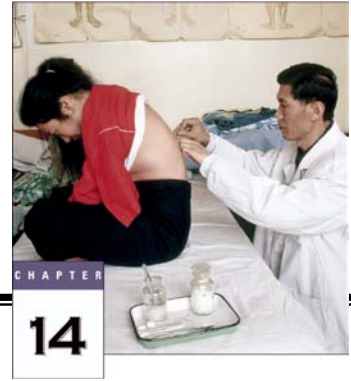# Chapter 14: Inference for Distributions of Categorical Variables: Chi-Square Procedures

**14**

**Key Vocabulary:**

- chi-square test for goodness of fit
- segmented bar chart
- chi-square statistic
- expected count

- observed count
- degrees of freedom
- chi-square distribution
- components of chi-square
- cell counts

- r x c table
- cell

**Calculator Skills:**

- sum ( )

- $\chi^2$cdf (leftbound, rightbound, df)

- $\chi^2$pdf (X, df)

- Shade $\chi^2$ (leftbound, rightbound, df)

- $\chi^2$-Test

## 14.1  Test for Goodness of Fit (pp.834-848)

1. What does the term *expected count* mean, and how is it calculated?

2. What is the *chi-square statistic*?

3. What is the difference between the notation $X^2$ and $\chi^2$?

4. How many degrees of freedom does the *chi-square distribution* have?

5.  State the general form for the null hypotheses for a $\chi^2$ goodness of fit test.

6.  State the general form for the alternative hypotheses for a $\chi^2$ goodness of fit test.

7.  What conditions must be met in order to use the *goodness of fit test*?

8.  What is the shape of a *chi-square distribution*?  What happens to the shape as the degrees of freedom increases? (Illustrate with a diagram)

9.  What is meant by a *component* of chi-square?

10. What does the largest *component* of chi-square signify?

11. Why is it necessary to perform follow-up analysis to a chi-square test?

## 14.2  Inference for Two-Way Tables (pp.849-885)

1.  What information is contained in a two-way table for a chi-square test?

2.  State the null and alternative hypotheses for comparing more than two population proportions.

3.  How do you calculate the expected count in any cell of a two-way table assuming the null hypothesis is true?

4.  How many degrees of freedom does a chi-square test for a two-way table with r rows and c columns have?

5.  What requirements must be checked before carrying out a Chi-square test?

6.  Summarize how to carry out a Chi-square Test for Homogeneity of Populations:

7.  State the null and alternative hypotheses for a Chi-square test for Association/Independence.

8.  Summarize how to carry out a Chi-square Test for Association/Independence: