**OCA2 variant gg is associated with nevus development**

**Introduction**

The incidence of malignant melanoma has been on the rise at an alarming rate in the United States and attracted great attention ([1](#_ENREF_1)). The occurrence of melanoma is associated with race, skin color, skin tendency to burn, freckles, blue or green eye color, light hair color, family history, and prevalence of numerous melanocytic nevi ([2-4](#_ENREF_2)). It has been shown that the presence of numerous melanocytic nevi is the strongest risk factor for melanoma. Nevi are likely to be precursor lesions for 20-60% of melanomas ([5](#_ENREF_5)). White populations have higher risks for malignant melanoma than other racial/ethnic groups. In the United States, non-Hispanic white individuals had an annual incidence rate of 25.1 per 100 000 population for the period 2000 through 2004 compared with 1.0 per 100 000 for black, 4.5 per 100 000 for Hispanic white ([1](#_ENREF_1), [6](#_ENREF_6)). Two studies suggested heritability accounts for about 2/3 of the variance in nevus counts ([7](#_ENREF_7)) ([8](#_ENREF_8)). Several specific genetic variations have been implicated. The most notable genetic factors implicated in melanoma at present include CDKN2A, MC1R, and OCA2 ([9](#_ENREF_9)). It has been shown that the OCA2 rs12913832 SNP is associated with Caucasian populations ([10](#_ENREF_10)). OCA2 was also strongly related with hair color, with 36% of those homozygous for the g form (gg) having blonde hair compared to 8% of homozygotes for the  form (aa) ([10](#_ENREF_10)).

Given the strong relationship between nevus density and melanoma risk, melanoma risk genes are likely candidate genes for nevus formation. Thus, we hypothesized that OCA2 has association with nevus and that population with certain OCA2 variant are susceptible to developing nevus. To determine the influence of OCA2 on total nevus counts and changes on children, we also take gender and race into account in this study during estimating the effect of OCA2 on nevus development.

**Materials and Methods**

This study used data collected as part of a randomized study to examine the relationship between OCA2 (birth to age 8 and 9) and nevus development in a cohort of 472 children born in 1998 ([6](#_ENREF_6), [11](#_ENREF_11)). Demographic, vacation data were acquired through annual phone interviews and phenotypic and nevus data were obtained in a comprehensive skin exam from 2004 to 2005.

**Participants.** From 2004 to 2008, 472 children born between January and September 1998 were randomly recruited to OCA2 study via private pediatric offices, a large managed care provider, and various community locations in the Denver-Boulder-Colorado Springs area of Colorado. Phone interviews were performed as previously described ([6](#_ENREF_6), [11](#_ENREF_11)).

**Skin Exams.** Nevus examinations were done by a team of seven physicians, nurses, and nurse practitioners, all of whom were trained to perform a standardized nevus examination. Consistency across the seven examiners was assessed by duplicate exams ([6](#_ENREF_6), [11](#_ENREF_11)).

**Genotyping.** We collected saliva samples with Oragene Disc Kit (DNA Genotek) for DNA and examine the interactions between nevus candidate genes and nevus development (DNA Genotek) ([12](#_ENREF_12)). OCA2 coding region SNPs were genotyped by sequence analysis.

**Statistical Analyses**

Although nevus counts were slightly positively skewed with a few children having very high counts, means of nevus counts were still approximately normally because of large enough sample size (> 30). One-way analysis of variance (ANOVA) with Tukey’s multiple comparison tests (SAS V9.3, SAS Institute Inc, NC) was used to statistically test for subgroup differences in mean nevus counts in 2007 and 2008 (Table 1). Means are presented in graphs with standard deviation, in which significant differences are noted (figure 1 & 2) (GraphPad Prism, GraphPad Software, Inc). We accessed whether OCA2 variants were associated with nevus development and controlled for gender and race/ethnicity. Unadjusted odd ratio and adjusted odd ratio were attained by Cochran-Mantel-Haenszel method, in which upper Quintile of mole-count in 2007 was used as a cutoff (if > 53, indicated as “+”; else indicated as “-“) (Table 2). Sampling weights were used to correct differential probability of nevus development by OCA2, gender and race/ethnicity. All statistical comparisons were two tailed. Data were considered to be significantly different when the P-value was < 0.05.

**Results**

**Characteristics of Study Sample**

Table 1 shows the characteristics of the sample included in this analysis and relationships between these characteristics and nevus count in 2007 and 2008. OCA variants don’t distributed equally and gg, ga and aa account for 48.3%, 41.3%, 10.4%, respectively. Our sample was approximately equally split by sex. Non-Hispanic children were 86.9%. Approximately 50% of participants had blonde hair.

**Table 1. Characteristics of study participants and associations with nevi**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Characteristic** |  | **No. nevi** | **No. nevi** | **Total no. waterside** | **Total no. waterside** |
|  | **At age9 ()2006** | **At age 10** | **Birth to age 8 (2006)** | **Birth to age 9**  **(2007)** |
| **n (%)** | **GM (SD)** | **GM (SD)** | **Mean (SD)** | **Mean (SD)** |
| **OCA2 variants** |  |  |  |  |  |
| **gg** | 228 (48.3) | 44.1 (28.0)ξ | 55.6 (31.7)ξ | 2.1 (2.1) | 2.5 (2.5) |
| **ga** | 195 (41.3) | 39.5 (24.3) | 48.3 (29.6) | 2.2 (2.2) | 2.7 (2.4) |
| **aa** | 49 (10.4) | 31.5 (18.9) | 40.8 (25.0) | 2.6 (2.9) | 3.0 (3.2) |
| **Gender** |  |  |  |  |  |
| **Female** | 250 (53.0) | 38.8 (25.2) | 48.8 (28.9) | 2.2 (2.1) | 2.7 (2.5) |
| **Male** | 222 (47.0) | 43.3 (26.6) | 53.7 (32.2) | 2.7 (2.4) | 2.7 (2.6) |
| **Ethnicity** |  |  |  |  |  |
| **Non-Hispanic** | 410 (86.9) | 43.0 (26.4)ξ | 53.5 (30.6)ξ | 2.3 (2.2) | 2.7 (2.6) |
| **Hispanic** | 62 (13.1) | 27.1 (16.9) | 33.4 (24.0) | 2.0 (2.4) | 2.3 (2.6) |
| **Hair color** |  |  |  |  |  |
| **Blonde** | 220 (46.7) | 43.6 (25.3)ξ | 55.5 (30.7)ξ | 2.3 (2.2) | 2.8 (2.5) |
| **Red** | 27 (5.7) | 27.3 (21.5) | 36.1 (22.5) | 2.7 (2.3) | 3.1 (2.7) |
| **Brown** | 212 (45.0) | 40.9 (26.7) | 49.0(29.9) | 2.0 (2.2) | 2.5 (2.6) |
| **Black** | 12 (2.6) | 22.4(14.0) | 2.3(2.8) | 2.3 (2.8) | 2.3 (2.8) |

Note: mole count data on Colorado children born in 1998 (n=472)

ξ P<0.01

**OCA2 status and nevus development**

Anova tests for relationship between OCA2 variants and nevi are reported in Table 1. The test suggested that at least one of the groups has significantly different nevi number than the rest both in 2007 and in 2008. Tukey’s multiple comparison tests further indicated that children with gg are more susceptible to nevus development than the ones who have aa gene (Figure 1).

