# World Risk Poll 2024 Report Methodology

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# 1. Overview

Lloyd's Register Foundation World Risk Poll is the first and only global, nationally representative study of worry about, and harm from, various risks to people's safety. The 2023 iteration of the Poll marks the third wave of data collection, with the first effort occurring in 2019 and the second in 2021.

The larger objective of this study is to provide new evidence and insights which will help a wide array of actors – government officials, policymakers, non-governmental organisations, employers, researchers and community leaders – understand not only what people think about the different types of risks they face in their lives, but what motivations or factors help shape these perceptions. This knowledge could help inform and target policies, interventions and public outreach efforts that can make the world a safer place.

| World Risk Poll Wave | Year |
|---|---|
| Wave 1 | 2019 |
| Wave 2 | 2021 |
| Wave 3 | 2023 |

The Poll provides this information in two important ways. The first is through the data collection process itself and all the activities that entails – which, in 2023, meant conducting 142 nationally representative surveys and then processing, combining and ultimately publishing all of the data stemming from those interviews. As with previous waves, Lloyd's Register Foundation is committed to making the 2023 World Risk Poll microdata available for public use (with attribution). Readers who are interested in downloading and exploring these data should visit the official website of the Poll, which is as follows: https://wrp.lrfoundation.org.uk/

Secondly, analysis and findings related to the data are published in a series of thematic reports. The newly released report – Resilience in a Changing World – is the first of these reports stemming from the most recent survey wave.

This methodology report provides additional information on how the data were collected and analysed. The first section of this document concerns the methodology, design and implementation of the 2023 World Risk Poll. The second section reviews the methods used in the data analysis, while the final section focuses on the methodology related to the Resilience Index.

# 2. Survey methodology

All three waves of the World Risk Poll (occurring in 2019, 2021 and 2023) were included as a module within the Gallup World Poll. Since 2005, the Gallup World Poll has regularly surveyed residents in more than 150 countries, areas and territories using randomly selected, nationally representative samples that represent, in most years, more than 98% of the world's aged 15–years–or–older population. In most countries, interviews are typically conducted face–to–face; in Northern America, Western Europe, developed Asia and Gulf Cooperation Council (GCC) countries, interviewing is conducted by telephone due to the very high (nearly universal) penetration of mobile or landline devices in those countries.

When the World Risk Poll was first fielded in 2019, Gallup surveyed in 142 countries and territories and, in general, relied on traditional method of data collection (face–to–face or telephone interviewing) as in past years of the World Poll.

As the World Risk Poll is conducted every two years, it was not included in the World Poll in 2020, when Gallup made the decision to interview almost entirely by telephone due to the COVID–19 pandemic and the health risks associated with face–to–face interviewing. In designing this new approach, Gallup's key objectives were ensuring the safety of interviewers and respondents, retaining high levels of representativity and ensuring high–quality data collection. In practice, this meant Gallup interviewed in fewer countries in 2020 than normal; 116 countries were polled that year, compared to the typical range of 140 to 150 countries or areas.

When the World Risk Poll was fielded again in 2021, Gallup was able to return to in–person data collection in many countries, areas and territories. At the same time, challenges created by the ongoing (if improving) COVID–19 pandemic limited the number of countries Gallup was able to poll in that year to 121[i]. Gallup also continued to interview by telephone in some countries where data collection had historically been conducted in person prior to the pandemic.

In 2023, the Gallup World Poll returned to face–to–face interviewing in virtually all countries where respondents had been interviewed this way prior to 2020 (for specific information about mode of interviewing, see country dataset details which appear at the end of this section), with an important exception; China. In China, data were collected via a web self–administered mode[ii]. More information is provided on this topic in the "World Poll methodology in 2023: Web data" section below.

The remainder of this section will focus on the methodology, design, implementation and processing related to the World Poll in general. In some instances, such as when discussing the development of the questionnaire, the focus narrows to the 2023 World Risk Poll.

## I. Preparing for data collection

### *Questionnaire development*

The World Risk Poll seeks to measure how people around the world feel, think and act about issues related to risk and safety. Risk, however, 'is a term with many meanings[iii]', as a 2017 Lloyd's Register Foundation report, Foresight on the Public Understanding of Risk, noted. From a research perspective, this complexity presents challenges and benefits. On one hand, the multifaceted nature of the subject provides a wealth of material in terms of formulating new survey questions which could either be added to the questionnaire or replace existing items; at the same time, it is important from an analytical point of view that the Poll does not totally shift focus with each new wave.

Given these pressures, each update of the Poll has attempted to strike the right balance between developing new survey questions and maintaining a core set of indicators and themes that are valuable to track on a regular basis. Furthermore, the questionnaire review process has been a collaborative effort among researchers at Lloyd's Register Foundation, Gallup and the Technical Advisory Group.

In refining the Wave 3 questionnaire, the researchers first identified which survey questions from the previous waves should be retained. One area of importance, which this most recent Poll revisits, is the series of survey questions that collectively help assess 'resilience' (see Section C below). These questions were first included in the 2021 wave of the Poll and provided the data for the World Poll Resilience Index, a unique measure of how prepared people and communities worldwide are to handle adversity such as disasters, based on their circumstances and perceptions of support systems.

Additionally, many of the questions reviewed in the 2021 report A Changed World? Perceptions and experiences of risk in the Covid age were included on the 2023 questionnaire; many of these items have been asked in all three waves.

In developing new survey questions, Lloyd's Register Foundation and Gallup followed the same methodologically rigorous process used to develop the 2019 and 2021 questionnaires. This process includes the following steps:

- A literature review was performed about the topic in general as well as from a survey research perspective.

- Stakeholder interviews were conducted with selected experts to identify the most salient issues and how these might be most effectively measured on a general population survey.

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i – For more information about the challenges of surveying in 2021, see the 2021 Lloyd's Register Foundation World Risk Poll Methodology. https://wrp.lrfoundation.org.uk/lrf_wrp_2021_full_methods.pdf

ii – Additionally, the 2023 Gallup World Poll interviewed by telephone and web in a subset of countries where Gallup typically interviews by telephone. However, the World Risk Poll was conducted in a separate wave of the 2023 World Poll, which did not employ this hybrid approach to interviewing. With the exception of China, interviewing related to the World Risk Poll was conducted either by telephone or face–to–face.

iii – Dennett-Thorpe, J. (2017). Foresight review on the public understanding of risk: Reconciling facts and fears. Lloyd's Register Foundation. https://www.lrfoundation.org.uk/en/publications/foresight-review-on-the-public-understanding-of-risk/

- A draft questionnaire was developed and reviewed with the core research team and the Technical Advisory Group (TAG). These discussions led to further revisions to the draft instrument.

- The draft questionnaire was then subjected to cognitive tests in eight countries and several local languages. In cognitive testing, respondents are asked the questions from the draft questionnaire as well as additional questions to determine if the questions work as intended and are understood well and if the response options are suitable. These interviews also explore the level of difficulty a respondent may have in answering a question and whether a survey question made an individual feel uncomfortable or uneasy, among other issues.

- After evaluating the feedback from cognitive testing, the survey instrument was refined and pilot tested – essentially, conducting a 'dry run' of the survey implementation process. Pilot test results can help highlight any remaining potentially problematic survey questions and response options and give an estimate of how long the survey instrument will take to administer.

- The final refinements and revisions were made to the survey instrument, and Lloyd's Register Foundation approved the final questionnaire in consultation with the TAG and other Foundation partners.

Once finalised, the 2023 World Risk Poll was incorporated into the Gallup World Poll survey instrument and was translated into over 130 languages in which the World Risk Poll would ultimately be fielded.

## Questionnaire translation

The questionnaire was translated into the major conversational languages of each country. The translation process starts with an English, French or Spanish version, depending on the region. One of two translation methods may be used:

**METHOD 1:** Two independent translations are completed. An independent third party with some knowledge of survey research methods adjudicates the differences. A professional translator translates the final version back into the source language.

**METHOD 2:** A translator translates into the target language. An independent third party with knowledge of survey methods reviews and revises the translation as necessary.

Any new question items are translated according to the Gallup World Poll's quality procedures; this applied, of course, to new World Risk Poll questions.

Gallup also instructs interviewers to follow the interview script; interviewers may not deviate from the translated language.

## Interviewer training and field quality control

To implement the World Poll, Gallup works with vendors across the globe who are crucial to the data collection process. Gallup selects vendors based on experience in nationwide survey research studies and conducts in-depth training sessions with local field staff prior to the start of data collection. To assist the fieldwork team with training and to ensure consistency and structure, Gallup provides a standardised training manual. Topics covered in training include:

1. Standards for conducting a quality interview:

- closed-ended questions
- open-ended questions
- skip patterns
- probing

2. Random route procedures:

- selecting a starting point
- household selection and substitution
- within household selection
- disposition coding

## II. Sampling and data collection methodology

With some exceptions, all samples are probability based and nationally representative of the resident adult population. The coverage area is the entire country including rural areas, and the sampling frame represents the entire civilian, non-institutionalised, aged 15 and older population. Exceptions include areas where the safety of interviewing staff is threatened, scarcely populated islands in some countries, and areas that interviewers can reach only by foot, animal or small boat.

Gallup uses telephone surveys in Northern America, Western Europe, developed Asia, and Gulf Cooperation Council (GCC) countries. In Central and Eastern Europe, much of Latin America, former Soviet states, nearly all of Asia, the Middle East and Africa, an area frame design is used for face-to-face interviewing.

The typical Gallup World Poll survey includes interviews with at least 1,000 individuals. In some countries, Gallup collects oversamples in major cities or areas of special interest. Additionally, in some large countries, such as China and Russia, sample sizes include at least 2,000 adults. Although rare, in some instances, the sample size falls between 500 and 1,000.

Data for the 2023 World Risk Poll from China were collected via self-administered web survey, the first time this mode has been used to collect any data related to the World Risk Poll.

This section will first provide a brief overview of how Gallup conducts face-to-face and telephone surveys – including sample design, respondent selection as well as data preparation and weighting processes.

Gallup's approach with respect to web data collection and processing appears at the end of this section.

## *Face-to-face survey design*

### First stage: Stratification and sampling

In countries where face-to-face surveys are conducted, sampling units are stratified by population size or geography and clustering is achieved through one or more stages of sampling. Where population information is available, sample selection is based on probabilities proportional to population size; otherwise, simple random sampling is used. Samples are drawn independently of any samples drawn for surveys conducted in previous years. The goal is to identify 100 to 125 ultimate clusters (sampling units), consisting of clusters of households.

For face-to-face surveys, Gallup uses three different sampling approaches, depending on the available population information:

#### METHOD 1:

In countries where Gallup has detailed population information from a recent census or other reliable source, it uses a stratified single-stage or multiple-stage cluster design. Sampling units are selected using probabilities proportional to population size for each sampling stage down to 100 to 125 ultimate clusters, with a fixed number of interviews (eight or 10) completed in each ultimate cluster. If a multiple stage of selection is used, a minimum of 33 primary sampling units (PSUs) are selected.

#### METHOD 2:

In countries with limited population information (for example, population data available at the state, province or district level), Gallup uses a stratified multiple-stage cluster design. PSUs are selected using probabilities proportional to size and units at subsequent stages are selected using simple random sampling. At least 33 PSUs are selected at the first stage of sampling, with 100 to 125 ultimate clusters selected at the last stage of sampling.

#### METHOD 3:

In countries where only overall population information is available at the strata level (broad geographies/regions or population density) and below that, just the name of units down to the lowest administrative unit, Gallup uses a stratified single-stage cluster design. PSUs (for example, wards or villages) are selected using simple random sampling. The sample design results in 100 to 125 PSUs/ultimate clusters.

