AFGHANISTAN EARTHQUAKE | Predictive analysis of people exposed to protection risks in areas affected by the earthquake.

4 September 2025

This analysis provides an initial estimated projection of protection risks intensifying in the aftermath of the earthquake of the 31st of August 2025. While the Protection Cluster is coordinating with partners for specific assessments, initial report indicates an intensification of existing vulnerabilities and collapse of capacities, which is heightening existing protection risks.

EXECUTIVE SUMMARY

On 31 August 2025, a magnitude 6.0 earthquake struck eastern Afghanistan, severely affecting Kunar, Nangarhar, Laghman, and Nuristan provinces. An estimated 2.1 million people were exposed to strong shaking (MMI V–IX), and predictive analysis indicates that about *1.2 million people (≈60%) are also exposed to heightened protection risks*. The most affected risks are mine contamination (43%), disinformation (26%), and gender-based violence (13%), which together account for over 80% of predicted exposure. While the largest number of affected people are in areas of "moderate" shaking (MMI V), *462K people in higher intensity zones (MMI VI–IX)* face disproportionately severe risks due to greater destruction and pre-existing vulnerabilities. Immediate response priorities include urgent protection interventions addressing mine action, risk communication, and GBV services, alongside broader protection support in moderately shaken but heavily populated areas.

2025 HNRP KEY FIGURES – PROTECTION CLUSTER

46M	35.5M	22.3M	3.4M
TOTAL POPULATION	PEOPLE EXPOSED TO RISKS*	PEOPLE IN NEED	PEOPLE TARGETED

* Data from October 2024, representing 77% of the population affected.

KEY FIGURES – 31 AUGUST 2025 EARTHQUAKE

4M	2.1M	1.2M
TOTAL POPULATION LIVING IN MMI SCALE II to IX*	PEOPLE EXPOSED TO EARTHQUAKE SHAKING – MMI V – IX **	PEOPLE EXPOSED TO PROTECTION RISKS – MMI V – IX ***

* People exposed to earthquake shaking, living in 4 provinces of Kunar, Laghman, Nangarhar, and Nuristan, under MMI scale II to IX.
** People exposed to earthquake shaking, living in areas under MMI scale V to IX.
*** People exposed to protection risks, living in areas under MMI scale V to IX, representing 57% of the population.

EVENT AND IMMEDIATE IMPACT

At 23:47 local time on 31 August 2025, a powerful earthquake magnitude 6+ struck Afghanistan's Nangarhar Province, close to the border with Pakistan. The epicenter was located in Nurgal district, approximately 37 kilometers southwest of Asadabad city (capital of Kunar province). The tremor was followed by multiple aftershocks and was felt across neighboring provinces including Nangarhar, Laghman, Nuristan, and in Kabul.

Due to the shallow depth of the quake—estimated between 8 and 10 kilometers below the surface—its impact

