

Problem Gambling Severity Index: Extended Summary Report

Draft 3

June 2023

Ipsos UK



Introduction

The Problem Gambling Severity Index (PGSI) is a validated screening tool, widely used, albeit not specifically designed, to estimate the number of people experiencing gambling problems, including in Health Survey for England, Scottish Health Survey and Welsh Problem Gambling Survey. It is also used by GambleAware to help inform the development of prevention campaigns and the evaluation of treatment and support services. However, PGSI has not been developed as a clinical tool and there is some debate surrounding how best to use the instrument as tool for identifying and measuring risk and gambling harms.

This report provides recommendations and discussion points for the future interpretation and use of PGSI by those wishing to understand and reduce the scale of gambling problems. The key findings have been informed by an extensive programme of advanced analytics, conducted on a sample of 21,172 responses to the 2020 and 2021 Annual GB Treatment and Support Surveys commissioned by GambleAware. A full technical report of the analysis can be found [here](#).

The Problem Gambling Severity Index (PGSI)

The problem gambling severity index (PGSI) is a nine-question instrument to measure gambling behaviour and consequences¹. Each answer is scored on a four-point scale, giving a total PGSI score ranging between 0 to 27. Depending on the score, respondents can be classified as:

'Non-problem gamblers' (PGSI = 0),

'Low risk' (PGSI = 1-2) experiencing a low level of gambling problems with few or no negative consequences identified),

'Moderate risk' (PGSI = 3-7) experiencing a moderate level of gambling problems leading to some negative consequences) and

'Problem gamblers' (PGSI = 8+)² gambling with negative consequences and a possible lack of control.

Use of PGSI

The PGSI was developed in Canada in 1999 and revised in 2003. It was developed for use in general population surveys. Today, the ways in which the PGSI is used could be grouped into national monitoring and surveillance, policy and regulation, compliance, and service delivery. For example, creating population health estimates of prevalence of 'problem gambling', informing case for policy/regulation change, and self-assessment tools to screen for and evaluate the impact of support services.

PGSI is used both **retrospectively** (to consider the impact of policies) and **proactively** (to inform guidelines, service policies and targeting interventions). It is used **alongside** other data and measures to

¹ A PGSI mini-screen scale (PGSI-MS) was further designed as a short form of the PGSI scale and includes three of the usual nine PGSI questions.

² The PGSI 8+ classification is sometimes referred to as 'problem gamblers' and this term is used in this report to refer to the 8+ PGSI group.

understand: behaviours by different demographics; outcome of interventions; co-occurring mental health, substance use, social behaviours, crime; and, harms of different types of gambling activity.

Despite its wide use, there is some concern about the validity and application of PGSI in different settings. Key criticisms include:³

- **Thresholds:** cut-off points create groups with people in the same classification group experiencing different sets of circumstances and the term ‘at risk’ can be interpreted in different ways. For example, the term ‘at-risk’ can imply that people who are classified into PGSI groups 1-2 or 3-7 are not experiencing harm now but will do in the future when in fact they are showing some signs of problematic behaviour now but remain below the 8+ threshold. Additionally, at risk may be interpreted as implying that people who currently fall within the 1-7 classification groups will in future progress into the 8+ group, when not all do so⁴⁵.
- **Conflation of probability vs impact:** being ‘at-risk’ of ‘problem gambling’, as measured by PGSI, should be distinguished from the impact of ‘problem gambling’ in terms of harm and well-being, instances of which can occur across different PGSI classification groups⁶.
- **Context of use:** how respondents’ answers can be influenced by the context of the survey, (e.g., specifically aimed at people who gamble or a more general multipurpose survey).
- **Mode effects:** as with all social surveys, differences in how it is administered (self-completion online or on paper, telephone, face-to-face) – issues of social desirability bias, confidentiality, anonymity can affect the size of the percentage of people identified as taking part in gambling or at risk of ‘problem gambling’.⁷ (e.g. people may be more inclined to talk about their gambling in an online self-completion survey than face to face with an interviewer present_.
- Use of **short-form** PGSI compared to longer-form version where the prevalence estimates are not directly comparable.⁸

Given these challenges, there are significant differences in the range of PGSI scores generated by survey studies that use the tool to estimate the number of people experiencing gambling problems in society. This also leads to debate about the most appropriate application of thresholds and identification of ‘risk’. The PGSI measures the risk of ‘problem gambling’ behaviour, which is not intended to be a measure of gambling harm per se, though, as we show below, the two are correlated.