It is well known that non-Hispanic have much higher incidence rate of melanoma and much more nevus than Hispanic ([1](#_ENREF_1), [6](#_ENREF_6)). It is necessary to test whether race/ethnicity is a potential confounding factor for OCA2 in terms of nevus development. In addition, it has been reported that OCA2 gene is associated with sex ([13](#_ENREF_13), [14](#_ENREF_14)). In this study, we also controlled gender to estimate the relationship between OCA2 and nevus development. To attain adjusted odd ratio and adjusted odd ratio by Cochran-Mantel-Haenszel method, upper Quintile of Nevus-count in 2007 was used as a cutoff (if > 53, it indicated as “+”; else indicated as “-“).

**Figure 1. Association between OCA2 status and nevus development**

Table 2 shows the unadjusted and adjusted odd ratio (OR) of positive nevus (+) occurrence, which were stratified by gender or race/ethnicity. When we stratified sample with gender, the adjusted ORs are different between male and female. However, their directions are the same even though their magnitudes differ and it suggested that OCA2 variants might play an unequal role on nevus development in female and male. But the adjusted OR for gg is still much higher than the one for aa in both female group (2.27 VS. 0.86) and male group (1.07 VS. 0.33). The means of nevus count in different OCA2 variants were presented in Figure 2 and it was consistent with the adjusted OR. When we stratified sample with race/ethnicity, the adjusted OR for Hispanic with aa variant was not available because of limited data on Hispanic children. The stratum-specific odds ratios differs from unadjusted odds ratios, but the direction is same. The adjusted OR for gg in Hispanic is still higher than the one for aa OCA2 variant (1.24 VS. 0.77).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **OCA2 variants** | | | | | | | | |
|  | **gg** | |  | **ga** | |  | **aa** | |
| **Risk Category** | **Unadjusted OR** | **Adjusted**  **OR** |  | **Unadjusted OR** | **Adjusted**  **OR** |  | **Unadjusted OR** | **Adjusted**  **OR** |
| **Gender** | **1.53** |  |  | **0.79** |  |  | **0.53** |  |
| **Female** |  | **2.27** |  |  | **0.44** |  |  | **0.86** |
| **Male** |  | **1.07** |  |  | **1.37** |  |  | **0.33** |
| **Ethnicity** |  |  |  |  |  |  |  |  |
| **Non-Hispanic** |  | **1.24** |  |  | **0.45** |  |  | **0.77** |
| **Hispanic** |  | **7.83** |  |  | **0.86** |  |  | **Not computed** |

**Table 2. Odd ratios (ORs) for nevi (>53) by OCA2 variant, gender and race**

**Figure 2.** **Association between OCA2 status and nevus development specified by gender**



**Discussion**

Previous studies have suggested that OCA2 variants are related with melanoma ([8-10](#_ENREF_8)). The OCA2 variants include three forms, gg, ga and aa. This cohort study found that indicated population who has gg genotype is more susceptible to nevus development than the one carries aa OCA2 gene. In this study, we further analyzed the effect of OCA variants on nevus development controlled by gender and race. The degree of association between OCA2 gg and nevus development is kind of different in male and female, however, population with gg OCA2 variant always showed higher susceptibleness than the one who has aa variant. The race/ethnicity-stratified study also indicated that gg variant is still associated with nevus development in non-Hispanic children in Colorado.

In conclusion, this study demonstrated that OCA2 variant gg is associated with nevus development and that Children with OCA2 variant gg in Colorado are more susceptible to nevus development than those who have OCA2 aa genotype. This study has some limitations since the study was controlled by gender and race. Since there are a great amount of risk factors of melanoma, it is necessary to clarify the effect of OCA variants by controlled other factors, such as skin propensity to burn, freckles, sun exposure and so on. The OCA2 gene may also influence nevus development by interacting with other gene factors. Future research is needed to address those problems and clarify the exact effect of OCA2 variants on nevus development.

**Reference:**

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14. Edwards M*, et al.* (2010) Association of the OCA2 polymorphism His615Arg with melanin content in east Asian populations: further evidence of convergent evolution of skin pigmentation. (Translated from eng) *PLoS Genet* 6(3):e1000867 (in eng).

**Appendix for Reproducible Research Goal:**

**Data: Mole Count Data 2004-2008 from Dr. Lori Crane in University of Colorado Denver**

**SAS code:**

/\* SAS code for miniproject B6611 in 2011 \*/

OPTIONS PAGESIZE=**60** LINESIZE=**80**; \* Output print options;

**PROC** **FORMAT**;

VALUE oca2\_status **0** = 'gg' **1** = 'ga' **2** = 'aa'**9** = 'missing';

VALUE gender **1** = 'Female ' **2** = 'Male';

Value hispanic **0**= 'No' **1**='Yes';

Value eyecolor **1**= 'blue green or combo' **2**='light/dark brown' **3**='hazel';

Value haircolor **1**= 'blonde' **2**='red' **3**='brown' **4**='black';

**RUN**;

/\* import excel file to SAS \*/

**PROC** **IMPORT** OUT= WORK.project DATAFILE= "C:\mole.xls"

DBMS=excel2002 REPLACE;

GETNAMES=YES;

**RUN**;

/\* print to check \*/

**Proc** **Print** data=project;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

/\* Produce descriptive statistics for different category \*/

**Proc** **freq** data = project;

table oca2\_status gender hispanic haircolor;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

**Proc** **means** data=project ;

Var molecount2007 molecount2008 number\_vacs\_\_birth\_thru\_2006 number\_vacs\_\_birth\_thru\_2007 ;

Class oca2\_status;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

**Proc** **means** data=project ;

Var molecount2007 molecount2008 number\_vacs\_\_birth\_thru\_2006 number\_vacs\_\_birth\_thru\_2007 ;

Class Gender;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

**Proc** **means** data=project ;

Var molecount2007 molecount2008 number\_vacs\_\_birth\_thru\_2006 number\_vacs\_\_birth\_thru\_2007 ;

Class hispanic;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

**Proc** **means** data=project;

Var molecount2004 molecount2005 molecount2006 molecount2007 molecount2008;

Class Gender;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

/\* Anova analysis to analyze differences in sub groups \*/

ODS GRAPHICS ON;

**PROC** **GLM** DATA = project ORDER = internal PLOT=diagnostics;

CLASS oca2\_status;

MODEL molecount2007 = oca2\_status/solution;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

ODS GRAPHICS OFF;

**PROC** **GLM** DATA = project ORDER = internal PLOT=diagnostics;

CLASS oca2\_status;

MODEL molecount2008 = oca2\_status/solution;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

ODS GRAPHICS OFF;

/\* post-Hoc comparision:tukey to detect which two groups are differences\*/

**PROC** **GLM** DATA = project ORDER=Internal;

CLASS oca2\_status;

MODEL molecount2007 = oca2\_status/noint solution;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

MEANS oca2\_status/ bon tukey;

**RUN**;

**PROC** **GLM** DATA = project ORDER=Internal;

CLASS oca2\_status;

MODEL molecount2008 = oca2\_status/noint solution;

MEANS oca2\_status/ bon tukey;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

/\* Anova analysis to analyze differences in sub groups \*/

**PROC** **GLM** DATA = project ORDER = internal PLOT=diagnostics;

CLASS gender;

MODEL molecount2007 = gender/solution;

**RUN**;

ODS GRAPHICS OFF;

**PROC** **GLM** DATA = project ORDER = internal PLOT=diagnostics;

CLASS gender;

MODEL molecount2008 = gender/solution;

**RUN**;

ODS GRAPHICS OFF;

**PROC** **GLM** DATA = project ORDER = internal PLOT=diagnostics;

CLASS hispanic;