was particularly severe. As of 2 September, 1,411 deaths and 3,124 injuries were reported across four provinces of Kunar, Laghman, Nangarhar, and Nuristan provinces, with around 2,000 others injured. Many of the affected individuals live in remote, mountainous regions where landslides and debris have blocked critical access routes.
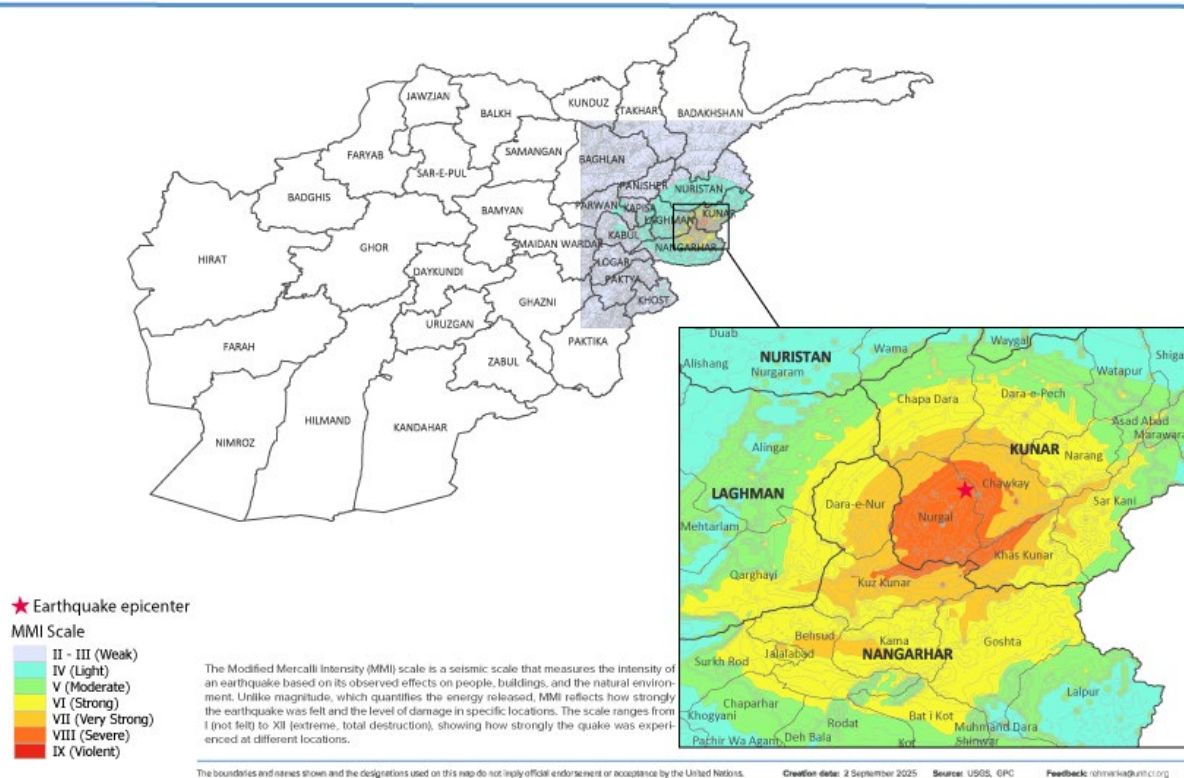
The districts of Chawkay and Nurgal in Kunar Province, along with Dara-e-Nur in Nangarhar Province, appear to be among the hardest hit. Other areas suffering significant damage and casualties include Chapa Dara, Dara-e-Pech, and Watapur in Kunar; Alingar, Mehtarlam, and Qarghayi in Laghman; and Jalalabad city, Behsud, and Kuz Kunar in Nangarhar[1].

The map below illustrates the geographic distribution of earthquake shaking intensity in Afghanistan, using the Modified Mercalli Intensity (MMI) scale[2]. It uses color- coded zones to represent different levels of ground shaking, from weak to extreme. Based on the MMI scale analysis, the districts most severely affected by the earthquake include the earthquake's epicentral zone (MMI VII–IX). In Kunar Province, the epicentral districts of Nurgal, Chawkay, Khas Kunar, and Kuz Kunar were hit hardest, lying in the zone of very strong to severe shaking (MMI VII–VIII) with heavy damage and high casualty risk. Surrounding districts such as Narang and Dara-e-Pech experienced strong to very strong shaking (MMI VI–VII), likely causing moderate structural damage. Areas like Chapa Dara and Sar Kani saw moderate to strong shaking (MMI V–VI), while Asadabad and Watapur registered lighter but still noticeable tremors (MMI IV–V).

AFGHANISTAN
Earthquake, 31 August 2025

★ Earthquake epicenter
MMI Scale
- II - III (Weak)
- IV (Light)
- V (Moderate)
- VI (Strong)
- VII (Very Strong)
- VIII (Severe)
- IX (Violent)

The Modified Mercalli Intensity (MMI) scale is a seismic scale that measures the intensity of an earthquake based on its observed effects on people, buildings, and the natural environment. Unlike magnitude, which quantifies the energy released, MMI reflects how strongly the earthquake was felt and the level of damage in specific locations. The scale ranges from I (not felt) to XII (extreme, total destruction), showing how strongly the quake was experienced at different locations.

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.   Creation date: 2 September 2025   Source: USGS, GPC   Feedback: rohmani@unhcr.org

In Nangarhar Province, Dara-e-Nur, Kama, and Goshta were exposed to strong to very strong shaking (MMI VI–VIII), creating risks of damage in vulnerable housing. Jalalabad, Behsud, and Batikot fell in the moderate to strong zone (MMI V–VI), where the quake was widely felt indoors and outdoors with some minor structural damage. Peripheral areas including Rodat and Pachir Wa Agam reported lighter shaking (MMI IV–V), while southern fringes registered only weak tremors (MMI III–IV). In Laghman Province, Qarghayi experienced moderate to strong shaking (MMI V–VI), which could result in some localized damage.

