Panel A of the table represents the result of instrumental variable estimation, and Panel B represents the first stage regression where the outcome variable is the average number of attacks per hundred thousand people per district. The unit of the outcome variable is individual, and the unit of the terrorist is measured at the district level. In this table, we use the 2020 PSLM survey and count the terrorist attacks for every individual who they exposed during their schooling age. This counting enables us to use the data as a panel, and we use the fixed effect as the birth-year fixed effect. The data on terrorist attacks on educational institutions was sourced from GTD. The census data on the population for every district has been taken from the PBS. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of birth-year effects and area-fixed effects, accounting for the province and district-specific fixed effects. The F-statistic is the Kleibergen-Paap rk Wald F statistic. Standard errors, shown in parentheses, are clustered at the district level.

completion rate by 9.45 percentage points (14.2 percent) for girls, but had no significant impact on boys. At the average level of terrorist attacks, there was an overall 1.5 percentage point (3.8 percent) decline in primary school completion, and a 3.3 percentage point (4.9 percent) decrease for girls specifically.

Furthermore, Table A5 shows the effects of terrorist attacks on various other outcomes. Specifically, terrorist attacks targeting education not only reduced enrollment rates but also led to an increase in the dropout rate, the likelihood of children engaging in labor, and the likelihood of early marriage. Boys were more likely to engage in labor, while girls were more likely to marry early in response to this shock,

suggesting the gendered social consequences of educational disruptions.

Fig. 4 from Eq. (3) illustrates the impact of terrorist attacks on educational attainment by age. The results show a decline in both years of education and grade 5 completion rates for children aged 5 to 13. This effect was significant among younger cohorts, whereas older cohorts did not exhibit such an impact. The OLS and reduced form estimates for these older groups were statistically indistinguishable from zero, supporting the validity of our empirical strategy based on the parallel trends assumption. Furthermore, Figs. A1 and A2 present coefficients by age and gender. Older cohorts, regardless of gender, did not experience a decline in educational outcomes in response to terrorist attacks on

educational institutions. However, younger cohorts, particularly girls, showed a significant decrease in educational attainment, consistent with the findings in [Table 4](#).

[Table 5](#) presents the impact of terrorism on learning levels, enrollment, and years of education for school-aged children. The OLS method is used to estimate the effect on academic performance, drawing on data from the ASER survey, which includes children aged 3 to 16 but does not report their birthplace. The explanatory variable is computed as the total number of attacks on education experienced by children in a given district from their schooling age up to the survey year.

The results show that terrorist attacks on educational institutions have led to average decreases in math, English, and reading scores of 0.12, 0.10, and 0.12 standard deviations, respectively, as shown in Columns 1 through 3. Additionally, Column 4 shows a significant reduction in enrollment rates, while Column 5 reveals a decrease of 0.49 years in children's education, corresponding to a 12.45 percent reduction relative to the mean of the dependent variable. These findings are consistent with previous results in [Table 4](#), which used data from the PSLM survey. Moreover, [Table A6](#) presents the results by gender, showing that both boys and girls experienced declines in academic performance.

To summarize, terrorist attacks carried out in retaliation for the death of Osama bin Laden significantly harmed the educational outcomes of children, particularly girls. These attacks led to reductions in years of education, primary school completion rates, and enrollment rates and increases in dropout rates, children's labor participation, and child marriage. Furthermore, academic performance in subjects like math, English, and reading declined in response to the violence.

5.3. Robustness checks

5.3.1. Placebo test

One concern with our empirical strategy is that the instrumental variable based on the death of Osama bin Laden may be correlated with other confounding factors. The Khyber Pakhtunkhwa region, where bin Laden was killed, might have had different initial characteristics from other regions. For example, KP is located in the northwestern part of the

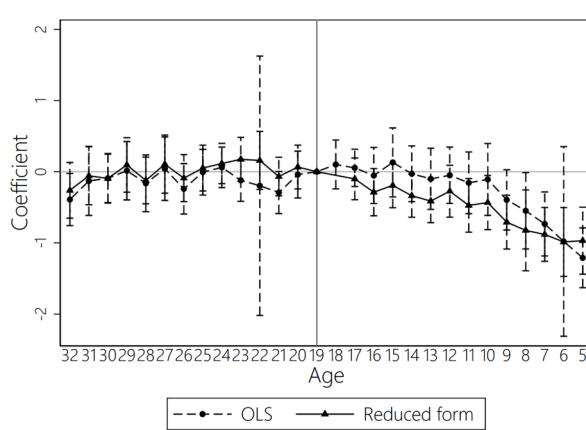
Table 5
Impact of Terrorism on Academic Performance.

Dependent Variable	Math	English	Reading	Enrollment	Years of Education
	(1)	(2)	(3)	(4)	(5)
Attacks on Education	-0.1189 (0.0394)	-0.1049 (0.0357)	-0.1171 (0.0380)	-0.0135 (0.0034)	-0.4854 (0.1491)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes
R-Squared	0.2384	0.2917	0.3052	0.5328	0.6678
Observations	308,627	309,703	306,813	397,197	272,204

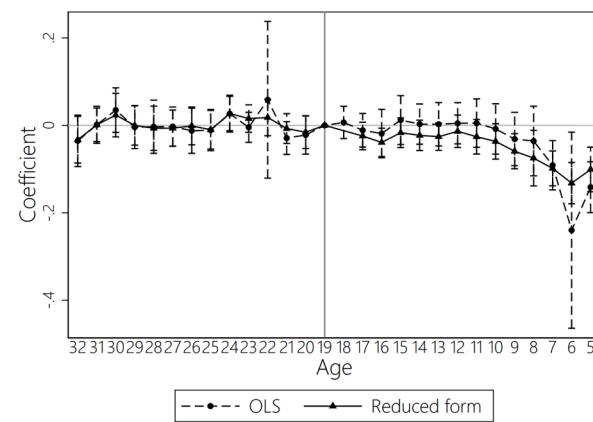
Notes: The variable 'Attacks on Education' measures the total number of attacks experienced by a child. We aggregate the number of attacks for each child aged 3-16 across all ASER surveys collected between 2012 and 2021 from the Khyber Pakhtunkhwa region. To normalize this variable, we divide the number of attacks by the district population. Columns (1-3) display the z-scores of test scores from ASER assessments, while column (4) shows enrollment, and column (5) indicates the current grade of children aged 3 to 16. Interpreting column 1, if a child resides in KP, each additional attack experienced during the schooling age reduces the math score by 0.12 standard deviations. Control variables include gender, household financial capacity, school type, child tuition, and parental education levels. The regression model includes time-fixed effects, represented by birth year fixed effects, and area-fixed effects, accounting for provincial and district fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

country and shares a border with Afghanistan, which could raise the concern that terrorist attacks were more likely to occur there than in other regions. In [Table 2](#), we show that there were no differences in terrorist attacks before the Red Mosque siege and the death of Osama bin Laden. However, the instrumental variable associated with the Khyber Pakhtunkhwa region could still be endogenous, despite the unexpected timing and location of bin Laden's death. The exclusion restriction of our IV method assumes that the death of Osama bin Laden did not affect educational outcomes in the absence of the terrorist attacks that followed it.

To provide evidence supporting this assumption, we explore the



(a) Years of Education



(b) Primary Education Completion

Fig. 4. Time-varying effect of terrorist attacks on education.

Notes: This figure presents the coefficients of the event study model based on the 2020 PSLM datasets. In this model, the treatment group consists of children who belong to KP and are aged between 5 and 18 years during 2011, the year Bin Laden died. On the other hand, the control group comprises individuals aged 19 to 32, as they are no longer of schooling age and hence their years of education are unaffected by the treatment. The primary independent variable tracks the number of terrorist attacks on educational institutions during the schooling age of children. The OLS coefficients explain the impact of terrorist attacks experienced during schooling age on attained years of education. The reduced form analysis represents the effect of the treatment, which is the interaction between post-2011 (for schooling age) and the province of Khyber Pakhtunkhwa. The dataset utilized in this model comprises 142,996 and 178,091 observations for years of education in the OLS and reduced-form models, respectively. The declining trend in schooling years depicted in the results underscores the significant impact of terrorist attacks on education and educational outcomes. The bars surrounding each observation represent the 95 % confidence interval. Standard errors are clustered at the district level, and the empirical specification includes area-fixed effects comprising district and province, while time-fixed effects incorporate birth-year-fixed effects.

effect of bin Laden's death across different levels of terrorist attack intensity. If terrorist attacks were infrequent, the death of bin Laden should not have impacted educational outcomes. Conversely, if terrorist attacks were frequent, the death of bin Laden should have had an impact on education. Table 6 presents the reduced form estimates measuring the impact of bin Laden's death on educational outcomes. Panel A includes individuals in regions where terrorist attacks were below the mean (columns 1 and 2) and below the median (columns 3 and 4), while Panel B includes individuals in regions where terrorist attacks were above the mean or median, respectively. All coefficients in Panel A are statistically insignificant, while those in Panel B are statistically significant. In the same fashion, we find no effect of the Red Mosque siege in low-terror regions, while the effects were significant in high-terror regions, as shown in Table A7. These findings suggest that bin Laden's death and the Red Mosque siege affected educational outcomes only through terrorist attacks, thus supporting the validity of our instrumental variables.

We also conducted a placebo test using the ASER survey. In this survey, the IV method is not feasible due to data limitations, so we use OLS estimates instead. We examine the effect of terrorist attacks in regions other than Khyber Pakhtunkhwa, where bin Laden was killed. We did not find any significant effects in these regions. As shown in Table A8, when the KP region is excluded, terrorist attacks did not impact educational outcomes in the ASER survey.

Although we provide several pieces of evidence supporting the validity of our instruments and the plausibility of the exclusion restriction, we acknowledge that it may not fully hold. For example, the Red Mosque siege or the death of Osama bin Laden could have triggered broader

Table 6
Placebo Test: Impact of Terrorism on Education.