MODEL molecount2007 = hispanic/solution;

**RUN**;

ODS GRAPHICS OFF;

**PROC** **GLM** DATA = project ORDER = internal PLOT=diagnostics;

CLASS hispanic;

MODEL molecount2008 = hispanic/solution;

**RUN**;

ODS GRAPHICS OFF;

**PROC** **GLM** DATA = project ORDER = internal PLOT=diagnostics;

CLASS haircolor;

MODEL molecount2007 = haircolor/solution;

**RUN**;

ODS GRAPHICS OFF;

**PROC** **GLM** DATA = project ORDER = internal PLOT=diagnostics;

CLASS haircolor;

MODEL molecount2008 = haircolor/solution;

**RUN**;

ODS GRAPHICS OFF;

/\* Produce descriptive statistics for molecount2007 \*/

**PROC** **UNIVARIATE** DATA=project;

VAR molecount2007;

**RUN**;

/\* Creat new data which indicate molecount as + if molecount > upper quintle for caculating odjusted OR \*/

**Data** projectone;

set project;

IF molecount2007<=**53** THEN indic = '-';

ELSE IF molecount2007>**53** THEN indic = '+';

**Run**;

**Proc** **print** data= projectone;

**Run**;

/\* Produce descriptive statistics for different subgroups \*/

**Proc** **freq** data=projectone ;

table indic\*oca2\_status;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. ;

**Run**;

**Proc** **freq** data=projectone ;

table indic\*oca2\_status\*gender;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. ;

**Run**;

**Proc** **freq** data=projectone ;

table indic\*oca2\_status\*gender\*hispanic;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. ;

**Run**;

/\* Produce descriptive statistics for different subgroups \*/

**PROC** **FORMAT**;

VALUE oca **0** = 'gg' **1** = 'ga' **2**='aa' **3**='ga/aa' **4**='gg/aa' **5**='gg/ga';

VALUE gender **1** = 'Female ' **2** = 'Male ';

Value hispanic **0**= 'No' **1**='Yes';

Value indic **0**='-';**1**='+';

**RUN**;

/\* creat categorical dataset to caculate adjusted OR for gg \*/

**DATA** oca0 ;

INPUT oca gender hispanic indic count;

CARDS;

0 1 0 0 87

0 1 0 1 33

0 1 1 0 4

0 1 1 1 2

0 2 0 0 68

0 2 0 1 26

0 2 1 0 8

0 2 1 1 0

3 1 0 0 86

3 1 0 1 17

3 1 1 0 20

3 1 1 1 1

3 2 0 0 64

3 2 0 1 29

3 2 1 0 27

3 2 1 1 0

;

**RUN**;

**Proc** **print** data=oca0;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**Run**;

**PROC** **FREQ** data=oca0;

TABLES oca\*indic /CMH EXPECTED;

Exact rror;

WEIGHT count;

**RUN**;

/\* Caculate crude and adjusted OR specified by gender or Hispanic \*/

**PROC** **FREQ** data=oca0;

TABLES gender\*oca\*indic /CMH EXPECTED RELRISK;

WEIGHT count;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**RUN**;

**PROC** **FREQ** data=oca0;

TABLES hispanic\*oca\*indic /CMH EXPECTED RELRISK;

WEIGHT count;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**RUN**;

/\* creat categorical dataset to caculate adjusted OR for ga \*/

**DATA** oca1 ;

INPUT oca gender hispanic indic count;

CARDS;

1 1 0 0 75

1 1 0 1 13

1 1 1 0 14

1 1 1 1 1

1 2 0 0 49

1 2 0 1 26

1 2 1 0 17

1 2 1 1 0

4 1 0 0 98

4 1 0 1 37

4 1 1 0 10

4 1 1 1 2

4 2 0 0 83

4 2 0 1 29

4 2 1 0 18

4 2 1 1 0

;

**RUN**;

**Proc** **print** data=oca1;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**Run**;

**PROC** **FREQ** data=oca1;

TABLES oca\*indic /CMH EXPECTED;

Exact rror;

WEIGHT count;

**RUN**;

/\* Caculate crude and adjusted OR specified by gender or Hispanic \*/

**PROC** **FREQ** data=oca1;

TABLES gender\*oca\*indic /CMH EXPECTED RELRISK;

WEIGHT count;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**RUN**;

**PROC** **FREQ** data=oca1;

TABLES hispanic\*oca\*indic /CMH EXPECTED RELRISK;

WEIGHT count;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**RUN**;

/\* creat categorical dataset to caculate adjusted OR for aa \*/

**DATA** oca2 ;

INPUT oca gender hispanic indic count;

CARDS;

2 1 0 0 11

2 1 0 1 4

2 1 1 0 6

2 1 1 1 0

2 2 0 0 15

2 2 0 1 3

2 2 1 0 10

2 2 1 1 0

5 1 0 0 162

5 1 0 1 46

5 1 1 0 18

5 1 1 1 3

5 2 0 0 117

5 2 0 1 52

5 2 1 0 25

5 2 1 1 0

;

**RUN**;

**Proc** **print** data=oca2;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**Run**;

**PROC** **FREQ** data=oca2;

TABLES oca\*indic /CMH EXPECTED;

Exact rror;

WEIGHT count;

**RUN**;

/\* Caculate crude and adjusted OR specified by gender or Hispanic \*/

**PROC** **FREQ** data=oca2;

TABLES gender\*oca\*indic /CMH EXPECTED RELRISK;

WEIGHT count;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**RUN**;

**PROC** **FREQ** data=oca2;

TABLES hispanic\*oca\*indic /CMH EXPECTED RELRISK;

WEIGHT count;

FORMAT oca oca. gender gender. hispanic hispanic. indic indic.;

**RUN**;

/\* Anova analysis to compare OCA varient stratified by gender \*/

/\* Anova analysis to compare OCA varient in female \*/

**Data** projectadjusted;

Set project;

Where gender =**1**;

**Run**;

**Proc** **print** data =projectadjusted;

**run**;

**PROC** **GLM** DATA = projectadjusted ORDER=Internal;

CLASS oca2\_status;

MODEL molecount2007 = oca2\_status/ solution;

MEANS oca2\_status/ bon tukey;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

/\* Anova analysis to compare OCA varient in male \*/

**Data** projectadjusted2;

Set project;

Where gender =**2**;

**Run**;

**Proc** **print** data =projectadjusted2;

**run**;

**Proc** **freq** data=projectadjusted2;

table oca2\_status;

**run**;

**Proc** **means** data =projectadjusted2;

Var molecount2007 molecount2008;

Class oca2\_status;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

**PROC** **GLM** DATA = projectadjusted2 ORDER=Internal;

CLASS oca2\_status;

MODEL molecount2007 = oca2\_status/ solution;

MEANS oca2\_status/ bon tukey;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

/\* Anova analysis to compare OCA varient in non-hispanic \*/

**Data** projectadjusted4;

Set project;

Where hispanic =**0**;

**Run**;

**Proc** **means** data =projectadjusted4;

Var molecount2007 molecount2008;

Class oca2\_status;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

**PROC** **GLM** DATA = projectadjusted4 ORDER=Internal;

CLASS oca2\_status;

MODEL molecount2007 = oca2\_status/ solution;

MEANS oca2\_status/ bon tukey;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

/\* post-Hoc comparision:tukey to detect which two groups are differences\*/

**PROC** **GLM** DATA = projectadjusted4 ORDER=Internal;

CLASS oca2\_status;

MODEL molecount2007 = oca2\_status/ solution;

