Ipsos Poll Conducted for Reuters

Germanwings Plane Crash 03.30.2015

These are findings from an Ipsos poll conducted for Thomson Reuters March 27-30, 2015. For the survey, a sample of 1,665 Americans ages 18+ were interviewed online. The precision of the Reuters/Ipsos online polls is measured using a credibility interval. In this case, the poll has a credibility interval of plus or minus 2.7 percentage. For more information about credibility intervals, please see the appendix.

The data were weighted to the U.S. current population data by gender, age, education, and ethnicity. Statistical margins of error are not applicable to online polls. All sample surveys and polls may be subject to other sources of error, including, but not limited to coverage error and measurement error. Figures marked by an asterisk (*) indicate a percentage value of greater than zero but less than one half of one per cent. Where figures do not sum to 100, this is due to the effects of rounding. To see more information on this and other Reuters/Ipsos polls, please visit http://polling.reuters.com/.

GERMANWINGS PLANE CRASH

Q1. From the list below, please choose the topics or issues you have heard or read anything about in the past few days. You can choose as many or few as needed. *(Added on 3/24/2015, n=2,536)*

The Germanwings airline crash in southeastern France, with all 150 passengers feared dead	65%

Q2. Which, if any, of the following things do you feel worried about while flying in an airplane? Please choose as many as apply.

Mechanical issues with the plane	53%
Terrorism/attempts to crash the plane	44%
Turbulence or bad weather	41%
Hijacking	37%
Pilots being disturbed or suicidal	37%
Pilots making mistakes	36%
Other	4%
None – I don't feel worried when I fly	20%
Don't know	7%

Q3. And which of the below are you MORE worried about? *(Asked of those who are afraid of both hijacking and disturbed/suicidal pilot at Q2, n=420)*

Pilots being disturbed or suicidal	49%
Hijacking	40%
Don't know	11%

Q4. Please indicate whether you agree or disagree with each of the following statements.

	Agree	Disagree	Not sure
On a commercial air flight, there should always be at least two people in the cockpit for the duration of the flight	91%	2%	7%
Airlines should administer regular psychological tests of their pilots	86%	5%	8%
Train and bus companies should administer regular psychological tests of their drivers	83%	5%	12%

Q5. Since 9/11, most cockpit doors on commercial flights can be locked from the inside in way that no one can access the cockpit from the main cabin, even someone who correctly enters a pilot's code in keypad entry outside the cockpit door. This means that anyone in the cockpit who locks the door is completely inaccessible until they unlock it. This is designed to protect pilots, but is also a risk if the pilot themselves is putting the flight in danger. All things considered, do you personally think that the cockpit door should be lockable in this way from the inside?

Yes, it should be completely lockable from the inside	11%
Yes, but only when at least two crew members are inside the cockpit	61%
No, it should not be completely lockable from the inside	15%
Don't know	13%

Q6. In what way, if at all, has the recent Germanwings airplane crash affected your attitude toward flying? *(Asked of those who were aware of the plane crash at Q1, n=1,249)*

I now feel more afraid of flying	27%
It has had no impact on my attitude toward flying	62%
I now feel less afraid of flying	3%
Don't know	8%

Q7. And in what way, if at all, has the recent Germanwings airplane crash affected your travel decisions? *(Asked of those who were aware of the plane crash at Q1, n=1,249)*

I have changed my travel plans	5%
I have considered changing my travel plans, but not yet changed them	9%
It has had no impact on my travel decisions	79%
Don't know	7%

Q8. In which of the following ways have you changed your travel plans as a result of the Germanwings crash? Choose as many as apply. *(Asked of those who changed travel plans at Q7, n=54)*

I have cancelled a flight and will travel by a different method, such as car, bus, or train	33%
I have cancelled a flight and will not travel at all	30%
I have changed a flight to a different carrier/airline	18%
I have changed the dates of my air travel	13%
Other	22%
Don't know	15%

How to Calculate Bayesian Credibility Intervals

The calculation of credibility intervals assumes that Y has a binomial distribution conditioned on the parameter θ\, i.e., Y|θ~Bin(n,θ), where n is the size of our sample. In this setting, Y counts the number of "yes", or "1", observed in the sample, so that the sample mean ($\bar{y}$) is a natural estimate of the true population proportion θ. This model is often called the likelihood function, and it is a standard concept in both the Bayesian and the Classical framework. The Bayesian [1] statistics combines both the prior distribution and the likelihood function to create a posterior distribution. The posterior distribution represents our opinion about which are the plausible values for θ adjusted after observing the sample data. In reality, the posterior distribution is one's knowledge base updated using the latest survey information. For the prior and likelihood functions specified here, the posterior distribution is also a beta distribution (π(θ/y)~β(y+a,n-y+b)), but with updated hyper-parameters.

Our credibility interval for ϑ is based on this posterior distribution. As mentioned above, these intervals represent our belief about which are the most plausible values for ϑ given our updated knowledge base. There are different ways to calculate these intervals based on π(θ/y). Since we want only one measure of precision for all variables in the survey, analogous to what is done within the Classical framework, we will compute the largest possible credibility interval for any observed sample. The worst case occurs when we assume that *a*=1 and *b*=1 and y=*n/2*. Using a simple approximation of the posterior by the normal distribution, the 95% credibility interval is given by, approximately:

$$\bar{y} \mp \frac{1}{\sqrt{n}}$$

For this poll, the Bayesian Credibility Interval was adjusted using standard weighting design effect 1+L=1.3 to account for complex weighting[2]

Examples of credibility intervals for different base sizes are below. Ipsos does not publish data for base sizes (sample sizes) below 100.

Sample size	Credibility intervals
2,000	2.5
1,500	2.9
1,000	3.5
750	4.1
500	5.0
350	6.0
200	7.9
100	11.2

[1] *Bayesian Data Analysis, Second Edition, Andrew Gelman, John B. Carlin, Hal S. Stern, Donald B. Rubin, Chapman & Hall/CRC | ISBN: 158488388X | 2003*

[2] *Kish, L. (1992). Weighting for unequal Pi . Journal of Official, Statistics, 8, 2, 183200.*