³ Gambling Commission, September 2021. *Statistics and research release. Problem gambling screens_*
www.gamblingcommission.gov.uk/statistics-and-research/publication/problem-gambling-screens

⁴ PHE. September 2021. Risk factors for gambling and harmful gambling: an umbrella review A review of systematic reviews and meta analyses. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1020749/Gambling_risk_factors.pdf

⁵ Kruse, K., White, J., Walton, D. K., & Tu, D. 2016. Changes in risky gambling prevalence among a New Zealand population cohort. *International Gambling Studies*, 0(0), 1–19. <http://doi.org/10.1080/14459795.2016.1183033>

⁶ <https://link.springer.com/article/10.1007/s10899-020-09954-1>

⁷ Sturgis, P., 2020. *An assessment of the accuracy of survey estimates of the prevalence of problem gambling in the United Kingdom*. Department of Methodology, London School of Economics, London.

⁸ *ibid*

Analysis

The findings are drawn from three broad phases of statistical analysis.

- The first phase reviewed the performance of the total PGSI score as an 'index'. The index is created by adding up the scores across the nine items to create a PGSI summary score between 0 and 27, which is then used to create the PGSI classification groups.
- The second phase explored the relationship between each of the individual PGSI items and their contribution to the PGSI summary score. In particular, we considered the extent to which items were more or equally indicative of 'problem gambling'⁹. This included reviewing the performance of the short-form, three-item version of the PGSI¹⁰, and the overlap between the PGSI classifications using the three and nine item scores.
- The final stage of analysis assessed how well the PGSI score corresponded with measures of wellbeing. Additionally, we explored a breakdown of the 'problem gambling' classification group by distinguishing between people with scores between PGSI 8-19 from those with score of 20-27 and identified the characteristics of those in the 20+ group.

As part of the research for this project, the authors also conducted a small sample of cognitive interviews with a range of people who gamble to better understand how respondents answer PGSI items.

Table 1: PGSI items

Item	Dimension	Label
Have you bet more than you could really afford to lose?	Behaviour	Loss of control
Have you needed to gamble with larger amounts of money to get the same excitement?	Behaviour	Tolerance
When you gambled, did you go back another day to try and win back the money you lost?	Behaviour	Chasing
Have you borrowed money or sold anything to get money to gamble?	Behaviour Personal	Borrowing
Have you felt that you might have a problem with gambling?	Consequence	Felt problem
Has gambling caused you any mental health problems, including stress or anxiety?	Personal Consequence	Negative health
Have people criticised your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?	Personal Consequence	Criticism
Has your gambling caused any financial problems for you or your household?	Social Consequence	Financial problems
Have you felt guilty about the way you gamble or what happens when you gamble?	Personal Consequence	Guilt feelings

⁹ The short-form, three-item scale uses a classification of 4+ (summing across the three items) to classify 'problem gambler's, which is compared to the regular nine-item PGSI score of 8+.

¹⁰ <https://www.gamblingcommission.gov.uk/statistics-and-research/publication/problem-gambling-screens>

Key Findings

1. Items in the PGSI scale should not be treated equally; individually they make a different contribution to assessments of risk.