Dependent Variable	Years of Education (1)	Primary Education Completion (2)	Years of Education (3)	Primary Education Completion (4)
<i>Panel A. Placebo Test: Few Terrorist Attacks</i>				
	<i>Attacks below Mean</i>		<i>Attacks below Median</i>	
Bin Laden's Death	-0.1592 (0.1318)	-0.0259 (0.0168)	-0.1212 (0.2453)	-0.0153 (0.0304)
Observations	163,136	163,136	152,467	152,467
Dep. Var. Mean	8.9627	0.6872	8.9472	0.6866
<i>Panel B. Many Terrorist Attacks</i>				
	<i>Attacks above Mean</i>		<i>Attacks above Median</i>	
Bin Laden's Death	-0.4320 (0.1313)	-0.0474 (0.0151)	-0.3233 (0.1170)	-0.0402 (0.0130)
Observations	162,966	162,966	173,635	173,635
Dep. Var. Mean	8.9581	0.6858	8.9720	0.6864
Controls	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes

Notes: Utilizing the variables 'Death of Bin Laden', this table represents the repercussions of attacks on attained years of education and completion of grade 5 during the schooling age between 5–18. In classifying attack groups, we delineate two categories: the below-mean, comprising the districts where the number of average attacks is below the mean value, and the below-median, comprising the districts where the number of average attacks is below the median value. In this table, we use the 2020 PSLM survey and count the terrorist attacks for every individual who they exposed during their schooling age. This counting enables us to use the data as a panel, and we use time fixed effects as a birth-year fixed effect. We also use the province and district fixed effects. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. Standard errors, enclosed in parentheses, are clustered at the district level.

changes in education policy, potentially influencing teacher allocation or public education spending. In such cases, our instruments might have affected educational outcomes through channels other than increased terrorist activity, thus violating the exclusion restriction. While we cannot directly test this assumption due to data limitations, we do not observe significant changes in the number of schools or teachers following these events. Moreover, the sharp increase in terrorist attacks specifically targeting educational institutions in the aftermath of both events supports the interpretation that the observed impacts were primarily driven by terrorism, rather than by broader policy shifts.

5.3.2. OLS, reduced form, IV estimates, and additional controls

To support the robustness and validity of our findings and empirical approach, we extend our analysis across different model specifications. OLS and reduced form estimates are examined in Tables A9 and A10, respectively. Additional outcomes such as enrollment, dropout rates, child labor participation, and child marriage are detailed in the OLS estimates in Table A11 and the reduced form estimate in Table A12. Our findings in OLS and reduced form estimates align consistently with our results from the IV estimates.

Furthermore, we exploit an alternative instrumental variable, the Red Mosque siege, to predict terrorist attacks. The IV estimates in Tables A13 and A14 corroborate our main results. Likewise, the reduced form estimates in Tables A15 and A16 further substantiate the consistency of our findings.

In addition, to mitigate concerns about endogeneity related to parental education and income, we control for a set of household and individual characteristics, including age, gender, urban/rural status, household financial capacity, asset index, and parental education and income. The results, reported in Table A17, remain consistent with our baseline estimates.

5.3.3. Effect by years of exposure

In the previous sections, we presented results for children aged 5–18, with the number of terrorist attacks calculated according to their location and the years they were in school. However, the effects could be more significant for younger children for whom more of their schooling years coincided with Osama bin Laden's death and the subsequent terrorist attacks. By analyzing subgroups of children by age, we examine how terrorist attacks impacted their educational outcomes differently depending on their level of exposure.

Table 7 provides a comprehensive analysis of educational outcomes relative to the exposed years of schooling. Columns (1) and (6) indicate a significant decrease of 0.52 years (5.8 percent) of education and a reduction of 5.9 percentage points (8.6 percent) in the completion rate of primary school education for the overall sample. Column (2) shows a more pronounced decrease of 1.05 years (12 percent) of education for the highly affected group, those exposed to 10 schooling years following Osama bin Laden's death (children who were aged 5–8 in 2011). Similarly, significant reductions in their primary school completion rate are observed. The moderately affected group (columns 3 and 8) also show a significant decrease in educational attainment.

In contrast, for the weakly affected group, consisting of children who completed their schooling shortly after Osama bin Laden's death (even during times of heightened terrorism), there is an insignificant effect on education (column 4), but completion rate decreased by 3.8 percentage points, reflecting higher dropout rates that occurred during periods of intense terrorism (column 9). As a robustness check and a placebo test, we examine the group aged 33–40 years at the time of Osama bin Laden's death, finding insignificant effects. Furthermore, Fig. A3 presents an event study analysis of the years children were exposed to terrorism after Osama bin Laden's death and years of education. These results provide evidence supporting the validity of our empirical strategy based on children's ages and years of schooling.

Table 7

Impact of Terrorism on Education by Exposure.

Dependent Variable	Years of Education					Primary Education Completion				
	5-18 Full Sample (1)	5-9 Highly Affected (2)	10-14 Moderately Affected (3)	15-18 Weakly Affected (4)	33-40 Placebo Unaffected (5)	5-18 Full Sample (6)	5-9 Highly Affected (7)	10-14 Moderately Affected (8)	15-18 Weakly Affected (9)	33-40 Placebo Unaffected (10)
	Panel A. Instrumental Variable Estimation									
Attacks on Education	-0.5198 (0.1364)	-1.0453 (0.1744)	-0.4263 (0.1471)	-0.1087 (0.1893)	-0.1255 (0.1858)	-0.0587 (0.0169)	-0.1111 (0.0241)	-0.0381 (0.0159)	-0.0457 (0.0221)	-0.0193 (0.0217)
Bin Laden's Death	Panel B. Reduced Form Estimation									
Bin Laden's Death	-0.2910 (0.1123)	-0.6529 (0.1606)	-0.2511 (0.1202)	-0.0508 (0.0834)	-0.0395 (0.0920)	-0.0362 (0.0126)	-0.0756 (0.0191)	-0.0225 (0.0124)	-0.0231 (0.0103)	-0.0084 (0.0099)
Bin Laden's Death	Panel C. Dependent Variable: Attacks on Education									
F-statistics	15.4481	17.3469	16.4948	13.9960	12.6043	15.4481	17.3469	16.4948	13.9960	12.6043
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	142,995	83,041	98,075	91,643	63,969	142,995	83,041	98,075	91,643	63,969
Dep. Var. Mean	8.9040	8.6875	9.0752	9.2635	9.0199	0.6807	0.6514	0.7043	0.7117	0.6940

Notes: Utilizing the instrumental variables 'Death of Bin Laden', this table represents the repercussions of attacks on attained years of education and completion of grade 5 during the schooling age between 5-18. In this table, we utilize the 2020 PSLM survey and count the terrorist attacks that occurred during the schooling years of each individual they exposed. This counting enables us to use the data as a panel, and we use time-fixed effects as birth-year fixed effects in addition to district fixed effects. Panel A of the table presents the results of instrumental variable estimation, Panel B represents the reduced-form estimation, and Panel C presents the first-stage regression, where the outcome variable is the average number of attacks per 100,000 people. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. The F-statistic is the Kleibergen-Paap rk Wald F statistic. Standard errors, enclosed in parentheses, are clustered at the district level.

6. Mechanisms

6.1. Hitting where it hurts

We investigate the mechanisms through which terrorist attacks affected educational outcomes and identify the groups most significantly impacted. As shown, girls were particularly affected in our context. Understanding why and how terrorists choose their targets is a crucial issue to address. Terrorist attacks come with a two-fold price: the terrorist group pays one cost, while society bears the human and economic losses. Therefore, terrorists strategically choose their targets, aiming to achieve their objective (Alfano and Görlich, 2024). The main goal is to sway the government by attacking soft targets. One way to influence the government is by capturing media attention and spreading fear (Gadarian, 2010). Rohner and Frey (2007) explained the relationship between blood and ink as a classic "win-win" game where terrorists use media coverage to spread their message, while the media thrive on the heightened attention and sales generated by reporting on these attacks. These findings are seconded by Jetter (2014), who explains that suicide missions receive much more media coverage than other types of attacks, helping to explain their growing appeal among terrorist groups. Analyzing 61,132 attack days across 201 countries, Jetter (2017) finds a causal relationship between media coverage and subsequent attacks. The findings show that greater coverage in the New York Times leads to more attacks in the same country, with each additional article correlating with an average of 1.4 more attacks and three additional casualties over the following week. This suggests that without media attention, terrorists might carry out fewer attacks. As a result, terrorists strategically select targets such as girls (Bloom, 2011). They also target

higher-income areas over lower-income ones (Krueger and Laitin, 2008), and higher-income areas correspond with high-education areas.

Table A18 presents the results comparing areas of high socioeconomic status with areas of low socioeconomic status. Our findings show that high-income and highly educated areas were significantly more affected by terrorism, aligning with existing literature on terrorist target selection. Specifically, Panel A shows a significant effect in high-income and high-education areas, both in terms of total attacks and attacks targeting education. Panel B shows an insignificant effect on low-income areas but a significant, though smaller, impact on low-education areas. Tables A19 and A20 provide more detailed results. These findings suggest that by inflicting greater human and economic damage—particularly in high-income and highly educated areas—terrorists aim to attract media attention, influence government responses, and spread fear.

6.2. Household characteristics

Since parental education, whether fathers' or mothers', is a key determinant of children's educational attainment, we extend our analysis by providing sub-group analysis based on parents' education. Table A21 presents the estimates of the effect of terrorist attacks on educational outcomes by different parental education groups employing the IV method as detailed in Eqs. (1) and 2. Panel A categorizes parents based on the parent with the higher level of education, either the mother or the father. Panel B focuses on fathers' education, while Panel C focuses on mothers' education. Column (1) shows that the group with higher parental education is more severely affected by terrorism, with a 0.47-year (4.4 percent) decrease in the education of school-going

children. In contrast, column (2) shows no significant effect on the years of education of children of low-educated parents. This disparity extends to the completion of primary school education, with a significant decrease of 3.8 percentage points (4.3 percent relative to the mean) in primary school completion rates for children of highly educated parents, while there is no such effect on children of low-educated parents. This analysis provides insights as to how terrorist groups maximize the impact of their attacks by targeting highly educated groups.

Table A22 presents the effects of terrorist attacks on educational outcomes across different income groups. Consistent with the parental education findings, our estimates indicate that high-income groups were more affected by terrorism. Column (1) illustrates that terrorist attacks following the death of Osama bin Laden reduced educational attainment by 0.58 years (6 percent) among the high-income group; however, there was no significant effect observed among the low-income group. Regarding primary school completion, we observe a similar significant impact across both income groups in columns (3) and (4), indicating a consistent effect of terrorist attacks on enrollment rates for high-income households, whereas attacks on low-income households showed more variability over the years.

