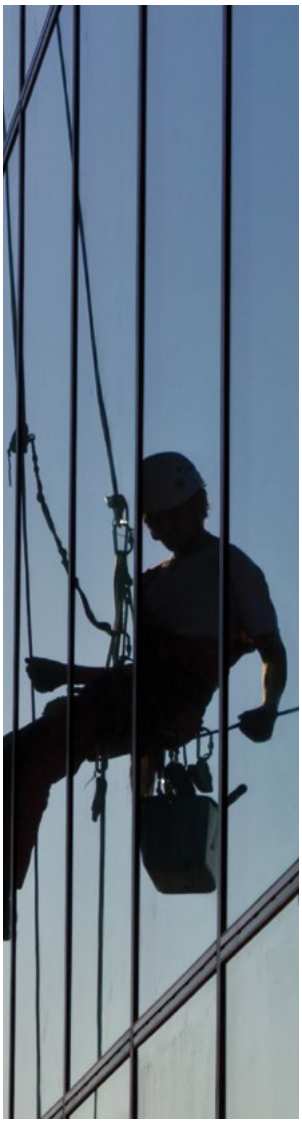


Foundation

2021 Lloyd's Register Foundation World Risk Poll Methodology

GALLUP®

GALLUP®

ABOUT LLOYD'S REGISTER FOUNDATION

Lloyd's Register Foundation is an independent global charity that helps to protect life and property at sea, on land and in the air. To do this, we support education, research and public engagement, and promote scientific excellence.

Lloyd's Register Foundation, 71 Fenchurch Street, London, EC3M 4BS, United Kingdom

Telephone: +44 20 7709 9166

Lloyd's Register Foundation is a Registered Charity (Reg. no. 1145988) and limited company.

(Reg. no. 7905861) registered in England and Wales, and owner of Lloyd's Register Group Limited. Copyright © Lloyd's Register Foundation, 2022.

https://wrp.lrfoundation.org.uk/

ABOUT GALLUP

Gallup delivers analytics and advice to help leaders and organisations solve their most pressing problems. Combining more than 80 years of experience with its global reach, Gallup knows more about the attitudes and behaviours of employees, customers, students and citizens than any other organisation in the world. For more information about Gallup, please visit **www.gallup.com/contact**.

Some of the information in this report has been obtained from other third-party data sources that are believed to be accurate and reliable. However, none of the data or information have been independently verified by the authors of this report and no representation or warranty is made as to any of the data's accuracy or reliability. Select images throughout this report are the property of Gallup, Inc. All other photos can be obtained online through Getty Images.

The 2021 Lloyd's Register Foundation World Risk Poll is the second wave of data collection and analyses of people's attitudes, experiences and behaviours with respect to various aspects of risk and safety. The global survey was conducted against the backdrop of the Covid-19 pandemic and focused in part on how risk-related experiences and perceptions have shifted since the 2019 World Risk Poll. The 2021 World Risk Poll also explored several new topics, such as resilience and perceptions of certain aspects of artificial intelligence.

This methodology report aims to provide technical information about the data collection process and the survey methodology used to develop and implement the 2021 World Risk Poll, which is discussed in the first section. The second section reviews the methods used in the data analysis.

A. Survey methodology

As in 2019, the 2021 World Risk Poll was 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.

In 2020, the Gallup World Poll was conducted almost entirely via 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 140-150 countries or areas. Countries were selected for inclusion based on client interest, population size, phone penetration rates and the ability of Gallup's local data collection partner to execute computer-assisted telephone interviewing (CATI) aligned with Gallup's quality assurance standards.

In 2021, the improvement in the Covid-19 situation and the availability of vaccines made it possible to return to in-person data collection in many countries, areas and territories. At the same time, conditions in some places remained too hazardous, or local restrictions made it impossible to conduct fieldwork — factors that ultimately limited the number of countries Gallup was able to poll in 2021. Thus, while the 2019 World Risk Poll included results from 142 countries and territories, the 2021 poll included results from 121. Nonetheless, the 2021 World Risk Poll represents approximately 94% of the world's age 15+ population.

This section focuses on the steps taken to prepare for data collection, which encompass activities such as questionnaire development and translation; interviewer training; sampling and data collection methodology; data preparation and adjustments made to enhance representativeness (commonly known as data 'weighting'); and a look at which countries have excluded or modified questions due to restrictions in fielding the questionnaire.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

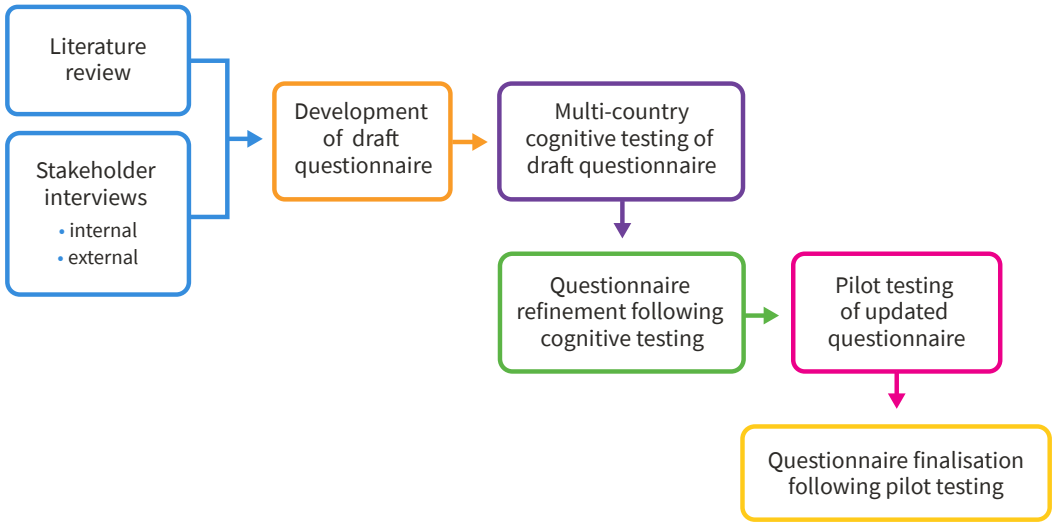
I. Preparing for data collection

Questionnaire development

The original survey instrument from the 2019 inaugural wave of the study[1] was used as the starting point for the 2021 World Risk Poll questionnaire. Lloyd's Register Foundation, in partnership with Gallup and a board of experts in relevant fields related to risk, safety and survey methodology (the World Risk Poll Technical Advisory Group), reviewed the 2019 survey questions and results to assess which questions were candidates for inclusion in the 2021 wave. Several factors were considered, including how well the questions aligned with the larger research or strategic objectives of Lloyd's Register Foundation; each question's 'performance' in the 2019 survey in terms of providing interesting or notable variation at the country or sub-group level; the likelihood of respondents' answers to a question changing during the two years separating the first and second survey; and survey space considerations.

Chart 1.

Survey instrument development process



Additionally, Lloyd's Register Foundation identified several important new topics to explore on the survey, including questions on resilience. In developing these questions, Lloyd's Register Foundation and Gallup followed the same research process utilised in the development of the original survey instrument, including:

- 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.
- 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, are understood well and 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.

1 To learn more about the questionnaire development process for the 2019 survey instrument, please see the 2019 report, *Talking Risk: Developing the Questionnaire for the Lloyd's Register Foundation World Risk Poll,* available at: https://wrp.lrfoundation.org.uk/wp-content/uploads/2020/09/LRFoundation_World_Risk_Poll_Report_6June_2019.pdf

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

- 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[2].
- 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 2021 World Risk Poll was incorporated into the Gallup World Poll survey instrument and was ready to be translated into the over 100 languages in which the World Risk Poll would ultimately be fielded.

Questionnaire translation

Gallup creates master language questionnaires in English, French, Spanish, Portuguese, Russian and Arabic. In most countries, partners will translate the English language version of the Gallup questionnaire into local languages as agreed upon in the contract. In some countries, local languages can be translated from French, Portuguese, Russian or Arabic versions.

The questionnaire must be translated into conversational language. Only questions new to the Gallup World Poll need to be translated. Translation partners carefully review previous translations for accuracy and contact the Gallup team if any mistakes are found. For all new questions, partners must use one of the following two options for the translation process:

- **Option 1:** Two independent translations should be obtained, and an independent third party with some knowledge of survey research methods should adjudicate differences.
- **Option 2:** A translator translates the questionnaire into the target language. Another translator with knowledge of survey methods reviews and revises the translation as necessary.

Interviewers are instructed to follow the interview script and may not deviate from the translated language.

Interviewer training and quality control

In fielding the World Risk Poll, Gallup and its local vendors employed thousands of interviewers across 121 countries. World Risk Poll interviewers participated in standard Gallup training, which includes — among others — the following topics:

- research ethics, protecting respondents' confidentiality, staying safe while in the field
- introductions: starting the interview
- reading survey questions as on the questionnaire
- handling questions from respondents
- closed-end items and open-end items
- read and rotate patterns
- skip patterns
- probing
- respondent selection
- household selection and substitution (for face-to-face countries)

2 The time varies depending on the mode of interview. For face-to-face interviews, the goal is for the average length to be no more than an hour — meaning the time it takes to administer the Gallup World Poll, including the World Risk Poll module, should not take longer than an hour, on average. For telephone surveys, the time limit is between 20-30 minutes.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

During fieldwork, field supervisors and independent validation staff performed a minimum number of validations in each country. Validations verify that the interview was completed and evaluate the interviewer's performance, confirming methodological standards were followed (e.g., starting point selection, random-route procedure, correct tracking sheet entry, respondent selection) and the questionnaire was administered appropriately (reading each question, not leading the respondent, etc.).

