Analytical Plan for Association between leadership commitment and professional development at NASA (2020): sex-adjusted stratified analysis

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**Document version**

|  |  |
| --- | --- |
| **Version** | **Alterations** |
| 01 | Initial version |

# Abbreviations

* CI: confidence interval
* FEVS: Federal Employee Viewpoint Survey
* OPM: U.S. Office of Personnel Management

# Context

The Federal Employee Viewpoint Survey (FEVS) addressed leadership commitment, professional development, and telework satisfaction while accounting for gender (OPM, 2020). This analysis addresses a subset of the FEVS survey reflecting NASA employees.

## Objectives

Test if there is an association between leadership commitment and employee professional development at NASA from the 2020 Federal Employee Viewpoint Survey.

## Hypotheses

There is a statistically significant correlation between leadership commitment and telework satisfaction among NASA’s employees in a telework environment after accounting for gender (men and women).

## Study design

Survey, with sampling weights accounting for sampling uncertainty.

# Data

## Raw data

## Analytical dataset

All variables in the analytical set were labeled according to the raw data provided and values were labeled according to the data dictionary for the preparation of production-quality results tables and figures.

After the cleaning process 5 variables were included in the analysis with 9633 observations. Table 1 shows the structure of the analytical dataset. Raw data was collected as a census of the eligible population (OPM, 2020), and statistical weighting was applied at the data collection to adjust for non-responses in in the census attempt. These survey weights allow for the estimation of the association under study in the source population. The raw data is expected to reflect a total employee population at NASA at 16809 employees but after cleaning procedures the observations in the analytical data represents a total of 15283 NASA employees.

**Table 1** Analytical dataset structure after variable selection and cleaning.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **id** | **dsex** | **q1** | **q21** | **postwt** |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| … |  |  |  |  |
| 9633 |  |  |  |  |

The analytical dataset will be included in the private version of the report, and will be omitted from the public version of the report.

# Study variables

## Primary and secondary outcomes

**Specification of outcome measures** (Zarin, 2011):

1. (Domain) employee professional development
2. (Specific measurement) N/A
3. (Specific metric) N/A
4. (Method of aggregation) N/A

**Primary outcome**

This analysis does not evaluate an outcome variable, but instead tests whether or not the distributions of answers from two questions are independent from one another.

## Covariates

The association will be stratified by the sex of survey respondents.

# Statistical methods

## Statistical analyses

### Descriptive analyses

The epidemiological profile of the study participants will be described. Demographic (sex, age and BMI) and will be described as mean (SD) or as counts and proportions (%), as appropriate. The distributions of participants’ characteristics will be summarized in tables and visualized in exploratory plots.

### Inferential analyses

All comparisons between groups will be performed as univariate analyses. Differences in distribution of categorical variables will be assessed with the chi-square test with the Rao correction for weighted survey data.

### Statistical modeling

N/A

### Missing data

No missing data imputation will be performed. All evaluations will be performed as complete case analyses.

## Significance and Confidence Intervals

All analyses will be performed using the significance level of 5%. All significance hypothesis tests and confidence intervals computed will be two-tailed.

## Study size and Power

N/A

## Statistical packages

This analysis will be performed using statistical software R version 4.1.2.

# Observations and limitations

N/A

# References

* **SAR-2022-008-GJ-v01** – Association between leadership commitment and professional development at NASA (2020): sex-adjusted stratified analysis
* OPM (2020). 2020 Federal Employee Viewpoint Survey – Technical report (<https://www.opm.gov/fevs/reports/technical-reports/>).
* Zarin DA, et al. The ClinicalTrials.gov results database — update and key issues. N Engl J Med 2011;364:852-60 (<https://doi.org/10.1056/NEJMsa1012065>).
* Gamble C, et al. Guidelines for the Content of Statistical Analysis Plans in Clinical Trials. JAMA. 2017;318(23):2337–2343 (<https://doi.org/10.1001/jama.2017.18556>).

# Appendix

This document was elaborated following recommendations on the structure for Statistical Analysis Plans (Gamble, 2017) for better transparency and clarity.

## Availability

Both this analytical plan and the corresponding analysis report (**SAR-2022-008-GJ-v01**) can be downloaded in the following address:

<https://philsf-biostat.github.io/SAR-2022-008-GJ/>