# A Descriptive Analysis of Reported Health Issues in Rural Jamaica

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## ABSTRACT

**Objective:** There are currently thousands of Jamaican citizens that lack access to basic healthcare. In order to improve the healthcare system I will collect and analyze data from two clinics in remote locations of the island. This report will analyze data collected from Clarendon parish, Jamaica. **Methodology**: In order to create a descriptive analysis I will use SAS studio 9.4®. A few of the procedures I will use include: PROC IMPORT, PROC MEANS, PROC FREQ, and PROC GCHART. **Results:** After conducting the aforementioned procedures, I will be able to produce a descriptive analysis of the health issues plaguing the island.


## INTRODUCTION

Currently, over 95% of the world's population lives in developing nations. Many of these individuals lack access to the most basic amenities including access to adequate health care. Unfortunately, this is the case for most of the 2.7 million people living in Jamaica. During March, 2015 I traveled with the Caribbean American Medical Educational Organization to the parishes of Portland and Clarendon, Jamaica on a medical mission trip. Many residents of these parishes seldom receive health care services because most residents live in inaccessible regions. The purpose of this trip was to establish temporary clinics and provide basic health care to the entire parishes.

Over the course of four days, my team and I treated 160 individuals suffering from a variety of symptoms. In order to record and analyze my team's data I decided to use SAS studio 9.4. I selected SAS because I wanted to create a descriptive report highlighting all of the various health symptoms we treated. This report includes many basic statistically procedures such as PROC MEANS, PROC FREQ, PROC PRINT, and PROC GCHART to statistically report all the recorded symptoms. I am proud to know this report has been used by both my mission team and local health departments to improve healthcare for many Jamaicans.

## PROC IMPORT

Before conducting any statistical analysis, I needed to import my excel spreadsheet data into SAS. In order to do so I used the 'Import XLSX File' snippet. I then replaced the DATAFILE, OUT, and DATA statement placeholders with my personal names.

PROC IMPORT reads data from an external data source and converts it to a SAS data set. When you run the IMPORT procedure, SAS reads the input file and writes the data into a SAS data set. The variable definitions are based on the input records, when the IMPORT procedure reads a delimited file it generates a DATA step code to import the data. You can control the results with options and specific statements for the data source. The IMPORT procedure generates the specified output SAS data set and writes information about the import to your SAS log. The log displays the DATA step code that the IMPORT procedure generates. To import data, you can also use the Import Wizard or the External File Interface (EFI) to guide you through the steps to import an external data source. Furthermore, can use the Import Wizard to generate IMPORT procedure statements, which you can save to a file for subsequent use. To open the Import Wizard or EFI from the SAS windowing environment, select File [arrow] Import Data. In order to import an external data set into SAS studio you may use 'snippets.'

```
PROC IMPORT DATAFILE="/home/josephverlin/CAMEO/SASVere.xlsx"
            OUT=vere
            DBMS=XLSX
            REPLACE;
RUN;

/** Print the results. **/

PROC PRINT DATA=vere; RUN;
```

**Figure 1. PROC IMPORT statement**

## PROC MEANS

The first statistical procedure I ran was the PROC MEANS statement. The PROC MEANS procedure can: calculate descriptive statistics, estimate quantiles, calculate confidence limits, identify extreme values, and can perform a t test. For my study I am primarily concerned with variable, mean, minimum, and maximum outputs.

```
title "Section 1: Vere - Summary";
proc means data=vere; run;
title;
```

**Figure 2. PROC MEANS statement**

The PROC MEANS procedure produced the following output:

**The MEANS Procedure**

| Variable | Label | N | Mean | Std Dev | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Cardiac | Cardiac | 4 | 0.5000000 | 0.5773503 | 0 | 1.0000000 |
| Respiratory | Respiratory | 4 | 2.2500000 | 1.8929694 | 1.0000000 | 5.0000000 |
| Pain | Pain | 4 | 41.7500000 | 13.6717470 | 28.0000000 | 54.0000000 |
| Eye | Eye | 4 | 3.0000000 | 1.6329932 | 1.0000000 | 5.0000000 |
| Allergy | Allergy | 4 | 6.7500000 | 3.5939764 | 4.0000000 | 12.0000000 |
| Hypertension | Hypertension | 4 | 17.7500000 | 8.9953692 | 11.0000000 | 31.0000000 |
| Infection | Infection | 4 | 15.7500000 | 4.9916597 | 9.0000000 | 20.0000000 |
| Blood | Blood | 4 | 1.0000000 | 1.4142136 | 0 | 3.0000000 |
| Neuro | Neuro | 4 | 1.7500000 | 1.7078251 | 0 | 4.0000000 |
| GERD | GERD | 4 | 3.2500000 | 1.2583057 | 2.0000000 | 5.0000000 |
| Worms | Worms | 4 | 1.7500000 | 0.5000000 | 1.0000000 | 2.0000000 |
| Cough_Cold | Cough_Cold | 4 | 8.5000000 | 1.7320508 | 7.0000000 | 11.0000000 |
| Diabetic | Diabetic | 4 | 5.0000000 | 2.5819889 | 2.0000000 | 8.0000000 |
| Stomach | Stomach | 4 | 6.2500000 | 2.3629078 | 3.0000000 | 8.0000000 |
| Skin | Skin | 4 | 7.5000000 | 5.4467115 | 3.0000000 | 15.0000000 |
| Glasses | Glasses | 4 | 7.2500000 | 0.5000000 | 7.0000000 | 8.0000000 |

**Output 1. Output from a PROC MEANS statement.**

The first three columns on the left list each categorical variable and the number of observations. The last four columns report the mean, standard deviation, minimum value, and maximum value. For example, over the course of four days my team treated an average of 41.75 cases of pain. During the trip the lowest amount of reported cases of pain was 28 cases while the most recorded cases of pain was 54. Further, the standard deviation for pain cases was 13.67.

## PROC FREQ

The FREQ procedure produces one-way to n-way frequency and contingency tables. In order to compute a two-way table, PROC FREQ computes tests and measures of association. In order to produce n-way tables, PROC FREQ provides stratified analysis by computing statistics across and within strata. For one-way frequency tables, PROC FREQ computes goodness-of-fit tests for equal proportions or specified null proportions. For one-way tables, PROC FREQ also provides confidence limits and tests for binomial proportions, including tests for noninferiority and equivalence.

For contingency tables, PROC FREQ can compute various statistics to examine the relationships between two classification variables. For some pairs of variables, you might want to examine the existence or strength of any association between the variables. To determine if an association exists, chi-square tests are computed. To estimate the strength of an association, PROC FREQ computes measures of association that tend to be close to zero when there is no association and close to the maximum (or minimum) value when there is perfect association

The statistics for contingency tables include the following: chi-square tests and measures, measures of association, binomial proportions and risk differences for 2x2 tables, odds rations and relative risks for 2x2 tables, test for trend, tests and measures of agreement, Cochran-Mantel-Hansel statistics

In choosing measures of association to use in analyzing a two-way table, you should consider the study design (which indicates whether the row and column variables are dependent or independent), the measurement scale of the variables (nominal, ordinal, or interval), the type of association that each measure is designed to detect, and any assumptions required for valid interpretation of a measure. You should exercise care in selecting measures that are appropriate for your data.

```
/* Hypertension*/
proc freq data=vere;
tables location/out=locationpct;
weight hypertension;
run;
```

**Figure 3. PROC FREQ**

The FREQ Procedure

| Location | | | | |
|---|---|---|---|---|
| Location | Frequency | Percent | Cumulative Frequency | Cumulative Percent |
| MTownD1 | 14 | 19.72 | 14 | 19.72 |
| MTownD2 | 11 | 15.49 | 25 | 35.21 |
| PortlandC | 31 | 43.66 | 56 | 78.87 |
| RockyP | 15 | 21.13 | 71 | 100.00 |