At least 30% of completed face-to-face interviews were validated using measures such as accompanied interviews, in-person re-contacts or telephone re-contacts. In an accompanying interview, the supervisor was present for at least 50% of the interview (e.g., if the interview was 40 minutes long, the supervisor would have been present for at least 20 minutes). During re-contacts (in-person or telephone), the respondent was re-contacted to validate the interview.

At least 15% of completed telephone interviews were validated by either listening to interviews live or to recorded interviews.

II. Sampling and data collection methodology

All samples collected as part of the Gallup World Poll, including for the World Risk Poll, 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 (see the Face-to-face survey design and Telephone survey design sections below). Exceptions include areas where the safety of interviewing staff is threatened, scarcely populated islands or areas of countries that are hard to reach or where government restrictions (including those related to Covid-19) make an area unreachable. These exceptions are noted in Table 3.

Gallup has historically surveyed countries in the developing world in person. In a typical year, this mode of data collection would be used in about three-fourths of all countries surveyed. However, in 2020, Covid-19 forced a departure from this approach, with virtually all interviews being conducted by telephone that year.

In 2021, the year of the World Risk Poll, the situation with respect to Covid-19 and government restrictions limiting social interaction had improved sufficiently enough for Gallup to conclude that it could safely return to face-to-face interviewing in some countries. Still, telephone remained the most common mode of interviewing in 2021: Of the 121 countries included in the World Risk Poll, 69 relied on telephone (either landline, mobile or some combination thereof) for interviewing, while 52 countries conducted interviews in person.

Of the 119 countries or areas that appear in both the 2019 and 2021 World Risk Poll, 83 used the same mode of interviewing across the two years. The remaining 36 countries conducted interviews by telephone in 2021 and in person in 2019. A discussion of the potential implications of this unavoidable change in interviewing mode in these 36 countries appears in Section II of this methodology report.

In most countries, Gallup interviewed approximately 1,000 people as part of the World Risk Poll. Notable exceptions include China and India, where at least 3,000 interviews were collected, and Russia, where 2,001 individuals participated. In only two countries did the sample size (i.e., the number of people interviewed) dip below 1,000 — Jamaica and Iceland, where about 500 people were interviewed.

A brief overview of how Gallup conducts face-to-face and telephone surveys — including sample design and respondent selection — follows.

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 and/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.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

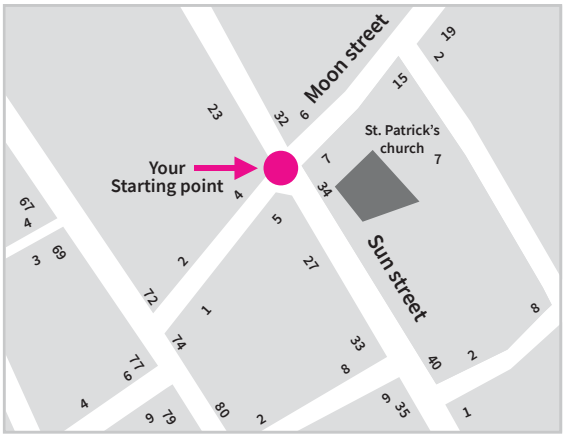
For face-to-face surveys, Gallup uses three different sampling approaches, depending on the available population information:

- **Method 1:** In countries where Gallup has detailed population information from a recent census or other reliable sources, a stratified single-stage or multiple-stage cluster design is used. 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 selection is used, a minimum of 33 primary sampling units (PSUs) are selected.
- **Method 2:** In countries with limited population information, 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.
- **Method 3:** In countries where only overall population information is available at the strata level (broad geographies/regions) and below, and just the name of units down to the lowest administrative unit are available, 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 were used to select sampled households. In each ultimate cluster, the supervisor or field manager pre-selected a starting point/address for the interviewer. Once the interviewer reached the starting point, they followed strict rules to determine the households they would visit to attempt an interview.

- **Definition of a Household:** All interviews took place at a person's home, which could range from a one-room flat to a single house. To be eligible, a household had to 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 placed their back to the (main) entrance of the structure and moved to the right (rule: Always go to the right). Counting three households (excluding the starting point), the interviewer attempted contact at the third household (main household). A higher interval (five or more) could be employed in dense urban areas or large apartment buildings. Unless an outright refusal occurred, interviewers could make up to three attempts to survey the household.



After visiting the first main household, the interviewer continued to select the third household to the right, and so on. If the interviewer did not successfully complete an interview at a selected household, it was replaced with another household using the same procedure.

The interviewer was instructed to count individual households and not houses, and not to count unoccupied structures. Group quarters (institutions and other group living arrangements such as rooming houses, dormitories and military barracks) were excluded from this survey.

Third stage: Respondent selection

The interviewer's next step was to randomly select the respondent within the household. The interviewer listed all household members aged 15 and older who lived in the household. The computer-assisted personal interviewing (CAPI) system then randomly selected the household member to be interviewed. If the country survey was collected using paper and

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

pencil (PAPI), the selection of the household member to interview was performed using the Kish grid, a prominent method for randomly selecting members of a household[3].

If the selected respondent was temporarily unavailable, the interviewer would revisit the household at another time. If the selected respondent refused to take part in an interview or was unavailable for the remainder of the field period, the household was replaced with another household (following the random-route procedure).

Telephone survey design

In countries, territories or areas where interviews were conducted by telephone, a dual-sampling frame (landline and mobile telephone) was generally used, particularly in countries where Gallup has traditionally relied on this technology for data collection (also referred to as 'traditional telephone countries'). For 'new telephone countries' — those nations, territories or areas where Gallup did not typically interview by telephone prior to 2020 — a dual-sampling frame was used only if historical Gallup estimates showed that landline presence and use in the country was 20% or higher.

In a smaller group of countries, respondents were contacted only through mobile telephone. Some of these countries include traditional telephone countries, such as Finland, where Gallup has determined that this is the most effective, efficient way to obtain a nationally representative sample. However, most of the countries where interviewing was conducted solely by mobile telephone were new telephone countries, which, according to Gallup estimates, have limited to no landline telephone presence (about 20% or less).

In traditional telephone countries, respondent selection followed the same procedure as in previous years:

- For respondents contacted by landline telephone, random respondent selection was performed within the household (among eligible respondents aged 15 and older), either by asking for the person aged 15 or older who has the next birthday or randomly selecting a respondent from a list of all eligible household members.
- For respondents contacted by mobile telephone, no further selection was performed (other than confirming the respondent is at least 15 years of age).

The design, stratification and execution of telephone samples in the new telephone countries differed from those that have traditionally used this mode. Stratification of landline frame was by geography, and where market share information for mobile service providers was known, the mobile frame was explicitly stratified by the service providers and the sample drawn proportional to the market share.

In new telephone countries with combined landline/mobile telephone coverage of 80% or higher, the following respondent selection procedures were applied:

- For respondents contacted by landline telephone, random respondent selection was performed within the household (among eligible respondents aged 15 and older), either by asking for the person aged 15 or older who has the next birthday or randomly selecting a respondent from a list of all eligible household members.
- For respondents contacted by mobile telephone, no further selection was performed (other than confirming the respondent is at least 15 years of age).
- In China, Gabon and the Philippines, an oldest male/youngest female respondent selection method was administered in an attempt to minimise gender and age skews over the telephone.

In new telephone countries with low combined landline/mobile telephone coverage (below 80%), random respondent selection within the household (among eligible household members aged 15 and older) was performed, regardless of whether the respondent was contacted by landline or mobile telephone.

3 Gallup, Inc. (2008). *Gallup World Poll methodology*. http://www.oecd.org/sdd/43017172.pdf

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Survey response rates

As is common with cross-country survey research, Gallup World Poll/World Risk Poll response rates 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, the table below shows each region's median response rate. The region with the highest median response rate was Southern Africa — which consists of only two countries — at 86%. All interviews were conducted in person in these countries.

The lowest median response rate was in Northern/Western Europe (4%), a bloc of 16 countries where interviewing was uniformly conducted by telephone. As these results might suggest, face-to-face interviewing tends to yield higher response rates compared to telephone-based interviews.

Table 1.