MEANS oca2\_status/ bon tukey;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

/\* Anova analysis to compare OCA varient in hispanic \*/

**Data** projectadjusted5;

Set project;

Where hispanic =**1**;

**Run**;

**Proc** **means** data =projectadjusted4;

Var molecount2007 molecount2008;

Class oca2\_status;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**Run**;

**PROC** **GLM** DATA = projectadjusted5 ORDER=Internal;

CLASS oca2\_status;

MODEL molecount2007 = oca2\_status/ solution;

MEANS oca2\_status/ bon tukey;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

/\* post-Hoc comparision:tukey to detect which two groups are differences\*/

**PROC** **GLM** DATA = projectadjusted5 ORDER=Internal;

CLASS oca2\_status;

MODEL molecount2007 = oca2\_status/ solution;

MEANS oca2\_status/ bon tukey;

Format oca2\_status oca2\_status. gender gender. hispanic hispanic. eyecolor eyecolor. haircolor haircolor.;

**RUN**;

**Selective SAS output:**

|  |
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| The SAS System |

The GLM Procedure

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **oca2\_status** | 3 | gg ga aa |

|  |  |
| --- | --- |
| **Number of Observations Read** | 472 |
| **Number of Observations Used** | 450 |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2007 molecount2007

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 2 | 6446.5669 | 3223.2835 | 4.89 | 0.0079 |
| **Error** | 447 | 294793.1308 | 659.4925 |  |  |
| **Corrected Total** | 449 | 301239.6978 |  |  |  |

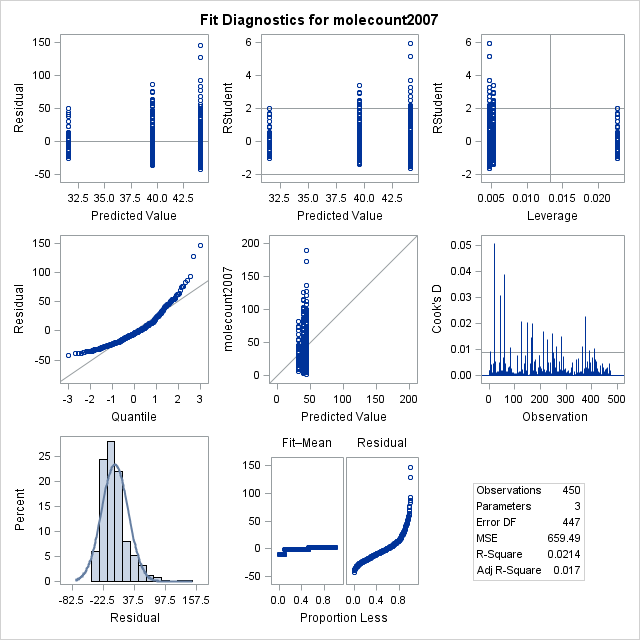
| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2007 Mean** |
| --- | --- | --- | --- |
| 0.021400 | 62.78531 | 25.68059 | 40.90222 |

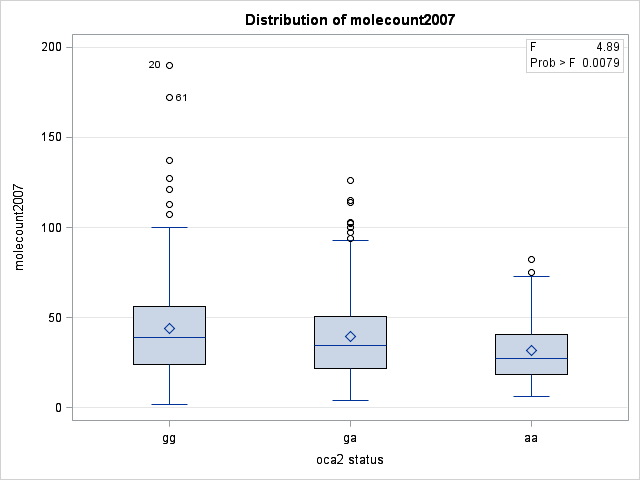
| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 2 | 6446.566937 | 3223.283468 | 4.89 | 0.0079 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 2 | 6446.566937 | 3223.283468 | 4.89 | 0.0079 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 31.50000000 | B | 3.87149391 | 8.14 | <.0001 |
| **oca2\_status gg** | 12.59345794 | B | 4.25090644 | 2.96 | 0.0032 |
| **oca2\_status ga** | 8.00000000 | B | 4.29223970 | 1.86 | 0.0630 |
| **oca2\_status aa** | 0.00000000 | B | . | . | . |

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| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |





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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2008 molecount2008

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 2 | 9890.3802 | 4945.1901 | 5.42 | 0.0047 |
| **Error** | 412 | 375811.1523 | 912.1630 |  |  |
| **Corrected Total** | 414 | 385701.5325 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2008 Mean** |
| --- | --- | --- | --- |
| 0.025643 | 59.13028 | 30.20204 | 51.07711 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 2 | 9890.380246 | 4945.190123 | 5.42 | 0.0047 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 2 | 9890.380246 | 4945.190123 | 5.42 | 0.0047 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 40.76190476 | B | 4.66027536 | 8.75 | <.0001 |
| **oca2\_status gg** | 14.79967159 | B | 5.11972462 | 2.89 | 0.0040 |
| **oca2\_status ga** | 7.50868347 | B | 5.20421282 | 1.44 | 0.1498 |
| **oca2\_status aa** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2007 molecount2007

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 3 | 759292.869 | 253097.623 | 383.78 | <.0001 |
| **Error** | 447 | 294793.131 | 659.492 |  |  |
| **Uncorrected Total** | 450 | 1054086.000 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2007 Mean** |
| --- | --- | --- | --- |
| 0.021400 | 62.78531 | 25.68059 | 40.90222 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 3 | 759292.8692 | 253097.6231 | 383.78 | <.0001 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 3 | 759292.8692 | 253097.6231 | 383.78 | <.0001 |

| **Parameter** | **Estimate** | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- |
| **oca2\_status gg** | 44.09345794 | 1.75548867 | 25.12 | <.0001 |
| **oca2\_status ga** | 39.50000000 | 1.85333661 | 21.31 | <.0001 |
| **oca2\_status aa** | 31.50000000 | 3.87149391 | 8.14 | <.0001 |

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| The SAS System |

The GLM Procedure

Tukey's Studentized Range (HSD) Test for molecount2007

|  |  |
| --- | --- |
| **Note:** | **This test controls the Type I experimentwise error rate.** |

|  |  |
| --- | --- |
| **Alpha** | 0.05 |
| **Error Degrees of Freedom** | 447 |
| **Error Mean Square** | 659.4925 |
| **Critical Value of Studentized Range** | 3.32559 |

| **Comparisons significant at the 0.05 level are indicated by \*\*\*.** | | | | |
| --- | --- | --- | --- | --- |
| **oca2\_status Comparison** | **Difference Between Means** | **Simultaneous 95% Confidence Limits** | |  |
| **gg - ga** | 4.593 | -1.409 | 10.596 |  |
| **gg - aa** | 12.593 | 2.597 | 22.590 | \*\*\* |
| **ga - gg** | -4.593 | -10.596 | 1.409 |  |
| **ga - aa** | 8.000 | -2.093 | 18.093 |  |
| **aa - gg** | -12.593 | -22.590 | -2.597 | \*\*\* |
| **aa - ga** | -8.000 | -18.093 | 2.093 |  |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2008 molecount2008