## Second stage: Household selection

Random route procedures are used to select sampled households. In each ultimate cluster, the supervisor or field manager has pre-selected a starting point/address for the interviewer. Once the interviewer reaches the starting point, he or she will need to follow strict rules to determine the households he or she will need to visit to attempt an interview.
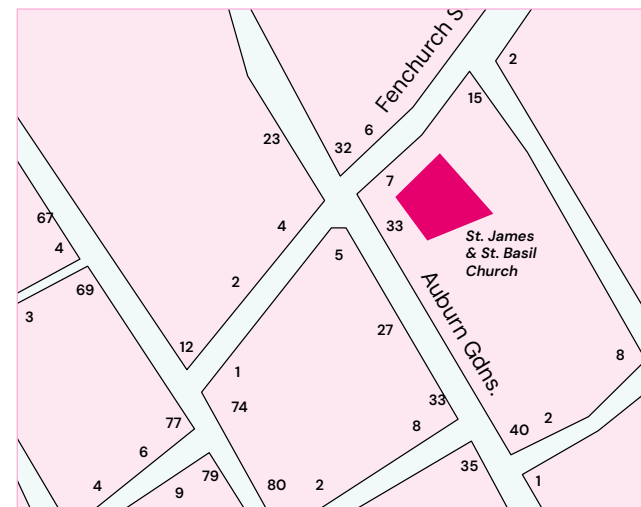


Definition of a household: All interviews will take place at a person's home, which can be anything from a one-room flat to a single house. To be eligible, a household must have its **own cooking facilities**, which could be anything from a standing stove in the kitchen to a small fire in the courtyard.

Movement from the starting point: Once at the given starting point, the interviewer will have to place his or her **back** to the (main) entrance of the structure and move to the right (rule: always go to the right). Counting three households (excluding the starting point), the interviewer will attempt a contact at the third household. This household is the **main** household where the interviewer will make up to three attempts to secure an interview with a household member. Unless an outright refusal occurs, interviewers may make up to three attempts to survey the household.

After visiting this first main household, the interviewer will continue to select the third household to the right, and so on. If the interviewer is not successful in completing an interview at a selected household, it is replaced with another household using the same procedure.

The interviewer should count individual households and not houses, as a house/building can contain numerous individual households. The interviewer will not count unoccupied structures. Group quarters are generally institutions and other group living arrangements such as rooming houses, dormitories and military barracks. Group quarters are excluded from this survey.

## Third stage: Respondent selection

After a person in the household, aged 15 or older, has agreed to an interview, the interviewer's next step is to randomly select the respondent within the household. The interviewer lists all household members aged 15+ who live in the household. The computer-assisted personal interviewing (CAPI) system then randomly selects the household member to be interviewed. (For countries or areas where paper and pencil interviewing is employed, the Kish grid selection is used.)

If the selected respondent is temporarily unavailable, the interviewer will revisit the household at another time. If the selected respondent refuses to take part in an interview or is unavailable for the remainder of the field period, the household is replaced with another household (following the random route procedure). The interviewer cannot interview any other person in the household. In a few Middle Eastern and Asian countries where cultural restrictions dictate gender matching, respondents are randomly selected among all eligible adults of the matching gender.

## *Telephone survey design*

In countries where interviews are conducted by telephone, Gallup uses random-digit-dialling (RDD) or a nationally representative list of phone numbers. Gallup typically uses either a dual sampling frame (landline and mobile telephone) or a mobile telephone-only frame. The split between expected landline and mobile completes in a dual-frame design is based on information Gallup has on landline and mobile use in those countries, either from past surveys or other secondary data.

For respondents contacted by landline telephone, random respondent selection within the household (among eligible respondents aged 15 and older) is performed by:

- asking for the person aged 15 and older who has the next birthday, or
- listing all eligible household members, and random selection of the respondent by the CATI program

Over different days and times of day, interviewers make at least five attempts to reach a person and complete an interview in each household.

## *Survey response rates*

As is common with cross-country survey research, response rates for the Gallup World Poll differ across countries, territories and areas. There are several reasons for this variation: the mode of interviewing (telephone or in person), how people in a country generally feel about survey research and the survey length, or idiosyncratic factors, such as a person's willingness to participate.

While Gallup does not publish country-level response rates for the World Poll, Table 1 below shows the median response rate for each of the 15 global regions. The region with the highest median response rate was Southern Africa – which consists of four countries and where all interviews were conducted in person – at 78.5%. The median response rate was nearly as high in Eastern Africa (74.5%), where the interviewing was largely done face-to-face.

By contrast, regions where interviewing was conducted either mostly or entirely by telephone posted the lowest response rates, including Northern America (2.5%) and Northern/Western Europe (4.0%).

## Table 1. Median response rate by region

| Region | No. of countries in region | Survey mode (no. of countries) | Response rate (median) |
|---|---|---|---|
| **Australia & New Zealand** | 2 | Telephone (2) | 5.0% |
| **Central Asia** | 7 | Face-to-Face (7) | 60.0% |
| **Central/Western Africa** | 19 | Face-to-Face (19) | 67.0% |
| **Eastern Africa** | 12 | Face-to-Face (11), Telephone (1) | 74.5% |
| **Eastern Asia\*** | 5 | Face-to-Face (1), Telephone (5) | 5.0% |
| **Eastern Europe** | 10 | Face-to-Face (6), Telephone (4) | 46.0% |
| **Latin America & the Caribbean** | 18 | Face-to-Face (18) | 34.5% |
| **Middle East** | 11 | Face-to-Face (7), Telephone (4) | 43.0% |
| **Northern Africa** | 5 | Face-to-Face (3), Telephone (2) | 31.0% |
| **Northern America** | 2 | Telephone (2) | 2.5% |
| **Northern/Western Europe** | 17 | Face-to-Face (1), Telephone (16) | 4.0% |
| **Southeastern Asia** | 9 | Face-to-Face (7), Telephone (2) | 46.0% |
| **Southern Africa** | 4 | Face-to-Face (4) | 78.5% |
| **Southern Asia** | 7 | Face-to-Face (6), Telephone (1) | 64.0% |
| **Southern Europe** | 13 | Face-to-Face (6), Telephone (7) | 18.0% |

\*Note: In this report, the region of Eastern Asia has six countries or territories, however one country from that region – China – is not included in these calculations as data were collected via web.

## Data preparation

To ensure interviewers are following the methodology and executing the questionnaire properly, Gallup requires vendors to conduct in-field validations for a percentage of face-to-face interviews and telephone interviews. Face-to-face interviews are validated by supervisor accompaniment, in-person re-contact, phone re-contact or listening to recorded interviews. Telephone interviews are validated by live listen-ins or recordings. In addition, interviewer productivity metrics and para data are tracked throughout data collection.

The World Risk Poll dataset, like any data collected by the World Poll, goes through a rigorous quality assurance process before it is publicly released. Gallup's directors of survey research in each region of the world review the data to confirm the sampling plan was followed and the data are nationally representative. They also review the data for consistency and stability by interviewer and region. If the regional director suspects a problem, it may be necessary to collect new data.

After the regional directors review the data, Gallup scientists perform additional validity reviews. The data are centrally aggregated and cleaned, ensuring correct variable codes and labels are applied. The data are then reviewed in detail for logical consistency and trends over time. Once the data are cleaned, weighted and vetted, the final step is to calculate approximate study design effect and margin of error.

## Data weighting

Data weighting minimises bias in survey-based estimates, ensures samples are nationally representative for each country and is intended to generate estimates within a country. The weighting procedure was formulated based on the sample design and performed in multiple stages.

In countries where data are collected face-to-face, Gallup first constructs sampling weights to account for any disproportionality in selection of primary and subsequent levels of sampling within each stratum. Sampling weights are calculated to account for any disproportionalities in allocation, selection probabilities of PSUs, SSUs and households within the ultimate cluster. Next, within selected households, weighting by household size (number of residents aged 15 and older) is used to adjust for the probability of selecting a single adult in each selected household, as residents in larger households will have a disproportionately lower probability of being selected for the sample. The product of these two steps constitutes the base weight. Adjustment to the calculation of sampling weights was added to the weighting process in 2021 in all face-to-face countries.

In countries where data are collected via telephone, Gallup constructs a probability weight factor (base weight) to account for selection of telephone numbers from the respective frames and correct for unequal selection probabilities as a result of selecting one adult in landline households and for dual users coming from both the landline and mobile frame. Adjustment to selection probabilities reflecting the relative frame sizes was added to the weighting process starting in 2020 in all telephone countries.

Next, the base weights are post-stratified to adjust for non-response and to match the weighted sample totals to known target population totals obtained from country-level census data. Gallup makes non-response adjustments to gender, age, and, where reliable data are available, education or socioeconomic status.

All survey weights are normalised, meaning they are rescaled in such a manner that the sum of the weights is equal to the total sample size for each country.

Finally, approximate study design effect and margin of error are calculated (calculations are presented in the 'Country dataset details, 2023 World Risk Poll' section at the end of this section). The design effect calculation reflects the influence of data weighting.

## Population or projection weights

Many of the results presented in Resilience in a Changing World are calculated first by aggregating (or combining) country-level data to produce cross-national statistics, typically at the global or regional level. For this type of cross-national analysis, a different weight, known as a projection weight, is used.

As described in the previous section, Gallup normalises all survey weights so that the sum of the survey weights for a given country will be equal to the overall sample size. Barring a few exceptions, the sample size for each country or area on the 2023 World Risk Poll will be around 1,000 respondents.

This has important implications for any analysis concerned with calculating statistical estimates that apply to a group of countries, rather than comparing results across countries. If the standard survey weights are applied for estimates that pertain to a group of countries, then the calculation will not account for differences in the aged 15+ population size across countries. Instead, using the normalised survey weight to calculate a statistic that applies to a group of countries would be akin to taking the simple average of the national results – though countries with larger sample sizes would have a slightly greater weight in shaping the final result.

The projection weight adjusts the normalised survey weight so that the revised weights now sum to the aged 15+ population of a country rather than its sample size in the 2023 World Risk Poll. Unless otherwise noted, any statistics that apply to a group of countries – including global or regional estimates – were calculated using the projection weight when reporting the 2023 Poll results.

## Sampling error/Precision of estimates

When interpreting survey results, all sample surveys are subject to potential errors. Errors may occur, for example, due to non-response (where selected respondents are never reached or refuse to participate), interviewer administration error (where a response can be mistyped or misinterpreted by the interviewer), or incomplete or inaccurate answers from the respondent.

The sampling design of the World Risk Poll was used to produce unbiased estimates of the stated target population. An unbiased sample will have the same characteristics and behaviours as those of the total

population from which it was drawn. In other words, with a properly drawn sample, statements can be made about the target population within a specific range of certainty. Sampling errors can be estimated, and their measures can be used to help interpret the final data results. The size of such sampling errors depends largely on the number of interviews and the complexity of the sampling design.

The margin of error (MOE), or the level of precision used in estimating the unknown population proportion 'P', can be derived based on the following formula[i]:

$$MOE = 1.96 * \sqrt{(P*(1-P)/n)}$$

where 'n' is the sample size (i.e., the number of completed surveys). Under the most conservative assumption (P = 0.5), the MOE for a sample size of 1,000 will be 1.96 * √(0.25/1000) = 3.1% under the assumption of simple random sampling.

