

UKRAINE

HOUSEHOLD SURVEY OF EFFECTS OF ATTACKS ON ENERGY INFRASTRUCTURE (2022-2025)

2026

(Data from September – October 2025)

Kobo IJET rating group

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INTRODUCTION

The full-scale Russian invasion of Ukraine, on February 24, 2022, produced widespread humanitarian consequences, including civilian casualties, forced displacement, and the violation of fundamental human rights. The United Nations (UN) documented thousands of civilian casualties, with a significant increase in 2024 and 2025 due to intensified clashes and widespread use of aerial bombs.[1] The conflict displaced more than 17 million civilians internally and forced millions more to seek refuge in neighboring countries. Violence and destruction also prevented civilians from accessing basic services, such as healthcare and education.[2] The invasion followed eight years of conflict in eastern Ukraine marked by the annexation of Crimea in 2014.[3]

Throughout the conflict, Russian forces have conducted large-scale, coordinated attacks on Ukraine's energy infrastructure, leading to widespread blackouts.[4] These attacks, involving missiles, shelling, and drones, have damaged power plants, transformer substations, and transmission lines across the country. Between March and August 2024, the UN documented 36 attacks by Russian forces on power generation facilities across the country, as well as over 100 strikes on energy distribution and transmission facilities.[5] Russian forces also occupied the Zaporizhzhia nuclear plant and several thermal power plants.[6] Although the entire country has been affected, most reported damage to energy facilities since the invasion have concentrated in eastern or southern Ukraine where Russia strategic, geographic, economic, and historical interest (i.e., Dnipro, Donetsk, Mykolaiv, Kharkiv, Kherson, Kyiv, Zaporizhzhia, Chernihiv, Odesa and Sumy.)[7]

This report will focus on understanding the civilian impacts resulting from attacks on energy infrastructure in Ukraine. The goal is to inform the government and humanitarian organizations as they develop responses to mitigate the fallout from these strikes. Although bombings of the energy grid have been documented by the UN, human rights organizations, and the media, the reverberating effects of these attacks on civilians' livelihoods, health, and education have not been fully explored. These documentations have not systematically consulted the population to assess impact. Since civilians are the ones best placed to relay the impacts of blackouts and describe their experiences during power outages, this report shares results from a large-scale survey with 3,950 Ukrainians. This study combines a national random digital dialing phone population survey with an in-person survey of randomly selected residents in five targeted cities. The randomly selected adults shared their experiences of conflict and power outages, including any effects for their household on health, psychological wellbeing, education, and earnings, as well as how the household coped with outages if present.

At the time of writing, Russia has intensified its winter offensive against Ukraine's energy grid, which has led to a catastrophic degradation of electricity and heat supply in early 2026. The attacks have left millions of civilians without heating, water, and electricity during life-threatening sub-zero temperatures.[8]

CONTEXT

After the full-scale Russian invasion in February 2022 and combat in the north of the country, including around the capital, Kyiv, the war has been characterized by a stable but contested frontline in eastern and southern Ukraine for much of 2024 and 2025. Russia controls approximately one-fifth of Ukraine's internationally recognized territory, which began with the annexation of Crimea in the south and occupation of part of Donetsk and Luhansk regions in 2014. Aside from the military targets along the front line, Russia has launched a multitude of long-range missile and drone strikes into Ukrainian territory, including strikes on civilians and civilian infrastructure, such as schools, hospitals, and the energy grid.[9] In 2024, Ukraine launched an incursion into the Kursk region of Russia, and the following year led a drone campaign against oil refineries inside Russia.[10]

Russian attacks have extensively damaged Ukrainian energy infrastructure, with the first barrage of coordinated missile and drone strikes in October 2022. In the years since, strikes have generally intensified in the months leading up to and during winter, when temperatures often drop below freezing.[11] March through August 2024 was an exception, however, when strikes on more than one hundred power generation, distribution, and transmission facilities were carried out across 20 regions.[12] Although the entire country has been affected, the greatest damage to energy infrastructure has generally been reported in the eastern and southern regions of Ukraine, as well as Kyiv.[13]

ELECTRICITY INFRASTRUCTURE IN UKRAINE

Electricity infrastructure is the facilities, equipment, and services needed to move electrical energy from the point of generation (fossil fuel, nuclear, or wind power plants) to the end user. This infrastructure includes power plants, substations, transmission towers and lines, and transformers for the transmission (high-voltage) and distribution (low-voltage) of energy.[14] In other words, "Electricity infrastructure…is made up of power generation that travels long distances over transmission and distribution to demand centers, such as cities, buildings, and industries, for electrical use. The infrastructure that moves generated power along these points is collectively known as 'the grid.'"[15]

The networked nature of energy transmission, and its interdependence with other civilian infrastructure and services, means that damage may produce ripple effects beyond the energy grid. For instance, damage to a power plant may produce blackouts in relatively far-away hospitals or schools; it may also affect the distribution of heat and water, if pumps and other components require electricity to run.[16]

Electricity in Ukraine comes from nuclear, coal, natural gas, hydro, and renewable sources. The first three account for around three-quarters of the country's electricity production.[17] High-voltage transmission lines carry energy throughout the country, while around 100 substations convert the high-kilovolt current flowing from power stations into lower voltages for regional distribution.[18]

Before the invasion, Ukraine had a dispatchable energy capacity of 38 gigawatts, or sufficient for the country's energy needs and to export. However, by the 2024-2025 winter, capacity had declined to around 12 gigawatts due to grid and powerplant damage and occupation. This level was lower than household and industry needs, placing Ukraine in an energy deficit, which the government addressed with planned power outages and the import of electricity from Europe.[19]

Already planned a half decade earlier, Ukraine switched from its connection to the Russian and Belarusian energy grid to synchronization with the European grid in the months following the invasion. This switch allowed for greater import and export of electricity from Western Europe. However, energy import is capped at around two gigawatts, in part for technical reasons, with efforts underway to increase the limit.[20]

Electricity infrastructure is also intertwined with heating in much of Ukraine. Although many of the large centralized district heating systems–which heat over one-third of homes in the country–are fueled by natural gas, they still require electricity to power auxiliary components, such as pumps to pipe hot water to homes, ignition systems, and fans. Moreover, around one-third of Ukraine's heat supply comes from combined heat and power plants.[21]

ATTACKS ON THE ENERGY GRID

Before February 2022, slightly more than half of Ukraine's electricity came from nuclear power, drawn from four nuclear plants. However, Russian forces occupied the largest plant, Zaporizhzhia, in March 2022, reducing nuclear energy production by around half.[22]

All of Ukraine's thermal and hydroelectric power plants have been damaged or occupied, significantly reducing their production capacity. For instance, the destruction of the Kakhovka Dam in June 2023 meant the loss of hundreds of megawatts of hydro power for the region. Some plants required only days or weeks to repair, while others were fully destroyed. Renewable energy sources also sustained significant damage due to the war.[23]

Around half of the country's high-voltage substations have been damaged in bombings, some of them multiple times. These are particularly slow to repair, since Ukraine runs higher voltage transformers than Europe, so replacement parts are harder to come by and manufacturing them is time-consuming.[24]

The first barrage of coordinated missile and drone strikes on Ukraine's energy infrastructure occurred in October 2022. The government implemented controlled blackouts to prevent grid failure. In total, electricity outages affected 12 million people during the 2022-2023 winter season, affecting heat, water, and internet access.[25]

Attacks continued during the 2022-2023 winter season, although controlled blackouts were not extensively implemented, due to the government's maintenance and repair efforts and the import of electricity from Europe.[26]

Between March and August 2024, the UN documented 36 attacks by Russian forces on power generation facilities across the country, as well as over 100 strikes on energy distribution and transmission facilities. The resulting power outages–at times lasting 12 or more hours–left millions of civilians without electricity.[27]

In 2024 and early 2025, Russian forces carried out attacks on thermal power and hydroelectric plants and renewable energy facilities, with Ivano-Frankivsk, Kharkiv, Kyiv, and Lviv regions particularly impacted. The Ukrainian government implemented rolling outages from mid-November 2024 through late January 2025 as a preventative measure against complete power grid failure.[28]

In late October 2025, 650 drones and more than 50 missiles were reportedly deployed in one night targeting Ukrainian energy infrastructure, making it one of the largest attacks on the power grid since the war began. Several people were reportedly killed in the strikes, and multiple cities, including parts of Kyiv, were without power for eight or more hours.[29] Large-scale missile and drone attacks on the energy grid continued in November and December 2025, affecting multiple regions and leading to power cuts up to 18 hours as temperatures dropped below freezing.[30]