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 3 | 1092571.848 | 364190.616 | 399.26 | <.0001 |
| **Error** | 412 | 375811.152 | 912.163 |  |  |
| **Uncorrected Total** | 415 | 1468383.000 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2008 Mean** |
| --- | --- | --- | --- |
| 0.025643 | 59.13028 | 30.20204 | 51.07711 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 3 | 1092571.848 | 364190.616 | 399.26 | <.0001 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 3 | 1092571.848 | 364190.616 | 399.26 | <.0001 |

| **Parameter** | **Estimate** | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- |
| **oca2\_status gg** | 55.56157635 | 2.11976738 | 26.21 | <.0001 |
| **oca2\_status ga** | 48.27058824 | 2.31639044 | 20.84 | <.0001 |
| **oca2\_status aa** | 40.76190476 | 4.66027536 | 8.75 | <.0001 |

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| The SAS System |

The GLM Procedure

Tukey's Studentized Range (HSD) Test for molecount2008

|  |  |
| --- | --- |
| **Note:** | **This test controls the Type I experimentwise error rate.** |

|  |  |
| --- | --- |
| **Alpha** | 0.05 |
| **Error Degrees of Freedom** | 412 |
| **Error Mean Square** | 912.163 |
| **Critical Value of Studentized Range** | 3.32653 |

| **Comparisons significant at the 0.05 level are indicated by \*\*\*.** | | | | |
| --- | --- | --- | --- | --- |
| **oca2\_status Comparison** | **Difference Between Means** | **Simultaneous 95% Confidence Limits** | |  |
| **gg - ga** | 7.291 | -0.095 | 14.677 |  |
| **gg - aa** | 14.800 | 2.757 | 26.842 | \*\*\* |
| **ga - gg** | -7.291 | -14.677 | 0.095 |  |
| **ga - aa** | 7.509 | -4.733 | 19.750 |  |
| **aa - gg** | -14.800 | -26.842 | -2.757 | \*\*\* |
| **aa - ga** | -7.509 | -19.750 | 4.733 |  |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2007 molecount2007

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 1 | 2309.5162 | 2309.5162 | 3.46 | 0.0635 |
| **Error** | 448 | 298930.1816 | 667.2549 |  |  |
| **Corrected Total** | 449 | 301239.6978 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2007 Mean** |
| --- | --- | --- | --- |
| 0.007667 | 63.15373 | 25.83128 | 40.90222 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **gender** | 1 | 2309.516198 | 2309.516198 | 3.46 | 0.0635 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **gender** | 1 | 2309.516198 | 2309.516198 | 3.46 | 0.0635 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 43.33492823 | B | 1.78678679 | 24.25 | <.0001 |
| **gender 1** | -4.54239711 | B | 2.44157724 | -1.86 | 0.0635 |
| **gender 2** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2008 molecount2008

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 1 | 2515.7461 | 2515.7461 | 2.71 | 0.1004 |
| **Error** | 413 | 383185.7865 | 927.8106 |  |  |
| **Corrected Total** | 414 | 385701.5325 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2008 Mean** |
| --- | --- | --- | --- |
| 0.006523 | 59.63529 | 30.45998 | 51.07711 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **gender** | 1 | 2515.746068 | 2515.746068 | 2.71 | 0.1004 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **gender** | 1 | 2515.746068 | 2515.746068 | 2.71 | 0.1004 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 53.74345550 | B | 2.20400708 | 24.38 | <.0001 |
| **gender 1** | -4.93988407 | B | 2.99994315 | -1.65 | 0.1004 |
| **gender 2** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2007 molecount2007

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 1 | 12868.9462 | 12868.9462 | 19.99 | <.0001 |
| **Error** | 448 | 288370.7516 | 643.6847 |  |  |
| **Corrected Total** | 449 | 301239.6978 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2007 Mean** |
| --- | --- | --- | --- |
| 0.042720 | 62.02827 | 25.37094 | 40.90222 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **hispanic** | 1 | 12868.94621 | 12868.94621 | 19.99 | <.0001 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **hispanic** | 1 | 12868.94621 | 12868.94621 | 19.99 | <.0001 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 27.13559322 | B | 3.30301535 | 8.22 | <.0001 |
| **hispanic 0** | 15.84394642 | B | 3.54346763 | 4.47 | <.0001 |
| **hispanic 1** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2008 molecount2008

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 1 | 17804.5032 | 17804.5032 | 19.99 | <.0001 |
| **Error** | 413 | 367897.0293 | 890.7918 |  |  |
| **Corrected Total** | 414 | 385701.5325 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2008 Mean** |
| --- | --- | --- | --- |
| 0.046161 | 58.43349 | 29.84614 | 51.07711 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **hispanic** | 1 | 17804.50322 | 17804.50322 | 19.99 | <.0001 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **hispanic** | 1 | 17804.50322 | 17804.50322 | 19.99 | <.0001 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 33.38000000 | B | 4.22088104 | 7.91 | <.0001 |
| **hispanic 0** | 20.12136986 | B | 4.50070687 | 4.47 | <.0001 |
| **hispanic 1** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2007 molecount2007

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 3 | 10402.7052 | 3467.5684 | 5.32 | 0.0013 |
| **Error** | 446 | 290836.9926 | 652.1009 |  |  |
| **Corrected Total** | 449 | 301239.6978 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2007 Mean** |
| --- | --- | --- | --- |
| 0.034533 | 62.43247 | 25.53627 | 40.90222 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **haircolor** | 3 | 10402.70516 | 3467.56839 | 5.32 | 0.0013 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **haircolor** | 3 | 10402.70516 | 3467.56839 | 5.32 | 0.0013 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 22.36363636 | B | 7.69947389 | 2.90 | 0.0039 |
| **haircolor 1** | 21.28259005 | B | 7.89669841 | 2.70 | 0.0073 |
| **haircolor 2** | 4.89562290 | B | 9.13420947 | 0.54 | 0.5922 |
| **haircolor 3** | 18.49136364 | B | 7.90837547 | 2.34 | 0.0198 |
| **haircolor 4** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2008 molecount2008

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 3 | 15366.4485 | 5122.1495 | 5.83 | 0.0007 |
| **Error** | 410 | 360125.0515 | 878.3538 |  |  |
| **Corrected Total** | 413 | 375491.5000 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2008 Mean** |
| --- | --- | --- | --- |
| 0.040924 | 58.30236 | 29.63703 | 50.83333 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **haircolor** | 3 | 15366.44853 | 5122.14951 | 5.83 | 0.0007 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **haircolor** | 3 | 15366.44853 | 5122.14951 | 5.83 | 0.0007 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 27.88888889 | B | 9.87901133 | 2.82 | 0.0050 |
| **haircolor 1** | 27.62626263 | B | 10.10103931 | 2.73 | 0.0065 |
| **haircolor 2** | 8.18803419 | B | 11.46201129 | 0.71 | 0.4754 |
| **haircolor 3** | 21.08348680 | B | 10.12164257 | 2.08 | 0.0379 |
| **haircolor 4** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

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| The SAS System |

The UNIVARIATE Procedure

Variable: molecount2007 (molecount2007)

| **Moments** | | | |
| --- | --- | --- | --- |
| **N** | 450 | **Sum Weights** | 450 |
| **Mean** | 40.9022222 | **Sum Observations** | 18406 |
| **Std Deviation** | 25.9019781 | **Variance** | 670.912467 |
| **Skewness** | 1.54279441 | **Kurtosis** | 4.09736023 |
| **Uncorrected SS** | 1054086 | **Corrected SS** | 301239.698 |
| **Coeff Variation** | 63.326579 | **Std Error Mean** | 1.22103096 |

| **Basic Statistical Measures** | | | |
| --- | --- | --- | --- |
| **Location** | | **Variability** | |
| **Mean** | 40.90222 | **Std Deviation** | 25.90198 |
| **Median** | 36.00000 | **Variance** | 670.91247 |
| **Mode** | 26.00000 | **Range** | 188.00000 |
|  |  | **Interquartile Range** | 30.00000 |