Table 2 shows the size of the 95% confidence interval half-widths for various sample sizes under the assumption of simple random sampling. They may be interpreted as indicating the approximate range (plus or minus the figure shown) around the sample estimate within which the results of repeated sampling in the same time period could be expected to fall 95% of the time, assuming the same sampling procedures, interviewing process and questionnaire. For any given sample size, the estimated precision is lowest when P = 0.5 (or 50%). For example, the sample size needed to ensure a sampling error (or half-width of confidence interval) of 0.05 at 95% confidence level is around 400 cases when P = 0.5 (or 50%). A sample size of 300 will produce a sampling error close to 0.057 at 95% level of significance when P = 0.5 (or 50%). With P = 0.4 (or 40%), a sample size of 300 will produce a sampling error of 0.056.

### Table 2. 95% confidence interval half-widths for percentages for entire sample or sub-groups, in percentage points

| Sample sizes near | For percentages near | | | | | |
|---|---|---|---|---|---|---|
| | 5/95% + | 10/90% + | 20/80% + | 30/70% + | 40/60% + | 50/50% + |
| 400 | 2.1 | 2.9 | 3.9 | 4.5 | 4.8 | 4.9 |
| 500 | 1.9 | 2.6 | 3.5 | 4.0 | 4.3 | 4.4 |
| 600 | 1.7 | 2.4 | 3.2 | 3.7 | 3.9 | 4.0 |
| 800 | 1.5 | 2.1 | 2.8 | 3.2 | 3.4 | 3.5 |
| 1,000 | 1.4 | 1.9 | 2.5 | 2.8 | 3.0 | 3.1 |
| 1,500 | 1.1 | 1.5 | 2.0 | 2.3 | 2.5 | 2.5 |
| 2,000 | .96 | 1.3 | 1.8 | 2.0 | 2.1 | 2.2 |
| 2,500 | .85 | 1.2 | 1.6 | 1.8 | 2.0 | 2.0 |
| 3,000 | .78 | 1.1 | 1.4 | 1.6 | 1.8 | 1.8 |
| 4,000 | .68 | .93 | 1.2 | 1.4 | 1.5 | 1.5 |
| 5,000 | .60 | .88 | 1.2 | 1.3 | 1.3 | 1.4 |

While the above table reflects precision assuming simple random sampling, face-to-face surveys use complex designs involving stratification and clustering. Even for telephone samples, although drawn as simple random samples within each frame, the overall sample design is complex. In addition to design complexities, both modes of data collection are weighted to correct for unequal probabilities of household selection and post-stratification adjustments. This introduces a design effect that needs to be considered while computing the sampling error (or precision) of the estimates. The design effect is defined as the ratio of the design-based sample variance to the sample variance obtained from a simple random sample of the same size. To calculate the precision of an estimate using the complex sampling design with a design effect, one must multiply the precision under the assumption of simple random sampling by the square root of the design effect associated with this estimate. In other words, the precision of an estimate

(p) of an unknown population proportion 'P' may be approximated as:

$$Precision\ (p) = \{SQRT\ (Deff)\} \times SE(p)$$

where 'Deff' is the design effect associated with the estimate (p)

$$SE(p) = SQRT\{p*(1-p)/(n-1)\}$$

**n = the unweighted sample size**

For purposes of simplicity, an estimate of 'Deff_wt' is provided for each country, taking into consideration only the variability of weights[i]. A design effect of 1 means the effective sample size is the same as the nominal sample size, which is 1,000 for most countries. For proportions close to 0.5 (or 50%), a design effect of 2 reduces the sample size by 50% or increases the margin of error by over 40% compared to simple random sample[ii].

In addition to the variability of weights, clustered samples in face-to-face surveys contribute to the design effect by reducing the effective sample size. The intraclass correlation coefficient for each estimate and the average cluster size impacts the design effect as follows:

$$Deff\_c = (1 + (c-1)*p)$$

Where 'Deff_c' is the design effect due to clustering, 'c' is the average cluster size and 'p' is the intraclass correlation coefficient for a particular estimate. In most of the face-to-face countries in the 2023 World Risk Poll, the average cluster size is ten. For purposes of illustration, if the average cluster size in a country is 10 and if the intraclass correlation coefficient estimate of 0.1, the design effect due to clustering is:

Deff_c = (1 + (10–1)*0.1) = 1.9. In general, design effects associated with clustered samples will be higher than 1.

Therefore, precision for estimates generated from face-to-face surveys can be approximated by this formula:

$$MOE = 1.96 * \sqrt{(P*(1-P)/n)} * \sqrt{(Deff\_wt)} * \sqrt{(Deff\_c)}$$

## World Poll methodology in 2023: Web data collection in China

2023 data for China were collected using a web self-administered mode (computer-aided web interviewing or CAWI). Gallup used high-quality third-party panels that are commercially available as the sample source for the portion of World Poll data collected via web in 2023. However, the panel was put together using opt-in methods.

To ensure adequate representation of the adult 15 and older population among panel members, Gallup set interview quotas on age, gender, region and education.

From a questionnaire design perspective, the web survey instrument closely matched the telephone survey instrument with the item format adapted slightly for self-administered mode and to capture high-quality data via web.

Gallup implemented best practices on web-survey design to minimise item non-response, illogical responses and incomplete responses. To minimise any potential effects due to unexpected events in country, the timing for the web portion of data collection was scheduled as close to the telephone data collection period as possible.

### CAWI quality assurance

Gallup's approach to quality control is informed by the recent AAPOR task-force report, *Data Quality Metrics for Online Samples: Considerations for Study Design and Analysis*[iii]. In addition to the standard quality control processes used to evaluate telephone data, Gallup also deployed the following quality control procedures on the web portion of the completes:

- **Digital fingerprinting:** Ensuring surveys are not completed by bots and that survey responses are unique and coming from valid devices.

- **Illogical or inconsistent responding:** Inconsistency was monitored and detected by use of logic checks that are programmed into the survey script. To ensure that these are fully activated, the project team completed the survey and attempted to bypass the logic. The project team also rechecked the survey link to ensure that the programmed logic was operating correctly prior to the survey going live.

- **Flat-liners:** This term refers to participants who overuse item non-response (e.g., don't know). These respondents were identified and removed from the data during quality checks.

- **Straight-liners:** Respondents who consistently select a single response category across an extensive list of questions or single block of items were also identified and removed from the data.

- **Speeders:** Gallup tracked the total time required to complete the survey and removed individuals who completed the survey in a timeframe that suggested speeding and not fully reading through the questions included in the survey. Typically, the threshold for reviewing interviews for minimum length is set at one-third of the median length in the country. Anything that falls below that threshold is evaluated for quality. If there were other quality issues, that interview was removed and replaced.

### Measuring household income via web

For cases collected over web, closed-ended questions were used to measure household income range for each respondent. An income value was assigned to each respondent, drawing from the empirical pool of observed values within the same income range collected over telephone. The remainder of income calculations (INCOME_1 through INCOME_5) are the same as outlined later in this document.

i – The design effect was defined formally by Kish (1965, Section 8.2, p. 258) as 'the ratio of the actual variance of a sample to the variance of a simple random sample of the same number of elements'. Based on Kish's approximate formula {design effect = (sample size)*(sum of squared weights)/(square of the sum of weights)}.

ii – Assuming the margin of error is being reported at the 95% confidence interval, the margin of error associated with an estimate of p=0.5, design effect=1 and sample size=1000 will be +/- 3.1. If the design effect increases to 2, then the margin of error will be +/- 4.4.

iii – McPhee, C, et.al. (2022). Data quality metrics for online samples: Considerations for study design and analysis. American Association for Public Opinion Research. https://aapor.org/wp-content/uploads/2023/02/Task-Force-Report-FINAL.pdf

## Weighting of China CAWI data

As the China web sample comes from a non-probability frame, where elements of the frame do not have a known probability of inclusion, Gallup used a quasi-randomization technique (Valiant, Volume 8, Issue 2, April 2020) called propensity weighting to construct pseudo base sampling weights. This approach uses data (common variables) from the 2023 web data and previous nationally representative telephone data collection waves Gallup conducted in China in 2020-21 to model the likelihood of a respondent coming from the panel frame using a logistic regression. This estimate of the probability of inclusion in the panel frame was used to generate respondent level survey weights for subsequent analysis. These weights were further adjusted through post-stratification to align with predetermined targets for age, gender, education, and region.

## *World Risk Poll modified or excluded questions*

The World Risk Poll was fielded in over 140 countries, territories and areas with diverse political, cultural, economic and geographic backgrounds. In some instances, these differences prevented Gallup from asking the full set of questions included in the World Risk Poll, and some questions were completely excluded, while others had to be worded differently in a few countries.

This section provides information about the countries or territories where any question appearing on the 2023 Poll was significantly modified or was excluded altogether.

### Algeria

Items excluded in Algeria include:

- WP22231 How much do you think the government of (NAME OF COUNTRY) cares about you and your wellbeing? A lot, somewhat or not at all?

- WP22260 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your religion

- WP22261 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your [insert nationality/ethnic group/race]

### Bahrain

The following question was not asked in Bahrain:

- WP22231 How much do you think the government of (NAME OF COUNTRY) cares about you and your wellbeing? A lot, somewhat or not at all?

### Gabon

The following two questions were not asked in Gabon:

- WP22231 How much do you think the government of (NAME OF COUNTRY) cares about you and your wellbeing? A lot, somewhat or not at all?

- WP22249 Still thinking about the last disaster you experienced, did you receive any advance warning about the event from any of the following, or not? Local government agency, such as [insert local example for the national weather service/disaster management agency], or the police

### Myanmar

In Myanmar, WP22231 was modified so that the text read 'the government of Myanmar currently in power'. However, the analysis and reporting has included this modified text to include this wording.

### Niger

The following two questions were not asked in Niger:

- WP22231 How much do you think the government of (NAME OF COUNTRY) cares about you and your wellbeing? A lot, somewhat or not at all?

- WP22249 Still thinking about the last disaster you experienced, did you receive any advance warning about the event from any of the following, or not? Local government agency, such as [insert local example for the national weather service/disaster management agency], or the police

### Saudi Arabia

The following five questions were not asked in Saudi Arabia:

- WP22231 How much do you think the government of (NAME OF COUNTRY) cares about you and your wellbeing? A lot, somewhat or not at all?

- WP22259 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? The colour of your skin

- WP22260 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your religion

- WP22261 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your [insert nationality/ethnic group/race]

- WP22262 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your gender

- WP22263 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? A disability, if you have one

## Tajikistan

Items omitted in Tajikistan include:

- WP22231 How much do you think the government of (NAME OF COUNTRY) cares about you and your wellbeing? A lot, somewhat or not at all?