Using data on parents employed in various industries, we explore another critical mechanism through which terrorism affects education. Specifically, we categorize children into three groups based on their parents' professional engagement in three sectors: agriculture, manufacturing, and services. **Table A23** shows that children of parents in the manufacturing and services sectors experienced more severe educational impacts compared with children of parents in the agricultural sector. Column (1) indicates the insignificant impact of terrorism on children whose parents work in the agricultural sector. In contrast, columns (2) and (3) show significant decreases of 0.54 years (6.5 percent) and 0.4 years (4.3 percent) of educational attainment for children whose parents are employed in the manufacturing and services sectors, respectively. These findings are consistent with primary school completion rates: column (4) shows no significant impact on completion among children of parents in the agricultural sector, while column (5) demonstrates a significant decrease of 9.4 percentage points (15 percent relative to the mean) in primary school completion for children of manufacturing sector parents. However, there is no statistically significant effect on primary school completion for children of service sector parents. This mechanism has significant implications in Pakistan, particularly in rural and urban areas and across different industries. The manufacturing and service sectors both necessitate relocation of workers from rural to urban centers where economic activities, such as markets and industries, expose residents to greater risks of terrorism that ultimately affect their children's educational outcomes.

Although we focus on non-migrant individuals, we also examine migration patterns following the Red Mosque siege and the death of Bin Laden. The announcement of Sharia law could have influenced the migration decisions of families with school-aged girls. **Fig. A4** shows increased out-migration from the KP region—where terrorist attacks intensified and enforcement of Sharia law was more likely. However, for families with school-aged girls, migration patterns remained largely unchanged, shown in **Fig. A5**. It is important to note, however, that the number of migrant households with school-aged girls from the KP region in our data is relatively small (831 observations out of 48,071 migrants), so the results should be interpreted with caution.

7. Conclusion

The killing of Osama bin Laden is regarded as a pivotal and unexpected event in the War on Terror. We estimated its causal impact on terrorism and the subsequent effects on education. In light of the

prevailing Kalashnikov culture and Talibanization of Pakistan, his death had the potential to either deter terrorism or exacerbate it through backlash and retaliation. We find that terrorist attacks nearly doubled, and those specifically targeting educational facilities increased 1.5-fold. Consequently, this surge in attacks on educational targets resulted in a decrease in average educational attainment of 0.52 years, and a drop of 5.9 percentage points in the primary education completion rate.

The effects of Osama bin Laden's death were more pronounced for girls and children in high-income areas. Girls' education was reduced by 0.93 years, while boys' education remained unaffected. Similarly, children's education dropped by 0.47 years in high-income areas, whereas there was no significant impact in low-income areas. Sensitive targets, such as girls and high-income areas, proved to be more vulnerable due to terrorists' strategic selection of targets that maximize media attention. Moreover, we find a decline in academic performance, with math, English, and reading scores decreasing by approximately 0.1 standard deviations. In addition, there was a reduction in enrollment rates and a rise in school dropouts, contributing to an increase in child labor for boys and child marriage for girls.

These findings suggest the importance of considering potential for backlash when determining counter-terrorism strategies, especially when targeting symbolic leaders of terrorist groups. While high-profile eliminations of terrorists such as that of Osama bin Laden may seem effective, they can provoke retaliation, intensifying violence in the short term. Instead, sustained ground operations, such as Pakistan's 'Zarb-e-Azb' and 'Radd-ul-Fasaad,' offer alternatives. These military campaigns, launched in 2015 in the KP region, have been associated with a reduction in terrorism, as evidenced by a decrease in attacks following their implementation. Another critical factor is the strategic approach employed by terrorists. They frequently exploit media sensitivity by targeting high-profile, vulnerable groups—such as girls' schools and affluent areas—knowing these attacks will receive widespread media coverage and provoke public outrage. This strategy allows terrorists to manipulate government responses and public sentiment, thereby intensifying the psychological impact of their actions. Consequently, counter-terrorism strategies should extend beyond operational measures to address the role of media and public perceptions in order to curb their exploitation.

This paper utilizes available nationally representative surveys and terrorism incident-level data to provide a comprehensive analysis of educational outcomes. However, labor market outcomes are beyond the scope of this study. Furthermore, the terrorist attacks in response to Osama bin Laden's death may have significantly impacted political outcomes. Future research could explore the effects of his death and subsequent violence on trust in democracy and the potential risks posed to democratic institutions.

CRediT authorship contribution statement

Saqib Hussain: Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation. **Chungeun Yoon:** Writing – review & editing, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization.

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Appendix

Figs. A1, A2, A3, A4, A5 and Tables A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21, A22, A23

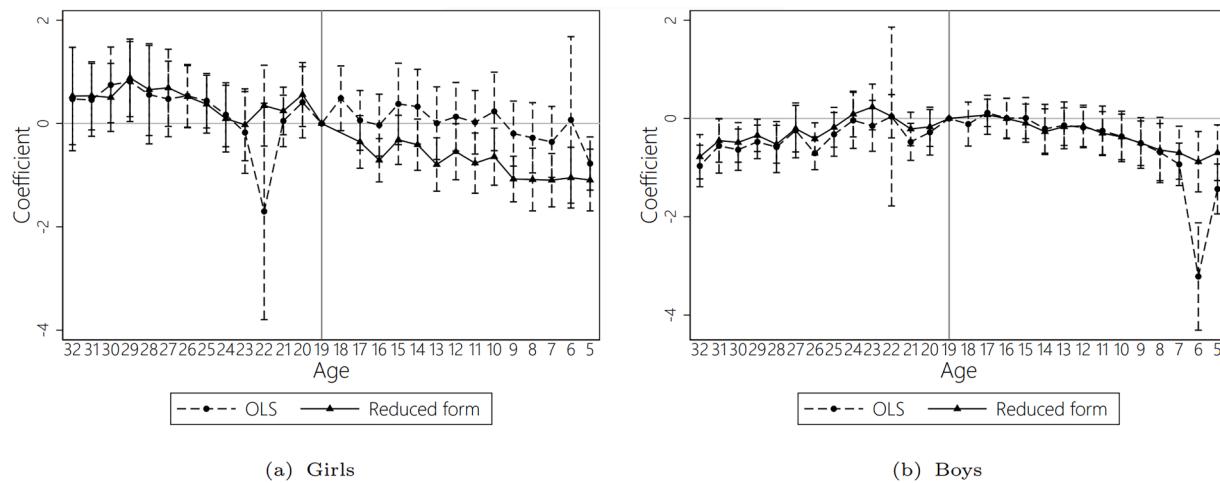


Fig. A1. Time-varying Effect of Terrorist Attacks on Years of Education by Gender.

Notes: This figure presents the coefficients of the event study model based on the 2020 PSLM datasets. In this model, the treatment group consists of children who belong to KP and are aged between 5 and 18 years during 2011, the year Bin Laden died. On the other hand, the control group comprises individuals aged 19 to 32, as they are no longer of schooling age and hence their years of education are unaffected by the treatment. The primary independent variable tracks the number of terrorist attacks on educational institutions during the schooling age of children. The OLS coefficients explain the impact of terrorist attacks experienced during schooling age on attained years of education. The reduced form analysis represents the effect of the treatment, which is the interaction between post-2011 (for schooling age) and the province of Khyber Pakhtunkhwa. The dataset utilized in this model comprises 142,996 and 178,091 observations for years of education in the OLS and reduced-form models, respectively. The declining trend in schooling years depicted in the results underscores the impact of terrorist attacks on education. The bars surrounding each observation represent the 95 % confidence interval. Standard errors are clustered at the district level, and the empirical specification includes area-fixed effects comprising district and province, while time-fixed effects incorporate birth-year-fixed effects.

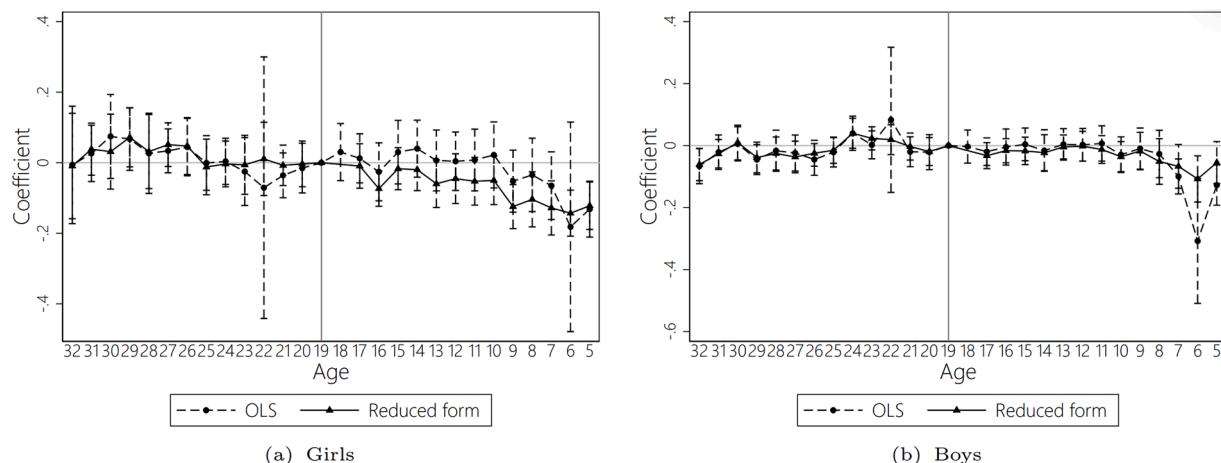


Fig. A2. Time-varying Effect of Terrorist Attacks on Primary Education Completion by Gender.

Notes: This figure presents the coefficients of the event study model based on the 2020 PSLM datasets. In this model, the treatment group consists of children who belong to KP and are aged between 5 and 18 years during 2011, the year Bin Laden died. On the other hand, the control group comprises individuals aged 19 to 32, as they are no longer of schooling age and hence their years of education are unaffected by the treatment. The primary independent variable tracks the number of terrorist attacks on educational institutions during the schooling age of children. The OLS coefficients explain the impact of terrorist attacks experienced during schooling age on completion of grade 5 within the stipulated time. The reduced form analysis represents the effect of the treatment, which is the interaction between post-2011 (for schooling age) and the province of Khyber Pakhtunkhwa. The dataset utilized in this model comprises 142,996 and 178,091 observations for years of education in the OLS and reduced-form models, respectively. The declining trend in schooling years depicted in the results underscores the impact of terrorist attacks on education. The bars surrounding each observation represent the 95 % confidence interval. Standard errors are clustered at the district level, and the empirical specification includes area-fixed effects comprising district and province, while time-fixed effects incorporate birth-year-fixed effects.