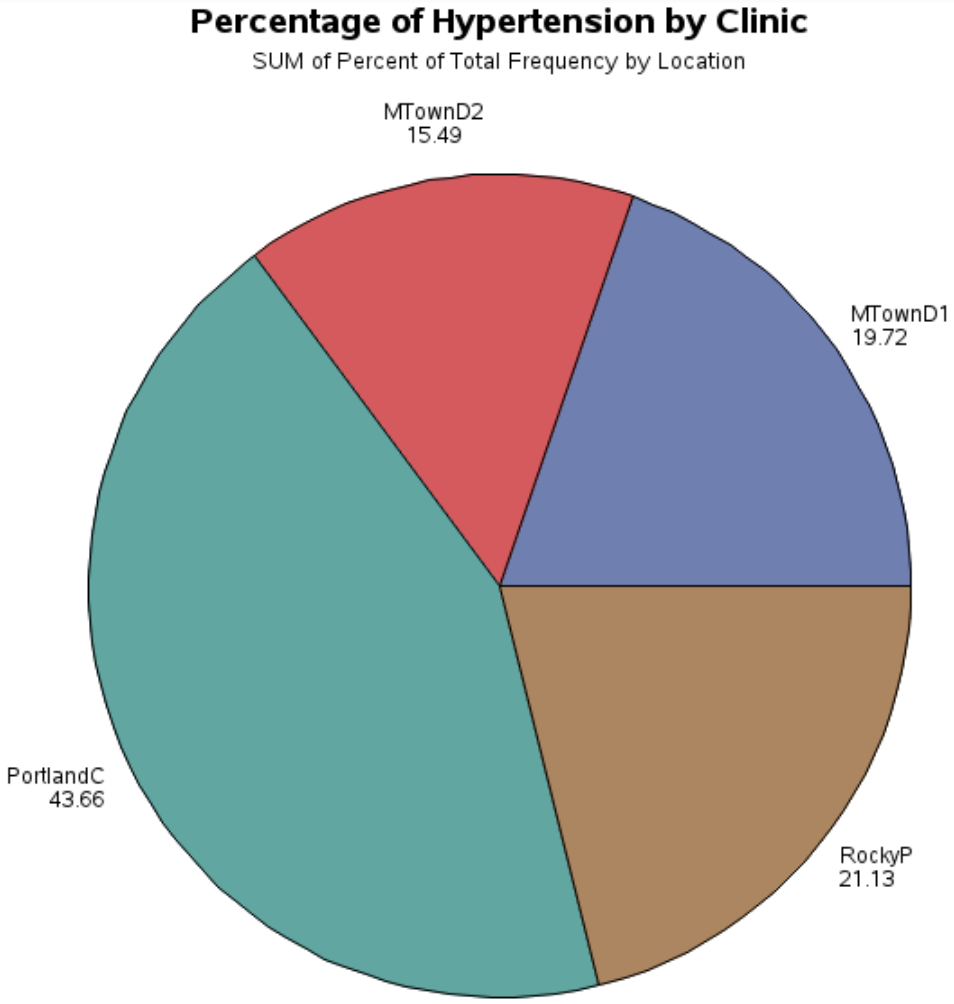
**Output 2. Output from a PROC FREQ statement**

### PROC GCHART

The next procedure I decided to use was PROC GCHART to illustrate the prevalence rates for a few symptoms. The GCHART procedure produces six types of charts: block charts, horizontal and vertical bar charts, pie and donut charts, and star charts. These charts graphically represent the value of a statistic calculated for one or more variables in an input SAS data set. The procedure can calculate the following statistics: frequency, percentages, sums, and means. Further, the procedure can also: display and compare exact relative magnitudes, examine the contribution of parts to the whole, analyze where data re out of balance. The following table is my code analyzing the variable hypertension:

```
title "Percentage of Hypertension by Clinic";
proc gchart data=locationpct;
pie location/sumvar=percent;
run;
title;
```

**Figure 4. PROC GCHART**




**Output 3. Output from a PROC GCHART statement**

## CONCLUSION

Prior to this study there were hundreds of Jamaicans suffering from various illness that were unable to receive treatment. Due to their remote residencies many Jamaican public health officials were unaware of their underserved population. Using SAS allowed me to conduct a report summarizing various health issues in Clarendon and Portland, Jamaica. Furthermore, this report was also submitted to Jamaican public health officials to help improve their current healthcare delivery system.

## REFERENCES


- http://www.ats.ucla.edu/stat/sas/
- http://support.sas.com/index.html


## CONTACT INFORMATION

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