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

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## TABLE OF CONTENTS

1 ABBREVIATIONS.....	2
2 CONTEXT.....	2
2.1 Objectives.....	2
2.2 Hypotheses.....	2
2.3 Study design.....	2
3 DATA.....	3
3.1 Raw data.....	3
3.2 Analytical dataset.....	3
4 STUDY VARIABLES.....	3
4.1 Primary and secondary outcomes.....	3
4.2 Covariates.....	4
5 STATISTICAL METHODS.....	4
5.1 Statistical analyses.....	4
5.1.1 Descriptive analyses.....	4
5.1.2 Inferential analyses.....	4
5.1.3 Statistical modeling.....	4
5.1.4 Missing data.....	4
5.2 Significance and Confidence Intervals.....	4
5.3 Study size and Power.....	4
5.4 Statistical packages.....	5
6 OBSERVATIONS AND LIMITATIONS.....	5
7 REFERENCES.....	5
8 APPENDIX.....	5
8.1 Availability.....	5

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## Document version

Version	Alterations
01	Initial version

## 1 ABBREVIATIONS

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

## 2 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.

### 2.1 Objectives

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

### 2.2 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).

### 2.3 Study design

Survey, with sampling weights accounting for sampling uncertainty.

### 3 DATA

#### 3.1 Raw data

#### 3.2 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 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.

### 4 STUDY VARIABLES

#### 4.1 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.

**4.2 Covariates**

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

**5 STATISTICAL METHODS****5.1 Statistical analyses****5.1.1 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.

**5.1.2 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.

**5.1.3 Statistical modeling**

N/A

**5.1.4 Missing data**

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

**5.2 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.

**5.3 Study size and Power**

N/A

## 5.4 Statistical packages

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

## 6 OBSERVATIONS AND LIMITATIONS

N/A

## 7 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/NEJMs1012065>).
- 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>).

## 8 APPENDIX

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

### 8.1 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/>