Note: The mode displayed is the smallest of 2 modes with a count of 12.

| **Tests for Location: Mu0=0** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Student's t** | **t** | 33.4981 | **Pr > |t|** | <.0001 |
| **Sign** | **M** | 225 | **Pr >= |M|** | <.0001 |
| **Signed Rank** | **S** | 50737.5 | **Pr >= |S|** | <.0001 |

| **Quantiles (Definition 5)** | |
| --- | --- |
| **Quantile** | **Estimate** |
| **100% Max** | 190 |
| **99%** | 126 |
| **95%** | 92 |
| **90%** | 75 |
| **75% Q3** | 53 |
| **50% Median** | 36 |
| **25% Q1** | 23 |
| **10%** | 13 |
| **5%** | 10 |
| **1%** | 6 |
| **0% Min** | 2 |

| **Extreme Observations** | | | |
| --- | --- | --- | --- |
| **Lowest** | | **Highest** | |
| **Value** | **Obs** | **Value** | **Obs** |
| 2 | 40 | 126 | 169 |
| 4 | 444 | 127 | 247 |
| 5 | 443 | 137 | 148 |
| 5 | 15 | 172 | 61 |
| 6 | 461 | 190 | 20 |

| **Missing Values** | | | |
| --- | --- | --- | --- |
| **Missing Value** | **Count** | **Percent Of** | |
| **All Obs** | **Missing Obs** |
| . | 22 | 4.66 | 100.00 |

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table of indic by oca2\_status** | | | | | | --- | --- | --- | --- | --- | | **indic** | **oca2\_status(oca2 status)** | | | | | **gg** | **ga** | **aa** | **Total** | | **+** | |  | | --- | | 61 | | 12.92 | | 56.48 | | 26.75 | | |  | | --- | | 40 | | 8.47 | | 37.04 | | 20.51 | | |  | | --- | | 7 | | 1.48 | | 6.48 | | 14.29 | | |  | | --- | | 108 | | 22.88 | |  | |  | | | **-** | |  | | --- | | 167 | | 35.38 | | 45.88 | | 73.25 | | |  | | --- | | 155 | | 32.84 | | 42.58 | | 79.49 | | |  | | --- | | 42 | | 8.90 | | 11.54 | | 85.71 | | |  | | --- | | 364 | | 77.12 | |  | |  | | | **Total** | |  | | --- | | 228 | | 48.31 | | |  | | --- | | 195 | | 41.31 | | |  | | --- | | 49 | | 10.38 | | |  | | --- | | 472 | | 100.00 | | |

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 1 of oca2\_status by gender** | | | | | --- | --- | --- | --- | | **Controlling for indic=+** | | | | | **oca2\_status(oca2 status)** | **gender(gender)** | | | | **Female** | **Male** | **Total** | | **gg** | |  | | --- | | 35 | | 32.41 | | 57.38 | | 66.04 | | |  | | --- | | 26 | | 24.07 | | 42.62 | | 47.27 | | |  | | --- | | 61 | | 56.48 | |  | |  | | | **ga** | |  | | --- | | 14 | | 12.96 | | 35.00 | | 26.42 | | |  | | --- | | 26 | | 24.07 | | 65.00 | | 47.27 | | |  | | --- | | 40 | | 37.04 | |  | |  | | | **aa** | |  | | --- | | 4 | | 3.70 | | 57.14 | | 7.55 | | |  | | --- | | 3 | | 2.78 | | 42.86 | | 5.45 | | |  | | --- | | 7 | | 6.48 | |  | |  | | | **Total** | |  | | --- | | 53 | | 49.07 | | |  | | --- | | 55 | | 50.93 | | |  | | --- | | 108 | | 100.00 | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 2 of oca2\_status by gender** | | | | | --- | --- | --- | --- | | **Controlling for indic=-** | | | | | **oca2\_status(oca2 status)** | **gender(gender)** | | | | **Female** | **Male** | **Total** | | **gg** | |  | | --- | | 91 | | 25.00 | | 54.49 | | 46.19 | | |  | | --- | | 76 | | 20.88 | | 45.51 | | 45.51 | | |  | | --- | | 167 | | 45.88 | |  | |  | | | **ga** | |  | | --- | | 89 | | 24.45 | | 57.42 | | 45.18 | | |  | | --- | | 66 | | 18.13 | | 42.58 | | 39.52 | | |  | | --- | | 155 | | 42.58 | |  | |  | | | **aa** | |  | | --- | | 17 | | 4.67 | | 40.48 | | 8.63 | | |  | | --- | | 25 | | 6.87 | | 59.52 | | 14.97 | | |  | | --- | | 42 | | 11.54 | |  | |  | | | **Total** | |  | | --- | | 197 | | 54.12 | | |  | | --- | | 167 | | 45.88 | | |  | | --- | | 364 | | 100.00 | | |