- WP22260 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your religion

- WP22261 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your [insert nationality/ethnic group/race]

## United Arab Emirates

Questions omitted from the UAE are as follows:

- WP22259 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? The colour of your skin

- WP22260 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your religion

- WP22261 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your [insert nationality/ethnic group/race]

- WP22262 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your gender

- WP22263 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? A disability, if you have one

## Yemen

Questions omitted from Yemen are as follows:

- WP22259 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? The colour of your skin

- WP22260 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your religion

- WP22261 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your [insert nationality/ethnic group/race]

- WP22262 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? Your gender

- WP22263 Have you, PERSONALLY, ever EXPERIENCED any discrimination because of any of the following? A disability, if you have one

## Table 3. Country dataset details, 2023 World Risk Poll

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| Afghanistan | Jul 1 – Jul 19, 2023 | 1,002 | 1.24 | 3.5 | Face-to-Face (HH)* | Dari, Pashto | |
| Albania | Jul 28 – Nov 12, 2023 | 1,000 | 1.98 | 4.4 | Face-to-Face (HH)* | Albanian | People living in remote or difficult-to-access rural areas were excluded. The excluded area represents approximately 2% of the population. |
| Algeria | Oct 16 – Nov 14, 2023 | 1,000 | 2.11 | 4.5 | Mobile Telephone | Arabic | |
| Argentina | Aug 5 – Oct 12, 2023 | 1,003 | 1.49 | 3.8 | Face-to-Face (HH)* | Spanish | Those living in dispersed rural population areas were excluded. This represents about 4% of the population. |
| Armenia | Jul 7 – Aug 21, 2023 | 1,000 | 1.69 | 4.0 | Face-to-Face (HH)* | Armenian | Settlements near territories disputed with Azerbaijan were not included for insecurity reasons. The excluded area represents approximately 3% of the population. |
| Australia | Jul 2 – Sep 12, 2023 | 1,002 | 1.58 | 3.9 | Landline and Mobile Telephone | English | |
| Austria | Jul 10 – Aug 5, 2023 | 1,000 | 1.74 | 4.1 | Landline and Mobile Telephone | German | |
| Azerbaijan | Aug 7 – Oct 12, 2023 | 1,000 | 1.29 | 3.5 | Face-to-Face (HH)* | Azeri, Russian | Nakhichevan and East Zangezur territories not included. These areas represent approximately 8% of the total population. (Nagorno-Karabakh not included in sampling frame and not counted in exclusion per cent.) |
| Bahrain | Sep 9 – Oct 4, 2023 | 1,007 | 1.30 | 3.5 | Mobile Telephone | Arabic, English, Hindi | Includes only Bahrainis, Arab expatriates and non-Arabs who were able to complete the interview in Arabic, English or Hindi. |
| Bangladesh | Aug 5 – Sep 18, 2023 | 1,000 | 1.23 | 3.4 | Face-to-Face (HH)* | Bengali | |
| Belgium | Jul 10 – Aug 31, 2023 | 1,000 | 1.41 | 3.7 | Landline and Mobile Telephone | French, Flemish | |
| Benin | Aug 19 – Sep 4, 2023 | 1,000 | 1.72 | 4.1 | Face-to-Face (HH)* | Bariba, Fon, French | |
| Bolivia | Aug 5 – Oct 12, 2023 | 1,000 | 1.44 | 3.7 | Face-to-Face (HH)* | Spanish | Some distant, small locations were excluded due to accessibility and/or security issues. The exclusions represent approximately 7% of the population. |
| Bosnia and Herzegovina | May 11 – Jul 4, 2023 | 1,000 | 1.44 | 3.7 | Face-to-Face (HH)* | Bosnian | |
| Botswana | Sep 4 – Sep 29, 2023 | 1,009 | 1.62 | 3.9 | Face-to-Face (HH)* | English, Setswana | Sampling units of population size less than 50 are excluded from the sampling frame. This exclusion is approximately 4% of the population. |
| Brazil | Sep 11 – Nov 3, 2023 | 1,000 | 1.34 | 3.6 | Face-to-Face (HH)* | Portuguese | |
| Bulgaria | Jul 20 – Oct 8, 2023 | 1,000 | 1.38 | 3.6 | Face-to-Face (HH)* | Bulgarian | |
| Burkina Faso | Oct 2 – Nov 8, 2023 | 1,000 | 1.69 | 4.0 | Face-to-Face (HH)* | Dioula, French, Fulfulde, Moore | Some communities across regions were excluded due to security reasons. The areas excluded represent approximately 18% of the population. |
| Cambodia | Sep 20 – Oct 23, 2023 | 1,000 | 1.78 | 4.1 | Face-to-Face (HH)* | Khmer | Koh Kong, Stueng Treng, Otdor Meanchey and Kep provinces were excluded. These excluded areas represent approximately 3% of the population. |
| Cameroon | Jun 3 – Jul 1, 2023 | 1,000 | 1.42 | 3.7 | Face-to-Face (HH)* | French, English, Fulfulde | Some arrondissements in the East region, the North region, the extreme North region, the Northwest region and the Southwest region were excluded due to insecurity. Neighbourhoods with less than 50 households were also excluded from the sampling. The exclusion represents 21% of the total population. |
| Canada | Aug 2 – Sep 18, 2023 | 1,005 | 1.41 | 3.7 | Landline and Mobile Telephone | English, French | Northwest Territories, Yukon and Nunavut (representing approximately 0.3% of the Canadian population) were excluded. |
| Chad | Oct 4 – Oct 30, 2023 | 1,000 | 1.68 | 4.0 | Face-to-Face (HH)* | French, Chadian Arabic, Ngambaye | Because of security issues and difficult terrain, seven regions are excluded from the sampling: Lac, Ouaddaï, Wadi Fira, Bourkou, Ennedi, Tibesti and Salamat. In addition, the North Kanem and Bahr El Gazal North districts were excluded due to accessibility issues. Quartiers/villages with less than 50 inhabitants were also excluded from sampling. The excluded areas represent 23% of the population. |
| Chile | Aug 12 – Dec 19, 2023 | 1,000 | 1.62 | 3.9 | Face-to-Face (HH)* | Spanish | |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| China | Dec 21, 2023 – Feb 13, 2024 | 3,000 | 1.99 | 2.5 | Web | Chinese | |
| Colombia | Sep 9 – Nov 15, 2023 | 1,008 | 1.40 | 3.7 | Face-to-Face (HH)* | Spanish | Ten departments and an additional 19 municipalities were excluded since they are located in areas of low population or with extreme insecurity issues. The excluded areas represent approximately 5% of the population. |
| Comoros | Sep 20 – Nov 23, 2023 | 1,000 | 1.86 | 4.2 | Face-to-Face (HH)* | French, Comorian | |
| Congo | Jun 29 – Aug 18, 2023 | 1,000 | 1.84 | 4.2 | Face-to-Face (HH)* | French, Kituba, Lingala | |
| Congo (the Democratic Republic of the) | Aug 3 – Sep 26, 2023 | 1,000 | 2.10 | 4.5 | Face-to-Face (HH)* | French, Lingala, Swahili | Parts of Bandundu, Bas Congo, Equateur, Kasai Occidental, Maniema, Province Orientale, Nord Kivu, Sud Kivu and Katanga were excluded due to insecurity. Geographic exclusions represent 19% of the population. |
| Costa Rica | Sep 27 – Dec 28, 2023 | 1,000 | 1.47 | 3.8 | Face-to-Face (HH)* | Spanish | |
| Côte d'Ivoire | Jul 8 – Aug 3, 2023 | 1,000 | 2.07 | 4.5 | Face-to-Face (HH)* | French, Dioula | PSUs with population less than 100 were excluded prior to sampling, corresponding to 9.2% of the population. |
| Croatia | Sep 14 – Nov 14, 2023 | 1,004 | 1.94 | 4.3 | Face-to-Face (HH)* | Croatian | |
| Cyprus | Jun 30 – Oct 31, 2023 | 1,031 | 1.91 | 4.2 | Landline and Mobile Telephone | Greek, English | |
| Czech Republic | Aug 30 – Oct 31, 2023 | 1,004 | 1.44 | 3.7 | Landline and Mobile Telephone | Czech | |
| Denmark | Aug 7 – Sep 13, 2023 | 1,005 | 1.90 | 4.3 | Mobile Telephone | Danish | |
| Dominican Republic | Jul 19 – Aug 9, 2023 | 1,000 | 1.57 | 3.9 | Face-to-Face (HH)* | Spanish | |
| Ecuador | Jul 26 – Sep 1, 2023 | 1,000 | 1.65 | 4.0 | Face-to-Face (HH)* | Spanish | |
| Egypt | Sep 11 – Sep 26, 2023 | 1,000 | 1.36 | 3.6 | Face-to-Face (HH)* | Arabic | Frontier governorates (Matruh, Red Sea, New Valley, North Sinai and South Sinai) were excluded, as they are remote and represent a small proportion of the population of the country. The excluded areas represent less than 2% of the total population. |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| El Salvador | Oct 4 – Dec 22, 2023 | 1,000 | 1.86 | 4.2 | Face-to-Face (HH)* | Spanish | |
| Estonia | Aug 16 – Oct 1, 2023 | 1,009 | 1.47 | 3.7 | Mobile Telephone | Estonian, Russian | |
| Eswatini | Oct 13 – Dec 24, 2023 | 1,000 | 2.11 | 4.5 | Face-to-Face (HH)* | Siswati, English | |
| Ethiopia | Jun 26 – Aug 10, 2023 | 1,000 | 1.51 | 3.8 | Face-to-Face (HH)* | Amharic, Oromo | Due to ongoing conflict and security issues, Tigray, Gambella and Harari regions were excluded. The excluded areas represent approximately 7% of the total population. |
| Finland | Aug 10 – Sep 18, 2023 | 1,003 | 1.47 | 3.8 | Mobile Telephone | Finnish | |
| France | Jul 3 – Oct 9, 2023 | 1,000 | 1.89 | 4.3 | Landline and Mobile Telephone | French | |
| Gabon | Oct 20 – Nov 18, 2023 | 1,000 | 1.66 | 4.0 | Face-to-Face (HH)* | French, Fang | |
| Gambia | Oct 16 – Nov 27, 2023 | 1,000 | 1.26 | 3.5 | Face-to-Face (HH)* | English, Pulaar, Wolof, Malinke | |
| Georgia | Jul 14 – Oct 28, 2023 | 1,000 | 1.51 | 3.8 | Face-to-Face (HH)* | Georgian, Russian | South Ossetia and Abkhazia were not included for the safety of the interviewers. In addition, very remote mountainous villages or those with less than 100 inhabitants were also excluded. The excluded area represents approximately 8% of the population. |
| Germany | Jul 10 – Aug 12, 2023 | 1,000 | 2.47 | 4.9 | Landline and Mobile Telephone | German | |
| Ghana | Jun 29 – Jul 21, 2023 | 1,000 | 1.69 | 4.0 | Face-to-Face (HH)* | English, Ewe, Twi, Dagbani, Hausa | Localities with less than 100 inhabitants were excluded from the sample. The excluded areas represent approximately 4% of the population. |
| Greece | Oct 16 – Nov 16, 2023 | 1,011 | 2.30 | 4.7 | Landline and Mobile Telephone | Greek | |
| Guatemala | Aug 16 – Dec 22, 2023 | 1,000 | 1.79 | 4.2 | Face-to-Face (HH)* | Spanish | |
| Guinea | Sep 21 – Oct 12, 2023 | 1,000 | 1.73 | 4.1 | Face-to-Face (HH)* | French, Malinke, Pular, Soussou | |
| Honduras | Sep 4 – Dec 4, 2023 | 1,000 | 1.75 | 4.1 | Face-to-Face (HH)* | Spanish | PSUs with population less than 50, and De La Bahia and Gracias a Dios were excluded. The exclusion represents approximately 4% of the population. |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| Hong Kong, S.A.R. of China | Aug 26 – Oct 30, 2023 | 1,004 | 1.36 | 3.6 | Landline and Mobile Telephone | Chinese | |
| Hungary | Aug 28 – Oct 10, 2023 | 1,011 | 2.03 | 4.4 | Landline and Mobile Telephone | Hungarian | |
| Iceland | Sep 1 – Oct 2, 2023 | 505 | 1.19 | 4.8 | Landline and Mobile Telephone | Icelandic | |
| India | Sep 16 – Nov 8, 2023 | 3,000 | 1.36 | 2.1 | Face-to-Face (HH)* | Assamese, Bengali, Gujarati, Hindi, Kannada, Malayalam, Marathi, Odia, Punjabi, Tamil, Telugu | Excluded population living in Northeast states and remote islands, and Jammu and Kashmir. The excluded areas represent less than 10% of the population. |
| Indonesia | Aug 23 – Sep 30, 2023 | 1,000 | 1.30 | 3.5 | Face-to-Face (HH)* | Bahasa Indonesia | |
| Iran | Oct 23 – Oct 27, 2023 | 1,007 | 1.29 | 3.5 | Landline and Mobile Telephone | Farsi | |
| Iraq | Oct 3 – Nov 19, 2023 | 1,035 | 1.20 | 3.3 | Face-to-Face and Face-to-Face (HH)* | Arabic, Kurdish | |
| Ireland | Jul 10 – Aug 7, 2023 | 1,000 | 2.08 | 4.5 | Landline and Mobile Telephone | English | |
| Israel | Oct 17 – Dec 3, 2023 | 1,000 | 1.14 | 3.3 | Face-to-Face (HH)* | Hebrew, Arabic | The sample does not include the area of East Jerusalem. This area is included in the sample of the State of Palestine. Unsafe or evacuated areas near the border with Gaza were excluded from the survey. |
| Italy | Sep 4 – Oct 5, 2023 | 1,000 | 2.51 | 4.9 | Landline and Mobile Telephone | Italian | |
| Japan | Sep 22 – Nov 15, 2023 | 1,004 | 1.31 | 3.5 | Landline and Mobile Telephone | Japanese | Landline RDD excluded 12 municipalities near the nuclear power plant in Fukushima. These areas were designated as not-to-call districts due to the devastation from the 2011 disasters. The exclusion represents less than 1% of the population. |
| Jordan | Aug 19 – Sep 10, 2023 | 1,000 | 1.29 | 3.5 | Face-to-Face (HH)* | Arabic | |
