

Practice Assignment: More Conditional Probabilities

- 1) In a certain hospital's emergency room, 10% of admitted patients are initially listed in critical condition, and 90% of admitted patients who are initially listed in critical condition must stay in the hospital overnight. Only 8% of admitted patients who are not initially listed in critical condition must stay in the hospital overnight.

Tala (who is a nurse at this hospital) randomly selects a patient who is staying in the hospital overnight. What is the probability that this patient was initially listed in critical condition? Round to 3 decimal places.

Hint: Construct a table with 1,000 hypothetical patients.

Answer:

$$P(\text{critical GIVEN overnight}) = 90/162 = 5/9 \approx 0.556$$

Tables will vary.

Sample table:

	Overnight	Not Overnight	Total
cal	90	10	100
Critical	72	828	900
l	162	838	1,000

- 2) A hospital uses the Emergency Severity Index¹ to classify its patients. This classification scheme has five categories from Level 1 (the patient requires resuscitation or other highly emergent care) to Level 5 (the patient requires non-urgent care).

At this hospital, 2% of patients are classified as Level 1, 7% are classified as Level 2, 30% are classified as Level 3, 10% are classified as Level 5, and the remaining percentage of patients are classified as Level 4.

At this hospital, 99% of Level 1 patients stay overnight, 90% of Level 2 patients stay overnight, 30% of Level 3 patients stay overnight, 10% of Level 4 patients stay overnight, and 1% of Level 5 patients stay overnight.

Kennedy (a nurse at this hospital) randomly selects a patient who is staying in the hospital overnight. What is the probability that this patient was initially classified as Level 1? Round to the three decimal places.

¹ Gilboy, N., Tanabe, T., Travers, D., & Rosenau, A. M. (2011). Emergency severity index (ESI): A triage tool for emergency department care, Version 4. Implementation Handbook 2012 Edition, Agency for Healthcare Research and Quality.
https://emscimprovement.center/documents/107/ESI_Handbook2125.pdf

Hint: Construct a table with 10,000 hypothetical patients.

Answer:

$$P(\text{Level 1 GIVEN overnight}) = 198/2,248 \approx 0.088$$

Tables will vary.

Sample table:

	Overnight	Not Overnight	Total
Level 1	198	2	200
Level 2	630	70	700
Level 3	900	2,100	3,000
Level 4	510	4,590	5,100
Level 5	10	990	1,000
Total	2,248	7,752	10,000