**Code Description**

This is a fraction of code I wrote for a project from work. The purpose of this demo is to illustrate my abilities of using SAS Macros and some frequently used SAS procedures.

This part of project aims to understand the distribution of inequitable gender norms scale score (int type, range 11-33, fairly normally distributed) among the three African countries (Eswatini, Uganda and Zimbabwe) in both sex and stratified by several key variables (n8 - marital status, n3 - highest school attended, n11 – occupation, n51 – whether tested for HIV, nn41-nn50 – questions about stigma towards HIV). Some values of each stratifying variables could have no participants in some categories (no data in this country-sex-strata combination).

The original outputs from proc means each contains only one stratifying variable. Dataset summ combines all outputs with means and standard deviations in the same column, but the value of stratifying variables are in different columns (Figure 1). New variable "print" is created to combine the mean and standard deviation in each row with proper format (Figure 2).

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**Figure 1. Example of the combined dataset print view (part)**

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**Figure 2. Example of the "print" variable construction (part)**

Proc SQL is used first to select useful variables and output in desired order. Then, the construction of main program is separated into 4 different Macros.

Macro %cname is used in Proc IML. Using %do %to loops, %cname reads value of print and stratifying variable for the range of rows corresponding to each combination of country, sex and stratifying variable, and generate one 2-column table for each (value of print in one column and stratifying variable value in the other column, see Figure 3).

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**Figure 3. Example of output generated by %cname**

Macro %cc is used in Proc SQL to combine tables of both sex in a country for each stratifying variable. Macro %chart is then used (along with macro %cc) to combine tables of the three countries. Full join and coalesce options are used to correctly combine the datasets according to stratifying variable value.

Finally, Macro %imls is used to execute all macros above and show all tables from %chart at once. The final result is demonstrated by Figure 4. The report of this part of project (as demonstrated in Table 1) is then easily formed.

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**Figure 4. Example of the final result (part)**

**Table 1. Example of the report (part)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Eswatini** | | **Uganda** | | **Zimbabwe** | |
| **Women**  **(N,%)** | **Men**  **(N,%)** | **Women**  **(N,%)** | **Men**  **(N,%)** | **Women**  **(N,%)** | **Men**  **(N,%)** |
| **Marital Status** |  |  |  |  |  |  |
| Never married | 18.6 (4.2) | 18.4 (4.4) | 23.7 (4.6) | 22.0 (3.8) | 21.2 (4.8) | 20.8 (5.3) |
| Married/monogamous relationship | 19.5 (4.3) | 18.5 (4.7) | 24.8 (3.8) | 22.8 (4.5) | 22.8 (4.9) | 20.3 (5.2) |
| Married/polygamous relationship | 21.4 (4.9) | 18.9 (5.8) | 25.6 (4.0) | 23.9 (4.8) | 24.0 (5.4) | 19.6 (6.2) |
| Cohabiting/Living together | 21.2 (2.3) | 20.8 (2.7) | 24.4 (3.4) | 23.3 (3.0) | 22.0 (2.6) | - |
| Divorced/Separated | 20.5 (4.2) | 21.4 (3.2) | 23.6 (3.2) | 23.5 (5.1) | 23.0 (4.7) | 22.2 (5.1) |
| Widowed | 20.9 (5.4) | 18.9 (4.8) | 24.0 (4.6) | 23.8 (3.3) | 24.7 (4.8) | 25.1 (5.8) |
| Other | - | - | 28.5 (2.1) | - | - | 31.0 (.) |
|  |  |  |  |  |  |  |
| **Education** |  |  |  |  |  |  |
| Primary or less | 21.4 (4.5) | 20.5 (4.3) | 25.1 (3.9) | 23.5 (4.3) | 25.4 (4.6) | 23.1 (5.2) |
| Secondary | 18.3 (3.9) | 17.5 (4.1) | 23.0 (3.8) | 22.1 (4.4) | 21.9 (4.6) | 20.1 (5.1) |
|  |  |  |  |  |  |  |