World Risk Poll response rates, median results, by region

Region	No. of countries in region	Survey mode (no. of countries)	Response rate (median)
Australia & New Zealand	2	Telephone (2)	6.5%
Central Asia	6	Face-to-Face (6)	61.5%
Central/Western Africa	13	Face-to-Face (12), Telephone (1)	69%
Eastern Africa	7	Face-to-Face (6), Telephone (1)	67%
Eastern Asia	6	Face-to-Face (1), Telephone (5)	5.5%
Eastern Europe	10	Face-to-Face (2), Telephone (8)	7%
Latin America & Caribbean	18	Face-to-Face (10), Telephone (8)	28.5%
Middle East	8	Face-to-Face (3), Telephone (5)	30%
Northern Africa	4	Face-to-Face (2), Telephone (2)	31%
Northern America	2	Telephone (2)	6%
Northern/Western Europe	16	Telephone (16)	4%
Southeastern Asia	9	Face-to-Face (3), Telephone (6)	15%
Southern Africa	2	Face-to-Face (2)	86%
Southern Asia	6	Face-to-Face (5), Telephone (1)	68%
Southern Europe	12	Face-to-Face (1), Telephone (11)	8.5%

Data preparation

In line with standard Gallup World Poll procedures, the World Risk Poll is subjected to a rigorous quality assurance process — one that begins the moment the first interview is conducted. Throughout the fielding period, Gallup's regional survey directors or analysts working under their direction frequently reviewed the data. For trended items, researchers looked for consistency against 2019 results; otherwise, the results were judged against relevant historical and cultural trends to term the validity of the results. Researchers also examined results by interviewer and region of the country to identify any incongruities that might suggest problems related to the survey implementation process.

At the end of the fielding period, the regional directors again reviewed the data and, if necessary, reached out to Gallup's on-the-ground data collection partners to discuss any potential anomalies or issues. Once the regional directors were satisfied with the underlying integrity of the data, the data were aggregated and cleaned, ensuring correct variable codes and labels were applied. The data were then reviewed for logical consistency and trends over time. Next, the data were cleaned, weighted and vetted.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Data weighting

Data weighting is used to ensure samples are nationally representative for each country, territory and area and is intended to be used for calculations within a country. Gallup's national survey weights are constructed in the following manner.

First, Gallup constructs base-sampling weights.

In countries where data are collected face-to-face, Gallup 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 primary sampling units, secondary sampling units and households within the ultimate cluster. Next, 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.

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 resulting from selecting one adult in landline households (number of residents aged 15 and older) and for dual users coming from both the landline and mobile frame.

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 socio-economic status.

The final weights are then normalised, so their sum is equal to the sample size of the country (typically 1,000).

Unless otherwise noted, all reports published by Lloyd's Register Foundation and Gallup examining the results of the World Risk Poll (regardless of the wave) will only feature estimates calculated using the survey weights discussed here. For users of the World Risk Poll microdata, this weight corresponds to the variable 'WGT' and is suitable for producing any weighted estimates at a national or sub-national level, regardless of the year of interview.

Cross-country or projection weights

Many of the statistical estimates examined in A Changed World? Perceptions and Experiences of Risk in the Covid Age are derived 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.

The central idea behind the projection weight is to account for the fact that population size (aged 15 years and older) varies considerably by country. However, this is not an issue that can be addressed by the national survey weights, as they are normalised to the sample size. Projection weights adjust the survey weight, so it instead signifies the number of individuals within a given country theoretically represented by one respondent.

This is done by multiplying each respondent's weight by a population adjustment factor. The population adjustment factor will vary on a country-by-country basis and is equal to the total number of age 15+ individuals in a country divided by the weighted sample size for that country (typically 1,000). Projection weights are designed such that, for a given country or territory, the sum of the projection weights will be equal to the age 15+ population.

Users of the public microdata of the World Risk Poll should note that there are two projection weights in the file designed to be used when analysing data from a particular year. As might be intuitive, PROJWT_2021 is the projection weight that should be applied for analysis of the 2021 data; PROJWT_2019 is to be used for the first wave.

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.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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[4]:

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

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 $1.96 * \sqrt{(0.25/1000)} = 3.1\%$ 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

4 This formula is calculated at the 95% confidence level, i.e., α=.05, resulting in $z\alpha/2 = 1.96$.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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:

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

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

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

$$n = \text{the unweighted sample size}$$

For purposes of simplicity, an estimate of 'Deff_wt' is provided for each country, taking into consideration only the variability of weights[5]. 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:

$$\text{Deff_c} = (1 + (c-1)^*\rho)$$

Where 'Deff_c' is the design effect due to clustering, 'c' is the average cluster size and 'ρ' is the intraclass correlation coefficient for a particular estimate. For purposes of illustration, given an average cluster size of 10 and an intraclass correlation coefficient estimate of 0.1, the design effect due to clustering is:

$$\text{Deff_c} = (1 + (10-1)^*0.1) = 1.9$$

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

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

Modified or excluded questions

The Lloyd's Register Foundation World Risk Poll was fielded in 121 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 reviews the countries or territories where some modifications/deletions had to be implemented.

China

Items excluded in mainland China include:

- *Overall, compared to five years ago, do you feel more safe, less safe, or about as safe as you did five years ago?* This question was asked in China in the original 2019 World Risk Poll, where 66% said 'more safe,' compared and 6% who said 'less safe.' However, in the 2021 World Risk Poll, this question was deemed too sensitive to ask. As a result, any reference to past global or regional figures with respect to this question in the report, *A Changed World? Perceptions and Experiences of Risk in the Covid Age*, does not include China's 2019 results. The report and analyses only include countries, territories and areas with available data in both the 2019 and 2021 waves of the World Risk Poll to examine trends in particular items.
- *In your own words, what is the greatest source of RISK TO YOUR SAFETY in your daily life?* This question was also asked in China in 2019 but not included in the 2021 report.

Saudi Arabia

- *In your own words, what is the greatest source of RISK TO YOUR SAFETY in your daily life?* This question was asked in 2021; however, the code about the political situation in the country was excluded due to the sensitive nature of this response.

Tajikistan

- *In your own words, what is the greatest source of RISK TO YOUR SAFETY in your daily life?* This question was asked in 2021; however, the code about the political situation in the country was excluded due to the sensitive nature of this response.

5 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)}.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Table 3