| Kazakhstan | Aug 6 – Sep 29, 2023 | 1,000 | 1.39 | 3.7 | Face-to-Face (HH)* | Russian, Kazakh | |
| Kenya | Oct 16 – Nov 10, 2023 | 1,000 | 1.32 | 3.6 | Face-to-Face (HH)* | English, Swahili/ Kishwahili | |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| Kosovo | Jul 27 – Oct 13, 2023 | 1,000 | 1.66 | 4.0 | Face-to-Face (HH)* | Albanian, Serbian | |
| Kuwait | Sep 8 – Oct 20, 2023 | 1,063 | 1.63 | 3.8 | Landline and Mobile Telephone | Arabic, Bengali, English, Hindi | Includes only Kuwaitis, Arab expatriates and non-Arabs who were able to complete the interview in Arabic, English, Bengali or Hindi. |
| Kyrgyzstan | Aug 6 – Sep 19, 2023 | 1,000 | 1.33 | 3.6 | Face-to-Face (HH)* | Kyrgyz, Russian | |
| Lao People's Democratic Republic | Oct 2 – Oct 28, 2023 | 1,000 | 1.57 | 3.9 | Face-to-Face (HH)* | Lao | Excluded Xaisomboun Province, Xayaboury Province and some communes that are unreachable and/or have security considerations. The excluded areas represent approximately 7% of the population. |
| Latvia | Aug 21 – Sep 24, 2023 | 1,020 | 1.39 | 3.6 | Mobile Telephone | Latvian, Russian | |
| Lebanon | Aug 3 – Sep 9, 2023 | 1,010 | 1.17 | 3.3 | Face-to-Face (HH)* | Arabic | Hermel, Baalbak and Bint Jbeil under the strict control of Hezbollah were excluded. The excluded areas represent approximately 10% of the population. |
| Liberia | Aug 3 – Sep 11, 2023 | 1,002 | 1.37 | 3.6 | Face-to-Face (HH)* | English, Pidgin English | |
| Libya | Oct 27 – Dec 13, 2023 | 1,005 | 1.26 | 3.5 | Mobile Telephone | Arabic | |
| Lithuania | Jul 12 – Nov 10, 2023 | 1,000 | 1.40 | 3.7 | Face-to-Face (HH)* | Lithuanian | Very small settlements (with less than 100 inhabitants) were excluded. The excluded areas represent approximately 9% of the total population. |
| Luxembourg | Jul 10 – Aug 10, 2023 | 1,000 | 1.82 | 4.2 | Landline and Mobile Telephone | French, German | |
| Madagascar | Jun 25 – Aug 13, 2023 | 1,000 | 1.50 | 3.8 | Face-to-Face (HH)* | French, Malagasy | Regions that were unsafe or unreachable were excluded from the sample. The excluded areas represent approximately 17% of the total population. |
| Malawi | Oct 2 – Oct 17, 2023 | 1,000 | 1.38 | 3.6 | Face-to-Face (HH)* | Chichewa, English, Tumbuka | |
| Malaysia | Aug 21 – Nov 10, 2023 | 1,000 | 1.68 | 4.0 | Face-to-Face (HH)* | Bahasa Malay, Chinese, English | |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| Mali | Aug 28 – Sep 17, 2023 | 1,000 | 1.41 | 3.7 | Face-to-Face (HH)* | French, Bambara | The regions of Gao, Kidal, Mopti and Tombouctou were excluded because of insecurity. Quartiers and villages with less than 50 inhabitants were also excluded from the sample. The excluded areas represent 23% of the total population. |
| Malta | Jul 8 – Aug 25, 2023 | 1,000 | 1.28 | 3.5 | Landline and Mobile Telephone | Maltese, English | |
| Mauritania | Jul 27 – Aug 22, 2023 | 1,000 | 1.39 | 3.7 | Face-to-Face (HH)* | French, Poulaar, Hassanya | Some communes in Hodh Ech Chargui and Hodh El Gharbi were excluded due to increasing insecurity. The excluded areas represent approximately 4% of the population. |
| Mauritius | Jul 7 – Sep 11, 2023 | 1,000 | 1.69 | 4.0 | Landline and Mobile Telephone | Creole, English, French | |
| Mexico | Aug 4 – Nov 7, 2023 | 1,000 | 1.47 | 3.8 | Face-to-Face (HH)* | Spanish | |
| Moldova (the Republic of) | Jul 6 – Sep 25, 2023 | 1,000 | 2.00 | 4.4 | Face-to-Face (HH)* | Romanian/ Moldavian, Russian | Transnistria (Prednestrovie) excluded for safety of interviewers. The excluded area represents approximately 13% of the population. |
| Mongolia | Jul 31 – Sep 22, 2023 | 1,000 | 1.28 | 3.5 | Face-to-Face (HH)* | Mongolian | |
| Montenegro | Aug 31 – Nov 16, 2023 | 1,000 | 1.33 | 3.6 | Face-to-Face (HH)* | Montenegrin | |
| Morocco | Sep 14 – Oct 18, 2023 | 1,014 | 1.30 | 3.5 | Face-to-Face (HH)* | Moroccan Arabic | Excludes the Southern provinces. The excluded area represents approximately 3% of the population. |
| Mozambique | Jun 17 – Sep 8, 2023 | 1,000 | 2.21 | 4.6 | Face-to-Face (HH)* | Portuguese, Xichangana, Emakhuwa | Cabo Delgado province, as well as a small number of districts in other provinces, were excluded due to insecurity. The excluded areas represent 8% of the population. |
| Myanmar | Sep 5 – Oct 7, 2023 | 1,000 | 2.43 | 4.8 | Mobile Telephone | Myanmar, Burmese | |
| Namibia | Sep 17 – Oct 18, 2023 | 1,002 | 1.55 | 3.9 | Face-to-Face (HH)* | English, Oshivambo, Afrikaans | |
| Nepal | Jun 11 – Jul 19, 2023 | 1,000 | 1.37 | 3.6 | Face-to-Face (HH)* | Nepali | |
| Netherlands | Jul 10 – Aug 13, 2023 | 1,007 | 1.52 | 3.8 | Landline and Mobile Telephone | Dutch | |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| New Zealand | Jul 20 – Sep 12, 2023 | 1,000 | 1.56 | 3.9 | Landline and Mobile Telephone | English | |
| Nicaragua | Sep 23 – Nov 1, 2023 | 1,000 | 1.60 | 3.9 | Face-to-Face (HH)* | Spanish | |
| Niger | Aug 15 – Sep 12, 2023 | 1,000 | 1.54 | 3.8 | Face-to-Face (HH)* | French, Hausa, Zarma | Some communes in the Agadez region and Diffa region were excluded because of insecurity. In addition, PSUs with fewer than 25 households were also excluded. The excluded area represents approximately 8% of the population. |
| Nigeria | Sep 13 – Oct 12, 2023 | 1,000 | 2.30 | 4.7 | Face-to-Face (HH)* | English, Hausa, Igbo, Pidgin English, Yoruba | The three northeastern states of Adamawa, Borno and Yobe were excluded due to insecurity and Boko Haram insurgency. In addition, disputed areas of Taraba state were also excluded. Together, these exclusions account for roughly 7% of the total population. |
| North Macedonia | Jul 13 – Sep 30, 2023 | 1,000 | 1.46 | 3.8 | Face-to-Face (HH)* | Macedonian, Albanian | |
| Norway | Aug 3 – Sep 18, 2023 | 1,000 | 2.02 | 4.4 | Mobile Telephone | Norwegian | |
| Pakistan | Sep 22 – Oct 25, 2023 | 1,001 | 1.70 | 4.0 | Face-to-Face (HH)* | Urdu | Did not include AJK, Gilgit-Baltistan and parts of FATA. The excluded area represents approximately 5% of the population. Gender-matched sampling was used during the final stage of selection. |
| State of Palestine | Jul 16 – Sep 28, 2023 | 1,000 | 1.22 | 3.4 | Face-to-Face (HH)* | Arabic | Areas with security concerns close to the Israeli borders, areas that are accessible only to special Israeli permit holders and areas with population concentrations less than 1,000 people were excluded. The excluded areas represent less than 2% of the population. The sample includes East Jerusalem. |
| Panama | Oct 4, 2023 – Jan 11, 2024 | 1,000 | 1.83 | 4.2 | Face-to-Face (HH)* | Spanish | |
| Paraguay | Sep 11 – Oct 9, 2023 | 1,000 | 1.45 | 3.7 | Face-to-Face (HH)* | Spanish, Jopara | |
| Peru | Aug 9 – Oct 9, 2023 | 1,000 | 1.29 | 3.5 | Face-to-Face (HH)* | Spanish | |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| Philippines | Oct 9 – Dec 7, 2023 | 1,003 | 1.52 | 3.8 | Face-to-Face (HH)* | Filipino, Iluko, Cebuano, Hiligaynon, Bicol, Waray | |
| Poland | Aug 28 – Oct 29, 2023 | 1,000 | 1.31 | 3.5 | Face-to-Face (HH)* | Polish | Low population areas were excluded. The excluded areas represent approximately 5% of the population. |
| Portugal | Jul 26 – Sep 18, 2023 | 1,001 | 1.63 | 3.9 | Landline and Mobile Telephone | Portuguese | |
| Romania | Sep 10 – Dec 10, 2023 | 1,000 | 1.40 | 3.7 | Face-to-Face (HH)* | Romanian | |
| Russian Federation | Jun 27 – Oct 4, 2023 | 2,024 | 1.60 | 2.8 | Mobile Telephone | Russian | |
| Saudi Arabia | Jul 9 – Aug 3, 2023 | 1,018 | 1.33 | 3.5 | Landline and Mobile Telephone | Arabic, English, Hindi, Urdu | Includes Saudis, Arab expatriates and non-Arabs who were able to complete the interview in Arabic, English, Urdu or Hindi. |
| Senegal | Sep 30 – Oct 24, 2023 | 1,000 | 1.49 | 3.8 | Face-to-Face (HH)* | French, Wolof | Sindian commune in Zinguichor region was excluded due to insecurity. PSUs (quartiers and villages) with household size less than 50 were excluded due to the small population size. The excluded areas represent 18% of the population. |
| Serbia | Jun 1 – Sep 3, 2023 | 1,000 | 1.30 | 3.5 | Face-to-Face (HH)* | Serbian | |
| Sierra Leone | Dec 2 – Dec 25, 2023 | 1,000 | 1.25 | 3.5 | Face-to-Face (HH)* | English, Krio, Mende | |
| Singapore | Nov 21 – Dec 27, 2023 | 1,031 | 1.70 | 4.0 | Mobile Telephone | English, Chinese, Bahasa Malay | |
| Slovakia | Jun 13 – Aug 3, 2023 | 1,001 | 1.27 | 3.5 | Face-to-Face (HH)* | Hungarian, Slovak | |
| Slovenia | Aug 16 – Oct 1, 2023 | 1,001 | 1.68 | 4.0 | Landline and Mobile Telephone | Slovene | |
| Somalia | Oct 4 – Dec 27, 2023 | 1,000 | 1.28 | 3.5 | Face-to-Face (HH)* | Somali | The regions of Hiraan, Bakool and Middle Juba were excluded due to the prevailing security situation, as well as some districts in other areas of the country. Excluded areas represent approximately 29% of the population. |
| South Africa | Oct 19, 2023 – Feb 1, 2024 | 1,000 | 1.60 | 3.9 | Face-to-Face (HH)* | Afrikaans, English, Sotho, Xhosa, Zulu | |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| South Korea | Sep 6 – Nov 1, 2023 | 1,027 | 1.50 | 3.7 | Landline and Mobile Telephone | Korean | |
| Spain | Jul 10 – Aug 7, 2023 | 1,000 | 1.69 | 4.0 | Landline and Mobile Telephone | Spanish | |
| Sri Lanka | Sep 23 – Nov 19, 2023 | 1,000 | 1.45 | 3.7 | Face-to-Face (HH)* | Sinhala, Tamil | |
| Sweden | Aug 16 – Sep 26, 2023 | 1,005 | 1.63 | 3.9 | Mobile Telephone | Swedish | |
| Switzerland | Jul 10 – Aug 12, 2023 | 1,000 | 1.92 | 4.3 | Landline and Mobile Telephone | German, French, Italian | |
| Taiwan, Province of China | Jun 21 – Jul 16, 2023 | 1,000 | 1.74 | 4.1 | Landline and Mobile Telephone | Chinese | |
| Tajikistan | Oct 7 – Nov 15, 2023 | 1,001 | 1.37 | 3.6 | Face-to-Face (HH)* | Tajik | The GBAO was excluded, as it was closed for any kind of surveys or field research by the national security service. The excluded region represents approximately 3% of the population. |
| Tanzania | Dec 7 – Dec 23, 2023 | 1,002 | 1.48 | 3.8 | Face-to-Face (HH)* | Swahili, Kishwahili | |
| Thailand | Sep 4 –Nov 19, 2023 | 1,000 | 1.61 | 3.9 | Face-to-Face (HH)* | Thai | Three provinces in the South region (Pattani, Narathiwat and Yala) were excluded for security reasons; in addition, a few districts in other provinces were excluded. The excluded areas in total represent less than 4% of the population. |
| Togo | Oct 5 – Oct 26, 2023 | 1,000 | 1.90 | 4.3 | Face-to-Face (HH)* | French, Ewe | PSUs with less than 100 population were excluded prior to sampling. The excluded areas represent approximately 7% of the population. |
| Tunisia | Jul 28 – Aug 24, 2023 | 1,000 | 1.33 | 3.6 | Face-to-Face (HH)* | Arabic | |
| Türkiye | Sep 7 – Dec 7, 2023 | 1,000 | 1.28 | 3.5 | Face-to-Face (HH)* | Turkish | Gaziantep and Sanliurfa provinces, and portions of Adana, Hatay and Malatya provinces, were excluded due to an earthquake in February 2023. The excluded areas represent approximately 12% of the population. |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| Uganda | Dec 27, 2023 – Feb 6, 2024 | 1,000 | 1.41 | 3.7 | Face-to-Face (HH)* | Ateso, English, Luganda, Runyankole | Three districts in the North region were excluded for security reasons – Kotido, Moroto and Nakapiripirit. The excluded areas represent 2% or less of the population. |
| Ukraine | Aug 11 – Aug 19, 2023 | 1,000 | 1.75 | 4.1 | Mobile Telephone | Russian, Ukrainian | Some occupied territories with entrenched Russian control are excluded due to lack of coverage by Ukrainian mobile operators. The exclusion represents approximately 10% of the population. |
| United Arab Emirates | Sep 5 – Sep 27, 2023 | 1,000 | 1.30 | 3.5 | Mobile Telephone | Arabic, English, Hindi, Urdu | Includes only Emiratis, Arab expatriates and non-Arabs who were able to complete the interview in Arabic, English, Hindi or Urdu. |
| United Kingdom of Great Britain and Northern Ireland | Jul 10 – Aug 7, 2023 | 1,000 | 1.78 | 4.1 | Landline and Mobile Telephone | English | Regions outside of England, Scotland, Wales and Northern Ireland are excluded. |
| United States of America | Jul 22 – Sep 23, 2023 | 1,003 | 1.71 | 4.0 | Landline and Mobile Telephone | English, Spanish | |