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| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 1 of gender by hispanic** | | | | | --- | --- | --- | --- | | **Controlling for indic=+ oca2\_status=gg** | | | | | **gender(gender)** | **hispanic(hispanic)** | | | | **No** | **Yes** | **Total** | | **Female** | |  | | --- | | 33 | | 54.10 | | 94.29 | | 55.93 | | |  | | --- | | 2 | | 3.28 | | 5.71 | | 100.00 | | |  | | --- | | 35 | | 57.38 | |  | |  | | | **Male** | |  | | --- | | 26 | | 42.62 | | 100.00 | | 44.07 | | |  | | --- | | 0 | | 0.00 | | 0.00 | | 0.00 | | |  | | --- | | 26 | | 42.62 | |  | |  | | | **Total** | |  | | --- | | 59 | | 96.72 | | |  | | --- | | 2 | | 3.28 | | |  | | --- | | 61 | | 100.00 | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 2 of gender by hispanic** | | | | | --- | --- | --- | --- | | **Controlling for indic=+ oca2\_status=ga** | | | | | **gender(gender)** | **hispanic(hispanic)** | | | | **No** | **Yes** | **Total** | | **Female** | |  | | --- | | 13 | | 32.50 | | 92.86 | | 33.33 | | |  | | --- | | 1 | | 2.50 | | 7.14 | | 100.00 | | |  | | --- | | 14 | | 35.00 | |  | |  | | | **Male** | |  | | --- | | 26 | | 65.00 | | 100.00 | | 66.67 | | |  | | --- | | 0 | | 0.00 | | 0.00 | | 0.00 | | |  | | --- | | 26 | | 65.00 | |  | |  | | | **Total** | |  | | --- | | 39 | | 97.50 | | |  | | --- | | 1 | | 2.50 | | |  | | --- | | 40 | | 100.00 | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 3 of gender by hispanic** | | | | | --- | --- | --- | --- | | **Controlling for indic=+ oca2\_status=aa** | | | | | **gender(gender)** | **hispanic(hispanic)** | | | | **No** | **Yes** | **Total** | | **Female** | |  | | --- | | 4 | | 57.14 | | 100.00 | | 57.14 | | |  | | --- | | 0 | | 0.00 | | 0.00 | | . | | |  | | --- | | 4 | | 57.14 | |  | |  | | | **Male** | |  | | --- | | 3 | | 42.86 | | 100.00 | | 42.86 | | |  | | --- | | 0 | | 0.00 | | 0.00 | | . | | |  | | --- | | 3 | | 42.86 | |  | |  | | | **Total** | |  | | --- | | 7 | | 100.00 | | |  | | --- | | 0 | | 0.00 | | |  | | --- | | 7 | | 100.00 | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 4 of gender by hispanic** | | | | | --- | --- | --- | --- | | **Controlling for indic=- oca2\_status=gg** | | | | | **gender(gender)** | **hispanic(hispanic)** | | | | **No** | **Yes** | **Total** | | **Female** | |  | | --- | | 87 | | 52.10 | | 95.60 | | 56.13 | | |  | | --- | | 4 | | 2.40 | | 4.40 | | 33.33 | | |  | | --- | | 91 | | 54.49 | |  | |  | | | **Male** | |  | | --- | | 68 | | 40.72 | | 89.47 | | 43.87 | | |  | | --- | | 8 | | 4.79 | | 10.53 | | 66.67 | | |  | | --- | | 76 | | 45.51 | |  | |  | | | **Total** | |  | | --- | | 155 | | 92.81 | | |  | | --- | | 12 | | 7.19 | | |  | | --- | | 167 | | 100.00 | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 5 of gender by hispanic** | | | | | --- | --- | --- | --- | | **Controlling for indic=- oca2\_status=ga** | | | | | **gender(gender)** | **hispanic(hispanic)** | | | | **No** | **Yes** | **Total** | | **Female** | |  | | --- | | 75 | | 48.39 | | 84.27 | | 60.48 | | |  | | --- | | 14 | | 9.03 | | 15.73 | | 45.16 | | |  | | --- | | 89 | | 57.42 | |  | |  | | | **Male** | |  | | --- | | 49 | | 31.61 | | 74.24 | | 39.52 | | |  | | --- | | 17 | | 10.97 | | 25.76 | | 54.84 | | |  | | --- | | 66 | | 42.58 | |  | |  | | | **Total** | |  | | --- | | 124 | | 80.00 | | |  | | --- | | 31 | | 20.00 | | |  | | --- | | 155 | | 100.00 | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 6 of gender by hispanic** | | | | | --- | --- | --- | --- | | **Controlling for indic=- oca2\_status=aa** | | | | | **gender(gender)** | **hispanic(hispanic)** | | | | **No** | **Yes** | **Total** | | **Female** | |  | | --- | | 11 | | 26.19 | | 64.71 | | 42.31 | | |  | | --- | | 6 | | 14.29 | | 35.29 | | 37.50 | | |  | | --- | | 17 | | 40.48 | |  | |  | | | **Male** | |  | | --- | | 15 | | 35.71 | | 60.00 | | 57.69 | | |  | | --- | | 10 | | 23.81 | | 40.00 | | 62.50 | | |  | | --- | | 25 | | 59.52 | |  | |  | | | **Total** | |  | | --- | | 26 | | 61.90 | | |  | | --- | | 16 | | 38.10 | | |  | | --- | | 42 | | 100.00 | | |

|  |
| --- |
| The SAS System |

| **Obs** | **oca** | **gender** | **hispanic** | **indic** | **count** |
| --- | --- | --- | --- | --- | --- |
| **1** | gg | Female | No | - | 87 |
| **2** | gg | Female | No | 1 | 33 |
| **3** | gg | Female | Yes | - | 4 |
| **4** | gg | Female | Yes | 1 | 2 |
| **5** | gg | Male | No | - | 68 |
| **6** | gg | Male | No | 1 | 26 |
| **7** | gg | Male | Yes | - | 8 |
| **8** | gg | Male | Yes | 1 | 0 |
| **9** | ga/aa | Female | No | - | 86 |
| **10** | ga/aa | Female | No | 1 | 17 |
| **11** | ga/aa | Female | Yes | - | 20 |
| **12** | ga/aa | Female | Yes | 1 | 1 |
| **13** | ga/aa | Male | No | - | 64 |
| **14** | ga/aa | Male | No | 1 | 29 |
| **15** | ga/aa | Male | Yes | - | 27 |
| **16** | ga/aa | Male | Yes | 1 | 0 |

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table of oca by indic** | | | | | --- | --- | --- | --- | | **oca** | **indic** | | | | **0** | **1** | **Total** | | **0** | |  | | --- | | 167 | | 175.83 | | 35.38 | | 73.25 | | 45.88 | | |  | | --- | | 61 | | 52.169 | | 12.92 | | 26.75 | | 56.48 | | |  | | --- | | 228 | |  | | 48.31 | |  | |  | | | **3** | |  | | --- | | 197 | | 188.17 | | 41.74 | | 80.74 | | 54.12 | | |  | | --- | | 47 | | 55.831 | | 9.96 | | 19.26 | | 43.52 | | |  | | --- | | 244 | |  | | 51.69 | |  | |  | | | **Total** | |  | | --- | | 364 | | 77.12 | | |  | | --- | | 108 | | 22.88 | | |  | | --- | | 472 | | 100.00 | | |

Statistics for Table of oca by indic

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **0.6532** | 0.4237 | 1.0068 |
| **Cohort (Col1 Risk)** | **0.9072** | 0.8212 | 1.0022 |
| **Cohort (Col2 Risk)** | **1.3890** | 0.9937 | 1.9414 |

| **Odds Ratio (Case-Control Study)** | |
| --- | --- |
| **Odds Ratio** | 0.6532 |
|  |  |
| **Asymptotic Conf Limits** |  |
| **95% Lower Conf Limit** | 0.4237 |
| **95% Upper Conf Limit** | 1.0068 |
|  |  |
| **Exact Conf Limits** |  |
| **95% Lower Conf Limit** | 0.4132 |
| **95% Upper Conf Limit** | 1.0295 |

Sample Size = 472

Summary Statistics for oca by indic

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 3.7413 | 0.0531 |
| **2** | **Row Mean Scores Differ** | 1 | 3.7413 | 0.0531 |
| **3** | **General Association** | 1 | 3.7413 | 0.0531 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 0.6532 | 0.4237 | 1.0068 |
| **(Odds Ratio)** | **Logit** | 0.6532 | 0.4237 | 1.0068 |
| **Cohort** | **Mantel-Haenszel** | 0.9072 | 0.8212 | 1.0022 |
| **(Col1 Risk)** | **Logit** | 0.9072 | 0.8212 | 1.0022 |
| **Cohort** | **Mantel-Haenszel** | 1.3890 | 0.9937 | 1.9414 |
| **(Col2 Risk)** | **Logit** | 1.3890 | 0.9937 | 1.9414 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 1 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for gender=Female** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **gg** | |  | | --- | | 91 | | 99.288 | | 36.40 | | 72.22 | | 46.19 | | |  | | --- | | 35 | | 26.712 | | 14.00 | | 27.78 | | 66.04 | | |  | | --- | | 126 | |  | | 50.40 | |  | |  | | | **ga/aa** | |  | | --- | | 106 | | 97.712 | | 42.40 | | 85.48 | | 53.81 | | |  | | --- | | 18 | | 26.288 | | 7.20 | | 14.52 | | 33.96 | | |  | | --- | | 124 | |  | | 49.60 | |  | |  | | | **Total** | |  | | --- | | 197 | | 78.80 | | |  | | --- | | 53 | | 21.20 | | |  | | --- | | 250 | | 100.00 | | |