Country dataset details, 2021 World Risk Poll

Country	Data collection date	Number of interviews	Design effect	Margin of Error	Mode of Interviewing	Languages	Exclusions (samples are nationally representative unless noted otherwise)
Afghanistan	Aug 8 – Sep 29, 2021	1,000	1.54	3.8	Face-to-Face and Face-to-Face (HH)*	Dari, Pashto	Gender-matched sampling was used during the final stage of selection.
Albania	Jun 29 – Aug 26, 2021	1,000	1.71	4.1	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	Aug 10 – Sep 17, 2021	1,000	2.50	4.9	Landline and Mobile Telephone	Arabic	
Argentina	Aug 24 – Nov 11, 2021	1,001	2.43	4.8	Landline and Mobile Telephone	Spanish	
Armenia	Aug 5 – Dec 12, 2021	1,002	1.67	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 12 – Aug 22, 2021	1,000	1.71	4.0	Landline and Mobile Telephone	English	
Austria	Jul 5 – Jul 29, 2021	1,000	1.56	3.9	Landline and Mobile Telephone	German	
Bangladesh	Feb 27 – Mar 30, 2022	1,000	1.31	3.6	Face-to-Face (HH)*	Bengali	
Belgium	Nov 29, 2021 – Jan 5, 2022	1,001	1.23	3.4	Landline and Mobile Telephone	French, Dutch	
Benin	Jul 26 – Aug 14, 2021	1,000	1.47	3.8	Face-to-Face (HH)*	Bariba, Fon, French	
Bolivia	Aug 11 – Sep 6, 2021	1,002	2.03	4.4	Mobile Telephone	Spanish	
Bosnia and Herzegovina	Aug 20 – Oct 13, 2021	1,000	1.92	4.3	Landline and Mobile Telephone	Bosnian	
Brazil	Sep 13 – Oct 15, 2021	1,004	2.18	4.6	Landline and Mobile Telephone	Portuguese	
Bulgaria	Jun 2 – Aug 26, 2021	1,008	1.68	4.0	Landline and Mobile Telephone	Bulgarian	
Burkina Faso	Aug 16 – Sep 8, 2021	1,000	1.46	3.8	Face-to-Face (HH)*	Dioula, French, Fulfulde, Moore	Some communities in the East and Sahel regions were excluded for security reasons. The areas excluded represent 4% of the population.
Cambodia	Aug 28 – Oct 5, 2021	1,000	1.61	3.9	Face-to-Face (HH)*	Khmer	Koh Kong, Stueng Treng, Otdar Meanchey and Kep provinces were excluded. These excluded areas represent approximately 3% of the population of Cambodia.
Cameroon	Jun 8 – Jul 1, 2021	1,000	1.42	3.7	Face-to-Face (HH)*	French, English, Fulfulde	Some arrondissements in 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 20% of the total population.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Country	Data collection date	Number of interviews	Design effect	Margin of Error	Mode of Interviewing	Languages	Exclusions (samples are nationally representative unless noted otherwise)
Canada	Jul 30 – Sep 11, 2021	1,010	1.38	3.6	Landline and Mobile Telephone	English, French	Northwest Territories, Yukon and Nunavut (representing approximately 0.3% of the Canadian population) were excluded.
Chile	Aug 19 – Dec 23, 2021	1,001	1.59	3.9	Face-to-Face (HH)*	Spanish	
China	Sep 26 – Dec 16, 2021	3,500	2.40	2.6	Mobile Telephone	Chinese	Tibet was excluded from the sample. The excluded areas represent less than 1% of the population of China.
Colombia	Aug 25 – Oct 9, 2021	1,000	1.56	3.9	Landline and Mobile Telephone	Spanish	
Congo	Jun 29 – Jul 21, 2021	1,000	1.58	3.9	Face-to-Face (HH)*	French, Kituba, Lingala	
Costa Rica	Aug 19 – Sep 30, 2021	1,000	1.40	3.7	Landline and Mobile Telephone	Spanish	
Cote D'Ivoire	Oct 28 – Nov 28, 2021	1,000	1.63	4.0	Face-to-Face (HH)*	French, Dioula	
Croatia	Aug 25 – Sep 28, 2021	1,003	1.53	3.8	Landline and Mobile Telephone	Croatian	
Cyprus	Jul 12 – Oct 3, 2021	1,009	2.03	4.4	Landline and Mobile Telephone	Greek, English	
Czech Republic	Jul 24 – Oct 18, 2021	1,006	1.45	3.7	Landline and Mobile Telephone	Czech	
Denmark	Jul 22 – Sep 3, 2021	1,000	1.71	4.1	Mobile Telephone	Danish	
Dominican Republic	Aug 1 – Sep 15, 2021	1,001	1.33	3.6	Face-to-Face (HH)*	Spanish	
Ecuador	Aug 24 – Oct 7, 2021	1,001	1.63	4.0	Landline and Mobile Telephone	Spanish	
Egypt	Sep 4 – Sep 25, 2021	1,006	1.49	3.8	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 country's population. The excluded areas represent less than 2% of the total population.
El Salvador	Sep 16 – Nov 24, 2021	1,001	1.60	3.9	Face-to-Face (HH)*	Spanish	
Estonia	Aug 9 – Sep 24, 2021	1,006	1.43	3.7	Mobile Telephone	Estonian, Russian	
Finland	Jul 8 – Aug 25, 2021	1,006	1.53	3.8	Mobile Telephone	Finnish, Swedish	
France	Jul 5 – Aug 3, 2021	1,000	1.69	4.0	Landline and Mobile Telephone	French	
Gabon	Oct 10 – Oct 31, 2021	1,000	2.19	4.6	Mobile Telephone	French, Fang	
Georgia	Jul 29 – Dec 5, 2021	1,001	1.45	3.7	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 villages with less than 100 inhabitants were also excluded. The excluded area represents approximately 8% of the population.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Country	Data collection date	Number of interviews	Design effect	Margin of Error	Mode of Interviewing	Languages	Exclusions (samples are nationally representative unless noted otherwise)
Germany	Jul 5 – Jul 31, 2021	1,000	2.40	4.8	Landline and Mobile Telephone	German	
Ghana	Jul 27 – Sep 5, 2021	1,000	1.32	3.6	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	Jul 1 – Jul 31, 2021	1,000	2.20	4.6	Landline and Mobile Telephone	Greek	
Guinea	Sep 7 – Sep 25, 2021	1,000	1.47	3.8	Face-to-Face (HH)*	French, Malinke, Pular, Soussou	
Honduras	Sep 21 – Dec 20, 2021	1,005	1.72	4.1	Face-to-Face (HH)*	Spanish	
Hong Kong SAR of China	Sep 3 – Oct 31, 2021	1,004	1.23	3.4	Landline and Mobile Telephone	Chinese	
Hungary	Oct 5 – Nov 27, 2021	1,000	1.87	4.2	Landline and Mobile Telephone	Hungarian	
Iceland	Sep 3 – Oct 26, 2021	500	1.39	5.2	Landline and Mobile Telephone	Icelandic	
India	Jul 29 – Oct 14, 2021	3,000	1.30	2.0	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	Jul 8 – Oct 16, 2021	1,063	1.54	3.7	Face-to-Face (HH)*	Bahasa Indonesia	
Iran	Sep 30 – Oct 6, 2021	1,011	1.25	3.4	Landline and Mobile Telephone	Farsi	
Iraq	Nov 1 – Dec 6, 2021	1,002	1.55	3.9	Face-to-Face and Face-to-Face (HH)*	Arabic, Kurdish	
Ireland	Jul 5 – Jul 29, 2021	1,000	1.57	3.9	Landline and Mobile Telephone	English	
Israel	Aug 15 – Nov 26, 2021	1,001	1.17	3.4	Face-to-Face (HH)*	Hebrew, Arabic	The sample does not include the area of East Jerusalem. This area was included in the sample of Palestinian Territories.
Italy	Jul 5 – Jul 31, 2021	1,000	2.70	5.1	Landline and Mobile Telephone	Italian	
Jamaica	Sep 18 – Nov 9, 2021	505	1.60	5.5	Face-to-Face (HH)*	English	
Japan	Aug 19 – Oct 27, 2021	1,010	1.36	3.6	Landline and Mobile Telephone	Japanese	For landline RDD, 12 municipalities near the nuclear power plant in Fukushima were excluded. 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 of Japan.
Jordan	Sep 30 – Oct 14, 2021	1,008	1.34	3.6	Mobile Telephone	Arabic	

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Country	Data collection date	Number of interviews	Design effect	Margin of Error	Mode of Interviewing	Languages	Exclusions (samples are nationally representative unless noted otherwise)
Kazakhstan	Sep 4 – Oct 19, 2021	1,000	1.50	3.8	Face-to-Face (HH)*	Russian, Kazakh	
Kenya	Jun 21 – Jul 20, 2021	1,003	1.40	3.7	Face-to-Face (HH)*	English, Swahili/ Kiswahili	
Kosovo	Jul 3 – Sep 30, 2021	1,000	1.59	3.9	Face-to-Face (HH)*	Albanian, Serbian	
Kyrgyzstan	Aug 26 – Oct 4, 2021	1,001	1.53	3.8	Face-to-Face (HH)*	Kyrgyz, Russian, Uzbek	
Lao People's Democratic Republic	Aug 30 – Dec 14, 2021	1,000	1.44	3.7	Face-to-Face (HH)*	Lao	Excluded Xaisomboun Province, Xayaboury Province and some communes that are unreachable and/ or have security considerations. In addition, during fieldwork, Attapu and Houaphan were also excluded due to COVID (COVID-19 red zones). The excluded areas represent approximately 14% of the population.
Latvia	Aug 24 – Sep 28, 2021	1,038	1.57	3.8	Mobile Telephone	Latvian, Russian	
Lebanon	Sep 20 – Oct 8, 2021	1,010	1.17	3.3	Landline and Mobile Telephone	Arabic	
Lithuania	Sep 2 – Oct 19, 2021	1,007	1.60	3.9	Landline and Mobile Telephone	Lithuanian	
Malaysia	Aug 22, 2021 – Jan 12, 2022	1,009	1.98	4.3	Landline and Mobile Telephone	Bahasa Malay, Chinese, English	
Mali	Jul 15 – Aug 2, 2021	1,000	1.33	3.6	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 15 – Sep 20, 2021	1,001	1.34	3.6	Landline and Mobile Telephone	Maltese, English	
Mauritius	Jun 24 – Aug 16, 2021	1,000	1.96	4.3	Landline and Mobile Telephone	Creole, English, French	
Mexico	Aug 27 – Oct 20, 2021	1,000	1.65	4.0	Landline and Mobile Telephone	Spanish	
Moldova, Republic of	Jul 13 – Sep 10, 2021	1,000	1.23	3.4	Face-to-Face (HH)*	Romanian/ Moldavian, Russian	Transnistria (Pridnestrovie) was excluded for safety of interviewers. The excluded area represents approximately 13% of the population.
Mongolia	Aug 20 – Oct 12, 2021	1,000	1.50	3.8	Face-to-Face (HH)*	Mongolian	
Morocco	Sep 16 – Oct 7, 2021	1,002	1.82	4.2	Mobile Telephone	Moroccan Arabic	
Mozambique	Oct 26 – Dec 21, 2021	1,000	1.89	4.3	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 11% of the population.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Country	Data collection date	Number of interviews	Design effect	Margin of Error	Mode of Interviewing	Languages	Exclusions (samples are nationally representative unless noted otherwise)
Myanmar	Nov 5 – Dec 2, 2021	1,000	2.05	4.4	Mobile Telephone	Myanmar, Burmese	
Namibia	Aug 29 – Oct 10, 2021	1,004	1.56	3.9	Face-to-Face (HH)*	English, Oshivambo, Afrikaans	
Nepal	Sep 9 – Nov 18, 2021	1,000	1.44	3.7	Face-to-Face (HH)*	Nepali	
Netherlands	Jul 14 – Nov 12, 2021	1,000	1.53	3.8	Landline and Mobile Telephone	Dutch	
New Zealand	Jul 5 – Aug 15, 2021	1,000	1.50	3.8	Landline and Mobile Telephone	English	
Nicaragua	Sep 15 – Nov 22, 2021	1,010	1.64	4.0	Face-to-Face (HH)*	Spanish	
Nigeria	Jul 15 – Aug 22, 2021	1,000	1.80	4.2	Face-to-Face (HH)*	English, Hausa, Igbo, Pidgin English, Yoruba	The states of Adamawa, Borno and Yobe were excluded for safety and security reasons. These states represent 7% of the population.
North Macedonia	Sep 13 – Oct 22, 2021	1,002	1.18	3.4	Landline and Mobile Telephone	Macedonian, Albanian	
Norway	Jul 6 – Aug 18, 2021	1,000	1.72	4.1	Mobile Telephone	Norwegian	
Pakistan	Oct 13 – Dec 15, 2021	1,000	1.62	4.0	Face-to-Face (HH)*	Urdu	Did not include AJK, Gilgit-Baltistan. The excluded area represents approximately 5% of the population. Gender-matched sampling was used during the final stage of selection.
Panama	Oct 4 – Dec 17, 2021	1,003	1.59	3.9	Face-to-Face (HH)*	Spanish	
Paraguay	Sep 1 – Oct 12, 2021	1,001	1.37	3.6	Face-to-Face (HH)*	Spanish, Jopara	
Peru	Aug 22 – Oct 21, 2021	1,000	1.39	3.7	Face-to-Face (HH)*	Spanish	
Philippines	Jul 12 – Sep 13, 2021	1,000	1.76	4.1	Mobile Telephone	Filipino, Iluko, Cebuano, Waray	
Poland	Jul 12 – Aug 10, 2021	1,002	1.48	3.8	Landline and Mobile Telephone	Polish	
Portugal	Aug 5 – Oct 6, 2021	1,000	1.64	4.0	Landline and Mobile Telephone	Portuguese	
Romania	Jul 27 – Aug 30, 2021	1,001	1.36	3.6	Landline and Mobile Telephone	Romanian	
Russian Federation	Jun 25 – Aug 28, 2021	2,001	1.55	2.7	Landline and Mobile Telephone	Russian	
Saudi Arabia	Jun 20 – Jul 13, 2021	1,026	2.31	4.6	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	Aug 17 – Sep 11, 2021	1,000	1.49	3.8	Face-to-Face (HH)*	French, Wolof	

