

Some Binomial Example Problems

- 1) Let X be a $B(6,.3)$ random variable. Find $P(X = 2)$.
> dbinom(2,6,.3)
[1] 0.324135
- 2) Let X be a $B(6,.3)$ random variable. Find the probability that X is at least 2.
> 1-pbinom(1,6,.3)
[1] 0.579825
- 3) According to a report entitled "Pediatric Nutrition Surveillance" published by Centers for Disease Control (CDC), 18 percent of children younger than 2 years had anemia in 1997. On a particular day, a pediatrician examined 11 children.
 - a) What is the probability that none will have anemia?
> dbinom(0,11,.18)
[1] 0.1127074
 - b) What is the probability that exactly 5 will have anemia?
> dbinom(5,11,.18)
[1] 0.02653919
 - c) What is the probability that all will have anemia?
> dbinom(11,11,.18)
[1] 6.426841e-09
 - d) Compute the expectation and variance of the number of children with anemia.
Mean=11(.18)=1.98.Variance = 11(.18)(.82)=1.63
 - e) What is the probability that at least 7 will have anemia?
> 1-pbinom(6,11,.18)
[1] 0.001021352
- 4) About 27 percent of the population take flu shots. You are in a class of 750 students.
 - a) Compute the mean μ and standard deviation σ of the number students who took a flu shot.
Mean=750(.27),Variance=750(.27)(.73)
 - b) Compute the probability that at most 200 would have taken a flu shot
> pbinom(200,750,.27)
[1] 0.4370975
 - c) Compute the probability that between 190 and 215 students would have taken a flu shot.
> pbinom(215,750,.27)-pbinom(189,750,.27)
 - d) [1] 0.7150749

The Normal Distribution