In response to these attacks, the Ukrainian government increased defense of the power grid, and UkrEnergo, the national-grid operator, carried out around-the-clock maintenance and repairs. The production of decentralized, renewable energy, such as solar, has also been increased, alongside the import of energy from Europe. The government also implemented emergency shutdowns and controlled outages as needed to balance the power system and carry out repairs. Rolling blackouts often lasted between four and eight hours.[31] Finally, donor governments provided equipment and technical assistance to repair damaged plants and infrastructure.[32]

The government has constructed thousands of "invincibility centers," or spaces that provide heating, electricity, and first aid.[33] International humanitarian organizations and local civil society groups have also

distributed generators, often prioritizing hospitals and schools, so that healthcare and education can continue despite blackouts.[34] Informal mutual aid groups have also sprung up, with neighbors offering their gas cookers, generators, or charging stations to one another.[35]

IMPACTS OF ATTACKS

Attacks on energy infrastructure severely impact civilians. In addition to the killings and injuries of energy workers, prolonged power outages put households at risk of botulism and salmonella from a lack of refrigeration or thorough cooking, as well as waterborne illnesses from untreated drinking water.[36] Cuts to heating due to blackouts elevate the risk of hypothermia during winter and exacerbate chronic illnesses, such as heart disease and respiratory illnesses.[37] Attacks on the energy grid also put livelihoods at risk, since businesses and many jobs depend on electricity.[38] In particular, the healthcare, education, and water and sanitation sectors in Ukraine have been impacted by attacks on the energy grid.

The destruction of electrical infrastructure produced grave consequences for the healthcare sector. Hospitals and other medical facilities rely heavily on stable electricity for lighting, operating essential medical equipment such as ventilators, and maintaining the cold chain for vaccines and medicines. Power outages in Ukraine have forced surgeons to operate by flashlight, interrupted or delayed critical surgeries, and led to failures in life support systems. In one human rights report, 92% of surveyed Ukrainian healthcare workers experienced power outages at their facility due to attacks on energy infrastructure, and 66% reported that these power outages affected medical procedures.[39]

Disruptions to electricity have also severely impacted the education sector. Schools rely on electricity for heating, lighting, computers, and remote learning platforms. Prolonged power outages interrupted learning since most schools do not have back-up generators, meaning students had to study from home during blackouts. However, remote learning was also impacted by power outages, since teachers and students both required electricity and internet connection for online classes. Students temporarily studying from home, displaced students, and students whose schools were damaged by direct attacks were all likely to have their online learning impacted. Combined, the effects of blackouts have exacerbated learning loss in Ukraine.[40]

Finally, disruptions to electricity have critically affected water and sanitation services. Water pumping stations, treatment plants, and wastewater systems require stable electricity to function. Power outages have led to widespread interruptions in access to safe drinking water and adequate sanitation in Ukraine. The UN has warned that damage to energy infrastructure translates to a lack of access to clean water, heightening the risk of waterborne diseases.[41]

In all cases, the most vulnerable populations have been most at risk. Children, older and disabled persons, and those with chronic illnesses have been differentially impacted by power outages and their consequences. For instance, these groups may be more susceptible to waterborne diseases or more impacted by the cold or prolonged gaps in health services.[42]

THE STUDY

STUDY DESIGN

To document civilians' experiences and harm resulting from power outages, the research team designed a nested random digit dialing phone survey study that includes a nationwide survey with an embedded focused in-person survey in targeted cities. The nationwide phone survey is based on a random digit dialing sample (n=1,450), and an in-person survey in five cities based on a stratified multistage random cluster sampling procedure (n=2,000). For the in-person survey, interviews were conducted with city residents (n=400 each) in Dnipro, Kyiv, Mykolaiv, Odesa, and Kharkiv. The five cities were selected as urban areas affected by aerial bombardment and power outages and based on accessibility, excluding areas under Russian military control.

The nationwide phone survey serves as the broad baseline for understanding trends across the population, while the in-person survey examines more closely the experience of civilians in selected locations which have experienced intense disruptions to the energy grid. This design increases the chance of capturing specific information about harm, while placing that information in the context of broader nationwide trends.

The nationwide phone survey included only multiple-choice questions; the in-person survey included the same questions plus several open-ended questions. The purpose of this design was to capture more qualitative depth and nuance from the in-person interviews.

SAMPLE SIZE AND SAMPLING METHODS

Eligible participants for the surveys were Ukrainian residents 18 years of age or older. For the in-person survey, the target sample size was 400 per city for the city residents based on a sample size for comparing two equally sized groups, assuming a 50% baseline proportion, 90% confidence level, 80% power, a 20% minimum detectable difference, and a design effect of 2 to reflect the complex design compared to a simple random sample, and after increasing the required sample size by 20% to account for non-response. For the nationwide survey, we anticipated comparing results for up to four groups based on demographic characteristics, resulting in a sample of 1,450.

For the nationwide survey, telephone numbers were randomly generated and called, thus providing all individuals with a phone an equal chance of being selected, including those with unlisted numbers. For the cities survey, a random route protocol was used to randomly select households. Within households, respondents were randomly selected using the next birthday method.

SURVEY INSTRUMENT

The research team designed and developed a standardized, semi-structured questionnaire and consent form in English after consultation with key informants and stakeholders. The instrument was then translated into Russian and Ukrainian, and an independent expert review was performed. A small scale pilot survey was implemented to validate the instrument, ensure clarity of language, and necessary amendments were made to create the final version for interviewing study subjects.

The final questionnaire included sections on demographics, living conditions and context, exposure to violence, exposure to power outages, health, access to healthcare, access to food and water, livelihoods, access to education, coping and vulnerability, mental health, and preparedness

Most questions in the instrument asked about the household and its members, including the respondent. However, several demographics and mental health questions were directed to the respondent specifically.

▼ *Figure 1: Sample distribution.*
Nationwide survey



Cities survey



DATA COLLECTION AND ANALYSIS

Interviewers received detailed training on the study methodology, instruments, and data collection protocols in Kyiv (for the nationwide survey) or virtually (for the in-person survey). All survey responses were recorded electronically.

For the nationwide survey, interviews were conducted by phone from a call center over a one-week period in September 2025. These interviews took an average of slightly less than 24 minutes to complete. The response rate was 7.8% which is aligned with expectations for random phone surveys. In total, 1,450 people agreed and participated in the survey.

For the cities survey, interviews were conducted in-person by visiting sampled locations during a 2.5-week period in September and October 2025. These interviews took an average of slightly more than 20 minutes to complete. In total, 5,198 households were approved, and 2,500 accepted to participate in the interview, for a response rate of 48.1%.

After collection, basic descriptive statistics and crosstabulations were produced by region, cities, power outage exposure, and other demographic data. The analyses account for the sampling design and weight factors for the nationwide and in-person survey populations. For the nationwide survey and aggregated cities, results are representative of adults in Ukraine with a margin of error of approximately ±3.6 percentage points at the 95% confidence level, accounting for weighting and clustering. For subgroup estimates, including individual cities and power outage exposure groups, the margin of error is approximately ±6.5 percentage points at the 95% confidence level, assuming a design effect of 2.

ETHICAL REVIEW

This study was approved by TIER Institutional Review Board.[43] In absence of a similar board in Ukraine, the study was reviewed by national experts, including a psychologist, to ensure the protection of human subjects.

LIMITATIONS

This report is based on self-reported survey data, which reflects respondents' perceptions and experiences. As such, the findings document associations between power outages and reported outcomes but do not allow for the establishment of causal relationships. Health, mental health, livelihoods, and education impacts attributed to power outages may also be influenced by other concurrent war-related stressors, including displacement, economic hardship, insecurity, and exposure to violence.

Self-reported data are also subject to recall bias and reporting bias. Respondents may underreport or overreport events or impacts depending on the time elapsed, the salience of recent experiences, or current stress levels. While efforts were made to structure questions clearly and consistently, these limitations are inherent to survey-based research conducted in crisis settings.

The surveys were not designed to assess intent, motive, or legal responsibility for harm, nor to determine whether specific actions constitute violations of International Humanitarian Law. Findings related to power outages and their impacts should therefore not be interpreted as evidence of intentional targeting or legal culpability, but rather as documentation of civilian harm and humanitarian consequences as reported by affected households.

Finally, due to ongoing security constraints, including active hostilities, shelling, and electricity interruptions, data collection in several cities took longer than originally planned. These conditions may have affected the timing and pace of fieldwork, although no systematic differences in responses linked to data collection delays were identified.