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Country	Data collection date	Number of interviews	Design effect	Margin of Error	Mode of Interviewing	Languages	Exclusions (samples are nationally representative unless noted otherwise)
Serbia	Aug 25 – Oct 25, 2021	1,002	1.81	4.2	Landline and Mobile Telephone	Serbian	
Sierra Leone	Jun 15 – Jul 7, 2021	1,001	1.33	3.6	Face-to-Face (HH)*	English, Krio, Mende	
Singapore	Aug 12 – Dec 20, 2021	1,012	1.35	3.6	Landline and Mobile Telephone	English, Chinese, Bahasa Malay	
Slovakia	Aug 12 – Sep 28, 2021	1,007	1.44	3.7	Landline and Mobile Telephone	Hungarian, Slovak	
Slovenia	Sep 20 – Nov 23, 2021	1,002	2.00	4.4	Landline and Mobile Telephone	Slovene	
South Africa	Aug 5 – Nov 9, 2021	1,023	1.65	3.9	Face-to-Face (HH)*	Afrikaans, English, Sotho, Xhosa, Zulu	
South Korea	Aug 4 – Sep 27, 2021	1,004	1.52	3.8	Landline and Mobile Telephone	Korean	
Spain	Jul 5 – Jul 31, 2021	1,000	1.64	4.0	Landline and Mobile Telephone	Spanish	
Sri Lanka	Nov 22, 2021 – Jan 9, 2022	1,004	2.37	4.8	Mobile Telephone	Sinhala, Tamil	
Sweden	Jul 8 – Aug 19, 2021	1,001	1.53	3.8	Landline and Mobile Telephone	Swedish	
Switzerland	Jul 5 – Aug 4, 2021	1,000	1.72	4.1	Landline and Mobile Telephone	German, French, Italian	
Taiwan	Jul 12 – Aug 5, 2021	1,000	1.52	3.8	Landline and Mobile Telephone	Chinese	
Tajikistan	Aug 18 – Oct 11, 2021	1,000	1.57	3.9	Face-to-Face (HH)*	Tajik	
Tanzania	Aug 2 – Aug 26, 2021	1,000	1.50	3.8	Face-to-Face (HH)*	Swahili, Kiswahili	
Thailand	Oct 11 – Dec 24, 2021	1,033	2.34	4.7	Mobile Telephone	Thai	
Togo	Sep 4 – Sep 24, 2021	1,000	1.64	4.0	Face-to-Face (HH)*	French, Ewe	
Tunisia	Sep 24 – Oct 16, 2021	1,000	1.26	3.5	Face-to-Face (HH)*	Arabic	
Turkey	Sep 28 – Oct 22, 2021	1,000	1.54	3.8	Landline and Mobile Telephone	Turkish	
Uganda	Sep 12 – Oct 3, 2021	1,000	1.54	3.8	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 20 – Sep 7, 2021	1,000	1.90	4.3	Landline and Mobile Telephone	Russian, Ukrainian	
United Arab Emirates	Aug 9 – Sep 13, 2021	1,011	1.26	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, Urdu or Hindi.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Country	Data collection date	Number of interviews	Design effect	Margin of Error	Mode of Interviewing	Languages	Exclusions (samples are nationally representative unless noted otherwise)
United Kingdom of Great Britain and Northern Ireland	Jul 5 – Jul 31, 2021	1,000	1.47	3.8	Landline and Mobile Telephone	English	
United States of America	Jul 19 – Oct 4, 2021	1,005	1.53	3.8	Landline and Mobile Telephone	English, Spanish	
Uruguay	Aug 24 – Dec 1, 2021	1,000	1.30	3.5	Face-to-Face (HH)*	Spanish	
Uzbekistan	Aug 12 – Oct 6, 2021	1,000	1.57	3.9	Face-to-Face (HH)*	Uzbek, Russian	
Venezuela	Aug 27 – Nov 17, 2021	1,000	1.77	4.1	Landline and Mobile Telephone	Spanish	
Vietnam	Nov 13 – Dec 12, 2021	1,007	2.56	4.9	Mobile Telephone	Vietnamese	
Zambia	Aug 31 – Sep 28, 2021	1,000	1.54	3.8	Face-to-Face (HH)*	Bemba, English, Lozi, Nyanja, Tonga	
Zimbabwe	Jun 26 – Aug 18, 2021	1,000	1.49	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: √(0.25/N)*1.96*√(DE)

c Areas with a 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.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

B. Methods for report analysis

This section reviews the statistical methods used in the analysis of the 2021 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 but not part of the World Risk Poll questionnaire. This section provides additional information that will, in conjunction with the data dictionary, be a valuable resource for users of the 2021 World Risk Poll dataset.

World Risk Poll results: Reporting & 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 (see the above section for further information on this point). Results that were aggregated across more than one country (for instance, by region or country-income level) were weighted by the age 15+ population size of the countries included in the analysis unless otherwise noted.

This means that respondents from larger countries, such as China or India, are assigned a higher weight — reflective of the fact that individuals from these places represent, at least in a theoretical sense, the views, attitudes or experiences of a greater number of people than those respondents from smaller countries. The guiding principle behind this type of population-based weighting is that the individual is still the fundamental unit of analysis; therefore, countries with larger populations should be given a greater voice in shaping global or country grouping results than those with smaller populations.

However, analysts of the World Risk Poll may be more interested in comparing (rather than combining) country-level results; for this type of investigation where the country becomes the fundamental unit of analysis, researchers may consider referring solely to the national-level weight variable (WGT) — though the decision is ultimately up to the researcher as to which approach is most appropriate.

Country groupings used in the analysis

Geographic Region: Consistent with the approach established in the inaugural 2020 Lloyd's Register Foundation World Risk Poll report, all 121 countries or territories included in the 2021 World Risk Poll were divided into 15 regional groups (see box below). These geographic regions closely follow those used by the United Nations Statistics Division (UNSD)[6], 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).

Users of the public dataset interested in utilising these regions in their own research should refer to the variable 'GlobalRegion.'

6 *UNSD methodology.* (n.d.). United Nations Statistics Division. Retrieved 19 July 2022 from https://unstats.un.org/unsd/methodology/m49/

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Table 4.

Region groupings used in the 2021 World Risk Poll analysis and report

Africa

- **Eastern Africa:** Kenya, Mauritius, Mozambique, Tanzania, Uganda, Zambia, Zimbabwe
- **Central/Western Africa:** Benin, Burkina Faso, Cameroon, Congo Brazzaville, Gabon, Ghana, Guinea, Ivory Coast, Mali, Nigeria, Senegal, Sierra Leone, Togo
- **Northern Africa:** Algeria, Egypt, Morocco, Tunisia
- **Southern Africa:** Namibia, South Africa

Americas

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

Asia

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

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, Netherlands, Norway, Sweden, Switzerland, United Kingdom
- **Southern Europe:** Albania, Bosnia Herzegovina, Croatia, Cyprus, Greece, Italy, Malta, North Macedonia, Portugal, Serbia, Slovenia, Spain

Oceania

- **Australia & 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 2021-2022 thresholds the World Bank announced on 01 July 2021[7]. These thresholds are as follows:

- **Low Income:** Gross national income (GNI) per capita of less than $1,046
- **Lower-Middle Income:** GNI per capita of $1,046-$4,095
- **Upper-Middle Income:** GNI per capita of $4,096-$12,695
- **High Income:** GNI per capita above $12,695

Beyond these four core categories, the World Bank was unable to classify the country Venezuela 'due to a lack of available data in the recent period[8].'

