Repeat the data from the last example, but we want a max. error of 3 percentage points with 95% confidence.

$\alpha = 1 - .95 = .05$

$1 - \alpha/2 = 1 - \frac{.05}{2} = .9750$

Table A1

1.9 ← .9750 (.06)

$z_{\alpha/2} = 1.96$

$\hat{p} = .44$, $\hat{q} = .56$

$$n = \frac{z_{\alpha/2}^2 \hat{p} \hat{q}}{E^2} = \frac{1.96^2 \cdot (.44)(.56)}{.03^2}$$

$= 1051.7$

Round up → $\underline{1052}$ ← New sample size

Suppose no $\hat{p}$ value is available

Some possible values

$\hat{p}$	$\hat{q}$	$\hat{p} \cdot \hat{q}$
0	1.00	0
.10	.90	.09
.20	.80	.16
.30	.70	.21
.40	.60	.24
.50	.50	.25
.60	.40	.24
.70	.30	.21
.80	.20	.16
.90	.10	.09
1.00	0	0

maximum of $\hat{p}\hat{q}$

This means we can use

$$n = \frac{z_{\alpha/2}^2 (0.25)}{E^2}$$

Using this, our last example becomes

$$n = \frac{z_{\alpha/2}^2 (.25)}{E^2} = \frac{1.96^2 (.25)}{.03^2}$$

$= 1067.1$

→ $\underline{1068}$.

This still gives the 3% error but doesn't require preliminary data