

Binomial Distribution

The Women Example



The Problem

According to a recent study, **1 in every 9** women has been a victim of domestic abuse at some point in her life. Suppose we have randomly and independently **sampled twenty-five** women and asked each whether she has been a victim of domestic abuse at some point in her life. Find the probability that **at least 2** of the women sampled have been the victim of domestic abuse. Hint: Use the binomial probability distribution .

What do we know?

- That $n = 25$, $p = 1/9$ and $q = 1 - 1/9 = 8/9$.
- We want **at least 2** women, surveyed have been a victim $P(x > \text{and} = \text{to } 2)$.
- We could do the binomial probability for $x = 2, 3, 4, \dots, 25$ which would take a long time.
- So use the complement and calculate instead $1 - [P(0) + P(1)] =$
 $1 - [(1)(1)(.0526) + (25)(.1111)(.059)] =$
 $1 - [.2163] = .7836$