The table below provides a breakdown of the 4 million people exposed to earthquake shaking based on the MMI

[1] (OCHA sitrep– 1 Sep 2025)
[2] See Annex 'A' for explanation of the MMI scale

scale in the three most affected provinces of Kunar, Laghman and Nangarhar.

PROVINCE	II – III (WEAK)	IV (LIGHT)	V (MODERATE)	VI (STRONG)	VII (VERY STRONG)	VIII (SEVERE)	IX (VIOLENT)	GRAND TOTAL
Kunar	99,476	357,718	111,155	79,438	8,424	104,381	795	**761,387**
Nangarhar	30,874	674,068	975,476	618,463	48,607	16,590	-	**2,364,077**
Laghman	38,961	548,161	114,069	815	-	-	-	**702,007**
Total	**169,310**	**1,579,947**	**1,200,701**	**698,717**	**57,030**	**120,970**	**795**	**3,827,471**

PROTECTION RISKS ANALYSIS – PEOPLE EXPOSED TO PROTECTION RISKS (PER)

This analysis is carried out to estimate at district level (admin level 2), **how many people are currently exposed to heightened protection risks[3].** The model was trained on the recent protection risks severity ranking dataset, with the affected population (living in MMI scale V, VI, VII, VIII, IX) as the outcome variable. The higher the MMI level, the more severe the shaking and potential damage and potential greater protection risks for affected populations.

The prediction pinpoints specific protection risks relevant in the context: **presence of mines, disinformation, gender-based violence, legal identity, psychosocial distress** and **displacement** related protection risks, to identify the most immediate effects on the population's ability to meet their essential needs and ensure their safety.

Protection Risks Importance in the Model
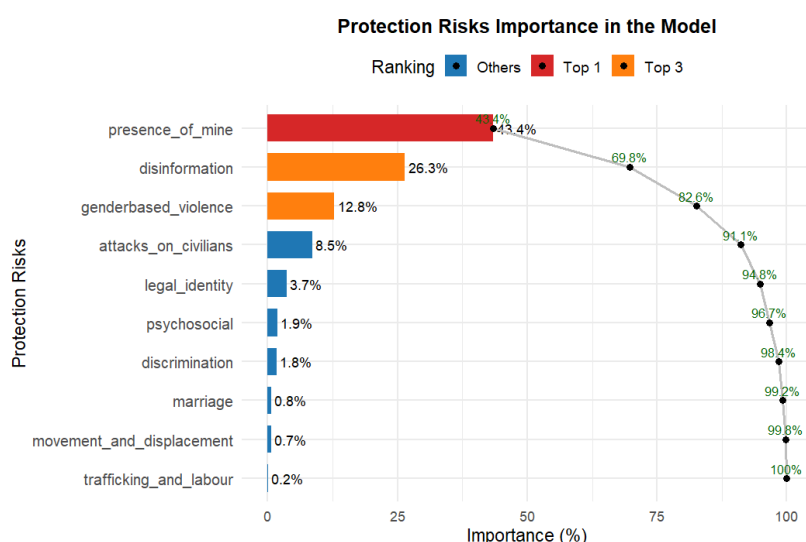
The projection shows that the **presence of mines, disinformation** and **gender-based violence** in areas affected by the earthquake, will particularly increase the exposure of people to further violence, coercion and deliberate deprivation. Presence of mines is by far the strongest predictor (43%), followed by disinformation (26%) and gender-based violence (13%), together accounting for more than 80% of the model's explanatory power. Other risks such as attacks on civilians, legal identity issues, psychosocial distress, and displacement related protection risks contribute less but they present still relevant signals, while risks like forced early / forced marriage or trafficking have minimal effect observed on predictions. This shows that although many risks are tracked, a small subset (mines, disinformation, GBV) overwhelmingly drives the variation in exposure across districts. In other words, people in areas with high severity for those risks before the earthquake will suffer heavy protection impacts because of the earthquake.

