

Hypothesis testing:

There are no identifiable work types where women are outnumbered.

Question:

What jobs under the labor force do women take the most?

For this portion of analysis, the following metrics from the data set were considered, listed with their value sets:

1. Sex
 - a. 1 – Male
 - b. 2 – Female
2. Work and Job indicators
 - a. 1 – Yes
 - b. 2 – No
3. Primary Occupation Type
 - a. Armed Forces Occupations (0) – 1-3
 - b. Managers (1) – 11-14
 - c. Professionals (2) – 21-26
 - d. Technicians and Associate Professionals (3) – 31-35
 - e. Clerical Support Workers (4) – 41-44
 - f. Service and Sales Workers (5) – 51-54
 - g. Skilled Agricultural, Forestry, and Fishery Workers (6) – 61-63
 - h. Craft and Related Trades Workers (7) – 71-75
 - i. Plant and Machine Operators and Assemblers (8) – 81-83
 - j. Elementary Occupations (9) – 91-96
4. Primary Occupation Industry
 - a. Agriculture and Forestry (10) – 1-2
 - b. Fishing and Aquaculture (11) – 3
 - c. Mining and Quarrying (12) – 5-9
 - d. Manufacturing (13) – 10-33
 - e. Electricity, Gas, Steam, and Airconditioning Supply (14) – 35
 - f. Water Supply, Sewerage, Waste Management, and Remediation Activities (15) – 36-39
 - g. Construction (16) – 41-43
 - h. Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles (17) – 45-47
 - i. Transportation and Storage (18) – 49-53
 - j. Accommodation and Food Service Activities (19) – 55-56

- k. Information and Communication (20) – 58-63
 - l. Financial and Insurance Activities (21) – 64-66
 - m. Real Estate Activities (22) – 68
 - n. Professional, Scientific and Technical Activities (23) – 69-75
 - o. Administrative and Support Service Activities (24) – 77-82
 - p. Public Administration and Defense; Compulsory Social Security (25) – 84
 - q. Education (26) – 85
 - r. Human Health and Social Work Activities (27) – 86-88
 - s. Arts, Entertainment and Recreation (28) – 90-93
 - t. Other Service Activities (29) – 94-96
 - u. Activities of Households as Employers (30) – 97-98
 - v. Activities of Extraterritorial Organizations and Bodies (31) – 99
5. Worker Class
- a. Private Household (32) – 0
 - b. Private Establishment (33) – 1
 - c. Gov't/Gov't Corporation (34) – 2
 - d. Self Employed (35) – 3
 - e. Employer (36) – 4
 - f. With pay (Family owned Business) (37) – 5
 - g. Without Pay (Family owned Business) (38) – 6

The total number of men and women for each category each metric were tallied for statistical analysis. Data points where the respondent is underage or unemployed were naturally discarded. Gender ratios were obtained per sub-metric using the formula:

$$\text{gender ratio (share of women)} = \frac{\text{\# of women}}{\text{\# of women} + \text{\# of men}}$$

The gender ratio was statistically analyzed via a one-sample t-test against an expected mean of 0.5 (equal gender distribution). The standard deviation for each sub-metric assessment would also be 0.5, since each male employee would set the data point to 0 and each female employee would set it to 1. N for each sub-metric is obtained by getting the sum of men and women that possess work that fall under them.

The t-tests were performed with two (2) tails and a 95% confidence interval. The significance of the difference between men and women under each sub-metric were assessed via obtained p-values, and are sorted into the following categories: not significant, significant ($p < 0.05$), very significant* ($p < 0.005$), and extremely significant** ($p < 0.001$). The latter three classifications are where the null hypothesis is rejected, and it can be assumed that women are either the dominant or the ones being outnumbered for that job description—identifying which of these is true was done by inspecting the gender ratio, a value less than 0.5 would indicate that the latter is the case.

The t-tests were able to identify that women are significantly outnumbered in the following:

Primary Occupation Type

1. Skilled Agricultural, Forestry and Fishery Workers** (p = 0.0002)
2. Craft and Related Trades Workers* (p = 0.0030)
3. Plant and Machine Operators and Assemblers** (p = 0.0001)

Primary Occupation Industry Type

4. Agriculture and Forestry** (p = 0.0004)
5. Fishing and Aquaculture (p = 0.0580)
6. Construction** (p = 0.0001)
7. Transportation and Storage** (p = 0.0001)

Class of Worker

8. Private Establishment** (p = 0.0001)
9. Self Employed** (p = 0.0009)

On the other hand, women outnumber men in the following:

Primary Occupation Type

1. Clerical Support Workers (p = 0.0245)
2. Service and Sales Workers (p = 0.0417)

Primary Occupation Industry Type

3. Wholesale and Retail Trade; Repair of Motor Vehicles* (p = 0.0014)
4. Human Health and Social Work Activities (p = 0.0479)

Class of Worker

5. Private Household (p = 0.0281)
6. Without Pay (Family-owned Business)** (p = 0.0005)

From this analysis, it can be concluded that there are identifiable work types where women are outnumbered.