Previous studies have suggested that some of the nine PGSI items are more likely indicate a more severe risk of gambling than are other items (e.g., Miller et al., 2013¹¹). Consequently, treating each item as equivalent to other items when summing the scores of each to create the PGSI score would not be appropriate. The evidence found in our study concurs with these findings and so suggests that not all the PGSI items should contribute equally to the index nor to higher PGSI groups. The items Borrowing Money, Financial Problems and Tolerance (Table 1) appeared to measure a higher severity level, whereas Guilt Feelings and Chasing Losses appeared to be indicative of less severity.¹² In other words someone scoring a maximum of nine through summing the items scores from Borrowing Money, Financial Problems and Tolerance would be at greater risk than someone scoring nine across a different three PGSI items.

For example, whilst only four per cent of people who had gambled in our study had borrowed money or sold something to get money to gamble ('Borrowing Money'), of those who did, 83% were in the PGSI 'problem gambler' (PGSI 8+) group. Similarly, only five per cent said gambling had caused them financial problems ('Financial Problem') but of these, 73% were in the PGSI 'problem gambler' (PGSI 8+) group. Of the six per cent who reported they need to gamble with greater amounts of money (Tolerance), 63% were in the PGSI 8+ group. At the other extreme, 13% said they felt guilty about the way they gamble ('Feeling Guilty'), but just under one-third of these were in the PGSI 1-2 group with just under a third in PGSI 8+ and PGSI 3-7 groups. Similarly, 12% of people who gambled said they chased losses (Chasing), but of those who did, 38% were classed as PGSI 1-2, 29% PGSI 3-7 and 34% PGSI 8+.

Analysis also considered the extent to which items 'co-occurred' (selected by the same individual). This showed that Problem Recognition ('have you felt you have a problem with gambling') acted as a pathway for many other items to connect to each other.

Our findings concur with previous studies in this respect,¹³ and challenge the notion that each PGSI item measures the severity of gambling risk to the same extent as all other items. Care is therefore needed to use PGSI as a clinical or screening tool. For example, selecting 'sometimes' to financial difficulty may be more illustrative of a need for help and support than an individual declaring they 'almost always' feel guilty.

¹¹ <https://pubmed.ncbi.nlm.nih.gov/24014164/>

¹² These findings were also apparent in cognitive interviews. It was common for participants to comment that feeling 'guilty' was less severe than feeling that there was 'a problem'. Some participants also placed greater importance on financial items which were seen as more likely to be accurate and a pre-cursor to other outcomes.

¹³ For example, Miller et al. (2013)¹³ using survey data provided by Canadian adults found similar results, though 'Tolerance' was not as a high an indicator of severity in their study.

2. Despite its limitations, the PGSI scale should continue to be used as a general instrument to estimate potential risk of ‘problem gambling’ among larger groups.

Notwithstanding the findings above, overall, the PGSI items hold together as a composite single measure using standard statistical techniques. The statistical analysis showed evidence that the items worked together to form a single scale and that responses across the items were consistent, showing that the scale had good reliability.¹⁴ Additionally, use of a specialised statistical grouping technique¹⁵, designed to group people into three groups, showed that the distinguishing feature separating people in these three groups was their PGSI summary total score – this indicates that there is merit in making broad distinctions between summary groups within the PGSI summary scale¹⁶.

3. There is a clear link between PGSI scores and psychological distress, it is therefore appropriate to continue to use PGSI as an indicator of likely harm

One indicator of harm available through the Treatment and Support Survey dataset is wellbeing. There is strong evidence shown within the analysis that higher PGSI scores equate to worse wellbeing outcomes. For example, nearly half (47%) of those PGSI 8+ (‘problem gamblers’) were classified as ‘severe’ on K10 scale¹⁷, with another 28% classified as ‘moderate’ distress.

We do not know to what extent people in a poor state of wellbeing have a higher propensity for involvement in ‘problem gambling’ or vice-versa. However, the general trend is apparent and suggests that there is value in using PGSI as a tool by which to consider interventions or plan prevention activity. It is worth remembering that one PGSI item (Negative Health) asks directly about gambling impacting on mental health so further work would benefit from looking at the association between PGSI item scores and K-10, as well as the overall PGSI score.