| Country | Data Collection Date | Number of Interviews | Design Effect[a] | Margin of Error[b] | Mode of itnerviewing | Languages | Exclusions (Samples are nationally rpreesentative unless noted otherwise) |
|---|---|---|---|---|---|---|---|
| Uruguay | Aug 30 – Oct 28, 2023 | 1,000 | 1.40 | 3.7 | Face-to-Face (HH)* | Spanish | |
| Uzbekistan | Jul 26 – Nov 5, 2023 | 1,000 | 1.46 | 3.7 | Face-to-Face (HH)* | Uzbek, Russian | The entire Karakalpak region was excluded, which corresponds to 6% of the total population. |
| Venezuela | Aug 3 – Aug 30, 2023 | 1,000 | 1.48 | 3.8 | Face-to-Face (HH)* | Spanish | The federal dependencies are excluded due to remoteness and difficulty of access. Exclusions represent less than 1% of the population. |
| Vietnam | May 29 – Jul 28, 2023 | 1,000 | 1.37 | 3.6 | Face-to-Face (HH)* | Vietnamese | |
| Yemen | Aug 26 – Oct 10, 2023 | 1,000 | 1.96 | 4.3 | Face-to-Face and Face-to-Face (HH)* | Arabic | Al Baydaa, Al Jawf, Mareb, Sadah, the Island of Socotra and several districts in other governorates were excluded due to their small size, remoteness or security issues. The excluded areas represent approximately 20% of the population. |
| Zambia | Dec 28, 2023 – Jan 31, 2024 | 1,000 | 1.66 | 4.0 | Face-to-Face (HH)* | Bemba, English, Lozi, Nyanja, Tonga | |
| Zimbabwe | Jul 19 – Aug 10, 2023 | 1,000 | 1.54 | 3.8 | Face-to-Face (HH)* | English, Shona, Ndebele | |

a The design effect calculation reflects the weights and does not incorporate the intraclass correlation coefficients. Design effect calculation: n*(sum of squared weights)/[(sum of weights)*(sum of weights)]

b Margin of error is calculated around a proportion at the 95% confidence level. The maximum margin of error was calculated assuming a reported percentage of 50% and takes into account the design effect. Margin of error calculation: $\sqrt{(0.25/N)}*1.96*\sqrt{(DE)}$

c Areas with disproportionately high number of interviews in the sample.

d Reasons for these differences could include household sampling, respondent sampling in the household, errors in self-reports of actual attainment or dated population information.

*Handheld data collection.

# 3. Methods for report analysis

This section reviews the statistical methods used in the analysis of the 2023 Lloyd's Register Foundation World Risk Poll. It also provides further information about other data sources and Gallup World Poll questions used in the analysis, which were not part of the World Risk Poll questionnaire.

## World Risk Poll results: Reporting and calculation

The World Risk Poll results were generally reported at three major levels: globally, across groups of countries, areas and territories (including by global region or country-income level) and nationally.

All results presented by country are weighted to enhance the representativeness of the data. Results that were aggregated across more than one country (for instance, by region or country-income level) were weighted by the aged 15+ population size of the countries included in the analysis unless otherwise noted.

## Country groupings used in the analysis

**Geographic region:** The Resilience in a Changing World report uses the same 15 regional groupings (see below) which have been used in past reports. These geographic regions closely follow those used by the United Nations Statistics Division (UNSD). though, in some instances, these definitions were modified. Most notably, the UNSD region of 'Western Asia' was re-named to the more familiar name of the 'Middle East'; countries assigned to the Western Asia region used by the UNSD but not traditionally associated with the Middle East (such as Armenia, Azerbaijan and Georgia) were placed in different regions.

Additionally, this report combined some UNSD regions to reduce the number of categories, including Latin America and the Caribbean (which consists of the UNSD regions of the Caribbean, South America and Central America); Central/Western Africa (which consists of the UNSD regions of Middle Africa and Western Africa) and Northern/Western Europe (which consists of the UNSD regions Northern and Western Europe).

## Africa

- **Eastern Africa:** Comoros, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Somalia, Tanzania, Uganda, Zambia, Zimbabwe
- **Central/Western Africa:** Benin, Burkina Faso, Cameroon, Chad, Congo Brazzaville (Republic of Congo), Congo Kinshasa (Democratic Republic of Congo), Côte d'Ivoire, Gabon, Gambia, Ghana, Guinea,. Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo
- **Northern Africa:** Algeria, Egypt, Libya, Morocco, Tunisia
- **Southern Africa:** Botswana, Eswatini, Namibia, Southern Africa

## Americas

- **Latin America and the Caribbean:** Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela
- **Northern America:** Canada, United States

## Asia

- **Central Asia:** Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan
- **Eastern Asia:** China, Hong Kong SAR of China, Japan, Mongolia, South Korea, Taiwan, Province of China
- **Southeastern Asia:** Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam
- **Southern Asia:** Afghanistan, Bangladesh, India, Iran, Nepal, Pakistan, Sri Lanka
- **Middle East:** Bahrain, Iraq, Israel, Jordan, Kuwait, Lebanon, Palestine, Saudi Arabia, Türkiye, United Arab Emirates, Yemen

## Europe

- **Eastern Europe:** Bulgaria, Czech Republic, Hungary, Kosovo, Moldova, Poland, Romania, Russia, Slovakia, Ukraine
- **Northern/Western Europe:** Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Sweden, Switzerland, United Kingdom
- **Southern Europe:** Albania, Bosnia Herzegovina, Croatia, Cyprus, Greece, Italy, Malta, Montenegro, North Macedonia, Portugal, Serbia, Slovenia, Spain

## Oceania

- **Australia and New Zealand:** Australia, New Zealand

**Country-income level:** The report frequently examines World Risk Poll results by country income group, consisting of four income groups – high, upper-middle, lower-middle and low. Countries, territories and areas were classified according to the 2023-2024 thresholds the World Bank announced on 01 July 2023. These thresholds are as follows:

- **Low income:** Gross national income (GNI) per capita of less than $1,135
- **Lower-middle income:** GNI per capita of $1,136-$4,465
- **Upper-middle income:** GNI per capita of $4,466-$13,845
- **High income:** GNI per capita above $13,845

Beyond these four core categories, the World Bank was unable to classify Venezuela due to a lack of available data in the recent period.