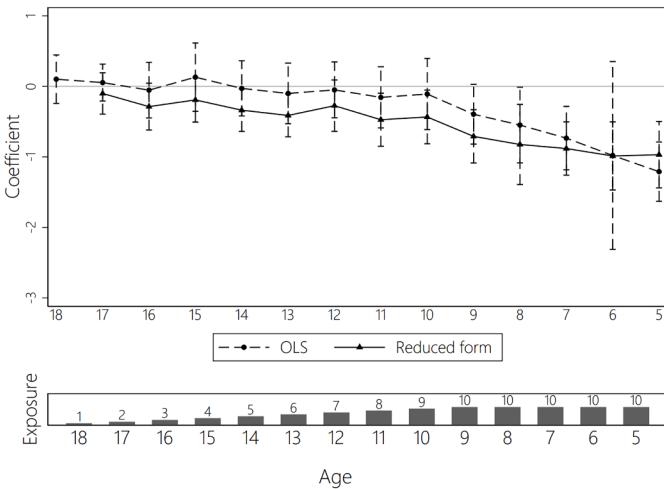


Fig. A3. Time-varying Effect of Terrorist Attacks on Years of Education by Exposure.

Notes: This figure presents the coefficients of the event study model based on the 2020 PSLM datasets. In this model, the treatment group consists of children who belong to KP and are aged between 5 and 18 years during 2011, the year Bin Laden died. On the other hand, the control group comprises individuals aged 19 to 32, as they are no longer of schooling age and hence their years of education are unaffected by the treatment. Since the different ages are exposed differently to the treatment. For instance, those whose age is 18 years in 2011 are exposed only one year. Similarly, those who were 5 years old in 2011, they exposed to 10 years from 2011 to 2020. Therefore, the x-axis of this figure represents the years of exposure and the y-axis represents the years of education. The primary independent variable tracks the number of terrorist attacks on educational institutions during the schooling age of children. The OLS coefficients explain the impact of terrorist attacks experienced during schooling age on attained years of education. The reduced form analysis represents the effect of the treatment, which is the interaction between post-2011 (for schooling age) and the province of Khyber Pakhtunkhwa. The dataset utilized in this model comprises 142,996 and 178,091 observations for years of education in the OLS and reduced-form models, respectively. The declining trend in schooling years depicted in the results underscores the significant impact of terrorist attacks on education and educational outcomes. The bars surrounding each observation represent the 95 % confidence interval. Standard errors are clustered at the district level, and the empirical specification includes area-fixed effects comprising district and province, while time-fixed effects incorporate birth-year fixed effects.

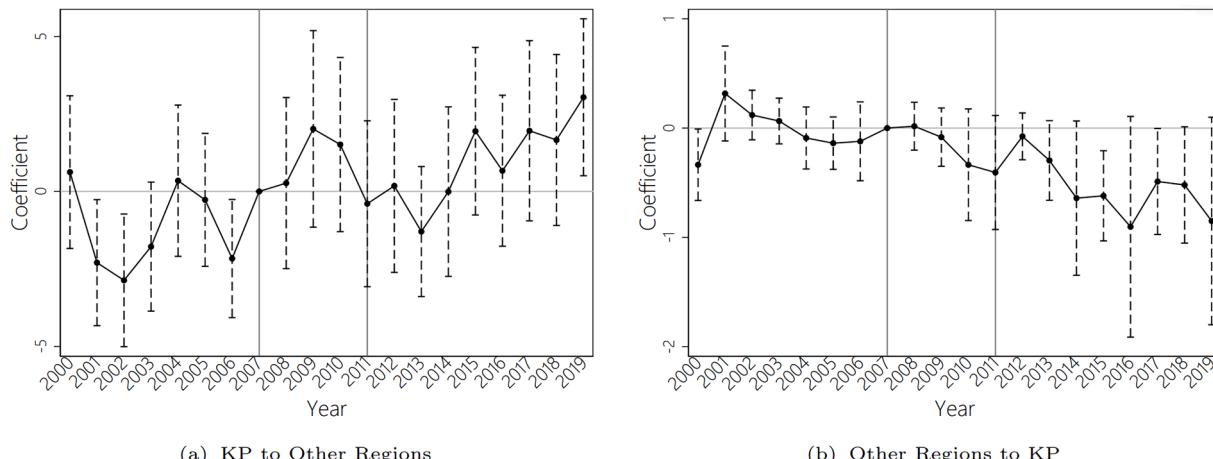
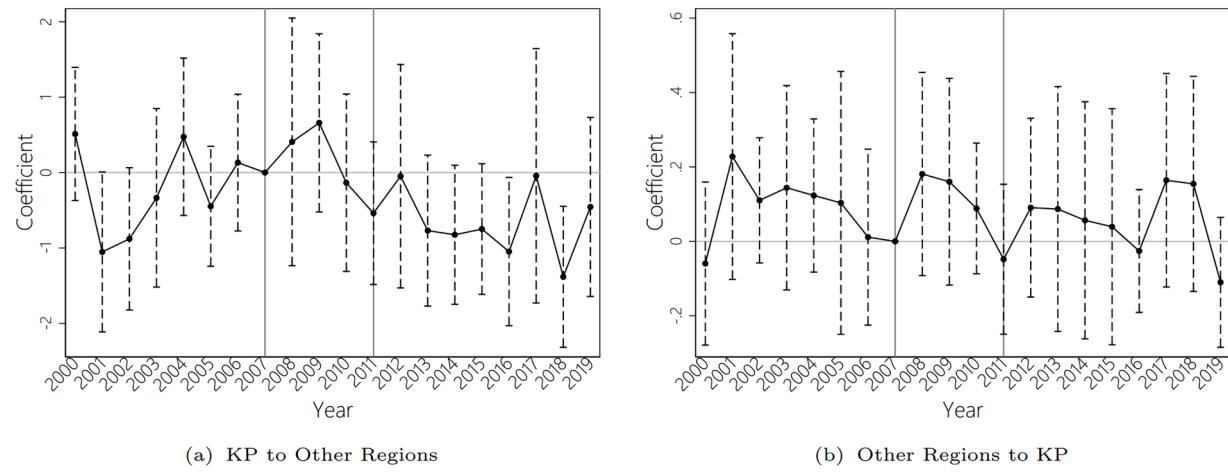


Fig. A4. Migration, full sample.

Notes: This figure presents the coefficients of the event study model based on the 2020 PSLM datasets. In this model, the treatment group referred to the KP region, while the other regions include all districts in other provinces of Pakistan, such as Punjab, Sindh, and Balochistan.

**Fig. A5.** Migration, aged 16–64 with primary school girls.

Notes: This figure presents the coefficients of the event study model based on the 2020 PSLM datasets. In this model, the treatment group referred to the KP region, while the other regions include all districts in other provinces of Pakistan, such as Punjab, Sindh, and Balochistan.

Table A1
Impact of Red Mosque Siege on Terrorist Attacks.

Dependent Variable	Number of Attacks						Human and Economic Damages		
	Total (1)	Education (2)	Government (3)	Law Enforcement (4)	Citizen (5)	Non-State Actors (6)	Deaths (7)	Injuries (8)	Properties Damage (9)
Red Mosque Siege	0.0859 (0.0314)	0.0243 (0.0098)	0.0003 (0.0002)	0.0045 (0.0046)	0.0435 (0.0141)	0.0023 (0.0012)	0.2464 (0.0944)	0.1728 (0.0790)	0.0363 (0.0180)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0666	0.0224	0.0136	0.0422	0.0402	0.0092	0.0194	0.0231	0.0628
No. of Tehsils	573	573	573	573	573	573	573	573	573
Observations	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592
Dep. Var. Mean	0.0407	0.0021	0.0001	0.0125	0.0095	0.0009	0.0621	0.0847	0.0201

Notes: Utilizing the DID model, this table presents the effect of the Red Mosque siege on terrorist attacks, human and economic losses. The variable 'Red Mosque Siege' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2007 to past-May 2011, between the Red Mosque Siege and Bin Laden's Death; otherwise, it takes the value of 0. Columns (1-6) present the average number of monthly attacks per tehsil per hundred thousand people, while columns (7-9) depict the average number of monthly deaths, injuries, and property damages per tehsil per hundred thousand people. The unit of data is monthly at the tehsil level, which is the lowest administrative boundary in Pakistan. The analysis covers the period from 1970 to the year 2020, covering 573 tehsils and 612 months. The data on terrorism and human economic losses were sourced from GTD. The census data on population for every tehsil has been taken from the PBS. In the regression model, time-fixed effects consist of month-year fixed effects and area-fixed effects, accounting for the province, district, and tehsil-specific fixed effects. Standard errors, shown in parentheses, are clustered at the tehsil level.

Table A2
Impact of Red Mosque Siege & Bin Laden on Terrorist Attacks.