The table below provides a breakdown of the people exposed to protection risks based on the MMI scale (V to IX) in the three provinces of Kunar, Laghman and Nangarhar.

MMI SCALE	DESCRIPTION	PEOPLE EXPOSED TO EARTHQUAKE SHAKING	PEOPLE EXPOSED TO PROTECTION RISK
V (Moderate)	Unstable objects are overturned	1,200,701	732,318
VI (Strong)	Noticeable shaking indoors, possible minor damage	698,717	367,005

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[3] The GPC prediction model uses the latest protection risk severity assessment carried out jointly with Protection Cluster's partners in Afghanistan as predictors and the 2025 core HNRP population as baseline (outcome variable).

VII (Very Strong)	Damage is considerable in poorly built or badly designed structures; fear among population	57,030	21,917
VIII (Severe)	Severe damage in poorly built structures	120,970	72,574
IX (Violent)	Building shifts off foundations	795	632
Total	**All levels combined**	**2,078,213**	**1,194,446**

KEY CONCLUSIONS

This predictive analysis is carried out to inform early actions and first response, while more precise assessments will provide a specific picture of the situation of protection and the urgent protection needs of the population. The following key insights can be driven from the analysis:

1. **Scale of exposure**
   - Out of nearly **2 million people** exposed to earthquake shaking in Kunar, Laghman, and Nangarhar, about **1.2 million are predicted to face protection risks**.
   - This means roughly **6 in 10 people exposed to shaking** are also exposed to protection risks, highlighting a significant overlap between physical hazard and protection vulnerability.
2. **Geographic intensity (by MMI levels)**
   - **Most affected by numbers:** The **MMI V (Moderate)** zone holds the majority of the exposed population (~732,000 at protection risk).
   - **Most severe by impact:** Around **462,000 people in MMI VI and IX zones** face **heightened risks**, as these areas combine stronger physical destruction with increased vulnerabilities (mines, displacement, GBV, injuries).
3. **Risk drivers**
   - The model shows that **presence of mines (43%)**, **disinformation (26%)**, and **gender-based violence (13%)** are the **dominant predictors**, jointly explaining over 80% of risk exposure.
   - Other risks (e.g., attacks on civilians, legal identity issues, psychosocial distress, displacement) are still relevant but secondary.
4. **Implications for response**
   - **Immediate priorities:** Address areas and population affected by mine contamination, disinformation, GBV to anticipate heightened consequences and provide urgent mitigation and response, especially in **MMI VI–IX areas**.
   - **Broader strategy:** Even though MMI V is "moderate" shaking, the **large number of exposed people** there requires scaled-up protection services (legal aid, psychosocial support, risk communication).
   - **Operational challenge:** Access constraints in mountainous districts (e.g., blocked routes, remote locations) will likely delay assistance, further amplifying risks.

The analysis demonstrates that the earthquake's impact is not only physical but also deeply protection-related, with **pre-existing protection risks which will be critical multipliers of harm, heightened and urgent needs**. While the bulk of the affected population is in MMI V areas, the **smaller population in MMI VI–IX zones is at disproportionately higher risk and must be prioritized for urgent protection interventions**.

ANNEX 'A'

The Modified Mercalli Intensity (MMI) Scale[4]

The MMI scale describes the intensity of shaking experienced during an earthquake, ranging from I (Not Felt) to X (Extreme Destruction). Unlike magnitude (which measures energy released), intensity reflects how people, buildings, and the environment are actually affected in different locations.

The following is an abbreviated description of the levels of Modified Mercalli intensity.

MMI	Description	Effects
I - II	Not felt / Very weak	Only detected by instruments or a few people under favorable conditions.
III–IV	Weak to Ligh	Felt indoors by many; dishes rattle, walls and windows creak.
V	Moderate	Felt by nearly all; small objects move; minor cracks and plaster damage possible.
VI	Strong	People frightened; objects fall; some chimney and window damage.
VII	Very Strong	Considerable damage in poorly built structures; landslides possible.
VIII	Severe	Heavy furniture moves; partial building collapses; widespread structural damage.
IX	Violent	Buildings shift off foundations; serious structural damage even in stronger buildings.
X	Extreme	Most masonry structures destroyed; severe damage in engineered buildings.

Zoomed in map of earthquake Affected Areas