**Activity 7.6.3 – Applying Chi-Square Tests to Social-Justice Topics**

**Racial Makeup of Prospective Jurors in Manhattan Superior Court**

Researchers were concerned that racial composition of prospective jurors – individuals selected for juror duty who form the jury pool – did not accurately reflect the racial composition of adults in Manhattan. The researchers attended jury selection proceedings over a 12-week period and visually identified the race of the jurors selected for criminal court jury duty. The racial composition of adults in Manhattan, according to the 2000 U.S. Census, is shown below (leftt table). The racial makeup of individuals selected for criminal court jury duty is shown below (right table).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Racial Composition of Adults in  Manhattan, NY | |  | Racial Composition of Adults in  Random Survey of Jurors, *n* = 7720 | |
| White | 54% |  | White | 6,023 |
| Black | 18% |  | Black | 765 |
| Asian | 10% |  | Asian | 500 |
| Other | 18% |  | Other | 432 |

(Source: <http://ppefny.org/2007/06/racial-and-ethnic-disparity-in-manhattan-jury-pools-results-of-a-survey-and-suggestions-for-reform/474>)

All individuals in a population should have an equal chance to serve on a jury. Does the observed sample provide evidence that the criminal courts are disproportionally selecting certain groups for jury duty?

1. Answer this question by conducting a chi-square goodness-of-fit test.
2. State the hypothesis about the population to test.
3. Construct a randomization distribution of chi-square statistics under the assumption that the initial hypothesis is correct (using Statkey).
4. Calculate chi-square for the observed sample.
5. Find the probability of obtaining a random sample with a chi-square statistic greater than the observed chi-square statistic.
6. Determine if the observed chi-square statistic is statistically significant.
7. State a conclusion about the population.

**Racial Composition of Inmates Incarcerated in Connecticut**

The racial composition of adults in Connecticut, based on the 2013 U.S. Census estimates, is shown below (left table). The racial makeup of inmates incarcerated in Connecticut correctional facilities (prisons and jails), as of July 2015, is shown below (right table).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Racial Composition of Connecticut Adults  (2013 U.S. Census) | |  | Racial Composition of Inmates in  Connecticut Prisons and Jails, *n* = 16,025 | |
| White | 69% |  | White | 5,363 |
| Black | 11% |  | Black | 6,578 |
| Hispanic | 15% |  | Hispanic | 3,961 |
| Asian | 4% |  | Asian | 82 |
| American Indian | 1% |  | American Indian | 41 |

(Source: <http://www.ct.gov/doc/lib/doc/PDF/MonthlyStat/Stat201507.pdf>)

Are certain racial groups disproportionally represented in Connecticut prisons?

1. Answer this question by conducting a chi-square goodness-of-fit test.
2. State the hypothesis about the population to test.
3. Construct a randomization distribution of chi-square statistics under the assumption that the initial hypothesis is true (using Statkey).
4. Calculate chi-square for the observed sample.
5. Find the probability of obtaining a random sample with a chi-square statistic greater than the observed chi-square statistic.
6. Determine if the observed chi-square statistic is statistically significant.
7. State a conclusion about the population.