Dependent Variable	Number of Attacks						Human and Economic Damages		
	Total (1)	Education (2)	Government (3)	Law Enforcement (4)	Citizen (5)	Non-State Actors (6)	Deaths (7)	Injuries (8)	Properties Damage (9)
Red Mosque Siege	0.1196 (0.0359)	0.0266 (0.0102)	0.0003 (0.0002)	0.0168 (0.0054)	0.0480 (0.0149)	0.0046 (0.0015)	0.3046 (0.0989)	0.2330 (0.0844)	0.0426 (0.0200)
Bin Laden's Death	0.1081 (0.0293)	0.0072 (0.0019)	0.0003 (0.0002)	0.0393 (0.0112)	0.0143 (0.0050)	0.0074 (0.0018)	0.1870 (0.0436)	0.1935 (0.0511)	0.0203 (0.0105)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0682	0.0227	0.0136	0.0435	0.0404	0.0099	0.0199	0.0235	0.0629
No. of Tehsils	573	573	573	573	573	573	573	573	573
Observations	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592
Dep. Var. Mean	0.0407	0.0021	0.0001	0.0125	0.0095	0.0009	0.0621	0.0847	0.0201

Notes: Utilizing the DID model, this table presents the effect of the Red Mosque siege and Bin Laden's death on terrorist attacks, human and economic losses. The variable 'Red Mosque Siege' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2007 to past-May 2011, between the Red Mosque Siege and Bin Laden's Death; otherwise, it takes the value of 0. Similarly, the variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011, when the US Navy killed Bin Laden; otherwise, it takes the value of 0. Columns (1-6) present the average number of monthly attacks per tehsil per hundred thousand people, while columns (7-9) depict the average number of monthly deaths, injuries, and property damages per tehsil per hundred thousand people. The unit of data is monthly at the tehsil level, which is the lowest administrative boundary in Pakistan. The analysis covers the period from 1970 to the year 2020, covering 573 tehsils and 612 months. The data on terrorism and human economic losses were sourced from GTD. The census data on the population for every tehsil has been taken from the PBS. In the regression model, time-fixed effects consist of month-year fixed effects and area-fixed effects,

accounting for the province, district, and tehsil-specific fixed effects. Standard errors, shown in parentheses, are clustered at the tehsil level.

Table A3

Impact of the Death of Osama bin Laden on Terrorist Attack by Type and Group.

Dependent Variable	Attacks by Type							Attacks by Group		
	Bombing (1)	Assassination (2)	Unarmed (3)	Armed (4)	Facility (5)	Hijacking (6)	Hostage (7)	Al Qaeda (8)	Others (9)	Unknown (10)
Bin Laden's Death	0.0370 (0.0145)	0.0035 (0.0013)	-0.0000 (0.0001)	0.0082 (0.0053)	-0.0028 (0.0010)	-0.0002 (0.0001)	-0.0040 (0.0018)	0.0194 (0.0042)	-0.0132 (0.0051)	0.0022 (0.0008)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0800	0.0374	0.0045	0.0509	0.0059	0.0042	0.0135	0.0302	0.0294	0.0072
No. of Tehsils	564	564	564	564	564	564	564	564	564	564
Observations	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592	236,592
Dep. Var. Mean	0.0248	0.0027	0.0001	0.0089	0.0011	0.0000	0.0031	0.0042	0.0084	0.0008

Notes: Utilizing the DID model, this table presents the effect of Bin Laden's death on terrorist attacks by attack type and terrorist groups. The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011, when the US Navy killed Bin Laden; otherwise, it takes the value of 0. Columns (1-7) present the average number of monthly attacks per tehsil by attack type, while columns (8-10) depict the average number of monthly attacks by group. The unit of data is monthly at the tehsil level, which is the lowest administrative boundary in Pakistan. The analysis covers the period from 1970 to the year 2020, covering 564 tehsils and 612 months. In the regression model, time-fixed effects consist of month-year fixed effects and area-fixed effects, accounting for the province, district, and tehsil-specific fixed effects. Standard errors, shown in parentheses, are clustered at the tehsil level.

Table A4

Impact of the Death of Osama bin Laden on Terrorist Attack by Nationality.

Dependent Variable	Non-US			US		
	Deaths (1)	Injuries (2)	Hostages (3)	Deaths (4)	Injuries (5)	Hostages (6)
Bin Laden's Death	0.1407 (0.0402)	0.1581 (0.0471)	-0.0874 (0.0526)	0.0000 (0.0000)	0.0001 (0.0001)	-0.0004 (0.0004)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0192	0.0232	0.0043	0.0071	0.0067	0.0042
No. of Tehsils	564	564	564	564	564	564
Observations	236,592	236,592	236,592	236,592	236,592	236,592
Dep. Var. Mean	0.0621	0.0847	0.0315	0.0000	0.0000	0.0001

Notes: Utilizing the DID model, this table presents the effect of Bin Laden's death on deaths, injuries, and hostagess. The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011, when the US killed Bin Laden; otherwise, it takes the value of 0. The unit of data is monthly at the tehsil level, which is the lowest administrative boundary in Pakistan. The analysis covers the period from 1970 to the year 2020, covering 564 tehsils and 612 months. In the regression model, time-fixed effects consist of month-year fixed effects and area-fixed effects, accounting for the province, district, and tehsil-specific fixed effects. Standard errors, shown in parentheses, are clustered at the tehsil level.

Table A5

Impact of Terrorism on Schooling and Vulnerability.

Dependent Variable	Enrollment			Drop-out			Child Labor			Child Marriage		
	Full Sample (1)	Girls (2)	Boys (3)	Full Sample (4)	Girls (5)	Boys (6)	Full Sample (7)	Girls (8)	Boys (9)	Full Sample (10)	Girls (11)	Boys (12)
	<i>Panel A: Instrumental Variable Estimation</i>											
Attacks on Education	-6.6529 (1.3329)	-8.3651 (1.6393)	-5.3646 (1.1287)	5.3187 (1.0685)	5.0145 (1.0391)	5.4885 (1.0984)	1.5488 (0.4090)	0.3971 (0.2415)	2.5464 (0.6222)	0.8897 (0.1963)	1.6142 (0.3588)	0.2634 (0.0607)
Bin Laden's Death	0.0194 (0.0042)	0.0198 (0.0043)	0.0191 (0.0042)	0.0194 (0.0042)	0.0198 (0.0043)	0.0191 (0.0042)	0.0194 (0.0042)	0.0198 (0.0043)	0.0191 (0.0042)	0.0194 (0.0042)	0.0198 (0.0043)	0.0191 (0.0042)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	703,366	299,535	403,831	908,585	422,080	486,505	524,758	241,719	283,039	908,585	422,080	486,505
Dep. Var. Mean	0.7764	0.7368	0.8057	0.0988	0.0985	0.0991	0.1256	0.0538	0.1868	0.0117	0.0208	0.0038
F-statistics	22.3580	21.3761	22.8618	20.9777	21.2362	20.6421	20.0243	20.1991	19.8186	20.9730	21.2362	20.6421

Notes: Utilizing the instrumental variable 'Bin Laden's Death', this table represents the effect of terrorist attacks on educational outcomes. The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011, when the US Navy killed Bin Laden; otherwise, it takes the value of 0. The independent variable in this model is the average number of terrorist attacks on education per hundred thousand people per district. The outcome variables are measured for every individual during their school age. Columns 1-3 delineate the status of current enrollment in school, while columns 4-6 represent the drop-out of children from schools during their schooling age, and columns 7-9 represent the child labor between the ages of 5 and 18. Finally, columns 10-12 show the child marriages. Panel A of the table represents the result of instrumental variable estimation, and Panel B represents the first stage regression where the outcome variable is the average number of attacks per hundred thousand people per district. The unit of the outcome variable is individual, and the unit of the terrorist is measured at the district level. The data on outcome variables is taken from 5 nationally representative surveys of PSLM that consist of ten years from 2006 to 2020, with some missing years. The data on terrorist attacks on educational institutions was sourced from GTD. The census data on the population for every district has been taken

from the PBS. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of enrollment-year-fixed effects and area-fixed effects, accounting for the province and district-specific fixed effects. The F-statistic is the Kleibergen-Paap rk Wald F statistic. Standard errors, shown in parentheses, are clustered at the district level.

Table A6

Impact of Terrorism on Academic Performance by Gender.

Dependent Variable	Math (1)	English (2)	Reading (3)	Enrollment (4)	Years of Education (5)
<i>Panel A. Girls</i>					
Attacks on Education	-0.1003 (0.0310)	-0.0877 (0.0268)	-0.0991 (0.0285)	-0.0101 (0.0030)	-0.5150 (0.1316)
R-Squared	0.2436	0.3059	0.3138	0.5921	0.6631
Observations	112,125	112,946	110,402	157,369	90,222
<i>Panel B. Boys</i>					
Attacks on Education	-0.1328 (0.0459)	-0.1176 (0.0424)	-0.1298 (0.0447)	-0.0160 (0.0040)	-0.4739 (0.1554)
R-Squared	0.2214	0.2664	0.2856	0.4716	0.6672
Observations	196,502	196,757	196,411	239,828	181,982
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes

Notes: The variable 'Attacks on Education' measures the total number of attacks experienced by a child. We aggregate the number of attacks for each child aged 3-16 across all ASER surveys collected between 2012 and 2021 from the Khyber Pakhtunkhwa region. To normalize this variable, we divide the number of attacks by the district population. Due to data unavailability before the event 'Death of Osama bin Laden,' we provide separate estimates for affected and unaffected areas. Columns (1-3) display the z-scores of test scores from ASER assessments, while column (4) shows enrollment, and column (5) indicates the current grade of children aged 3 to 16. Interpreting column 1, if a child resides in KP, each additional attack experienced during the schooling age reduces the math score by 0.12 standard deviations. Control variables include gender, household financial capacity, school type, child tuition, and parental education levels. The regression model includes time-fixed effects, represented by birth year fixed effects, and area-fixed effects, accounting for provincial and district fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

Table A7

Placebo Test: Impact of Terrorism on Education.

Dependent Variable	Years of Education (1)	Primary Education Completion (2)	Years of Education (3)	Primary Education Completion (4)
<i>Panel A: Placebo Test: Few Terrorist Attacks</i>				
<i>Attacks below Mean</i>				<i>Attacks below Median</i>
Red Mosque Siege	-0.0858 (0.1342)	-0.0174 (0.0176)	0.2442 (0.1378)	0.0260 (0.0182)
Observations	162,119	162,119	154,635	154,635
Dep. Var. Mean	9.1995	0.7169	9.1792	0.7158
<i>Panel B: Many Terrorist Attacks</i>				
<i>Attacks above Mean</i>				<i>Attacks above Median</i>
Red Mosque Siege	-0.2155 (0.1022)	-0.0248 (0.0126)	-0.2511 (0.0827)	-0.0326 (0.0098)
Observations	165,926	165,926	173,410	173,410
Dep. Var. Mean	9.2030	0.7161	9.2210	0.7172
Controls	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes

Notes: Utilizing the variables 'Red Mosque Siege', this table represents the repercussions of attacks on attained years of education and completion of grade 5 during the schooling age between 5-18. In classifying attack groups, we delineate two categories: the below-mean, comprising the districts where the number of average attacks is below the mean value, and the below-median, comprising the districts where the number of average attacks is below the median value. In this table, we utilize the 2020 PSLM survey and count the terrorist attacks that occurred during the schooling years of each individual they exposed. This approach enables us to use the data as a panel, and we employ time-fixed effects, specifically birth-year fixed effects. We also use the province and district fixed effects. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. Standard errors, enclosed in parentheses, are clustered at the district level.