As the PGSI score increases, the K10 score increases in line, until around a PGSI score of 20, when sample sizes are too small for this level of resolution. The cut-off point for a severe disorder classification on the K-10 scale is 30, which tends to occur at around a score of 16 and above on the PGSI.

This relationship between the PGSI and K-10 scales suggests that whilst the PGSI does not intrinsically measure harm, inference of the probability of harm in the form of psychological wellbeing can be inferred from the PGSI score. Whilst not everybody with a PGSI score of 16+ will necessarily be severely distressed, the majority will be. However, lower PGSI scores will result in fewer instances of severe distress. For example, of the PGSI 8+ group, 47% are classified as in severe distress.

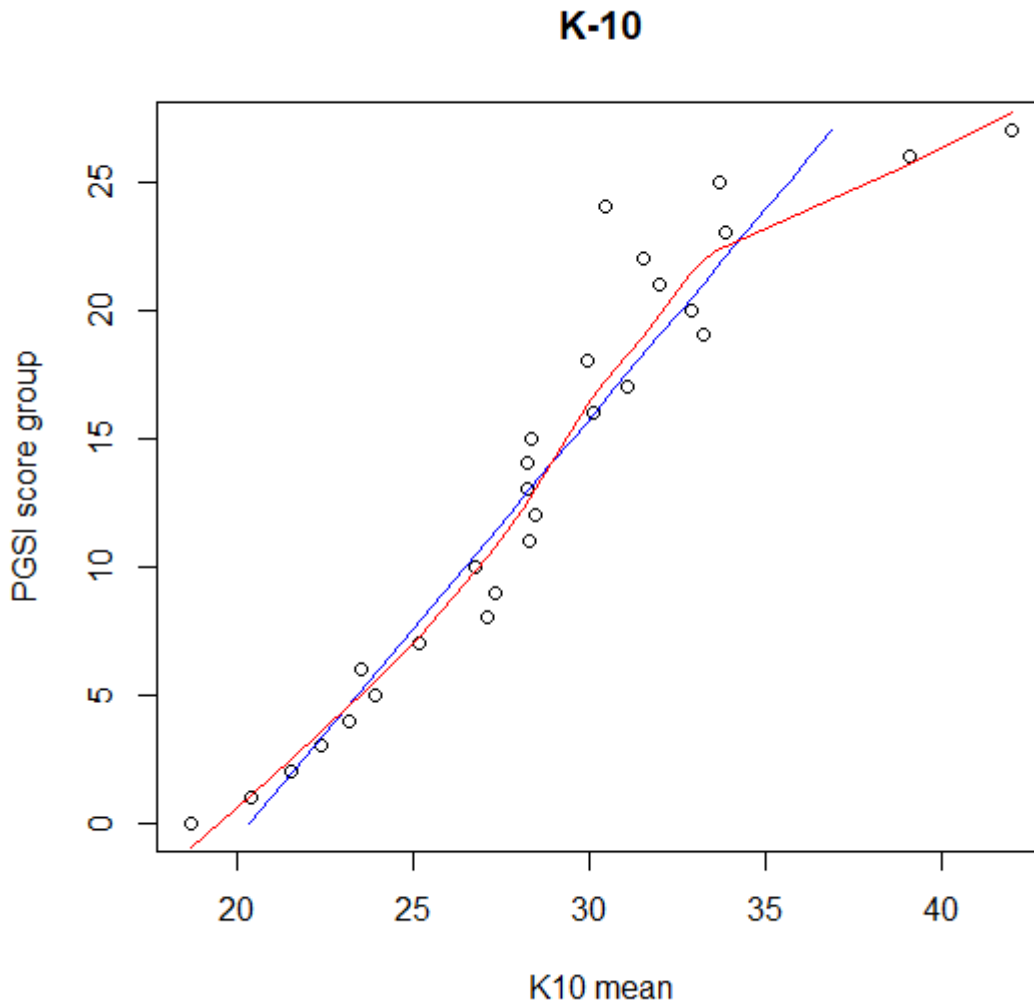
¹⁴ Factor analysis indicated a strong association between items and all other items. All items show solid correlations with the overall scale score and a high Cronbach’s alpha score (0.94).