RESULTS

WIDESPREAD VIOLENCE AND PERVASIVE POWER OUTAGES

Although 84% of households report at least one form of war-related violence, power outages are even more pervasive, affecting virtually all households (97% nationwide; 99% in cities). One in five households nationwide and more than one in four in major cities experience power outages that are both frequent and prolonged, with the highest exposure in the East and in cities such as Odesa and Kharkiv. These outages are largely attributed to deliberate attacks on energy infrastructure and are closely associated with other forms of violence, highlighting electricity disruption as a pervasive and compounding dimension of the war's impact on households.

Since the full-scale invasion of Ukraine, households across the country have been exposed to very high levels of violence and war-related disruption. More than eight out of ten households report at least one form of direct or indirect exposure to violence (84%), including forced displacement (42%), decreased access to basic needs (45%), loss of income or employment (40%), separation from household members (33%), damages to or loss of property (23%), or witnessing violent acts (35%). Direct violence and deaths are experienced by one in ten households, including injuries or physical harm of a household member (12%) and fatality of a household member (9%). In the Eastern part of the country, almost every household reports exposure to violence. Among participants in the cities survey, exposure to war-related violence is most frequent in Kharkiv (92%), Mykolaiv (88%), and Odesa (86%).

Table 1: Exposure to violence by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Displacement	42%	27%	47%	44%	68%	34%	44%	40%	60%	50%	45%
Property losses	23%	11%	20%	33%	50%	18%	26%	19%	44%	23%	26%
Separation from household	33%	31%	31%	36%	43%	25%	34%	32%	41%	35%	33%
Income / job loss	40%	36%	36%	46%	53%	31%	40%	47%	50%	39%	41%
Loss of access to basic needs	45%	33%	48%	47%	63%	26%	45%	37%	48%	37%	39%
Injuries or physical harm	12%	11%	12%	10%	20%	8%	12%	11%	13%	12%	11%
Fatality of a household member	9%	10%	10%	7%	7%	6%	7%	10%	10%	7%	8%
Witnessing acts of violence	35%	23%	34%	44%	54%	29%	46%	40%	53%	27%	39%
Any exposure	84%	78%	82%	89%	97%	73%	88%	86%	92%	78%	83%

In contrast to more direct manifestations of physical and mental harm, disruptions to electricity supply are generally not perceived or classified as exposure to war related harm or as violations of right. However, as this report will show, power outages disrupt access to healthcare, services, and livelihoods. Electricity cuts are a form of structural violence that is less dramatic than destruction or injury, but is frequent, cumulative, and damaging to physical and mental health and overall well-being. It is also a form of violence that is almost universally experienced in Ukraine: 97% of respondents in the nationwide survey and 99% in the cities survey report power outages due to the war, making electricity cuts one of the most widespread consequences of the conflict. Less than one third of participants report owning a generator or alternative power source in the nationwide survey (31%) and cities survey (23%).

Are power outages perceived as deliberate attacks? At the national level, most respondents see these power outages as the result of deliberate attacks on energy infrastructure (67% nationwide, 80% in the East). There are small percentages of respondents who believe that electricity outages are attributed to other causes such as acknowledging rotational outages to manage supply (17%), indirect damage from nearby fighting (8%), or other reasons (7%). For the targeted cities survey, three out of four perceived outages are deliberate attacks on energy infrastructure (77%) and about 9% identifying indirect impacts of nearby fighting and rotational supply management (6%) or other causes (7%).

Table 2: Experience and causes of power outages by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Power outages (% yes)	97%	97%	96%	99%	98%	98%	99%	99%	98%	98%	99%
Generator (% yes)	31%	35%	30%	30%	25%	23%	17%	28%	22%	24%	23%
Causes of outages:											
Deliberate attacks on energy infrastr.	67%	64%	67%	68%	80%	72%	71%	81%	85%	77%	77%
Indirect effects of fighting	8%	7%	8%	10%	13%	8%	13%	4%	10%	9%	9&
Rotational supply management	17%	21%	19%	15%	2%	9%	9%	4%	2%	6%	6%
Other	7%	9%	6%	8%	4%	11%	6%	11%	4%	9%	8%

Power outages vary in terms of frequency and intensity or duration. According to the nationwide survey, about half the population has experienced infrequent power outages since the beginning of the war, either experiencing them rarely/a few times (8%), or infrequently with long periods of stable electricity supply (40%). Inversely, about half the population experienced frequent electricity cuts with many periods of repeated outages (39%), or almost all the time, with few periods of stable supply (10%). In terms of intensity, most participants experienced outages that typically last less than a day (65%), while one in three (32%) experienced longer outages on average. The rest did not experience outages (3%) or did not report on duration (1%). Among respondents to the targeted cities survey, the reported frequency of outages is similar to the percentages reported in the nationwide survey, but a higher percentage of respondents reported outages that lasted typically more than a day (45% v. 32% in the nationwide survey)

Table 3: Frequency and duration of power outages by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Frequency of outages											
None	3%	3%	4%	1%	2%	2%	1%	1%	2%	2%	1%
Rarely (few, isolated times)	8%	9%	7%	8%	9%	10%	10%	5%	16%	7%	9%
Occasional, long periods of stability	40%	44%	38%	38%	36%	45%	38%	33%	41%	37%	39%
Frequently, repeated outages	39%	35%	40%	42%	36%	39%	45%	51%	35%	44%	43%
Almost all the time	10%	8%	9%	11%	16%	4%	5%	10%	6%	8%	6%
No answer	1%	0%	1%	1%	1%	1%	2%	1%	1%	3%	1%
Average duration of outages											
None	3%	3%	4%	1%	2%	0%	1%	0%	2%	1%	2%
Less than 1 hour	1%	0%	1%	1%	0%	3%	1%	1%	2%	0%	1%
1–6 hours	33%	42%	35%	24%	18%	40%	22%	14%	40%	22%	24%
7–12 hours	21%	28%	18%	21%	8%	27%	16%	15%	27%	16%	19%
13–23 hours (less than a day)	10%	10%	10%	12%	7%	7%	7%	8%	7%	7%	7%
1 - 2 days (24 - 48 hours)	15%	8%	18%	16%	21%	14%	32%	24%	14%	32%	24%
3 - 4 days	8%	5%	6%	11%	14%	5%	10%	22%	5%	10%	12%
5 days or more	9%	2%	6%	15%	28%	3%	7%	15%	3%	7%	9%
Not sure/Refuse to answer	1%	1%	1%	0%	1%	1%	5%	2%	1%	5%	2%

When combining frequency and intensity of exposure to power outages, the nationwide survey shows that 38% of participants experience no/ low frequency (occasional or less) and low duration (a day or less) outages, 12% experience low frequency but high duration outages, 29% experience high frequency but low duration outages, and 20% experience high frequency and high duration outages (39% in the East). In comparison, for the cities survey, a higher percentage of participants experience high frequency and high duration outages (28%), with the highest percentage found in the cities of Odesa (43%), Kharkiv (31%), and Mykolaiv (29%). When examining these patterns, exposure to power outages is associated with other forms of harm: households experiencing high-frequency and high-intensity outages are also more likely to report exposure to other forms of violence (94%), including displacement, income loss, loss of access to basic needs, and witnessing acts of violence.

Table 4: Power outage exposure categories across regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Low frequency, low duration	38%	51%	37%	32%	24%	47%	24%	21%	29%	32%	30%
Low frequency, high duration	12%	5%	13%	15%	25%	9%	25%	19%	30%	14%	19%
High frequency, low duration	29%	33%	32%	26%	12%	30%	23%	18%	10%	31%	22%
High frequency, high duration	20%	11%	18%	27%	39%	13%	29%	43%	31%	23%	28%

Table 5: Exposure to violence and power outages

		Exposure to violence (any)			
		Nationwide survey		Cities survey	
		No	Yes	No	Yes
Power outages	Low frequency, low duration	23%	77%	26%	74%
	Low frequency, high duration	8%	92%	15%	85%
	High frequency, low duration	18%	82%	16%	84%
	High frequency, high duration	6%	94%	10%	90%

THE EFFECTS OF POWER OUTAGES ON HEALTH

Power outages have had widespread and measurable health consequences for households across the country, affecting both health outcomes and access to care. Nationwide, 61% of households report that outages have negatively affected health, including 20% reporting moderate and 3% severe impacts (6% in the selected cities). At the same time, a significant minority of households report disruptions in access to routine medical care (15%), emergency care (9%), prescribed medications (18%), and medical devices (7%), with higher impacts in the East and in cities such as Kyiv and Odesa. One in five households report worsening chronic health conditions (20%) and more than one in five report illness or injury linked to lack of heating or cooling (22%). Health impacts are strongly associated with outage severity: households experiencing high-frequency, high-duration outages are twice as likely nationwide (and up to three times as likely in cities) to report negative health outcomes compared to those with low exposure. While deaths directly attributed to power outages are rare (1–2%), their occurrence underscores the serious health risks associated with prolonged and repeated electricity disruptions.