Table A8

Placebo Test: Impact of Terrorism on Academic Performance.

Dependent Variable	Math (1)	English (2)	Reading (3)	Enrollment (4)	Years of Education (5)
Attacks on Education	-0.0159 (0.0204)	-0.0092 (0.0133)	-0.0129 (0.0171)	-0.0027 (0.0007)	-0.1472 (0.1054)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes

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Table A8 (continued)

Dependent Variable	Math (1)	English (2)	Reading (3)	Enrollment (4)	Years of Education (5)
R-Squared	0.2387	0.3157	0.3037	0.5190	0.5979
Observations	960,204	958,234	949,616	1226343	855,024

Notes: The variable 'Attacks on Education' measures the total number of attacks experienced by a child. We aggregate the number of attacks for each child aged 3-16 across all ASER surveys collected between 2012 and 2021 from the comparison region. To normalize this variable, we divide the number of attacks by the district population. Due to data unavailability prior to the event 'Death of Osama bin Laden,' we provide separate estimates for affected and unaffected areas. Columns (1-3) display the z-scores of test scores from ASER assessments, while column 4 shows enrollment, and columns 5 indicate the current grade of children aged 3 to 16. Interpreting column 1, if a child resides in a region other than KP, the control regions, each additional attack experienced during the schooling age reduces the scores but the effect is insignificant. Control variables include gender, household financial capacity, school type, child tuition, and parental education levels. The regression model includes time-fixed effects, represented by birth year fixed effects, and area-fixed effects, accounting for provincial and district fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

Table A9

Impact of Terrorism on Education, OLS.

Dependent Variable	Years of Education			Primary Education Completion		
	Full Sample (1)	Girls (2)	Boys (3)	Full Sample (4)	Girls (5)	Boys (6)
Attacks on Education	-0.5370 (0.0815)	-0.6685 (0.0757)	-0.3818 (0.1157)	-0.0561 (0.0091)	-0.0779 (0.0114)	-0.0365 (0.0128)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	142,995	59,858	83,137	142,995	59,858	83,137
Dep. Var. Mean	8.9040	8.9099	8.8998	0.6807	0.6636	0.6930

Notes: Utilizing the OLS model, this table presents the effect of terrorism on educational outcomes. In the model, only the terrorist attacks on educational institutions are considered independent variables. Terrorist attacks are used after taking an average of a hundred thousand people at the district level. The outcome variables are measured for every individual during their school age. Columns 1-3 represent the attained years of education, while columns 4-6 contain the dummy variable if an individual has completed grade 5. The unit of the outcome variable is individual, and the terrorist attacks were measured at the district level. In this table, we use the 2020 PSLM survey and count the terrorist attacks for every individual who they exposed during their schooling age. This counting enables us to use the data as a panel, and we use the fixed effect as the birth-year fixed effect. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of year-fixed effects and area-fixed effects, accounting for the province and district-specific fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

Table A10

Impact of Bin Laden's Death on Education, Reduced Form.

Dependent Variable	Years of Education			Primary Education Completion		
	Full Sample (1)	Girls (2)	Boys (3)	Full Sample (4)	Girls (5)	Boys (6)
Bin Laden's Death	-0.2910 (0.1123)	-0.5021 (0.1381)	-0.0561 (0.1169)	-0.0362 (0.0126)	-0.0553 (0.0187)	-0.0138 (0.0122)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	178,089	74,154	103,935	178,089	74,154	103,935
Dep. Var. Mean	8.9697	8.9789	8.9631	0.6857	0.6707	0.6964

Notes: Utilizing the reduced form for 'Bin Laden's Death', this table represents the direct effect of his death on educational outcomes. The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011, when the US Navy killed Bin Laden; otherwise, it takes the value of 0. The outcome variables are measured for every individual during their school age. Columns 1-3 represent the attained years of education, while columns 4-6 contain the dummy variable if an individual has completed grade 5. The unit of the outcome variable is individual, and the unit of the independent variable is measured at the province level. In this table, we use the 2020 PSLM survey. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of birth-year effects and area-fixed effects, accounting for the province and district-specific fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

Table A11

Impact of Terrorism on Schooling and Vulnerability, OLS.

Dependent Variable	Enrollment			Drop-out			Child Labor			Child Marriage		
	Full Sample (1)	Girls (2)	Boys (3)	Full Sample (4)	Girls (5)	Boys (6)	Full Sample (7)	Girls (8)	Boys (9)	Full Sample (10)	Girls (11)	Boys (12)
	Attacks on Education	-0.0835 (0.0583)	-0.1997 (0.0968)	0.0285 (0.0383)	0.0981 (0.0340)	0.1594 (0.0425)	0.0472 (0.0290)	-0.0141 (0.0419)	0.0359 (0.0390)	-0.0557 (0.0509)	-0.0146 (0.0074)	-0.0358 (0.0139)

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Table A11 (continued)

Dependent Variable	Enrollment			Drop-out			Child Labor			Child Marriage		
	Full Sample	Girls	Boys	Full Sample	Girls	Boys	Full Sample	Girls	Boys	Full Sample	Girls	Boys
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	703,366	299,535	403,831	908,585	422,080	486,505	524,758	241,719	283,039	908,585	422,080	486,505
Dep. Var. Mean	0.7764	0.7368	0.8057	0.0988	0.0985	0.0991	0.1256	0.0538	0.1868	0.0117	0.0208	0.0038

Notes: Utilizing the OLS model, this table presents the effect of terrorism on educational outcomes. In the model, only the terrorist attacks on educational institutions are considered independent variables. Terrorist attacks are used after taking an average of a hundred thousand people at the district level. The outcome variables are measured for every individual during their schooling years. Columns 1-3 delineate the status of current enrollment in school, while columns 4-6 represent the drop-out of children from schools during their schooling age, and columns 7-9 represent the child labor between the ages of 5 and 18, and columns 10-12 show the child marriages. The unit of the outcome variable is individual, and the terrorist attacks were measured at the district level. The data on outcome variables is taken from 5 nationally representative surveys of PSLM that consist of ten years from 2006 to 2020, with some missing years. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of year-fixed effects and area-fixed effects, accounting for the province and district-specific fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

Table A12

Impact of Bin Laden's Death on Schooling and Vulnerability, Reduced Form.

Dependent Variable	Enrollment			Drop-out			Child Labor			Child Marriage		
	Full Sample	Girls	Boys	Full Sample	Girls	Boys	Full Sample	Girls	Boys	Full Sample	Girls	Boys
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Bin Laden's Death	-0.1494 (0.0104)	-0.1902 (0.0151)	-0.1173 (0.0073)	0.1019 (0.0042)	0.0994 (0.0055)	0.1040 (0.0041)	0.0401 (0.0071)	0.0121 (0.0064)	0.0627 (0.0096)	0.0144 (0.0018)	0.0264 (0.0034)	0.0048 (0.0005)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	857,725	366,146	491,577	110,0452	510,770	589,680	648,986	298,845	350,141	1,100,452	510,770	589,680
Dep. Var. Mean	0.7704	0.7280	0.8021	0.0995	0.0986	0.1002	0.1238	0.0515	0.1855	0.0124	0.0221	0.0040

Notes: Utilizing the reduced form for 'Bin Laden's Death', this table represents the direct effect of his death on educational outcomes. The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011, when the US Navy killed Bin Laden; otherwise, it takes the value of 0. The outcome variables are measured for every individual during their schooling years. Columns 1-3 delineate the status of current enrollment in school, while columns 4-6 represent the drop-out of children from schools during their schooling age, and columns 7-9 represent the child labor between the ages of 5 and 18. Finally, columns 10-12 use the child marriages. The unit of the outcome variable is individual, and the death of Bin Laden is measured at the province level, considering the treatment region. The data on outcome variables is taken from 5 nationally representative surveys of PSLM that consist of ten years from 2006 to 2020, with some missing years. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of year-fixed effects and area-fixed effects, accounting for the province and district-specific fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

Table A13

Impact of Terrorism on Education, Red Mosque Siege.

Dependent Variable	Years of Education			Primary Education Completion		
	Full Sample	Girls	Boys	Full Sample	Girls	Boys
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Instrumental Variable Estimation</i>						
Attacks on Education	-0.4120 (0.1689)	-1.0290 (0.2301)	0.1815 (0.2227)	-0.0568 (0.0203)	-0.1071 (0.0284)	-0.0048 (0.0232)
<i>Panel B. Dependent Variable: Attacks on Education</i>						
Red Mosque Siege	0.5370 (0.1228)	0.5185 (0.1181)	0.5579 (0.1282)	0.5370 (0.1228)	0.5185 (0.1181)	0.5579 (0.1282)
F-statistics	15.0753	10.5451	17.6469	15.0753	10.5451	17.6469
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	145,486	59,214	86,272	145,486	59,214	86,272
Dep. Var. Mean	9.0892	9.0919	9.0873	0.7035	0.6856	0.7158

Notes: Utilizing the instrumental variables 'Red Mosque Siege', this table represents the effect of terrorism on attained years of education and completion of grade 5 during the schooling age between 5-18. The variable 'Red Mosque Siege' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2007; otherwise, it takes the value of 0. The independent variable in this model is the average number of terrorist attacks on education per hundred thousand people per district. The outcome variables are measured for every individual during their schooling years. Columns 1-3 represent the attained years of education, while columns 4-6 contain the dummy variable if an individual has completed grade 5. Panel A of the table represents the result of instrumental variable estimation, and Panel B represents the first stage regression where the outcome variable is the average number of attacks per hundred thousand people per district. The unit of the

outcome variable is individual, and the unit of the terrorist is measured at the district level. In this table, we use the 2020 PSLM survey and count the terrorist attacks for every individual who they exposed during their schooling age. This counting enables us to use the data as a panel, and we use the fixed effect as the birth-year fixed effect. The data on terrorist attacks on educational institutions was sourced from GTD. The census data on the population for every district has been taken from the PBS. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of birth-year effects and area-fixed effects, accounting for the province and district-specific fixed effects. The F-statistic is the Kleibergen-Paap rk Wald F statistic. Standard errors, shown in parentheses, are clustered at the district level.