¹⁵ Latent class analysis was used to identify different groupings across all scores of 1+; this helped identify different patterns of co-occurrence between the variables.

¹⁶ The current PGSI classifications group individuals into one of three categories: PGSI = 1-2; PGSI = 3-7; PGSI = 8+

¹⁷ The K-10 scale is also known as the Kessler Psychological Distress Scale and ranges between 10 and 50.

Figure 1: Scatterplot of K-10 average scores against PGSI score



4. There is merit in revisiting the traditional PGSI classifications; however, this should be traded against pragmatic considerations to identify, target and track groups over time

Analysis also shows that the current PGSI groupings of 1-2, 3-7 and 8+ may be sub-optimal in making clear distinctions between different sub-populations. For example, when comparing current PGSI classifications to three groups created separately by analysis for this study, the findings identified a poor degree of correspondence (or overlap) between the two models¹⁸. Initial analytics conducted for this study suggests that groupings of 1-4, 5-10 and 11+ offer an alternative to the traditional groupings. Further research is required to test if this grouping is more reliable and appropriate across different populations and sample sizes.¹⁹ Testing which groupings are most appropriate requires an external reference point against which to judge the scale, either on the basis of what it is measuring, i.e., ‘at risk

¹⁸ The Latent Class Analysis produced three groups (or ‘classes’). PGSI 8 + comprised all but one of the Class 1 cases, but also around half of the Class 3 cases. Class 2 cases were predominantly aligned to PGSI 1-2 but a substantial minority were also classed as PGSI 3-7.

¹⁹ A Discriminant Function Analysis (DFA) was used to predict allocation to different classification models. The DFA was able to predict the 1-4, 5-10, 11+ classifications to a higher degree of accuracy (95%) than it was able to predict to traditional 1-2, 3-7, 8+ classifications (87%)

of problem gambling' or against an associated concept (e.g., harm). Subsequent analysis in this study examining the link between the PGSI summary score and the K-10 distress score showed good separation using a different grouping of PGSI 0-7, 8-15 and 16+, derived from the pinch-point analysis of psychological distress (K-10). However, this is but one potential validation scale out of many, and different validation scales may suggest different PGSI groupings.

Currently, it is not clear which breakdown (e.g., traditional PGSI grouping, K-10 pinch-point analysis or the one derived from the latent class analysis) is most appropriate and if any one breakdown is suitable for all purposes. At the population estimate level, analysis suggests that there may be some value to revisiting notion that a threshold of PGSI 8+ justifies the label of 'problem gambling'. For example, increasing the cut-off threshold from 8 to 11 would result in being more sure that those classified at PGSI 11+ were more likely to experience 'problem gambling' than those at 8+. However, the PGSI 8-10 group would still include some people who were harmed but were no longer being classified in the 11+ 'problem gambling' group.²⁰ Additionally, it should be noted that a highest category of PGSI 11+ would reduce the total number of cases in this group by around a third, thus making it more difficult to identify and monitor over time, i.e., social surveys would require comparatively large sample sizes to measure the 11+ group with precision.

In designing treatment and support services, it seems that the PGSI 8+ group does capture many in psychological distress; however, distress does not flatline at PGSI 8+. A more stringent cut-off higher up the PGSI scale (16+) will certainly identify a group who are even more distressed than the PGSI 8+ group and will likely require different scale or nature of support.

5. Overall, there is a risk that that PGSI underreports the proportion of individuals who are at risk of harm from gambling; where possible, additional survey measures should therefore be explored that ask people to self-refer as experiencing harm

The cognitive interviews identified a risk that some individuals may not want to or be unable to answer PGSI accurately. This was particularly relevant to items which consider personal consequence, and whether an individual feels guilty or that they may have a 'problem'. Participants felt it was likely that someone who is experiencing significant impact from gambling may be inclined to answer 'sometimes' if they are unable or unwilling to acknowledge the true significant impact on their lives or want to 'play down' the impact. It was further suggested that an individual may genuinely not feel guilty or perceive there to be a problem, even if they were experiencing harm. This would in turn underestimate the prevalence of those scoring PGSI 3-7 and PGSI 8+ because respondents may be underreporting the frequency of occurrence when responding to individual items and lowering their overall PGSI score.