7 *New World Bank country classifications by income level: 2021-2022.* (n.d.). World Bank Blogs. Retrieved 1 March 2022 from https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2021-2022

8 Ibid.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Among the 121 countries, territories and areas included in the 2021 World Risk Poll, eight countries were classified as low-income economies, 36 as lower-middle-income economies, 34 as upper-middle-income economies, 42 as high-income economies and one as 'not classified.'

Note that on 01 July 2022, the World Bank updated its country income classifications for the 2022-2023 period[9]. Nonetheless, all analyses and reporting related to the 2021 World Risk Poll are based on the 2021-2022 guidelines detailed above.

In the public dataset, the variable 'CountryIncomeLevel2021' also groups countries into these four groups (or five, if including the single country 'unclassified' as its own category) in line with the 2021-2022 thresholds. A second variable — 'CountryIncomeLevel2019' — provides the country income groupings used in the 2020 World Risk Poll report and analysis.

Trend analysis

The 2021 World Risk Poll report explores how individuals' risk perceptions and experiences changed between 2019 and 2021, a period that saw the outbreak of the first worldwide pandemic in nearly 100 years.

The World Risk Poll is not a longitudinal study, meaning it does not interview the same respondents at different points in time — a method that allows researchers to easily identify changes in respondents' attitudes or behaviours. Instead, the world Risk Poll is a reoccurring, cross-sectional study. From a trend analysis perspective, this means the focus is on understanding how attitudes or experiences shifted not on an individual basis but at a broader level, such as nationally, among major sub-groups, regionally and globally.

However, the 2021 World Risk Poll featured slightly fewer countries than the 2019 survey (121 vs. 142), 119 of which appeared on both waves. If this fact was not accounted for, it could lead to potentially misleading results when comparing global and regional results between the two waves, as any apparent differences between a 2019 and 2021 estimate may simply reflect the differences in the composition of countries rather than a true shift in the public mindset (and both factors might play a role in any hypothetical change).

For this reason, the trended analysis data presented in A Changed World? Perceptions and Experiences of Risk in the Covid Age are only drawn from those countries where the World Risk Poll was fielded in both years. As such, the 2019 global or regional estimates shown in the report will differ from those in the 2020 report of the inaugural poll.

Additionally, some 2021 World Risk Poll questions were omitted in certain countries, as discussed in the Survey methodology section above. For trended questions, countries where Gallup could not ask the item in 2021 were also excluded when reporting either global or regional results. This point is worth stressing as China, which has the largest weight when tabulating cross-country results due to its status as the world's most populous nation, had multiple items excluded from its questionnaire — including trended items asked in 2019. However, the 2019 results for those trended items presented in this report would not include China or any other country where Gallup was not allowed to ask the question in 2021.

Users of the public data file will find an indicator variable that identifies which countries appeared in both iterations of the World Risk Poll. This variable can be used as a filter to conduct a trended analysis in the same manner as the first World Risk Poll report if needed.

Effects of mode change

Another important point to consider when comparing the 2019 and 2021 results of the World Risk Poll is that, for a subset of countries (36), the mode of interviewing changed between the intervening periods. In all instances, these countries were surveyed by telephone in 2021 and in-person interviewing in 2019, largely due to issues related to the ongoing Covid-19 pandemic.

Though this change in interviewing approach was unavoidable, it is still worth considering any potential issues with respect to comparability between the 2019 and 2021 results for those countries, territories and areas that changed modes, or the 'new telephone countries.' While Gallup generally only allowed those nations or territories with relatively high telephone penetration to

9 *New World Bank country classifications by income level: 2022-2023.* (n.d.). World Bank Blogs. Retrieved 19 July 2022 from: https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2022-2023.
According to the World Bank's analysis in the cited link, six countries switched categories between the two time periods; however, one of these countries, Palau, was not included in the World Risk Poll. Venezuela remains unclassified due to data availability issues.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

switch from in-person to telephone interviewing, the change in mode may lead to a phenomenon survey methodologists refer to as 'under-coverage,' or the inability to reach all members of the target population.

For the Gallup World Poll, the usual target population (i.e., the entire set of individuals who could theoretically be included in the survey) are people aged 15 and older. In the new telephone countries, where telephone penetration is high, but not necessarily at the nearly universal rates seen in traditional phone countries, it is reasonable to expect that some segments of the target population became much harder to access due to the change in mode. Those who were most affected by this change, in terms of broad demographic characteristics, differed on a country-by-country basis.

Gallup implemented numerous measures to mitigate the scale of this issue through the sampling procedures described in the above section, as well as mitigate its consequences through the weighting procedure (also discussed above). These procedures generally help address the comparability of the data between the two survey waves.

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 post-secondary. 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.
- **Post-secondary (16 years or more):** Functional equivalent to completing four years of post-secondary 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, Gallup asked respondents two questions. The first asked respondents about their monthly household income in local currency before taxes. Respondents were instructed to include all income from all wages and salaries in the household, remittances from family members living elsewhere, and all other sources. If the respondents hesitated to answer or had difficulty answering the first question, they were presented with a set of income ranges in their local currency and were asked which group they fell into.

- *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 were imputed using hot-deck imputation but restricting imputing values to the reported range. Estimates for respondents who did not answer either income question were 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.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

The hot-deck imputation procedure matched respondents with answers and without answers (called 'donors' and 'beggars,' respectively) by a set of external independent variables that are expected to be related to both household income and non-response to the household income survey question. For imputing household income, the list of these variables included survey items related to respondents' feelings about household income, ratings of standards of living, reporting of not having enough money for food, household size and other variables that may vary by country such as urbanicity. Below is an illustration:

> *Louise did not report her exact household income but reported $10K-20K in the follow-up closed-ended item. Her household income was imputed by finding a respondent with the same or very similar characteristics on the survey variables who did report their income and whose reported income was between $10K and $20K. That respondent's income value was used to fill in Louise's household income.*

After the imputation of income ranges and missing values, income data were annualised, and per capita annual income was calculated by dividing household income by the total number of persons living in the household. Per capita annual income was used to create income quintiles within each country dataset.

Update of the Worried & Experienced of Harm Indexes

The 2021 World Risk Poll updated the World Worry Index and the Experience of Harm Index, which were introduced in the 2019 report. Both measures can be found in the public data file. This section further provides the methodological background of these indices.

The World Worry Index (Worry Index) summarises an individual's overall level of worry or anxiety across the seven hazards tested on the World Risk Poll, including the food you eat, the water you drink, violent crime, severe weather events such as floods or violent storms, mental health issues and the work you do. It is important to note that the range of everyday risks measured by the Worry Index is slightly different from 2019 due to changes in the underlying questionnaire. In 2019, worry about electrical power lines and household appliances were included in the metric, as well as several of the risks also included in this year's poll, including the food you eat, the water you drink, violent crime, severe weather events and mental health issues.

Likewise, the Experience of Harm Index represents an individual's combined personal experience of harm from these seven areas of risk with that of someone they know. In 2021, this related to harm related to the same set of risks included in the Worry Index, including the food you eat, the water you drink, violent crime, severe weather events such as floods or violent storms, mental health issues and the work you do.

One challenge inherent to developing a measure of risk perception is that the items used in the World Risk Poll capture a subset of all the possible sources of risk that could have been included. For example, the study includes questions about food poisoning, violence and severe weather, but does not ask about other common risks such as burns, falls or chemical exposures. Additionally, the items used to ask about these risks are categorical — i.e., there are only a few possible response categories — whereas the latent construct of risk perceptions is more likely to be a continuum.

Item Response Theory (IRT) provides a modelling framework to estimate continuous measures from categorical variables as a function of the trade-off between (a) the respondent's level of 'risk perception' and (b) the 'risk severity' of the item — for example, being 'somewhat worried' about harm from household appliances represents a much lower level of overall 'worry' than being 'very worried' about harm from violent crime.

The Rasch model is an IRT psychometric model for analysing categorical data, providing tools to assess the suitability of the risk perception items for constructing a measurement scale. IRT tools indicated that risk perception items met appropriate validity and reliability criteria for measure development.

Below is a summary of results from the Rasch Analysis used to model the question sets asking people about their level of worry and experience of harm.

1) Chronbach's alpha: 'worry' series = 0.72, 'previous experience' series = 0.73
2) asch reliability: 'worry' series = 0.64, 'previous experience' series = 0.65
3) All series show good item infit (values between 0.7 and 1.3), indicating equal discrimination of items

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

C. Resilience Index methodology

Building on the existing body of literature and different measures of resilience, the 2021 World Risk Poll included several questions on the topic. The questions, or items, were drafted in close consultation with Lloyd's Register Foundation and its subject matter expert partners[10]. While the data and insights from each individual item in the survey have value in themselves, the research team decided also to construct a composite measure of resilience: the Resilience Index.

Given the multiple ways resilience is defined and measured in the literature (see the next sections below), with different models and approaches, the 2021 World Risk Poll survey items were mapped to dimensions informed by the literature. The resulting Resilience Index is a first pilot measure that uses the World Risk Poll to add value by creating a summary tool useful for policy analysis and communication, where country-level trends and patterns could be highlighted and analysed before diving into the many constituent variables from which the index is constructed. Lloyd's Register Foundation hopes this index generates further thought and research into the topic and contributes to the knowledge base on resilience and its measurement.

