want to know: E(# Claims) needed

Game Plan:

1. What to estimate
2. Sample
3. Precision
4. Sample size.

1. What to Estimate:

μ = Underlying (Expected) pure premium

2. Sample:

Sample of observed premiums

3. Precision:

$\sigma^2 =$

observed pure premium within 2% of Expected pure premium

$$P\left(|\bar{S}-\mu| < .02\mu\right) > .90$$

S_i's Are random variables!

= 16,913 Claims

Characteristics of $\bar{S}$

1. $E(\bar{S}) = \mu$
2. $Var(\bar{S}) = Var(S)/n = \sigma^2/n$
3. $\bar{S} \sim$ Normal (Aprox)

$$P\left(\frac{|\bar{S}-\mu|}{|\sigma/\sqrt{n}|} < \frac{.02\mu}{\sigma/\sqrt{n}}\right) > .90$$

$$P\left(|Z| < \frac{.02\mu}{\sigma/\sqrt{n}}\right) > .90$$

$$P\left(-\frac{.02\mu}{\sigma/\sqrt{n}} < Z < \frac{.02\mu}{\sigma/\sqrt{n}}\right) > .90$$

$$\frac{.02\mu}{\sigma/\sqrt{n}} \geq 1.645$$

$$n \geq (1.645/.02)^2 \cdot \sigma^2/\mu^2$$

$$\mu = E(S) = E(N)\cdot E(X)$$

$$Var(S) = E(N)\cdot Var(X) + Var(N)\cdot E(X)^2$$

$$E(N) = \lambda \quad E(X) = \theta/(\alpha-1)$$

$$\mu = \lambda(.5/5) = (.10)\lambda$$

$$+\lambda[.10]^2$$

$$Var(S) = \lambda\left[.5^2\cdot 2/5\cdot4 - .5^2/5\cdot5\right]$$

$$= \lambda[.015] + \lambda[.01]$$

$$n \geq (1.645/.02)^2 \cdot \frac{\lambda[.025]}{(.10)^2\lambda^2}$$

.025

$$n \geq 16{,}912.65/\lambda$$