Wider research further indicates that there is a gap between those who self-identify as suffering harm from gambling and those who score 8+ on PGSI. We therefore recommend further research to develop a validated pairing of PGSI with a secondary question which assess self-reported harm (regardless of gambling activity) may help identify a separate pool of individuals who require tailored support to help raise self-awareness.

²⁰ Thus, we would decrease the number of false positives but at the expense of increasing the number of false negatives

6. Careful consideration should be given to the use of PGSI 1+ as a threshold at which ‘harm’ begins

Using the K-10 psychological distress score, analysis shows that people with a PGSI score of 1-2 have some wellbeing scores that are more similar to people who do not gamble and people with a PGSI score of zero than they do to PGSI 3-7 and PGSI 8+. For example, the average K10 score for those in PGSI 1-2 group was 20.7 compared to a score of 20.0 among people who do not gamble and 17.9 among those with PGSI = 0. Where people in the 3-7 group had an average K-10 score of 23.3 and those in the PGSI 8+ group had a K-10 average score of 28.7. Consequently, levels of psychological distress in the PGSI 1-2 group are more similar to those of people who do not gamble than they are to people with a score of PGSI 3-7 or PGSI 8+. Therefore, these results suggest that treating all those who have a PGSI score of 1+ as similar in terms of harm is inappropriate.

Taken alongside findings above that suggest not all PGSI items are equivalent, further analysis could explore the extent to which all scores of PGSI 1+ are equivalent in association with wellbeing and other gambling harms (for example comparing outcomes for individual with score of 1 for ‘feeling guilty’ vs score of 1 for ‘financial problems’), and whether there would be any benefit to differentiating further within PGSI classifications.

7. Avoid use of the short forms PGSI measure unless there is extremely limited opportunity to interact with individuals

Analysis shows that the short form PGSI measure tends to underpredict the PGSI 8+ group, reducing the prevalence of ‘problem gambling’ for people who gamble from 4.5% to 3%²¹. Using the nine-item form as the ‘true’ measure, the short-form predicts 634 cases as PGSI 8+ equivalent, of which 595 are accurate predictions, i.e., only 6% are false positive predictions. However, the short form misses 355 of the 950 true positives, a false negative rate of 37%. The predictive performance of the short form measure for the long-form PGSI 1-2 and PGSI 3-7 groups is worse than for the PGSI 8+ group.

The further work suggested under Recommendation 1 should take the severity of Items into account with reference to the construction of the short form. This suggests that the short form should not be used as a tool for population estimates of potential risk of gambling harms and has limited value as a tool for self-assessment or in service delivery. However, it may still have some value in identifying those most likely to be PGSI 8+ where collection across all 9 PGSI items may be impractical or not appropriate.

Implications

The PGSI is based on responses to nine question items which cover both behavioural situations and consequences of gambling. Using standard procedures, responses to each of these items are treated as equally important in contributing to the total summary score created through adding up the response to each item. This summary score approach appears to work well as a general indicator of potential risk of ‘problem gambling’ among the general population. As such, it can be used to monitor trends in potential levels of gambling problems, identify groups of people who are potentially at higher risk and be used to monitor the impact of policies aimed at reducing harm. However, it is unlikely to work as well on

²¹ Please note these are not official statistics which can be found at the Gambling Commission website. GambleAware estimates are based on the latest treatment and support online survey conducted among over 18,000 people in GB aged 18+ with fieldwork carried out in 2022 by YouGov. Surveys using other methods, including official surveys, generally lead to lower levels of estimated prevalence and therefore these figures may be seen as an upper bound.

its own as a diagnostic instrument for individuals or for such screening purposes. Further work is recommended to explore PGSI items which appear more and less severe and their relationship to the wellbeing outcomes. The tendency of the more severe items to co-occur, as well as the less severe items also to co-occur might be indicative of different experiences of risk and harm, which would require further work to assess.