Power outages have had a measurable impact on households' ability to access healthcare services, according to survey participants, affecting both routine and critical aspects of care since the beginning of the war. Nationwide, a non-negligible percentage of households report disruptions to obtaining routine care (15%) or emergency care (9%) from hospitals, clinics, or doctors' offices. The cities survey shows these disruptions are most frequently reported in Kyiv (24% and 16%, respectively), and Odesa (19% and 13%, respectively).

Qualitative accounts from the cities survey provide insights into disruptions in medical care. Some respondents report unavailable procedures due to blackouts. One respondent says she, "couldn't get an ultrasound, procedures," while others share that "light outages affected the blood filtration machine," or that "[I] couldn't get…a tomography [CT] scan." Power outages also limited access to hospitals, clinics, and doctors, with respondents reporting difficulties scheduling appointments and calling an ambulance, as well as postponed procedures. One respondent says, "If there is no electricity, there is no access to medicine." These qualitative descriptions help explain the proportion of households reporting disruptions in routine and emergency care due to power outages.

Table 6: The effects of power outages on access to healthcare by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Impact on ability to… (% yes)											
Obtain routine medical care	15%	10%	16%	16%	17%	10%	12%	19%	18%	24%	17%
Obtain emergency medical care	9%	7%	9%	11%	13%	5%	7%	13%	9%	16%	10%
Obtain, use or properly store prescribed medications	18%	11%	19%	22%	24%	8%	14%	16%	16%	21%	15%
Operate medical devices that are needed for care	7%	7%	5%	8%	12%	6%	7%	7%	8%	16%	9%

Households also report an impact on their access to and use or storage of prescribed medicines (18%) and medical devices needed for care (7%). Reported impacts are more frequent in the eastern part of the country. Qualitative responses provide details, with respondents sharing that some pharmacies were unable to receive electronic prescriptions, and that at-home cold storage of insulin and other medicines sometimes failed due to outages. At-home use of nebulizers, tonometer, and other at-home medical equipment was also not possible for some respondents due to blackouts.

Access to health care is impacted by power outages: Households reporting high frequency and high duration of power outages report more frequent disruptions in access to healthcare. For the nationwide survey, among households experiencing low-frequency, low-duration outages, between 3 and 10% of households report disruptions in access to healthcare, including medications and medical devices. In comparison, for households experiencing high-frequency and high-duration outages, one in four report difficulties accessing routine medical care (24%) and prescribed medications (29%), while 17% report impacts on access to emergency care and 13% on the use of medical devices. Patterns are similar among respondents in the cities survey.

Table 7: The effects of power outages on access to healthcare by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Impact on ability to… (% yes)								
Obtain routine medical care	9%	15%	15%	24%	11%	14%	19%	23%
Obtain emergency medical care	5%	13%	8%	17%	7%	8%	11%	14%
Obtain, use or properly store prescribed medications	10%	22%	19%	29%	8%	12%	15%	24%
Operate medical devices that are needed for care	3%	4%	9%	13%	5%	5%	11%	13%

Across the surveys, participants were asked to report how much power outages have impacted the health status of household members. Nationwide, 61% of the households report some level of impact of power outages on the state of health of household members, with 20% rating the impact as moderate (repeated or ongoing health problems, but managed), and 3% indicating severe impacts (serious or prolonged health problems, such as worsening of chronic conditions or missed treatments), affecting all regions similarly. The percentages were also similar among respondents to the cities survey, and across all cities, with a higher percentage reporting severe impact (6%).

Households exposed to high frequency and high duration power outages experienced more severe impacts on health status. In the nationwide survey, among households with low-frequency, low-duration outages, 50% report some impact on health, including 13% reporting moderate (12%) or severe impacts (1%). In comparison, 77% of households who experienced high frequency and high duration power outages report some impact on health status, including 38% reporting moderate (30%) or severe (8%) impacts. Similar patterns apply to the cities survey.

Table 8: The general effects of power outages on health by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Impact on health status of household											
No impact	39%	48%	38%	33%	36%	43%	41%	32%	36%	33%	37%
Minor impact	37%	33%	36%	41%	40%	30%	37%	39%	39%	37%	37%
Moderate impact	20%	16%	22%	22%	16%	18%	18%	21%	18%	22%	19%
Severe impact	3%	3%	3%	4%	8%	8%	4%	8%	8%	6%	7%
Not sure/Refuse to answer	0%	0%	1%	0%	0%	1%	1%	0%	0%	1%	1%

Table 9: The general effects of power outages on health by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Impact on health status of household								
No impact	50%	44%	35%	23%	50%	42%	33%	22%
Minor impact	36%	31%	39%	38%	33%	39%	36%	38%
Moderate impact	12%	24%	22%	30%	12%	14%	21%	29%
Severe impact	1%	1%	4%	8%	3%	4%	9%	10%
Not sure/Refuse to answer	0%	0%	0%	1%	1%	1%	0%	1%

Households report a range of *specific health effects* directly linked to power outages. Nationwide, the most frequently reported impacts are worsening of chronic health conditions (20%) and illness or injury related to lack of heating or cooling (22%). These self-reported impacts affect all regions although worsening of chronic health conditions is most frequently reported in the East (29%). Findings from the cities survey broadly mirror national patterns, although almost one-third of respondents report worsening chronic conditions in Kharkiv (30%), or report illness or injuries due to a lack of heating or cooling in Kharkiv (31%) and Odesa (30%). Although rare, deaths believed to be directly related to power outages are reported in both surveys (1% nationwide; 2% in cities), suggesting power outages can have severe and, in some cases, fatal health consequences.

Qualitative accounts provide details about the specific health effects of outages. Respondents report hypertension and the worsening of other chronic conditions, and households connect several cold-related illnesses to a lack of heating during blackouts, including bronchitis, hypothermia, and pneumonia. One respondent says the household is "freezing from lack of electricity." Some respondents also report negative health effects from breathing generator exhaust fumes. In terms of fatalities, one respondent shares that her son fell and died during a power outage.

Table 10: Power outages specific effects on health by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Household experience because of outages											
Worsening of chronic health conditions	20%	16%	18%	24%	29%	18%	12%	20%	30%	19%	20%
Injury (e.g., falls, burns, accidents)	8%	6%	7%	10%	10%	9%	7%	11%	12%	17%	11%
Illness from spoiled or unsafe food	9%	8%	10%	10%	10%	10%	11%	8%	9%	14%	10%
Illness / injury from lack of heating or cooling	22%	19%	23%	25%	18%	24%	21%	30%	31%	23%	26%
Missed or complicated maternal, newborn, or infant care	7%	9%	6%	7%	5%	4%	5%	6%	3%	8%	5%
Death of a household member directly related to a power outage	1%	2%	1%	1%	1%	3%	0%	2%	2%	3%	2%

Consistent with the findings on general health impacts, the surveys show that higher frequency and duration of outages are associated with more frequent adverse health outcomes. Nationwide, respondents among the high frequency, high duration outage category were three times as likely to report negative health outcomes like worsening of chronic conditions or injuries and illnesses resulting from power outages, compared to those in the low frequency, low duration outage category. For the cities survey, the high outage exposure group was two times more likely to report negative health impacts compared to the low exposure group. Across both surveys, deaths directly attributable to power outages remain rare, but are reported across exposure groups, suggesting that even short, occasional events can have fatal consequences.