Table A14

Impact of Terrorism on Schooling and Vulnerability, Red Mosque Siege.

Dependent Variable	Enrollment			Drop-out			Child Labor			Child Marriage		
	Full Sample	Girls	Boys	Full Sample	Girls	Boys	Full Sample	Girls	Boys	Full Sample	Girls	Boys
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Panel A: Instrumental Variable Estimation</i>												
Attacks on Education	-8.9074 (2.0940)	-10.137 (2.4118)	-8.0334 (1.9350)	6.7244 (1.4873)	6.1394 (1.3727)	7.0545 (1.6108)	2.1422 (0.9326)	-0.1181 (0.7021)	4.0768 (1.3604)	1.1567 (0.2772)	2.3242 (0.5664)	0.1956 (0.0743)
<i>Panel B: Dependent Variable: Attacks on Education</i>												
Red Mosque Siege	0.0140 (0.0032)	0.0141 (0.0033)	0.0139 (0.0032)	0.0140 (0.0032)	0.0141 (0.0033)	0.0139 (0.0032)	0.0140 (0.0032)	0.0141 (0.0033)	0.0139 (0.0032)	0.0140 (0.0032)	0.0141 (0.0033)	0.0139 (0.0032)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	703,366	299,535	403,831	908,585	422,080	486,505	524,758	241,719	283,039	908,585	422,080	486,505
Dep. Var. Mean	0.7764	0.7368	0.8057	0.0988	0.0985	0.0991	0.1256	0.0538	0.1868	0.0117	0.0208	0.0038
F-statistics	18.3670	16.5472	19.3706	18.7719	18.4303	19.0393	16.1232	16.0206	16.0544	18.7729	18.4303	19.0393

Notes: Utilizing the instrumental variable 'Red Mosque Siege', this table represents the effect of terrorist attacks on educational outcomes. The variable 'Red Mosque Siege' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2007; otherwise, it takes the value of 0. The independent variable in this model is the average number of terrorist attacks on education per hundred thousand people per district. The outcome variables are measured for every individual during their schooling years. Columns 1-3 delineate the status of current enrollment in school, while columns 4-6 represent the drop-out of children from schools during their schooling age, and columns 7-9 represent the child labor between the ages of 5 and 18, and columns 10-12 show the child marriages. Panel A of the table represents the result of instrumental variable estimation, and Panel B represents the first stage regression, where the outcome variable is the average number of attacks per hundred thousand people per district. The unit of the outcome variable is individual, and the unit of the terrorist is measured at the district level. The data on outcome variables is taken from 5 nationally representative surveys of PSLM that consist of ten years from 2006 to 2020, with some missing years. The data on terrorist attacks on educational institutions was sourced from GTD. The census data on the population for every district has been taken from the PBS. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of year-fixed effects and area-fixed effects, accounting for the province and district-specific fixed effects. The F-statistic is the Kleibergen-Paap rk Wald F statistic. Standard errors, shown in parentheses, are clustered at the district level.

Table A15

Impact of Red Mosque Siege on Education, Reduced Form.

Dependent Variable	Years of Education			Primary Education Completion		
	Full Sample (1)	Girls (2)	Boys (3)	Full Sample (4)	Girls (5)	Boys (6)
Red Mosque Siege	-0.1557 (0.0943)	-0.3999 (0.1462)	0.1282 (0.0863)	-0.0213 (0.0113)	-0.0414 (0.0190)	0.0048 (0.0105)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	178,618	72,213	106,405	178,618	72,213	106,405
Dep. Var. Mean	9.2188	9.2372	9.2063	0.7169	0.7028	0.7264

Notes: Utilizing the reduced form for 'Red Mosque Siege', this table represents the direct effect of the siege on educational outcomes. The variable 'Red Mosque Siege' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2007; otherwise, it takes the value of 0. The outcome variables are measured for every individual during their schooling years. Column 1 represents the attained years of education, while column 2 contains the dummy variable if an individual has completed grade 5. The unit of the outcome variable is individual, and the unit of the independent variable is measured at the province level. In this table, we use the 2020 PSLM survey. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of birth-year effects and area-fixed effects, accounting for the province and district-specific fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

Table A16

Impact of Red Mosque Siege on Schooling and Vulnerability, Reduced Form.

Dependent Variable	Enrollment			Drop-out			Child Labor			Child Marriage		
	Full Sample	Girls	Boys	Full Sample	Girls	Boys	Full Sample	Girls	Boys	Full Sample	Girls	Boys
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Red Mosque Siege	-0.1298 (0.0087)	-0.1573 (0.0148)	-0.1118 (0.0068)	0.0910 (0.0039)	0.0847 (0.0048)	0.0957 (0.0044)	0.0316 (0.0100)	-0.0001 (0.0084)	0.0574 (0.0138)	0.0134 (0.0022)	0.0275 (0.0041)	0.0025 (0.0010)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	857,725	366,146	491,577	1100452	510,770	589,680	648,986	298,845	350,141	1100452	510,770	589,680
Dep. Var. Mean	0.7704	0.7280	0.8021	0.0995	0.0986	0.1002	0.1238	0.0515	0.1855	0.0124	0.0221	0.0040

Notes: Utilizing the reduced form for 'Red Mosque Siege', this table represents the direct effect of the siege on educational outcomes. The variable 'Red Mosque Siege' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2007; otherwise, it takes the value of 0. The outcome variables are measured for every individual during their schooling age. Columns 1-3 delineate the status of current enrollment in school, while columns 4-6 represent the drop-out of children from schools during their schooling age, and columns 7-9 represent the child labor between the ages of 5 and 18, and columns 10-12 show the child marriages. The unit of the outcome variable is individual, and the siege of the mosque is measured at the province level, considering the treatment region. The data on outcome variables is taken from 5 nationally representative surveys of PSLM that consist of ten years from 2006 to 2020, with some missing years. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. In the regression model, time-fixed effects consist of year-fixed effects and area-fixed effects, accounting for the province and district-specific fixed effects. Standard errors, shown in parentheses, are clustered at the district level.

Table A17

Impact of Terrorism on Education, Additional Controls.

Dependent Variable	Years of Education			Primary Education Completion		
	Full Sample (1)	Girls (2)	Boys (3)	Full Sample (4)	Girls (5)	Boys (6)
<i>Panel A: Instrumental Variable Estimation</i>						
Attacks on Education	-0.3883 (0.1413)	-0.8556 (0.1743)	0.1110 (0.1891)	-0.0484 (0.0194)	-0.0868 (0.0279)	-0.0056 (0.0186)
<i>Panel B: Dependent Variable: Attacks on Education</i>						
Bin Laden's Death	0.6266 (0.1544)	0.6151 (0.1524)	0.6393 (0.1569)	0.6266 (0.1544)	0.6151 (0.1524)	0.6393 (0.1569)
F-statistics	14.1081	10.8049	16.4735	14.1081	10.8049	16.4735
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	104,990	43,852	61,138	104,990	43,852	61,138
Dep. Var. Mean	9.2546	9.2822	9.2348	0.7182	0.7031	0.7291

Notes: This table utilizes the instrumental variable 'Death of Bin Laden' to assess the impact of terrorist attacks on educational attainment, specifically the number of years of education completed and the rate of grade 5 completion among individuals aged 5 to 18 during their schooling years. The analysis is based on the 2020 PSLM survey, in which we count the number of terrorist attacks that each individual experienced during their schooling years. This counting allows us to treat the data as a panel, incorporating time fixed effects as well as birth-year fixed effects, along with province and district fixed effects. Panel A of the table presents the results of the instrumental variable estimation, while Panel B displays the first stage regression, where the outcome variable is the average number of attacks per hundred thousand people. The control variables include all relevant covariates: age, gender, area (urban/rural), household income, parents' education, and an index of household assets. Standard errors, which are displayed in parentheses, are clustered at the district level.

Table A18

Impact of the Death of Osama bin Laden on Terrorist Attack.

Dependent Variable	Total Attacks (1)	Attacks on Education (2)	Total Attacks (3)	Attacks on Education (4)
<i>Panel A. High Socioeconomic Areas</i>				
<i>High Income Areas</i>				
Bin Laden's Death	0.3132 (0.1545)	0.0309 (0.0093)	0.2157 (0.1094)	0.0200 (0.0068)
R-Squared	0.1599	0.0583	0.1573	0.0518
Observations	198,291	198,291	207,974	207,974
<i>Panel B. Low Socioeconomic Areas</i>				
<i>Low Income Areas</i>				
Bin Laden's Death	0.0005 (0.0316)	0.0026 (0.0027)	0.1924 (0.0491)	0.0081 (0.0025)
R-Squared	0.1490	0.0278	0.1492	0.0336
Observations	202,501	202,501	211,342	211,342
Time Fixed Effects	Yes	Yes	Yes	Yes

(continued on next page)

Table A18 (continued)

Dependent Variable	Total Attacks (1)	Attacks on Education (2)	Total Attacks (3)	Attacks on Education (4)
Area Fixed Effects	Yes	Yes	Yes	Yes
Dep. Var. Mean	0.0414	0.0018	0.0517	0.0025

Notes: The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the period is post-July 2011 when the US Navy killed Bin Laden; otherwise, it takes the value of 0. High-income areas are identified by the index of socioeconomic characteristics and nighttime light data provided by the KP Board of Statistics. Similarly, the higher education areas are identified by the number of children in schools. The unit of data is monthly at the tehsil level, which is the lowest administrative boundary in Pakistan. In the regression model, time-fixed effects consist of both month year-fixed effects, and area-fixed effects account for province, district, and tehsil-specific fixed effects. Standard errors, shown in parentheses, are clustered at the tehsil level.

Table A19

Impact of the Death of Osama bin Laden on Terrorist Attack.