There is a need for PGSI users and practitioners to distinguish between the risk of 'problem gambling' and the binary problematic or not problematic classification using the classification grouping. Not all people within a PGSI classification group are at the same risk of harm on wellbeing measures. Again, this consideration is especially important when considering using the PGSI for treatment screening purposes and reinforces the need for supporting measures of harm.

This study has considered the PGSI as an existing instrument. It has not considered the extent to which other relevant questions might extend the classification of risk. The cognitive interviews suggested that further work in this regard might be useful to test for people whose risk is currently hidden from view of the PGSI. The work comparing the short-form measure to the nine-item PGSI illustrates the risk of missing hidden harms because not all appropriate items were included in the short-form measure. Extending the nine item PGSI could reveal a hidden sub-group at risk of harm. However, extension of the PGSI should be done with care. Any additional items should be justified on both theoretical and statistical grounds.

Changes to the PGSI, whether this be through increasing the number of items or changing the classification score groupings, will disrupt ongoing statistical series and comparability with other countries using the same scale and groupings. Consideration should be given to reporting any changes and ensuring either continuing to report comparable measures over time (where possible) alongside any new measures. Alternatively, adjustment factors between old and new measures should be derived to enable switching between new and old statistical series.

Our standards and accreditations

Ipsos' standards and accreditations provide our clients with the peace of mind that they can always depend on us to deliver reliable, sustainable findings. Our focus on quality and continuous improvement means we have embedded a "right first time" approach throughout our organisation.



ISO 20252

This is the international market research specific standard that supersedes BS 7911/MRQSA and incorporates IQCS (Interviewer Quality Control Scheme). It covers the five stages of a Market Research project. Ipsos was the first company in the world to gain this accreditation.



Market Research Society (MRS) Company Partnership

By being an MRS Company Partner, Ipsos endorses and supports the core MRS brand values of professionalism, research excellence and business effectiveness, and commits to comply with the MRS Code of Conduct throughout the organisation. We were the first company to sign up to the requirements and self-regulation of the MRS Code. More than 350 companies have followed our lead.



ISO 9001

This is the international general company standard with a focus on continual improvement through quality management systems. In 1994, we became one of the early adopters of the ISO 9001 business standard.



ISO 27001

This is the international standard for information security, designed to ensure the selection of adequate and proportionate security controls. Ipsos was the first research company in the UK to be awarded this in August 2008.



The UK General Data Protection Regulation (GDPR) and the UK Data Protection Act (DPA) 2018

Ipsos is required to comply with the UK GDPR and the UK DPA. It covers the processing of personal data and the protection of privacy.



HMG Cyber Essentials

This is a government-backed scheme and a key deliverable of the UK's National Cyber Security Programme. Ipsos was assessment-validated for Cyber Essentials certification in 2016. Cyber Essentials defines a set of controls which, when properly implemented, provide organisations with basic protection from the most prevalent forms of threat coming from the internet.



Fair Data

Ipsos is signed up as a "Fair Data" company, agreeing to adhere to 10 core principles. The principles support and complement other standards such as ISOs, and the requirements of Data Protection legislation.

For more information

3 Thomas More Square
London
E1W 1YW

t: +44 (0)20 3059 5000

www.ipsos.com/en-uk
<http://twitter.com/IpsosUK>

About Ipsos Public Affairs

Ipsos Public Affairs works closely with national governments, local public services and the not-for-profit sector. Its c.200 research staff focus on public service and policy issues. Each has expertise in a particular part of the public sector, ensuring we have a detailed understanding of specific sectors and policy challenges. Combined with our methods and communications expertise, this helps ensure that our research makes a difference for decision makers and communities.