# About Gallup World Poll demographics

One of the key research objectives was to assess how attitudes about risk and safety varied across demographic groups, including gender, urbanicity, education, household income and age. The ways income and education levels are reported vary by country, making equivalent cross-cultural comparisons difficult. Gallup harmonised education variables and consulted with experts to create income variables. In doing so, Gallup has created a worldwide dataset with standardised, respondent-level education and income data.

## *Education*

Countries have unique ways of classifying education levels, and these classifications need to be preserved during data collection for weighting purposes. However, consistent categories needed to be created to make comparisons across countries by educational attainment. All education descriptions can be placed within three categories: primary, secondary and tertiary. All responses regarding education are coded into their relevant category for global comparison.

- Primary (0-8 years): Functional equivalent to completing primary education or lower secondary or less, the level that is closest to completing up to eight years of education. The exact definition will vary by country.
- Secondary (9-15 years): Functional equivalent to completing some secondary up to some
- post-secondary education. This typically refers to individuals who have completed between nine and 15 years of education but have not yet completed the equivalent of a bachelor's degree. The exact definition will vary by country.
- Tertiary (16 years or more): Functional equivalent to completing four years of

tertiary education, or the equivalent of a bachelor's degree. This typically refers to individuals who have completed approximately 16 or more years of education. The exact definition will vary by country.

## *Income*

To provide household income measurements that are comparable across countries, Gallup asks respondents two questions. The respondent who answers these questions is the one randomly selected from the household in the final stage of sampling. The first question asks respondents about their monthly household income in local currency before taxes. Respondents are instructed to include all income from all wages and salaries in the household, remittances from family members living elsewhere and all other sources. In a few countries, Gallup asks about annual rather than monthly income.

If respondents hesitate to answer or have difficulty answering the first question, they are presented with a set of income ranges in their local currency.

- What is your total MONTHLY household income in (country), before taxes? Please include income from wages and salaries, remittances from family members living elsewhere, farming, and all other sources.
- (If don't know or refused, ask:) Would you say your total MONTHLY household income is _____?

Estimates for respondents answering the second income question are computed using hot deck imputation, while restricting imputing values to the reported range. Estimates for respondents who did not answer either income question are imputed using the same method, with no restriction of range. In this imputation process, each missing value is replaced with an observed value from another unit that has characteristics similar to the missing unit.

Estimates of household income are expressed in both local and international dollars. Local income is converted to international dollars using the World Bank's individual consumption PPP conversion factor, making income estimates comparable across all countries. From these two questions, several income variables are created.

Gallup researchers calculate the following income variables:

- annual household income in local currency (INCOME_1)
- annual household income in international dollars (INCOME_2)
- per capita annual income in local currency (INCOME_3)
- per capita annual income in international dollars (INCOME_4)
- per capita income quintiles (INCOME_5)
- reported versus imputed values (INCOME_7)
- total number of people living in household (HHSIZE)

# 4. Resilience Index methodology

First introduced in the 2022 World Risk Poll report '*A Resilient World? Understanding vulnerability in a changing climate*', the Resilience Index quantifies people's capacity for resilience and ability to deal with adversity based on their personal circumstances and perceptions[i]. The overall score ranges between 0 and 100, with higher values equating to higher resilience[ii]. The Resilience Index is a composite score based on four underlying dimensions: individual, household, community and societal resilience. By measuring resilience at these four levels, the index provides a holistic assessment of resilience.

The Resilience Index is calculated by evaluating how respondents answered over a dozen different survey questions, drawing from questions originally designed for the 2021 World Risk Poll to measure some aspects of resilience as well as some items from the larger Gallup World Poll that were deemed relevant to understanding this topic.

The motivation and methodology behind the original Resilience Index was described in the methodology report for the 2021 Poll[iii], though this section will also provide a brief recap of this process. Importantly, Gallup and Lloyd's Register Foundation researchers applied the same conceptual framework – including the selection of which survey questions map to each sub-dimension of the index – as in the previous analysis.

Similarly, the calculation process used to derive an individual's final index score did not change, however researchers transformed the scale of the final score to fall between 0 and 100, with higher values denoting greater resilience. By comparison, the 2022 report reported Resilience Index results using a 0–1 scale[iv].

This change was made to help readers more easily interpret the results, especially when comparing scores between the two waves.

The subsequent sections recap how the Resilience Index was developed and calculated.

## Construct definition

In its broadest sense, resilience is the capacity to handle and recover from adversity and difficulties. For risk management experts, that generally means how well individuals or groups manage and recover from 'shocks' – instances when risks evolve into disruptive events that threaten safety.

In some cases, resilience refers to the ability to return relatively quickly to the pre-shock state; this recalls how physicists use the term to describe a system's capacity to return to equilibrium after

being exposed to a stressor. The European Union's definition reflects this view of resilience as 'the ability of an individual, a household, a community, a country or a region to withstand, to adapt, and to quickly recover from stressors and shocks'[v].

In the context of risk and safety, however, resilience often refers not just to the ability to recover from specific shocks as they occur, but also to adapt to changes in the risk landscape to make shocks less likely or less harmful when they do occur. The Rockefeller Foundation's definition, for example, emphasises this adaptive aspect of resilience: 'The capacity of individuals, communities, and systems to survive, adapt, and grow in the face of stress and shocks, and even transform, when conditions require it'[vi].

Summarising these different conceptions, Béné et al.'s 2014 review of the literature concluded that resilience can consist of absorptive, adaptive or transformative capacities and that the need for each capacity varies with the intensity and costs of the shocks involved[vii]. Truly resilient systems have all three capacities to deal with a wide range of potential shocks.

## Construct composition

The Lloyd's Register Foundation report, Foresight Review on Resilience Engineering, notes that standards and processes for measuring resilience are still emerging, citing the need for 'assessment and predictive capabilities that do not presently exist, including identification, collection and analysis of relevant data'.

In recent years, researchers and development practitioners have developed a number of frameworks for measuring resilience, several of which were summarised in a 2016 report from the United Kingdom's Department for International Development (DFID), now the Foreign, Commonwealth and Development Office[viii]. The report lists several common methods for quantifying resilience, including the following:

1. Household or community characteristics: Includes income, access to safety nets and social capital

2. Functionality: Includes measures of infrastructure resilience – for example, the presence of a system to measure structures' resilience to earthquakes

3. Access to food

4. Activities: Attempts to put a monetary value on interventions designed to improve resilience

5. Subjective perceptions: Includes individuals' self-evaluation of their household's capacities in responding to risk

6. Costs of resilience: Includes the costs of anticipation, impact and recovery

i – A Resilient World? Understanding vulnerability in a changing climate. (2022). World Risk Poll. https://wrp.lrfoundation.org.uk/publications/a-resilient-world-understanding-vulnerability-in-a-changing-climate

ii – In the 2022 report, the index score was originally reported on a 0 to 1 scale as is discussed below.

iii – 2021 Lloyd's Register Foundation World Risk Poll methodology. (2021). Lloyd's Register Foundation. https://wrp.lrfoundation.org.uk/sites/default/files/2024-06/lrf_wrp_2021_full_methods.pdf

iv – A Resilient World? Understanding vulnerability in a changing climate. (2022). World Risk Poll. https://wrp.lrfoundation.org.uk/publications/a-resilient-world-understanding-vulnerability-in-a-changing-climate

v – European Commission. (2016). Building resilience: The EU's approach. https://ec.europa.eu/echo/files/aid/countries/factsheets/thematic/EU_building_resilience_en.pdf

vi – Rockefeller Foundation. (2017). Introducing Zilient: A global resilience network. https://www.rockefellerfoundation.org/blog/introducing-zilient-global-resilience-network/

vii – Béné, C., Newsham, A., Davies, M., Ulrichs, M., & Godfrey-Wood, R. (2014). Resilience, poverty and development. Journal of International Development, 26(5), 598–623.

viii – Lloyd's Register Foundation. (2015). Foresight review of resilience engineering. https://www.lrfoundation.org.uk/en/publications/resilience-engineering/

Another review of existing resilience studies conducted by Serfilippi and Ramnath in 2018 classified 76 indicators into three categories[i]:

1. **Social:** Includes coping strategies, access to safety nets, inclusion, education, living conditions, access to information, access to basic services and infrastructure

2. **Environmental:** Includes soil and water conservation measures, land use change and fertiliser use

3. **Economic:** Includes diversification of livelihoods, access to credit and productive assets

In his 2013 review of resilience measures, Béné wrote about the need for indicators that are not only generic enough to measure resilience to different types of shocks, but also 'multi-scale' in that they assess resilience at different levels – including the household, community and societal levels – to capture the full range of risk mitigation factors in their environment[ii].

## Indicator mapping

In the process of designing the Resilience Index, the conceptual frameworks described above were reviewed to identify unique, measurable variables. Each of these variables was then compared to data available from the World Risk Poll (Table 1) and the Gallup World Poll (GWP) more broadly (Table 2).

Matching indicators were then mapped to the existing resilience frameworks. As Table 1 and Appenedix Table 2 show, there was not a perfect match between the variables available in the World Risk Poll/GWP and any specific resilience frameworks; however, all frameworks were at least partially covered.

### Table 1. Correspondence between resilience conceptual frameworks and World Risk Poll items

| Framework | Variable | Cover Basic Needs | Government Cares | Neighbours Care | Look to/Trust Info Sources | Institutions Prepared | Experienced Disaster | Received Warning | Individual Agency | Household Plan | Loss of Services | Discrimination |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Capacities Framework** | Absorptive capacity | X | X | X | | | | | | X | | |
| | Adaptive capacity | | | | | | | | X | | | |
| | Transformative capacity | | | | | | | | X | | | |
| **Capacities Measurement Framework** | Social | | X | X | | | | X | | | | X |
| | Environmental | | | | | | | | | | | |
| | Economic | X | | | | | | | | | | |
| **DFID (2016)** | Hhld/Community characteristics | X | | X | | | | | | | | X |
| | Functionality | | | | | | | X | | | | |
| | Access to food | | | | | | | | | | | |
| | Activities | | | | | | | | | | | |
| | Subjective perceptions | | | | | | | | X | X | | |
| | Costs of resilience | | | | | | | | | | | |
| **Psychological Resilience – U.K.'s NHS** | Confidence (self-efficacy) | | | | | | | | X | | | |
| | Coordination (planning) | | | | | | | | | X | | |
| | Control | | | | | | | | X | | | |
| | Composure (low anxiety) | | | | | | | | | | | |
| | Commitment (persistence) | | | | | | | | | | | |
| | Make adversity meaningful | | | | | | | | | | | |

i – Serfilippi, E., & Ramnath, G. (2018). Resilience measurement and conceptual frameworks: A review of the literature. Annals of Public and Cooperative Economics, 89(4), 645–664. https://doi.org/10.1111/apce.12202
ii – Béné, C. (2013). Towards a quantifiable measure of resilience. IDS Working Papers, 434, 1–27.