Table 11: The specific effects of power outages on health by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Experienced because of outages…								
Worsening of a chronic health condition	12%	18%	21%	33%	12%	18%	21%	27%
Injury (e.g., falls, burns, accidents)	3%	10%	9%	15%	8%	7%	13%	16%
Illness from spoiled or unsafe food	4%	9%	11%	16%	7%	7%	12%	15%
Illness / injury from lack of heating or cooling	13%	19%	24%	37%	17%	21%	28%	37%
Missed or complicated maternal, newborn, or infant care	4%	6%	10%	9%	3%	3%	7%	8%
Death of a household member directly related to a power outage	1%	1%	2%	2%	2%	1%	2%	2%

THE EFFECTS OF POWER OUTAGES ON MENTAL HEALTH

Exposure to war-related violence is generally associated with high levels of psychological distress. Nationally, nearly half of respondents report symptoms of anxiety (48%) and one third report symptoms of depression (34%), with higher percentages in the East (59% and 43%, respectively). Overall, only 36% of respondents fall within the normal range of mental health status, while more than one third report moderate or severe symptoms. Power outages appear to be an important associated stressor. Mental health symptoms are more frequently reported among households experiencing frequent and prolonged outages, with anxiety and depression affecting up to 57% and 45% of respondents nationwide, respectively, in the highest exposure group. While power outages are rarely identified spontaneously as the main cause of mental health difficulties in open-ended responses at the national level, direct questioning shows that 71% of respondents report that outages contribute at least somewhat to their stress and anxiety, and about half report new or worsened mental health problems in their household due to outages.

Exposure to war-related violence is known to have profound mental health consequences, including anxiety, depression, and severe psychological distress. The survey included a set of questions about the respondents themselves rather than the household. To assess mental health status, we employed a short, widely used screening tool that measures symptoms of anxiety and depression (PHQ-4). It combines four questions to classify mental health status as normal, mild, moderate, or severe, helping to identify levels of psychological distress. It is general population screening tool and not a clinical diagnosis. Nationwide, symptoms of anxiety are reported by 48% of respondents (59% in the East), while symptoms of depression are reported by 34% of households (43% in the East). More generally, only 36% of respondents nationwide fall within the "normal" range of the mental health score, while 37% report mild symptoms and a substantial share report moderate (16%) or severe (21%) mental health difficulties. In the cities survey, symptoms of anxiety and depression are reported on average by 34% and 26% of the respondents, respectively, which may reflect better access to health services, information, social networks, and coping mechanisms in urban settings.

Qualitative responses in the cities survey provide more context, as respondents report a range of mental health symptoms related to power outages, including stress, nerves, panic attacks, and post-traumatic stress disorder. One respondent says that everyone in the household experiences "pressure, stress, [and] depression."

Table 12: Mental health symptoms by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Mental health symptoms											
Anxiety	48%	42%	47%	52%	59%	35%	31%	36%	39%	31%	34%
Depression	34%	32%	34%	33%	43%	28%	21%	28%	26%	27%	26%
Mental health category											
Normal	36%	40%	37%	33%	24%	37%	52%	44%	43%	46%	44%
Mild	27%	27%	26%	27%	30%	33%	26%	25%	26%	27%	27%
Moderate	16%	12%	16%	20%	19%	12%	12%	12%	13%	12%	12%
Severe	21%	21%	21%	20%	28%	18%	11%	19%	18%	16%	16%

Mental health symptoms vary across power outage exposure categories, with higher prevalence reported among households experiencing more frequent and prolonged outages. In the nationwide survey, the percentage of respondents reporting mental health symptoms among households with low-frequency, low-duration outages is 40%, compared to 57% among those with high-frequency, high-duration outages. The percentage of participants meeting criteria for symptoms of depression are 26% and 45%, respectively, among these two groups. Data on nationwide mental health and results for the cities survey show similar trends. However, these patterns should be interpreted with caution since households experiencing frequent and prolonged power outages are also more likely to face other war-related stressors, including displacement, economic hardship, and exposure to violence

Table 13: Mental health symptoms by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Mental health symptoms								
Anxiety	40%	53%	49%	57%	30%	33%	34%	40%
Depression	26%	37%	36%	45%	23%	24%	28%	29%
Mental health category								
Normal	43%	31%	34%	26%	50%	48%	41%	38%
Mild	28%	29%	25%	25%	26%	25%	30%	28%
Moderate	13%	16%	19%	20%	11%	14%	12%	12%
Severe	15%	24%	23%	29%	13%	13%	17%	22%

To further examine the potential effects of power outages on mental health, participants were asked, in an open-ended format, to identify the causes of mental health difficulties. Most respondents mention war and violence in general (58% nationwide), followed by uncertainty about the future (16%), economic stress and inability to meet basic needs (7%), and direct personal experiences of violence (8%). Power outages are infrequently mentioned (2%), although electricity disruptions may be perceived as part of the wider experience of war. In contrast, in the cities survey, power outages are mentioned far more often as a contributing factor, particularly in Dnipro, Odesa, and Kharkiv, where between one-third and over 40% of respondents identify outages among the causes of mental health difficulties. In part, this may reflect the frequent use of the "other" category in the nationwide survey to explain general anxiety.

Table 14: Main causes of mental health issues (self-reported)

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
War / violence in general	58%	48%	60%	63%	67%	68%	47%	58%	66%	53%	58%
Uncertainty about the future	16%	17%	16%	14%	16%	61%	32%	52%	46%	35%	45%
Direct violence	8%	5%	7%	12%	13%	12%	4%	6%	13%	6%	8%
Unable to meet basic needs / poverty	7%	9%	6%	7%	5%	15%	11%	20%	22%	10%	15%
Work	4%	5%	4%	5%	2%	15%	10%	20%	17%	13%	15%
Loss of a loved one	4%	5%	4%	4%	2%	6%	7%	12%	11%	6%	8%
Forced displacement	3%	2%	3%	3%	2%	11%	9%	13%	22%	10%	13%
Power outages	2%	1%	2%	3%	1%	42%	15%	36%	37%	20%	30%
Natural / always experienced it	1%	1%	1%	1%	1%	7%	5%	10%	7%	6%	7%
Not sure/Refuse to answer	1%	1%	1%	1%	0%	0%	1%	1%	0%	1%	1%
Other, specify	28%	29%	30%	25%	27%	0%	3%	1%	4%	2%	2%
None	0%	0%	0%	1%	1%	1%	2%	1%	1%	3%	2%

Lastly, responses from two direct questions on the impact of power outages on mental health make the relationship of power outages clearer. Nationwide, 71% of respondents report that power outages contribute at least a little to their stress and anxiety, including 25% who say power outages somewhat impacted their mental health, and 7% who judge this impact as "a lot" or "extreme". Participants in the cities survey were more likely to report strong impact (13% "a lot" or "extreme"). When considering household impact, 50% of nationwide participants and 47% of cities survey participants said that power outages created new or worsened mental health problems among household members.

Table 15: Contribution of power outages to stress and anxiety by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Contribution of power outages to stress and anxiety?											
Not at all	29%	32%	28%	29%	22%	22%	32%	21%	22%	25%	24%
A little	40%	39%	40%	38%	48%	37%	39%	32%	41%	29%	35%
Somewhat	25%	23%	27%	25%	20%	29%	22%	27%	24%	30%	26%
A lot	4%	3%	4%	5%	5%	9%	6%	14%	8%	8%	9%
Extremely	2%	3%	1%	2%	4%	3%	0%	6%	5%	7%	4%
Not sure/Refuse to answer	0%	0%	1%	0%	1%	1%	1%	1%	0%	1%	1%
Household experience because of outages											
New or worsened mental health problems	50%	43%	51%	53%	59%	45%	40%	56%	53%	44%	47%

In the nationwide survey, 3% of households with low-frequency, low-duration outages report that outages contribute "a lot" or "extremely" to stress, compared to 14% among those experiencing high-frequency, high-duration outages. Among cities survey participants, 23% of households in the highest exposure group report that outages contributed "a lot" or "extremely" to stress and anxiety, compared to 8% in the lowest exposure group. Reports of new or worsened mental health problems is also associated with outage exposure, at 37% and 70% nationwide, respectively, among the lowest and highest exposure groups, and 38% and 60%, respectively, among cities survey participants.

Table 16: Contribution of power outages to stress and anxiety by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Contribution of power outages to stress and anxiety?								
Not at all	39%	31%	21%	20%	33%	24%	22%	16%
A little	40%	37%	43%	36%	37%	41%	33%	32%
Somewhat	18%	27%	29%	29%	21%	26%	30%	29%
A lot	2%	3%	4%	10%	6%	5%	9%	15%
Extremely	1%	2%	2%	4%	2%	3%	5%	8%
Not sure/Refuse to answer	0%	0%	1%	0%	1%	1%	0%	1%
Household experience because of outages								
New or worsened mental health problems	37%	53%	51%	70%	38%	41%	50%	60%

THE EFFECTS OF POWER OUTAGES ON LIVELIHOODS AND EDUCATION

Power outages have contributed to significant livelihood and education disruptions for households since the onset of the war. In terms of livelihoods, more than one in five households nationwide report using unsafe water (22%) or reducing food consumption or consuming spoiled food (21%) due to outages, and over half report a negative impact on household nutrition (57%). Around one quarter of households report lost income or work linked to power outages, with more severe impacts concentrated among households experiencing frequent and prolonged outages and in urban areas. Education is similarly affected: among households with school-aged children, nearly six in ten report in-person school closures due to outages (59%), more than two-thirds report being unable to participate in remote learning (69%), and over half report difficulties completing homework or exams (54%). Learning losses are often substantial, with nearly one in five households reporting six months or more of in-person education lost, and even higher losses reported in heavily impacted cities such as Kharkiv.

