Comparison of Two Independent Populations

I. Introduction

A Practical Problem: We would like to compare the average time-loss due to accidents in two groups of industrial plants. One group is following the guidelines of Occupational Safety and Health Act (OSHA) more closely than the other group. What are the steps to do this study?

Consider two populations

Mean of \( \bar{Y}_1 - \bar{Y}_2 \) =

Variance of \( \bar{Y}_1 - \bar{Y}_2 \) =

Standard deviation of \( \bar{Y}_1 - \bar{Y}_2 \) =
II. Inferences When $\sigma_1$ and $\sigma_2$ Are Known

a. If the two populations are normal, then $(\bar{Y}_1 - \bar{Y}_2)$ is distributed as:

This shows that:

Example: Time-loss due to accidents
b. A $100(1 - \alpha)\%$ confidence interval for $(\mu_1 - \mu_2)$ when the population standard deviations are known is:

Example: Time-loss due to accidents