The Resilience Index was developed to summarise and facilitate the analysis of a complex construct — resilience. The development of an index starts by carefully defining the construct and its composition, including the construct structure and its dimensions. The composition of the construct is then mapped to measurable indicators, which are finally aggregated and summarised into a single index score. Each of these steps is described in more detail below.

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[11].'

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[12].'

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[13]. Truly resilient systems have all three capacities to deal with a wide range of potential shocks.

10 The foundation's partners included Resilience Rising, the UNDRR and the World Bank.

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

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

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

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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[14].' 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[15]. 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

Another review of existing resilience studies conducted by Serfilippi and Ramnath in 2018 classified 76 indicators into three categories[16]:

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[17].

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 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.

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

15 Sturgess, P. (2016). *Measuring resilience*. United Kingdom Department for International Development. https://assets.publishing.service.gov.uk/media/57a08956e5274a27b200002f/EoD_Topic_Guide_Measuring_Resilience_May_2016.pdf

16 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

17 Béné, C. (2013). Towards a quantifiable measure of resilience. *IDS Working Papers, 434*, 1-27.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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											

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Table 2

Correspondence between resilience conceptual frameworks and GWP items

Framework	Variable	Indi-vidual	Household							Community									Society	
		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																			

* *A Resilience Index ranking for this country is not included due to missing items in the Society Dimension. The Resilience Index scores are presented here as an indicative measure of resilience for each country individually, but a ranking is not advisable due to the lack of strict cross-country comparability.*

Following Béné's recommendation that resilience be assessed at different levels of individuals' social setting, the World Risk Poll Resilience Index was structured to combine indicators of resilience at the individual, household, community and society levels.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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?*
	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?*
	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 know about?*
	Access to communications: *Does your home have access to: 1) the internet, 2) a cellular phone?*
Community	**Social capital:** 1. *How much do you think most of your neighbours care about you and your wellbeing?* 2. *Do you feel safe walking alone at night in the city or area where you live?* 3. *Have you done any of the following in the past month? Helped a stranger or someone you didn't know who needed help.*
	Local infrastructure: *In the city or area where you live, are you satisfied or dissatisfied with:* 1. *The roads and highways?* 2. *The educational system or the schools?* 3. *The availability of quality health care?*
Society	**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?*
	Government support: *How much do you think the government of [country] cares about you and your wellbeing?*
	National Institutions Index *In [country], do you have confidence in each of the following, or not?* 1. *The military?* 2. *The judicial system or courts?* 3. *The national government?* 4. *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. Section 1 below discusses how overall index and dimension scores varied by region and demographic grouping, while Section 2 takes a more detailed look at the results for each index component.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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'). However, eight countries in the sample (Algeria, Cambodia, Laos, Morocco, Pakistan, Tajikistan, United Arab Emirates and Vietnam) were systematically missing data for one or more items in the 'society' dimension (see list below for items by country). 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 eight countries are presented in the report as an indicative measure of resilience but are not included in the resilience rankings due to the lack of strict cross-country comparability. Additionally, two countries (China and Saudi Arabia) were lacking all items in the society dimension, which prevented them from receiving a score for the Resilience Index.

The following list details the indicators for the eight countries that were systematically missing data for one or more items in the 'society' dimension:

Algeria:	Gallup Confidence in National Institution Index, Government cares about you and your wellbeing
Cambodia:	Gallup Confidence in National Institution Index
China:	Gallup Confidence in National Institution Index, Government cares about you and your wellbeing, Experience of discrimination
Laos:	Gallup Confidence in National Institution Index
Morocco:	Gallup Confidence in National Institution Index
Pakistan:	Gallup Confidence in National Institution Index
Saudi Arabia:	Gallup Confidence in National Institution Index, Government cares about you and your wellbeing, Experience of discrimination
Tajikistan:	Gallup Confidence in National Institution Index, Government cares about you and your wellbeing
United Arab Emirates:	Gallup Confidence in National Institution Index, Experience of discrimination
Vietnam:	Gallup Confidence in National Institution Index

Standardisation and aggregation

Standardisation and aggregation involve translating survey responses into numerical values that can be averaged into a quantitative index. This step is critical but also involves judgement calls regarding the numerical value of survey responses that are either nominal or, at best, ordinal in nature, and their relative weight in the final index.

Guided by the principles of transparency, simplicity and parsimony, each item identified by the resilience frameworks in the review was scored using a numerical equivalence ranging from 0 to 1, with a scaling approach corresponding to their response format:

- **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

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

- **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 e.g.:
  - 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 0-1 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 practice, they are given a score of 0.375
  - If someone experiences 3 discriminatory practice, they are given a score of 0.250
  - If someone experiences 4 discriminatory practice, they are given a score of 0.125
  - If someone experiences 5 discriminatory practice, 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.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

The details of item scoring for each item and dimension are provided below. The resulting variables were finally aggregated into four dimensions of resilience by averaging the variables in each dimension with equal weighting. 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.

1) Individual Dimension

- Individual Agency (0-1)
- Education (0-1)

2) Household Dimension

- Preparedness (0-1)
- Financial (0-1)
- Access to Communications (0-1)

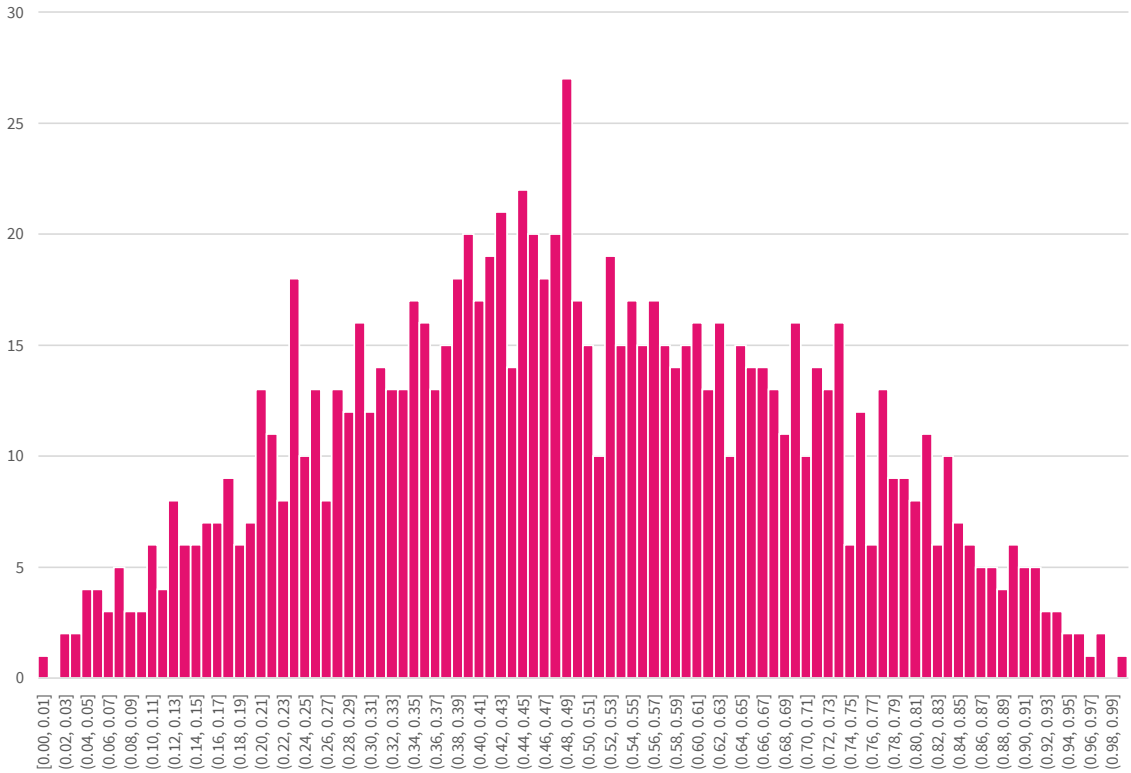
3) Community Dimension

- Social Capital (0-1)
- Local Infrastructure (0-1)

4) Society 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 valued values in all four dimensions.



Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Item scoring for the Resilience Index and its dimensions

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

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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

Society Dimension

WP22259: Experienced Racial Discrimination		
Value	**Value Label**	**Score**
1	Yes	1
2	No	0
98	Don't know	Missing
99	Refused	Missing

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

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

Analysis of how perceptions of AI relate to experiences with discrimination

To investigate whether perceptions of AI vary by people's experiences with discrimination, an indicator was constructed from the World Risk Poll question on discrimination to identify those in each country who had experienced discrimination. According to the literature, three main areas of discrimination often associated with discriminatory aspects of AI[18,19] are:

1) skin colour
2) race/ethnicity
3) sex

For the purpose of the analysis on page 35 of the AI report (*World Risk Poll 2021: A Digital World - Perceptions of risk from AI and misuse of personal data*), respondents who answered 'yes' to one or more of the following questions were counted as those who had experienced discrimination, while people who said 'no' to all three questions were counted as those who had not experienced discrimination:

- Have you, personally, ever experienced any discrimination because of any of the following?
- The color of your skin?
- Your race or ethnicity?
- Your gender?