FOOD SECURITY AND EMPLOYMENT

The survey also examined effects of power outages on household livelihoods, particularly in relation to food security and income generation. Nationwide, more than one in five households report using unsafe water for drinking or cooking (22%), or eating less food, skipping meals, or consuming spoiled food (21%) due to power outages, with more frequent impacts reported in the East and South. Such impacts are even more frequently reported in urban areas: in the cities survey, 34% of households report using unsafe water and 28% report reduced or compromised food consumption. Qualitative responses help explain these patterns, with respondents describing food spoilage caused by refrigerator and freezer failures during blackouts, the inability to cook when electric stoves are inoperable, and instances of foodborne illness linked to undercooked or spoiled meals. One respondent says, "The refrigerator doesn't hold up, the products are spoiling," while another says they "got food poisoning due to power outages."

Table 17: Effects of power outages on livelihoods by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Experienced because of outages…											
Used unsafe water	22%	17%	24%	26%	26%	29%	58%	22%	33%	30%	34%
Ate less food, skipped meals, or consumed spoiled food	21%	15%	22%	26%	25%	27%	26%	25%	28%	36%	28%
Negative impact on nutrition status	57%	47%	60%	61%	64%	52%	57%	61%	53%	61%	57%
Lost income / work	26%	25%	26%	27%	31%	30%	25%	34%	39%	35%	32%
Impact on income											
None	74%	75%	74%	73%	68%	70%	75%	67%	62%	65%	68%
Minimal (<10%)	5%	3%	6%	5%	6%	3%	5%	4%	7%	6%	5%
Moderate (10–25%)	8%	10%	7%	7%	11%	10%	8%	11%	11%	11%	10%
Significant (26–50%)	7%	6%	6%	8%	9%	9%	5%	8%	7%	6%	7%
Severe (51 - 75% of total income)	3%	2%	4%	4%	2%	3%	3%	4%	5%	5%	4%
All or almost all (75%–100%)	2%	2%	2%	1%	5%	4%	3%	6%	8%	6%	5%

Power outages also have measurable effects on income and employment. In the nationwide survey finds that 26% of households report lost income or work as a direct result of power outages (31% in the East). The cities survey finds a similar impact on jobs and employment among 32% of the participants (39% in Kharkiv). While most participants (74%) report no loss of income overall directly attributable to power outages, nationwide 3% of the households report severe income losses (above 50%), and 4% report similar losses among cities survey participants. Qualitative responses contextualize these figures, with participants describing missed work, business interruptions, and reduced productivity due to unreliable electricity and water supply. One respondent says, "I can't work when there's no light."

As expected, livelihood impacts are more frequently self-reported among households experiencing greater exposure to power outages. Nationwide, households in the high-frequency, high-duration outage category more often report using unsafe water (34%) and eating less food, skipping meals, or consuming spoiled food (36%) than households with low-frequency, low-duration outages (16% and 12%, respectively). Negative effects on household nutrition are reported by nearly three-quarters of households in the highest exposure group (73%), compared to 45% in the lowest exposure group. Income-related impacts show a similar pattern: 39% of households with high-frequency, high-duration outages report lost income or work, compared to 18% among those with lower exposure, and a larger share report significant to severe income losses (23% v. 5%). Findings from the cities survey show similar patterns, reinforcing the link between outage intensity and cumulative livelihood harm.

Table 18: Effects of power outages on livelihoods by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Experienced because of outages…								
Used unsafe water	16%	18%	25%	34%	27%	30%	37%	43%
Ate less food, skipped meals or consumed spoiled food	12%	19%	24%	36%	18%	21%	34%	40%
Negative impact on nutrition status	45%	59%	61%	73%	42%	57%	60%	70%
Lost income / work	18%	27%	29%	39%	22%	30%	34%	44%
Impact on income								
None	82%	73%	71%	62%	78%	70%	66%	57%
Minimal (<10%)	5%	7%	5%	3%	4%	7%	5%	5%
Moderate (10–25%)	7%	9%	8%	10%	6%	10%	12%	13%
Significant (26–50%)	3%	6%	8%	13%	6%	6%	7%	9%
Severe (51 - 75% of total income)	1%	4%	4%	6%	2%	3%	4%	6%
All or almost all (75%–100%)	1%	1%	3%	4%	4%	2%	5%	10%

EDUCATION

Power outages also have a significant impact on education for households with children and young people, affecting both in-person and remote learning. Nationwide, 45% of households report having children or youth aged 4–20 who have stayed with them during the past three years. Among these households, school disruptions linked to power outages are widespread. Nearly six in ten households report that schools were closed for in-person learning due to outages (59%) at some point in the last three years, and more than two-thirds report that children were unable to participate in remote or online classes (69%). More than half of households also report that children were unable to complete homework, tests, or exams because of electricity disruptions (54%). Participants in the cities survey report similar levels of disruptions. Consistent with patterns observed in other sectors, higher frequency and duration of outages is associated with greater levels of disruption.

Table 19: Effects of power outages on education by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Household composition											
Children of school age (% yes)	45%	52%	46%	39%	39%	35%	39%	40%	35%	40%	45%
Impact of power outages …											
School closed in-person	59%	58%	60%	64%	53%	58%	53%	66%	54%	55%	59%
Unable to participate in remote/online classes	69%	66%	70%	71%	74%	63%	72%	65%	68%	57%	69%
Unable to complete homework assignments, tests or exams	54%	45%	55%	61%	71%	62%	67%	62%	64%	51%	54%

Table 20: Effects of power outages on education by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Household composition								
Children of school age (% yes)	37%	48%	51%	52%	33%	39%	37%	42%
Impact of power outages …								
School closed in-person	55%	57%	57%	69%	55%	56%	56%	61%
Unable to participate in remote/online classes	61%	65%	70%	80%	60%	63%	65%	70%
Unable to complete homework assignments, tests or exams	45%	58%	53%	65%	58%	56%	60%	69%

Qualitative responses from the cities survey provide insights into how these disruptions occur. Households describe the loss of internet connectivity during blackouts, which prevents students from logging into or remaining connected to virtual classes and accessing online learning materials. As one respondent notes, "There was no internet, which made online learning impossible." These accounts help explain the high proportion of households reporting an inability to participate in remote learning.

For a substantial minority of households, the educational consequences are prolonged. Nationwide, 12% of households report that children in the household have lost one or multiple years of in-person education due to power outages, and another 7% report losses of 6 months to a year. It is likely that power outages are not the only factor contributing to such loss, nevertheless it is an important factor. More directly, losses in virtual learning are similarly frequent. Quantified losses of education are similar in the cities survey, although the scale of impact is particularly pronounced in Kharkiv, where as many as 30% of households with children report one or more years of in-person education lost due to power outages.

Table 21: Learning losses by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Average in-person learning loss per learner											
0 days	27%	31%	25%	23%	25%	21%	27%	15%	25%	18%	21%
1-7 days	13%	16%	12%	13%	2%	13%	6%	8%	15%	9%	10%
2-4 weeks	10%	11%	9%	8%	10%	6%	15%	6%	6%	8%	8%
1-2 months	13%	16%	14%	11%	4%	10%	5%	9%	8%	16%	10%
2-6 months	11%	11%	10%	14%	10%	12%	11%	12%	5%	16%	12%
6-12 months	7%	5%	9%	6%	13%	11%	3%	14%	4%	4%	7%
1-2 years	5%	1%	7%	6%	10%	6%	8%	5%	3%	6%	6%
2 years or more	7%	1%	6%	11%	21%	7%	2%	11%	27%	4%	10%
Not sure/Refuse to answer	7%	7%	8%	9%	4%	13%	22%	20%	8%	18%	17%
Average online learning loss per learner											
0 days	27%	31%	26%	24%	15%	22%	17%	17%	19%	21%	19%
1-5 days	17%	19%	17%	14%	13%	12%	15%	11%	27%	13%	16%
2-4 weeks	16%	23%	14%	12%	9%	10%	21%	10%	14%	14%	14%
1-2 months	13%	10%	12%	18%	17%	13%	10%	16%	12%	11%	13%
2-6 months	11%	7%	12%	14%	17%	14%	9%	11%	9%	8%	10%
6-12 months	5%	2%	6%	3%	15%	6%	6%	4%	5%	4%	5%
1-2 years	2%	0%	4%	1%	2%	4%	3%	3%	1%	6%	3%
2 years or more	2%	0%	2%	2%	4%	4%	1%	4%	5%	1%	3%
Not sure/Refuse to answer	8%	7%	8%	11%	9%	15%	17%	23%	9%	22%	17%

Disruptions extend beyond attendance to the quality of learning. Across surveys, respondents frequently link outages to difficulties completing homework and studying, especially in the evenings. Qualitative accounts describe students studying by candlelight or being unable to study at all due to lack of lighting and power, which respondents associate with eye strain, fatigue, and reduced learning effectiveness. As one participant explains, "In the evening there is no way without electricity… it is impossible to study." These experiences are consistent with the high proportion of households reporting an inability to complete schoolwork during outages.

