

9A Conservative Manager vs Aggressive Manager

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9A Subsections

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A.1 Intro

- You are a manager for a production line
- Default rate of the line must to be below 10%
- Two types of managers:
 - Conservative: Need assurance that $p < .1$ at all times.
 - Aggressive: Everything is fine until proven otherwise.

A.2 Formulas:

Two-sided 95% CI for p

$$\hat{p} \pm 1.96\sqrt{\hat{p}(1 - \hat{p})/n}, \quad (\text{Rule of Thumb}): \hat{p} \pm \frac{1}{\sqrt{n}}$$

One-sided upper-bound 95% CI for p

$$\hat{p} + 1.64\sqrt{\hat{p}(1 - \hat{p})/n}$$

One-sided lower-bound 95% CI for p

$$\hat{p} - 1.64\sqrt{\hat{p}(1 - \hat{p})/n}$$

Basic View

Examples:

Q1: How much sample size?

Q2: How do we sample?

A.3 AAA

n=1000; 1/sqrt(n) 0.032

n=300; 1/sqrt(n) 0.058

n=100; 1/sqrt(n) 0.1

n=1000; p=.1; 1.64*sqrt(p*(1-p)/n) 0.01555841

n=300; p=.1; 1.64*sqrt(p*(1-p)/n) 0.02840563

n=100; p=.1; 1.64*sqrt(p*(1-p)/n) 0.0492

n=300

p=.15; p-1.64*sqrt(p*(1-p)/n)

A.4 Conservative:

Conservative:

p=.10	$p+1.64\sqrt{p(1-p)/n}$	0.128
p=.09	$p+1.64\sqrt{p(1-p)/n}$	0.117
p=.08	$p+1.64\sqrt{p(1-p)/n}$	0.106
p=.07	$p+1.64\sqrt{p(1-p)/n}$	0.094
p=.06	$p+1.64\sqrt{p(1-p)/n}$	0.082

A.5 Aggressive:

Aggressive:

p=.15	$p - 1.64 \sqrt{p(1-p)/n}$	0.116
p=.14	$p - 1.64 \sqrt{p(1-p)/n}$	0.107
p=.13	$p - 1.64 \sqrt{p(1-p)/n}$	0.098
p=.12	$p - 1.64 \sqrt{p(1-p)/n}$	0.089