## Table 2. Correspondence between resilience conceptual frameworks and GWP items

| Framework | Variable | Educational Attainment* | Internet Access* | Mobile Phone Access* | Feelings About Household Income | Standard of Living | Standard of Living Better | Not Enough Money: Food | Not Enough Money: Shelter | Safe Walking Alone* | Helped a Stranger* | Money/Property Stolen | Public Transport | Roads* | Schools* | Quality of Air | Quality of Water | Quality Healthcare* | Voiced Opinion to Official | National Institutions Index* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Capacities Framework | Absorptive capacity | x | x | x | x | x | x | x | x | | | | | | | | | | | |
| | Adaptive capacity | | | | | | | | | | | | | | | | | | | |
| | Transformative capacity | | | | | | | | | | | | | | | | | | x | x |
| Capacities Measurement Framework | Social | x | x | x | x | x | x | | | x | x | x | x | x | x | | | x | | |
| | Environmental | | | | | | | | | | | | | | | x | x | | | |
| | Economic | | | | | | | x | x | | | | | | | | | | | |
| DFID (2016) | Hhld/Community characteristics | | | | x | x | x | | | x | x | x | | | | | | | | |
| | Functionality | | | | | | | | | | | | x | x | x | | | x | | |
| | Access to food | | | | | | | x | | | | | | | | | | | | |
| | Activities | | | | | | | | | | | | | | | | | | | |
| | Subjective perceptions | | | | | | | | | | | | | | | | | | | |
| | Costs of resilience | | | | | | | | | | | | | | | | | | | |
| Psychological Resilience – U.K.'s NHS | Confidence (self-efficacy) | | | | | | | | | | | | | | | | | | | |
| | Coordination (planning) | | | | | | | | | | | | | | | | | | | |
| | Control | | | | | | | | | | | | | | | | | | | |
| | Composure (low anxiety) | | | | | | | | | | | | | | | | | | | |
| | Commitment (persistence) | | | | | | | | | | | | | | | | | | | |
| | Make adversity meaningful | | | | | | | | | | | | | | | | | | | |

The World Risk Poll Resilience Index was structured to combine indicators at the individual, household, community and societal levels.

## Table 3. Dimensions and indicators in the World Risk Poll Resilience Index

| Dimension | Indicators |
|---|---|
| Individual | **Agency/Self-efficacy:** If a disaster were to occur near you in the future, do you think there is anything you could do to protect yourself or your family from its impact? <br><br> **Educational attainment:** What is your highest completed level of education? |
| Household | **Financial assets:** Suppose your household suddenly lost all income and had to survive only on savings and things that could be sold. How long would your household be able to cover all the basic needs, such as food, housing, and transportation? <br><br> **Planning:** If a disaster were to occur near you in the future, do you have a plan for what to do that all members of your household who are over 10 years old know about? <br><br> **Access to communications:** Does your home have access to: 1) the internet, 2) a cellular phone? |
| Community | **Social capital:** <br> • How much do you think most of your neighbours care about you and your wellbeing? <br> • Do you feel safe walking alone at night in the city or area where you live? <br> • Have you done any of the following in the past month? Helped a stranger or someone you didn't know who needed help. <br><br> **Local infrastructure:** In the city or area where you live, are you satisfied or dissatisfied with: <br> • The roads and highways? <br> • The educational system or the schools? <br> • The availability of quality healthcare? |
| Societal | **Discrimination:** Have you, personally, ever experienced any discrimination because of any of the following? The colour of your skin? Your religion? Your ethnicity/nationality? Your gender? A disability, if you have one? <br><br> **Safety net:** How much do you think the government of [country] cares about you and your wellbeing? <br><br> **National Institutions Index:** In [country], do you have confidence in each of the following, or not? <br> • The military? <br> • The judicial system or courts? <br> • The national government? <br> • The honesty of elections? |

Total scores for each of the four index dimensions (listed in Table 3) were derived by averaging the scores of the individual items in each dimension. The final overall Resilience Index score is computed as the arithmetic mean of the scores of the four dimensions. The section immediately following discusses how overall index and dimension scores varied by region and demographic grouping. The discussion then takes a more detailed look at the results for each index component.

It is important to note that the Resilience Index was designed to measure each of the four dimensions of resilience using multiple, conceptually inter-related, items. Doing so enhances the robustness of the measure in the event of missing, or otherwise uninformative, responses (e.g., 'Don't know/Refused').

In the 2023 Poll, however, 17 countries in the sample (Afghanistan, Algeria, Bahrain, Cambodia, China, Egypt, Ethiopia, Gabon, Kuwait, Laos, Morocco, Niger, Pakistan, Tajikistan, United Arab Emirates, Vietnam and Yemen) were systematically missing data for one or more items in the 'societal' dimension. An indicative resilience score can be computed for those countries, since they still have at least one item within all four dimensions of the index, but overall resilience scores for these countries are not strictly comparable to the other countries in the sample. Therefore, resilience scores for these 17 countries are presented in the report as an indicative measure of resilience, though their scores should be viewed with caution when comparing against other countries.

Additionally, one country (Saudi Arabia) was lacking all items in the societal dimension, which prevented it from receiving a score for the Resilience Index.

## Standardisation and aggregation

As previously noted, the scale of the 2023 Resilience Index was updated to fall on a scale between 0 and 100 rather than 0 and 1.

However, the standardisation and aggregation process – or how the survey responses were converted into numerical values which can averaged into a quantitative index – did not change, other than multiplying the final sub-index (averaged) scores by 100.

Survey items were standardised using a 0 to 1 scale. How this was accomplished depended on the type of survey question being used.

**Binary items:** Items where valid response options (i.e., excluding 'Don't know/Refused') only included two options were coded as binary values:

- Yes = 1
- No = 0
- DK or Refused = Missing

**Ordinal items:** Items where valid response options (i.e., excluding 'Don't know/Refused') included more than two ordered options were coded as rank order values:

- A lot = 1
- Somewhat = 0.5
- Not at all = 0
- DK or Refused = Missing

**Continuous items:** Items that could be expressed as continuous values were scaled to the 0 to 1 range. For example, household financial preparedness was expressed in terms of the number of weeks that the household could cover their basic needs using just their savings.

Besides these general approaches, some variables required multiple levels of standardisation and aggregation, including household-level access to communications, community-level social capital, and local infrastructure and society-level discrimination

Access to communications: Average of two binary variables

- Household access to the internet (0, 1)
- Household cell phone access (0, 1)

Social capital: Average of three ordinal and binary variables

- Neighbours care about you (0, 0.5, 1)
- Feel safe walking alone at night (0, 1)
- Helped a stranger (0, 1)

Local infrastructure: Average of three binary variables

- Satisfaction with local roads and highways (0, 1)
- Satisfaction with local education system (0, 1)
- Satisfaction with local healthcare system (0, 1)

Discrimination: Five binary variables of experienced discrimination were aggregated non-linearly using the following approach:

- If someone experiences 0 discriminatory practices, they are given a score of 1.0
- If someone experiences 1 discriminatory practice, they are given a score of 0.5
- If someone experiences 2 discriminatory practices, they are given a score of 0.375
- If someone experiences 3 discriminatory practices, they are given a score of 0.250
- If someone experiences 4 discriminatory practices, they are given a score of 0.125
- If someone experiences 5 discriminatory practices, they are given a score of 0

The rationale, based on literature supporting the cumulative impact of intersectional discrimination, is that the effects of intersectional discrimination are cumulative but not linear. One form of discrimination causes a person to feel disconnected from society, and any additional forms of discrimination add to their feelings of 'non-cohesion' but not at the same rate. A person would feel aggrieved from one form of discrimination and would not feel 'doubly so' from a second, 'triple' from a third and so on, with a finite 'worst' score of 0 if someone experienced five forms of discrimination.

The details of item scoring for each item and dimension are provided in the next section. The resulting variables were finally aggregated into four dimensions of resilience by averaging the variables in each dimension with equal weighting. In the analysis of the 2023 Poll data, this process was updated to multiply each dimension average by 100 (meaning the final index average will fall between 0 and 100).

To minimise missing data, dimension scores were computed even if one or more of the underlying variables was missing. In those cases, the dimension score was calculated as the average of any of the underlying variables containing valid data. Only individuals with missing data in all variables within a given dimension were given a missing score.

## Individual dimension

- Individual agency (0–1)
- Education (0–1)

## Household dimension

- Preparedness (0–1)
- Financial (0–1)
- Access to communications (0–1)

## Community dimension

- Social capital (0–1)
- Local infrastructure (0–1)

## Societal dimension

- Discrimination (0–1)
- Safety net (0–1)
- Trust in institutions (0–1)

The final Resilience Index is computed as the arithmetic mean of the four dimensions. The index was only calculated for individuals with valid values in all four dimensions.

## Item scoring for the Resilience Index

### Individual Dimension

**WP22252: Individual Agency**

| Value | Value Label | Score |
|-------|-------------|-------|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 3 | It depends | 0.5 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

**WP3117: Educational Attainment**

| Value | Value Label | Score |
|-------|-------------|-------|
| 1 | Primary (0–8 years) | 0 |
| 2 | Secondary (9–15 years) | 0.5 |
| 3 | Tertiary (16 years or more) | 1 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

## Household Dimension

### Cover Basic Needs

| Weeks | Score (0–1) | Value | Value Label | Score |
|---|---|---|---|---|
| 0 | 0 (0/16) | 1 | Less than a week | 0 |
| 1 | 0.0625 (1/16) | 2 | Between one and two weeks | 0.09375 |
| 2 | 0.125 | | | |
| 3 | 0.1875 | 3 | Between two and four weeks | 0.21875 |
| 4 | 0.25 | 4 | Less than a month | |
| | | 5 | Around a month | 0.25 |
| 5 | 0.3125 | 9 | A month or more (unsure) | 0.3125 |
| 8 | 0.5 | 6 | Two months | 0.5 |
| 12 | 0.75 | 7 | Three months | 0.75 |
| 16 | 1 (16/16) | 8 | Four months or more | 1 |
| | | 98 | Don't know | Missing |
| | | 99 | Refused | Missing |

### WP22253: HH Planning

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

### WP16056: Internet Access

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

### WP17626: Cellphone Access

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't Know | Missing |
| 99 | Refused | Missing |

## Community Dimension

### WP22232: Neighbours Care

| Value | Value Label | Score |
|---|---|---|
| 1 | A lot | 1 |
| 2 | Somewhat | 0.5 |
| 3 | Not at all | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

### WP113: Safe Walking Alone

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

### WP110: Helped a Stranger

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

### WP92: Roads and Highways

| Value | Value Label | Score |
|---|---|---|
| 1 | Satisfied | 1 |
| 2 | Dissatisfied | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

### WP93: Educational System

| Value | Value Label | Score |
|---|---|---|
| 1 | Satisfied | 1 |
| 2 | Dissatisfied | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

### WP97: Quality Healthcare

| Value | Value Label | Score |
|---|---|---|
| 1 | Satisfied | 1 |
| 2 | Dissatisfied | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

## Societal Dimension

**WP22259: Experienced Racial Discrimination**

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

**WP22260: Experienced Religious Discrimination**

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

**WP22261: Experienced Ethnic Discrimination**

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

**WP22262: Experienced Gender Discrimination**

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

**WP22263: Experienced Disability Discrimination**

| Value | Value Label | Score |
|---|---|---|
| 1 | Yes | 1 |
| 2 | No | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

**WP22231: Government Cares (Safety Net)**

| Value | Value Label | Score |
|---|---|---|
| 1 | A lot | 1 |
| 2 | Somewhat | 0.5 |
| 3 | Not at all | 0 |
| 98 | Don't know | Missing |
| 99 | Refused | Missing |

**National Institutions Index**

| Value | Score |
|---|---|
| 0 | 0 |
| 25 | 0.25 |
| 33.3 | 0.333 |
| 50 | 0.5 |
| 66.6 | 0.666 |
| 75 | 0.75 |
| 100 | 1 |
| Missing | Missing |

# Additional information

## About Lloyd's Register Foundation

Lloyd's Register Foundation is an independent global safety charity that supports research, innovation, and education to make the world a safer place. Its mission is to use the best evidence and insight, such as the World Risk Poll, to help the global community focus on tackling the world's most pressing safety and risk challenges.

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