Power outages also affect tertiary education, although fewer households report students at this level (23% nationwide and 20% in the selected cities). Among these households, more than half report that in-person classes were closed at some point due to outages (57%) and nearly two thirds report being unable to participate in remote classes (62%).

Disruptions are more frequent in cities, where 65% or more of households with tertiary students report being unable to attend in-person classes, and 71% unable to attend online classes. As with primary and secondary education, higher outage frequency and duration are associated with greater levels of disruption.

Finally, qualitative responses point to broader developmental and social consequences that are not fully captured by attendance or duration metrics alone. Respondents describe reduced interaction between students and teachers, diminished peer contact, and interruptions to routine learning environments, particularly during prolonged reliance on remote education. These findings suggest that power outages not only reduce instructional time but also undermine the quality, continuity, and social dimensions of education, with potentially lasting implications for children and young people.

Table 22: Effects of power outages on tertiary education by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Household composition											
Member(s) attending tertiary education institution (% yes)	23%	25%	27%	18%	20%	19%	15%	19%	21%	25%	20%
Impact of power outages …											
School closed in-person	57%	61%	51%	59%	64%	63%	59%	79%	62%	60%	65%
Unable to participate in remote/online classes	62%	65%	61%	56%	75%	68%	82%	77%	77%	58%	71%

Table 23: Effects of power outages on tertiary education by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Household composition								
Member(s) attending tertiary education institution (% yes)	22%	26%	22%	27%	18%	20%	19%	21%
Impact of power outages …								
School closed in-person	48%	67%	58%	64%	53%	68%	72%	70%
Unable to participate in remote/online classes	50%	70%	63%	74%	66%	72%	72%	74%

COPING WITH AND PREPARING FOR POWER OUTAGES

Households have widely adopted short-term coping strategies to manage power outages, but preparedness for prolonged disruptions remains limited amid pessimistic expectations for the future. Nationwide, most households report practical adaptations, such as keeping devices charged (84%), using alternative lighting (89%), and storing food or water (67%). Far fewer rely on collective support or external assistance. Looking ahead, only about one-third of respondents believe their household situation will improve in the next year, and expectations for peace are similarly low. Despite frequent exposure to outages, nearly half of households nationwide (46%) and over half in cities (55%) report being not at all or only a little prepared to cope with sustained power outages over the next six months.

Households have adopted a wide range of coping strategies to manage power outages. Nationwide, most households report basic preparedness measures such as keeping devices charged in advance (84%), using alternative sources of light (89%), and storing extra food or water (67%). Many also report adjusting daily routines (62%) or using alternative sources of heat (64%), while fewer rely on collective strategies such as sharing resources with neighbors or relatives (24%) or seeking external support (10%). Temporary relocation to places with electricity is reported by a minority (10%, 17% in the East). Patterns in the cities survey are broadly similar, with particularly high reliance on advance charging and storage of food and water. Unsurprisingly, participants who experienced high-frequency high-duration power outages were more likely to use all forms of coping mechanisms, compared to those with low-frequency low-duration exposure.

Qualitative responses to the cities survey reveal details about how Ukrainian households have coped with power blackouts since the onset of the war. Respondents commonly mention enduring the outages as best they can, with one saying, "It was difficult, but we adapted." Households adapt their schedules to power outage timetables, including cooking, studying, or working during hours with electricity, or waiting for the electricity to return. Others mention purchasing or using alternative power, light, and heating sources during outages, including relying on generators, battery-powered lanterns, and candles, as well as using firewood and portable stoves for heating, cooking, and boiling water. One person says, "We bought an inverter and a generator. It was very difficult with a baby."

Mitigation strategies are not without risk, however. The improper use of generators, stoves, and other heating equipment can result in carbon monoxide poisoning. Cases of such poisoning have been regularly reported in recent winters, despite warnings from the government and humanitarian agencies about the safe use of heating equipment indoors. Moreover, using solid-fuel heaters, such as burning firewood, can put households at risk of fire and place children in particular in danger of burns. Although less common, respondents also share insights about turning to their networks and external resources for support. For instance, qualitative accounts mention cooking in a neighbor's home if they have power, alongside sharing warm clothes with neighbors and extended family during the winter. One respondent relays that their household "went to friends' to cook food," and that their "food supply, water [were] combined with the neighbors'." Respondents also rely on charging and power sources outside the home, such as charging cellphones or laptops in community "invincibility centers," or at ATMs. These accounts show the extensive range of coping strategies households employ to weather electricity outages.

Table 24: Power outages coping strategies by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Kept devices (e.g., phone, power banks) charged in advance	84%	85%	84%	82%	80%	93%	93%	96%	88%	88%	92%
Stored extra food or water	67%	63%	69%	67%	69%	82%	71%	82%	80%	65%	76%
Used alternative sources of light	89%	88%	89%	88%	93%	94%	93%	92%	91%	78%	89%
Used alternative sources of heat	64%	67%	63%	60%	69%	43%	34%	45%	55%	35%	42%
Coordinated or shared resources with neighbors or relatives	24%	19%	27%	25%	31%	7%	9%	13%	17%	12%	11%
Changed daily routines or schedules to adapt to blackout periods	62%	63%	64%	60%	53%	38%	50%	55%	33%	44%	44%
Sought community or other external help/support	10%	5%	9%	11%	25%	2%	3%	4%	8%	7%	5%
Relocated temporarily to places with electricity	10%	4%	12%	13%	17%	4%	4%	5%	10%	10%	6%
Did not take any special actions	4%	3%	4%	5%	2%	2%	1%	1%	4%	4%	2%
Other (please specify)	4%	2%	5%	4%	3%	0%	0%	0%	0%	0%	0%
Not sure/Refuse to answer	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%

Moving forward, participants have low expectations that peace will happen and that their household situation will improve. Nationwide, just 37% believe it is likely or somewhat likely that peace will return within the next year, compared to 41% who consider it unlikely. At the same time, one-third of respondents (34%) consider it likely that their household situation will improve in the next year, while 40% consider improvement unlikely. Results among cities survey respondents are similar, with 43% and 33%, respectively, judging it unlikely that peace and their household conditions would improve in the coming year. Results across power outage exposure groups showed no specific patterns.

Table 25: Prospect for peace and improvement, by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Likelihood of peace within a year											
Very likely	7%	8%	6%	6%	7%	6%	11%	5%	9%	13%	9%
Somewhat likely	30%	27%	30%	33%	30%	30%	33%	25%	24%	24%	27%
Neither likely nor unlikely	16%	13%	19%	16%	18%	15%	14%	13%	16%	14%	14%
Somewhat unlikely	30%	32%	30%	31%	23%	28%	29%	30%	30%	22%	28%
Very unlikely	11%	14%	9%	8%	14%	14%	7%	19%	15%	19%	15%
Not sure/Refuse to answer	6%	6%	5%	6%	8%	6%	7%	9%	6%	9%	7%
Likelihood of improvement in household conditions											
Very likely	11%	12%	12%	9%	9%	6%	10%	11%	10%	13%	10%
Somewhat likely	23%	22%	22%	23%	24%	30%	34%	26%	25%	25%	28%
Neither likely nor unlikely	18%	21%	18%	19%	12%	18%	19%	18%	24%	23%	20%
Somewhat unlikely	27%	23%	29%	28%	30%	33%	22%	26%	22%	17%	24%
Very unlikely	13%	14%	12%	12%	14%	6%	3%	11%	11%	12%	9%
Not sure/Refuse to answer	8%	7%	8%	9%	11%	8%	13%	7%	9%	10%	9%

Considering the prospect for status quo or even worsening conditions shared among respondents, a key concern is the lack of preparedness for future power outages. Nationwide, half the households (46%) report being not at all or only a little prepared to cope with sustained power outages over the next six months. Among city survey participants, 55% report being not at all or only a little prepared to cope with sustained power outages over the next six months.