Dependent Variable	Number of Attacks						Human and Economic Damages		
	Total (1)	Education (2)	Government (3)	Law Enforcement (4)	Citizen (5)	Non-State Actors (6)	Deaths (7)	Injuries (8)	Properties Damage (9)
<i>Panel A. High Income Areas</i>									
Bin Laden's Death	0.3132 (0.1545)	0.0309 (0.0093)	0.0020 (0.0010)	0.1024 (0.0530)	0.0533 (0.0274)	0.0087 (0.0052)	0.3095 (0.2030)	0.5120 (0.3490)	0.1291 (0.0580)
R-Squared	0.1599	0.0583	0.0327	0.1308	0.0997	0.0364	0.1044	0.0877	0.1319
Observations	198,291	198,291	198,291	198,291	198,291	198,291	198,291	198,291	198,291
<i>Panel B. Low Income Areas</i>									
Bin Laden's Death	0.0005 (0.0316)	0.0026 (0.0027)	0.0001 (0.0003)	-0.0043 (0.0099)	0.0015 (0.0065)	0.0082 (0.0031)	0.0056 (0.0440)	-0.0395 (0.0767)	0.0010 (0.0120)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.1490	0.0278	0.0291	0.1241	0.0944	0.0204	0.1065	0.0789	0.1192
Observations	202,501	202,501	202,501	202,501	202,501	202,501	202,501	202,501	202,501
Dep. Var. Mean	0.0414	0.0018	0.0003	0.0113	0.0114	0.0006	0.0740	0.1406	0.0226

Notes: The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011 when the US Navy killed Bin Laden; otherwise, it takes the value of 0. Panel A consists of the districts that have high per capita GDP, and Panel B consists of the low-GDP districts. The Columns (1-6) present the average number of monthly attacks per tehsil per hundred thousand people, while columns (7-9) depict the average number of monthly deaths, injuries, and property damages per tehsil per hundred thousand people, following the death of Bin Laden. The analysis covers the period from 1970 to the year 2020. The unit of data is monthly at the tehsil level, which is the lowest administrative boundary in Pakistan. In the regression model, time-fixed effects consist of both month year-fixed effects, and area-fixed effects account for province, district, and tehsil-specific fixed effects. Standard errors, shown in parentheses, are clustered at the tehsil level.

Table A20

Impact of the Death of Osama bin Laden on Terrorist Attack.

Dependent Variable	Number of Attacks						Human and Economic Damages		
	Total (1)	Education (2)	Government (3)	Law Enforcement (4)	Citizen (5)	Non-State Actors (6)	Deaths (7)	Injuries (8)	Properties Damage (9)
<i>Panel A. High Education Areas</i>									
Bin Laden's Death	0.2157 (0.1094)	0.0200 (0.0068)	0.0012 (0.0007)	0.0706 (0.0375)	0.0355 (0.0194)	0.0102 (0.0037)	0.2176 (0.1439)	0.3231 (0.2479)	0.0848 (0.0412)
R-Squared	0.1573	0.0518	0.0323	0.1277	0.0983	0.0329	0.0995	0.0861	0.1299
Observations	207,974	207,974	207,974	207,974	207,974	207,974	207,974	207,974	207,974
<i>Panel B. Low Education Areas</i>									
Bin Laden's Death	0.1924 (0.0491)	0.0081 (0.0025)	0.0007 (0.0004)	0.0664 (0.0175)	0.0329 (0.0092)	0.0164 (0.0044)	0.2556 (0.0687)	0.3272 (0.1250)	0.0559 (0.0155)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.1492	0.0336	0.0270	0.1198	0.0939	0.0304	0.0955	0.0743	0.1189
Observations	211,342	211,342	211,342	211,342	211,342	211,342	211,342	211,342	211,342
Dep. Var. Mean	0.0517	0.0025	0.0004	0.0146	0.0137	0.0011	0.0897	0.1597	0.0256

Notes: The variable 'Bin Laden's Death' is a treatment dummy that takes the value of 1 if the province is KP and the time period is post-July 2011 when the US Navy killed Bin Laden; otherwise, it takes the value of 0. Panel A consists of the districts that have high education, and Panel B consists of the low education districts. The Columns (1-6) present the average number of monthly attacks per tehsil per hundred thousand people, while columns (7-9) depict the average number of monthly deaths, injuries, and property damages per tehsil per hundred thousand people, following the death of Bin Laden. The analysis covers the period from 1970 to the year 2020. The unit of data is monthly at the tehsil level, which is the lowest administrative boundary in Pakistan. In the regression model, time-fixed effects consist of both month year-fixed effects, and area-fixed effects account for province, district, and tehsil-specific fixed effects. Standard errors, shown in parentheses, are clustered at the tehsil level.

Table A21

Impact of Terrorism on Education by Parents' Education.

Dependent Variable	Years of Education		Primary Education Completion	
	High Education (1)	Low Education (2)	High Education (3)	Low Education (4)
<i>Panel A. Instrumental Variable Estimation (Parent's Education)</i>				
Attacks on Education	-0.4746 (0.1438)	-0.0575 (0.1797)	-0.0383 (0.0185)	-0.0318 (0.0280)
Observations	57,376	47,614	57,376	47,614
<i>Panel B. Instrumental Variable Estimation (Father's Education)</i>				
Attacks on Education	-0.3490 (0.1502)	-0.0183 (0.1603)	-0.0285 (0.0199)	-0.0184 (0.0243)
Observations	54,450	50,540	54,450	50,540
<i>Panel C. Instrumental Variable Estimation (Mother's Education)</i>				
Attacks on Education	-0.3711 (0.1675)	-0.2700 (0.5213)	-0.0261 (0.0142)	-0.0580 (0.0649)
Observations	35,376	22,097	35,376	22,097
<i>Panel D. Dependent Variable: Attacks on Education</i>				
Bin Laden's Death	0.5938 (0.1557)	0.6072 (0.1638)	0.5938 (0.1557)	0.6072 (0.1638)
Controls	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	57,376	47,614	57,376	47,614
Dep. Var. Mean	10.7988	7.3938	0.8816	0.5215
F-statistics	14.5439	13.7359	14.5439	13.7359

Notes: Utilizing the instrumental variables 'Death of Bin Laden', this table represents the repercussions of attacks on attained years of education and completion of grade 5 during the schooling age between 5-18. In the delineation of education cohorts, our classification scheme identifies two categories. Firstly, the below median parental education group comprises individuals whose parental educational attainment falls below the matriculation threshold. Second, the above median education group encompasses individuals whose parental education surpasses the matriculation. In this table, we use the 2020 PSLM survey and count the terrorist attacks for every individual who they exposed during their schooling age. This counting enables us to use the data as a panel, and we use time fixed effects as a birth-year fixed effect. We also use the province and district fixed effects. Panel A of the table represents the result of instrumental variable estimation using the median cutoff on parents' education, Panel B uses the median cutoff for father's education, Panel C uses the median cutoff of mother's education, and Panel D represents the first stage regression where the outcome variable is the average number of attacks per hundred thousand people. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. The F-statistic is the Kleibergen-Paap rk Wald F statistic. Standard errors, enclosed in parentheses, are clustered at the district level.

Table A22

Impact of Terrorism on Education by Household Income.

Dependent Variable	Years of Education		Primary Education Completion	
	High Income (1)	Low Income (2)	High Income (3)	Low Income (4)
<i>Panel A. Instrumental Variable Estimation</i>				
Attacks on Education	-0.5811 (0.1744)	-0.1633 (0.1698)	-0.0456 (0.0212)	-0.0600 (0.0179)
<i>Panel B. Dependent Variable: Attacks on Education</i>				
Bin Laden's Death	0.6630 (0.1767)	0.5705 (0.1364)	0.6630 (0.1767)	0.5705 (0.1364)
Controls	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	71,580	71,512	71,580	71,512
Dep. Var. Mean	9.6431	8.1639	0.7498	0.6115
F-statistics	14.0706	17.4851	14.0706	17.4851

Notes: Utilizing the instrumental variables 'Death of Bin Laden', this table represents the repercussions of attacks on attained years of education and completion of grade 5 during the schooling age between 5-18. In classifying income groups, we delineate two categories: the below-median, comprising households with a monthly income up to PKR 24500, and the above-median group, which includes those with monthly earnings exceeding PKR 24500. In this table, we use the 2020 PSLM survey and count the terrorist attacks for every individual who they exposed during their schooling age. This counting enables us to use the data as a panel, and we use time fixed effects as a birth-year fixed effect. We also use the province and district fixed effects. Panel A of the table represents the result of instrumental variable estimation, and Panel B represents the first stage regression where the outcome variable is the average number of attacks per hundred thousand people. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. The F-statistic is the Kleibergen-Paap rk Wald F statistic. Standard errors, enclosed in parentheses, are clustered at the district level.

Table A23

Impact of Terrorism on Education by Industry Classification.

Dependent Variable	Years of Education			Primary Education Completion		
	Agricultural (1)	Manufacturing (2)	Services (3)	Agricultural (4)	Manufacturing (5)	Services (6)
<i>Panel A. Instrumental Variable Estimation</i>						
Attacks on Education	-0.5578 (0.3584)	-0.5399 (0.2252)	-0.4003 (0.1871)	-0.0618 (0.0536)	-0.0944 (0.0297)	-0.0355 (0.0216)
<i>Panel B. Dependent Variable: Attacks on Education</i>						
Bin Laden's Death	0.5255 (0.1122)	0.6129 (0.1451)	0.6841 (0.1668)	0.5255 (0.1122)	0.6129 (0.1451)	0.6841 (0.1668)
F-statistics	17.0414	13.2466	14.6008	17.0414	13.2466	14.6008
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Birth Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,367	28,771	54,502	30,367	28,771	54,502
Dep. Var. Mean	8.1424	8.2433	9.3804	0.6020	0.6273	0.7247

Notes: Utilizing the instrumental variables 'Death of Bin Laden', this table represents the repercussions of attacks on attained years of education and completion of grade 5 during the schooling age between 5-18. In this table, we use the 2020 PSLM survey and count the terrorist attacks for every individual who they exposed during their schooling age. This counting enables us to use the data as a panel, and we use time fixed effects as a birth-year fixed effect. We also use the province and district fixed effects. Panel A of the table represents the result of instrumental variable estimation, and Panel B represents the first stage regression where the outcome variable is the average number of attacks per hundred thousand people. The control variables include all potential covariates, including age, gender, area (urban/rural), financial capacity of households, and the index of household assets. The F-statistic is the Kleibergen-Paap rk Wald F statistic. Standard errors, enclosed in parentheses, are clustered at the district level.

Data availability

Data will be made available on request.

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