The chart on page 35 shows perceptions of AI among those who had experienced discrimination as per the definition above, versus those who had not.

18 Manyika, J., Silberg, J., & Presten, B. (2019, October 25). What do we do about the biases in AI? Harvard Business Review. https://hbr.org/2019/10/what-do-we-do-about-the-biases-in-ai

19 Turner Lee, N., Resnick, P., & Barton, G. (2019, May 22). Algorithmic bias detection and mitigation: Best practices and policies to reduce consumer harms. The Brookings Institution. https://www.brookings.edu/research/algorithmic-bias-detection-and-mitigation-best-practices-and-policies-to-reduce-consumer-harms/

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

Violence and harassment data filtering

As briefly discussed in the main report the Lloyd's Register Foundation World Risk Poll is a significant data set, and part of the wider Gallup World Poll. The approach taken with the data is detailed here to ensure that the analysis can be understood and replicated independently.

The World Risk Poll module dedicated to violence and harassment in the workplace opens with three broad questions asking about experience of physical, psychological or sexual harassment – asked in that order – in the workplace. In each question, respondents could independently state that they have never worked[37]. At this point the following questions relating to that experience would be skipped.

For those who had experienced violence and harassment at work it is also possible to split the data by both the time frame of experience – within the last year, two to five years ago, or more than five years ago – and also by the number of times they had experienced it. Additionally, outside of this module and as part of the broader Gallup World Poll dataset, it is possible to group and filter the data based on current employment status.

Based on these interactions there are multiple ways to split the data. For this report we included experiences of violence and harassment from any time in the respondents' life in order to extract meaningful findings in the most objective manner.

For each question, respondents were asked if they worked. If they stated in the context of any of the three questions that they did not work, they were excluded from the analysis. In total, 12,038 respondents said that they have never worked in their lives, while 113,873 people did not say this – and this latter group are the focus of this report.

One outcome of providing respondents with the opportunity to state that they have never worked in relation to each type of violence and harassment is that it identifies a small group of respondents whose answers were inconsistent. Put another way: while 12,038 individuals said, at some point during the interview, that they have never worked, not all of them did so when asked the first question in the module[38] for all three questions. In fact, 780 people who would eventually say they have never worked answered the first question of the module; 45 of these individuals answered in the affirmative to this initial query, meaning they said that they had experienced the form of violence and harassment they were asked about. Another 716 said "no," to this initial question about their experience with violence and harassment at work, while the remainder were unsure.

Still, this means 11,258 of the people who said they have never worked mentioned this at the onset of the module; these respondents were asked no further questions about violence and harassment at work. In the following question about personal experience with violence and harassment at work (psychological for all respondents except people in China, who were asked a modified form of the question about sexual violence and harassment), 469 people said they have never worked. In the final question of this type – which focuses on sexual violence and harassment for 1,295 respondents, with all respondents (or a modified form of the question) – another 311 individuals said they have never worked. Notably, 63% of people who said they have never worked when asked about sexual violence and harassment (or the modified form of the question) were women.

20 This was a volunteered response, meaning it was not explicitly read as a response option by the interviewer, but an individual could offer this as answer to any of the questions about experience of violence and harassment at work. Volunteered responses are not uncommon in survey questions – for instance, "do not know," is a volunteered response for most of the questions asked on the Gallup World Poll; interviewers do not read this response option to respondents (except in rare cases), but if an individual indicates he or she is unsure, this is accepted as a response.

21 Except for respondents in China, the first question on this module was: "Have you, personally, EVER experienced PHYSICAL violence and/or harassment AT WORK, such as hitting, restraining, or spitting?" In China, this question was not asked, so the first question asked of respondents in that country was about experience of psychological violence and harassment at work (the second question of this type for all other countries).

Copyright © 2022Lloyd's Register Foundation. All rights reserved.

Table 1

Number of respondents who volunteered they have never worked when asked about violence and harassment at work, by when the respondent offered this response

Said "never worked" when…	Number of respondents
Asked first question about ever experiencing violence and harassment at work (physical violence and harassment at work, except for residents in China, who were asked if they have ever experienced psychological violence and harassment at work)	11,258
Asked second question about ever experiencing violence and harassment at work (psychological violence and harassment, except for residents in China who were asked about sexual violence and harassment at work)	469
Asked third question about ever experiencing violence and harassment at work (sexual violence and harassment for all respondents)	311
Total	**12,038**

Perhaps most striking is the fact that 99 respondents who eventually said they have never worked first admitted to experiencing some form of violence and harassment. While there is no way to know why this happened, the sensitive nature of the questions – and the troubled memories they may evoke – may be one reason why some respondents answered in an inconsistent manner. These respondents were excluded from the analysis, despite having answered at least one of the three questions about experience with violence and harassment in the affirmative.

This thorny issue is good way to highlight both the strengths and weaknesses of the World Risk Poll dataset and start a discussion around what some readers may consider surprising results, especially when looking at country and regional level differences.

Therefore, it is worth recalling that the World Risk Poll surveys individuals and because of this and despite the conceptual anchoring provided by the survey in terms of what constitutes violence and harassment in the workplace (either physical, psychological, or sexual), there are important limitations and considerations to keep in mind when comparing results across countries, territories, or areas, or even by subgroups within the same territory. A number of these limitations are explored here.

Attitudes or willingness to talk about violence and harassment at work will differ on an individual basis and may be shaped by larger forces such as individual (for example, personality traits), organisational (for example, quality of work environment and leadership) and socio-cultural factors (for example, national cultures and social norms).

An important consideration relates to the sensitivity of the subject. The survey asks about an inherently sensitive issue, and respondents asked sensitive questions may not always be entirely forthcoming in terms of their responses. The reasons for this reticence may depend on macroenvironmental factors (national politics, institutional norms, historic traditions, or cultural norms), microenvironmental factors (such as interviewing mode, place of interview, or presence of others in the interview setting) and personal characteristics and attitudes of respondents. While the Gallup World Poll has extensive experience asking about sensitive topics in ways that aim to minimise this type of effect, it is not possible to eliminate it entirely.

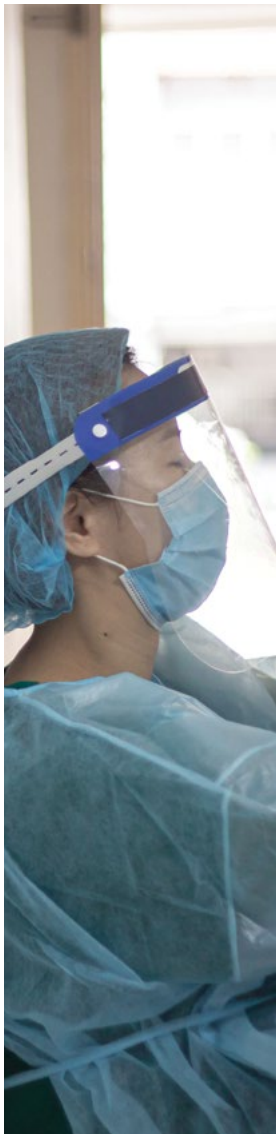
The definitions of and examples given for physical, psychological and sexual violence and harassment at work provided to the respondents may not always resonate with all respondents nor clarify how they understand these concepts.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.

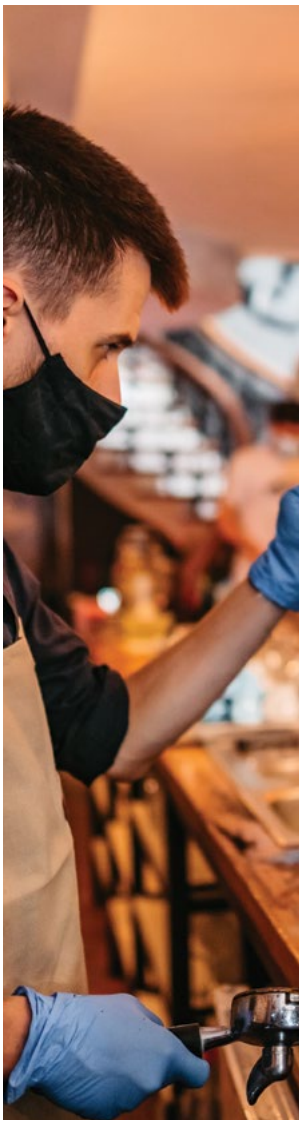
In a few countries, it was necessary for Gallup to ask some of the questions in a slightly different manner due to political sensitivities. In addition, in some countries, Gallup was not allowed to ask at least one survey question (relating to sexual violence and harassment) at all.

This theme of sensitivity, personal interpretation and societal norms influencing responses runs throughout the report and opens the door to many different interpretations.

Copyright © 2022 Lloyd's Register Foundation. All rights reserved.



Foundation



Get in touch

Please visit https://wrp.lrfoundation.org.uk/
for more information
or call +44(0)20 7709 9166

Lloyd's Register Foundation is a Registered Charity (Reg. no. 1145988) and limited company (Reg. no. 7905861) registered in England and Wales, and owner of Lloyd's Register Group Limited. © Lloyd's Register Foundation 2017

Lloyd's Register Foundation
71 Fenchurch Street
London
United Kingdom
EC3M 4BS

GALLUP®