Prolonged outages may trigger displacement with 14% of households in the nationwide survey and 20% in the cities survey indicating that they would not be able to stay in their place for more than one week if sustained outages occur. Despite past exposure, households experiencing more frequent and prolonged power outages are no better prepared to cope with future disruptions.

Table 26: Readiness for power outages by regions and cities

	Nationwide survey					Cities survey					
	Nationwide	West	Center	South	East	Dnipro	Mykolaiv	Odesa	Kharkiv	Kyiv city	Total
Preparedness level to deal with sustained power outages over the next six months											
Not at all	19%	19%	19%	19%	25%	35%	27%	25%	31%	22%	28%
A little	27%	23%	23%	36%	26%	25%	31%	28%	29%	25%	27%
Somewhat	34%	34%	38%	26%	34%	22%	27%	27%	24%	28%	26%
A lot	10%	10%	9%	10%	9%	10%	8%	10%	8%	12%	10%
Extremely	10%	13%	9%	8%	4%	7%	6%	10%	5%	11%	8%
Not sure/Refuse to answer	1%	1%	1%	1%	2%	2%	2%	1%	3%	3%	2%
Ability to stay in place for more than one week if there is sustained outage											
Yes	83%	88%	81%	82%	75%	72%	75%	77%	71%	71%	73%
No	14%	9%	15%	16%	17%	22%	20%	19%	21%	19%	20%
Not sure/Refuse to answer	3%	3%	4%	2%	7%	6%	5%	4%	9%	10%	7%

Table 27: Readiness for power outages by power outage exposure categories

	Power outage exposure categories							
	Nationwide survey				Cities survey			
	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration	Low frequency, low duration	Low frequency, high duration	High frequency, low duration	High frequency, high duration
Preparedness level to deal with sustained power outages over the next six months								
Not at all	17%	22%	19%	23%	28%	24%	28%	30%
A little	27%	23%	28%	25%	25%	30%	27%	29%
Somewhat	34%	36%	34%	31%	25%	28%	25%	24%
A lot	10%	10%	9%	10%	11%	8%	10%	8%
Extremely	10%	8%	10%	9%	8%	7%	8%	7%
Not sure/Refuse to answer	1%	1%	0%	1%	3%	3%	2%	2%
Ability to stay in place for more than one week if there is sustained outage								
Yes	87%	82%	82%	77%	75%	75%	73%	69%
No	10%	14%	14%	20%	18%	19%	20%	23%
Not sure/Refuse to answer	4%	3%	4%	3%	6%	6%	7%	8%

CONCLUSIONS

CONCLUSION

KEY FINDINGS

Throughout the war, widespread attacks on Ukraine's energy infrastructure have made power outages a near-universal civilian experience, adding to an already extreme exposure to war-related violence. While this report provides rich details across regions, cities, and outage-exposure groups, five high-level messages stand out:

1. *Power outages negatively impact health status and access.*
   Electricity disruption is not only a service interruption but a pervasive stressor with clear health and well-being consequences. Health impacts are widespread, with 61% of respondents nationwide reporting that outages have negatively affected household health (63% in the selected cities). Many report disrupted access to routine care (15% nationwide, 17% in selected cities), emergency care (9% nationwide, 10% in selected cities), prescribed medications (18% nationwide, 15% in selected cities), and medical devices (7% nationwide, 9% in selected cities).

2. *Power outages is associated with physical and mental health harms.*
   These disruptions negatively affect health outcomes, with one in five households reporting worsening chronic conditions and more than one in five reporting illness or injury linked to lack of heating or cooling. Deaths directly attributed to outages are rare (1–2%) but reported across exposure groups. Mental health impacts are similarly substantial. Nationally, 48% of respondents report symptoms of anxiety and 34% symptoms of depression, and direct questions indicate that 71% say outages contribute at least a little to their stress and anxiety, while about half report new or worsened mental health problems in the household due to outages.

3. *Households experiencing frequent and prolonged outages face the greatest health challenges.*
   Across domains, impacts concentrate among households facing frequent and prolonged outages, who report higher levels of disrupted healthcare access, worse health outcomes, and greater mental health stress, while also facing other war-related violence.

4. *Power outages also undermine livelihoods and education.*
   Beyond health, outages are linked to livelihood and education disruptions. Nationwide, 22% of households report using unsafe water and 21% compromised food consumption, while 26% report lost income or work. Among households with children, 59% report in-person school closures and 69% inability to participate in remote learning due to outages, with some reporting large cumulative learning losses.

5. *Coping is widespread, but preparedness for sustained outages is limited.*
   Despite extensive coping strategies already adopted (e.g., 84% charging devices in advance; 89% alternative lighting; 67% extra food/water), readiness for sustained outages remains limited. Around 46% of households nationwide and 55% in selected cities feel not at all or only a little prepared for prolonged outages, and 14% nationwide (20% in cities) say they could not stay in their home for more than a week during sustained outages, underscoring the risk of displacement driven by energy insecurity.

RECOMMENDATIONS

Results from this survey directly reflect self-reported experiences from two representative samples of Ukrainians: a nationwide random sample, and a targeted sample of Ukrainians in five affected cities. The results offer important insights for policymakers, local and international non-governmental

organizations, the UN, donors, and other stakeholders as they work to mitigate and respond to the humanitarian consequences of power outages. The following recommendations emerge from the survey results. In areas with frequent or long-lasting power outages:

- *Ensure continuity of access to healthcare services.*
  Continue to equip hospitals with high-capacity generators and fuel reserves so they can operate during outages and provide backup batteries for at-home medical equipment such as nebulizers and cold-storage alternatives for insulin and other medicines. Support patient transport during outages, decentralized medicine distribution, and backup power for pharmacies. Scale up mobile health units and other outreach, especially to expectant and new mothers and patients with chronic health conditions, as these groups report missed appointments, complications, and worsened conditions.

- *Integrate mental health support into crisis response.*
  Expand interventions that address symptoms of anxiety and depression exacerbated by electricity outages, particularly for low-income households which typically report the highest rates of psychological distress.

- *Prioritize access to food and safe water.*
  Scale up the distribution of non-perishable, spoil-resistant foods and safe drinking water through mobile and fixed distribution sites. Households report on food spoilage, skipping meals, and using unsafe water for drinking or cooking. Low-income urban households are particularly vulnerable.

- *Expand access to alternative power sources.*
  Broaden the provision of free and low-cost power sources, including through "invincibility centers," since more than 80% of low-income households report having no generator or alternative power source for electricity.

- *Reinforce winterization campaigns.*
  Make lower-risk heating equipment, warming centers, and other resources available during blackouts. Since generators, stoves, and solid-fuel heaters can put households at risk of carbon monoxide poisoning or fires, safety awareness campaigns must continue, particularly among households with children.

- *Ensure learning continuity through flexible education opportunities.*
  Continue to provide flexible alternative education particularly for low-income and rural households which reported higher rates of children being unable to attend remote classes or complete homework assignments due to electricity outages.

- *Provide economic and livelihoods assistance.*
  A quarter of households reported lost work or income due to electricity outages, with urban households in the south and east of the country particularly affected.

- *Enhance household resilience.*
  Reinforce coping strategies Ukrainians are already using to prepare for blackouts such as storing extra food and water, sharing resources within their networks, and using alternative power sources. Since 14% of households nationwide (20% in selected cities) report they could not stay in their home for more than a week during sustained outages, preparedness measures are pivotal to prevent displacement, particularly among urban and low-income households.

Most importantly, parties to the conflict must protect civilian energy infrastructure in line with International Humanitarian Law. Attacks on civilian energy infrastructure must cease. International Humanitarian Law requires all parties to the conflict to distinguish between military objectives and civilian objects and to

refrain from attacks on infrastructure indispensable to the survival and well-being of the civilian population.

This report shows that near-universal power outages have wide-ranging and cumulative impacts on civilian health, mental health, livelihoods, education, and displacement risk. Even when not directly lethal, repeated and prolonged electricity disruptions cause foreseeable and severe harm to civilians and must be considered in proportionality and precaution assessments. The persistence of such attacks throughout the period under review demonstrates that these harms are not incidental, but structural and cumulative, with long-term humanitarian consequences.

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