

Northern Ireland Tourism Statistics

Confidence Limits User Guidance

When reporting estimate results, wherever an inference is being made from a sample to a population, it is good practice to present confidence intervals alongside the estimate.

(Estimate +/- Margin of Error)

In the Annual Tourism Statistics publication, for example, figures are presented for the estimated number of overnight trips in Northern Ireland. These estimates are based on a series of surveys undertaken at household level, and also at airports and seaports and are subject to sampling errors. A sampling error indicates the limitations of our sample in reflecting the whole population in question, and the error refers to the discrepancy that may result from judging the whole (population) on the basis of the much smaller number (sample). This error would automatically be corrected if the whole population itself had been examined.

In the Northern Ireland Annual Tourism Statistics publication the estimated number of overnight trips made by visitors to NI is presented alongside a confidence interval for the estimated figure (the margin of error). The confidence interval gives the probability that the estimated range of values presented includes the actual value being estimated.

Standard statistical techniques are used to calculate this confidence interval for the estimated number of overnight trips. Confidence intervals can be presented at different levels. The 95% and 99% levels are commonly used. These levels reflect the uncertainty associated with the interval estimate. In the tourism statistics publications, the "95% confidence interval" is used. This means that if we used the same sampling method to select different samples for the surveys over and over again and computed the estimated number of overnight trips for each sample, we would expect the true number of overnight trips to fall within the interval estimates 95% of the time.

The use of confidence intervals allows us to make informed inferences about changes in the population. We could for example use them for probing estimated changes in the number of external visitors to Northern Ireland over a number of years.

For example, the number of overnight trips in Northern Ireland during January to December 2016 was estimated at 4,573,000; with a confidence interval of +/-7% (320,000). This means that we are 95% confident that the true number of overnight trips to Northern Ireland was between 4,253,000 and 4,893,000. The best estimate from the surveys was the published estimate of overnight trips to Northern Ireland of 4,573,000 (see Table 1).

Table 1: Estimated number of overnight trips to Northern Ireland and 95% upper and lower confidence limits 2011 to 2016

	Published Estimate	Confidence Interval %	Confidence Interval	95% Upper Limit	95% Lower Limit
2011	3,968,000	+/- 7%	+/- 290,000	4,246,000	3,690,000
2012	4,025,000	+/- 7%	+/- 290,000	4,306,000	3,743,000
2013	4,069,000	+/- 7%	+/- 291,000	4,354,000	3,785,000
2014	4,513,000	+/- 7%	+/- 330,000	4,829,000	4,197,000
2015	4,532,000	+/- 7%	+/- 329,000	4,849,000	4,214,000
2016	4,573,000	+/- 7%	+/-320,000	4,893,000	4,253,000

Notes:

- (1) *Figures have been rounded to the nearest thousand*
- (2) *Confidence intervals are available for the Northern Ireland Passenger Survey (NIPS) and the Continuous Household Survey (CHS) (NISRA); the confidence interval for the NIPS have been applied to the Survey of Overseas Travellers (Fáilte Ireland); and the confidence interval for the CHS has been applied to the Household Travel Survey (Central Statistics Office).*

In addition to calculating confidence intervals around the estimated number of overnight trips in Northern Ireland, they can also be calculated for any change in the estimates over time.

For example, say an estimate of the number of external trips by visitors to Northern Ireland in 2014 is made and its corresponding confidence interval is calculated, and this estimate is again made in 2015. We can use these two estimates to determine whether any significant change has occurred in the estimated number of external trips by visitors to Northern Ireland over the year. If the confidence intervals of these two estimates do not overlap then there is a statistically significant difference between the two estimates. However, if they do overlap, it does not necessarily mean there is no significant difference. A more exact approach is to calculate the ratio of the two estimates, or calculate the difference between them, and then produce a corresponding confidence interval for this difference.