Statistics for Table 1 of oca by indic  
Controlling for gender=Female

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **0.4415** | 0.2343 | 0.8321 |
| **Cohort (Col1 Risk)** | **0.8449** | 0.7416 | 0.9625 |
| **Cohort (Col2 Risk)** | **1.9136** | 1.1473 | 3.1917 |

Sample Size = 250

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 2 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for gender=Male** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **gg** | |  | | --- | | 76 | | 76.73 | | 34.23 | | 74.51 | | 45.51 | | |  | | --- | | 26 | | 25.27 | | 11.71 | | 25.49 | | 47.27 | | |  | | --- | | 102 | |  | | 45.95 | |  | |  | | | **ga/aa** | |  | | --- | | 91 | | 90.27 | | 40.99 | | 75.83 | | 54.49 | | |  | | --- | | 29 | | 29.73 | | 13.06 | | 24.17 | | 52.73 | | |  | | --- | | 120 | |  | | 54.05 | |  | |  | | | **Total** | |  | | --- | | 167 | | 75.23 | | |  | | --- | | 55 | | 24.77 | | |  | | --- | | 222 | | 100.00 | | |

Statistics for Table 2 of oca by indic  
Controlling for gender=Male

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **0.9315** | 0.5058 | 1.7156 |
| **Cohort (Col1 Risk)** | **0.9825** | 0.8440 | 1.1438 |
| **Cohort (Col2 Risk)** | **1.0548** | 0.6666 | 1.6689 |

Sample Size = 222

|  |
| --- |
| The SAS System |

The FREQ Procedure

Summary Statistics for oca by indic  
Controlling for gender

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 3.9088 | 0.0480 |
| **2** | **Row Mean Scores Differ** | 1 | 3.9088 | 0.0480 |
| **3** | **General Association** | 1 | 3.9088 | 0.0480 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 0.6463 | 0.4189 | 0.9973 |
| **(Odds Ratio)** | **Logit** | 0.6502 | 0.4189 | 1.0094 |
| **Cohort** | **Mantel-Haenszel** | 0.9053 | 0.8199 | 0.9996 |
| **(Col1 Risk)** | **Logit** | 0.9007 | 0.8159 | 0.9944 |
| **Cohort** | **Mantel-Haenszel** | 1.4026 | 0.9998 | 1.9678 |
| **(Col2 Risk)** | **Logit** | 1.3756 | 0.9776 | 1.9357 |

| **Breslow-Day Test for Homogeneity of the Odds Ratios** | |
| --- | --- |
| **Chi-Square** | 2.7810 |
| **DF** | 1 |
| **Pr > ChiSq** | 0.0954 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 1 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for hispanic=No** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **gg** | |  | | --- | | 155 | | 159.2 | | 37.80 | | 72.43 | | 50.82 | | |  | | --- | | 59 | | 54.805 | | 14.39 | | 27.57 | | 56.19 | | |  | | --- | | 214 | |  | | 52.20 | |  | |  | | | **ga/aa** | |  | | --- | | 150 | | 145.8 | | 36.59 | | 76.53 | | 49.18 | | |  | | --- | | 46 | | 50.195 | | 11.22 | | 23.47 | | 43.81 | | |  | | --- | | 196 | |  | | 47.80 | |  | |  | | | **Total** | |  | | --- | | 305 | | 74.39 | | |  | | --- | | 105 | | 25.61 | | |  | | --- | | 410 | | 100.00 | | |

Statistics for Table 1 of oca by indic  
Controlling for hispanic=No

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **0.8056** | 0.5157 | 1.2586 |
| **Cohort (Col1 Risk)** | **0.9464** | 0.8450 | 1.0600 |
| **Cohort (Col2 Risk)** | **1.1747** | 0.8418 | 1.6394 |

Sample Size = 410

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 2 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for hispanic=Yes** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **gg** | |  | | --- | | 12 | | 13.323 | | 19.35 | | 85.71 | | 20.34 | | |  | | --- | | 2 | | 0.6774 | | 3.23 | | 14.29 | | 66.67 | | |  | | --- | | 14 | |  | | 22.58 | |  | |  | | | **ga/aa** | |  | | --- | | 47 | | 45.677 | | 75.81 | | 97.92 | | 79.66 | | |  | | --- | | 1 | | 2.3226 | | 1.61 | | 2.08 | | 33.33 | | |  | | --- | | 48 | |  | | 77.42 | |  | |  | | | **Total** | |  | | --- | | 59 | | 95.16 | | |  | | --- | | 3 | | 4.84 | | |  | | --- | | 62 | | 100.00 | | |

Statistics for Table 2 of oca by indic  
Controlling for hispanic=Yes

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **0.1277** | 0.0107 | 1.5286 |
| **Cohort (Col1 Risk)** | **0.8754** | 0.7041 | 1.0884 |
| **Cohort (Col2 Risk)** | **6.8571** | 0.6702 | 70.1581 |

Sample Size = 62

|  |
| --- |
| The SAS System |

The FREQ Procedure

Summary Statistics for oca by indic  
Controlling for hispanic

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 1.5189 | 0.2178 |
| **2** | **Row Mean Scores Differ** | 1 | 1.5189 | 0.2178 |
| **3** | **General Association** | 1 | 1.5189 | 0.2178 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 0.7612 | 0.4915 | 1.1788 |
| **(Odds Ratio)** | **Logit** | 0.7605 | 0.4903 | 1.1798 |
| **Cohort** | **Mantel-Haenszel** | 0.9379 | 0.8458 | 1.0401 |
| **(Col1 Risk)** | **Logit** | 0.9308 | 0.8418 | 1.0293 |
| **Cohort** | **Mantel-Haenszel** | 1.2277 | 0.8853 | 1.7025 |
| **(Col2 Risk)** | **Logit** | 1.2172 | 0.8752 | 1.6929 |

| **Breslow-Day Test for Homogeneity of the Odds Ratios** | |
| --- | --- |
| **Chi-Square** | 2.5195 |
| **DF** | 1 |
| **Pr > ChiSq** | 0.1124 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

| **Obs** | **oca** | **gender** | **hispanic** | **indic** | **count** |
| --- | --- | --- | --- | --- | --- |
| **1** | ga | Female | No | - | 75 |
| **2** | ga | Female | No | 1 | 13 |
| **3** | ga | Female | Yes | - | 14 |
| **4** | ga | Female | Yes | 1 | 1 |
| **5** | ga | Male | No | - | 49 |
| **6** | ga | Male | No | 1 | 26 |
| **7** | ga | Male | Yes | - | 17 |
| **8** | ga | Male | Yes | 1 | 0 |
| **9** | gg/aa | Female | No | - | 98 |
| **10** | gg/aa | Female | No | 1 | 37 |
| **11** | gg/aa | Female | Yes | - | 10 |
| **12** | gg/aa | Female | Yes | 1 | 2 |
| **13** | gg/aa | Male | No | - | 83 |
| **14** | gg/aa | Male | No | 1 | 29 |
| **15** | gg/aa | Male | Yes | - | 18 |
| **16** | gg/aa | Male | Yes | 1 | 0 |

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table of oca by indic** | | | | | --- | --- | --- | --- | | **oca** | **indic** | | | | **0** | **1** | **Total** | | **1** | |  | | --- | | 155 | | 150.38 | | 32.84 | | 79.49 | | 42.58 | | |  | | --- | | 40 | | 44.619 | | 8.47 | | 20.51 | | 37.04 | | |  | | --- | | 195 | |  | | 41.31 | |  | |  | | | **4** | |  | | --- | | 209 | | 213.62 | | 44.28 | | 75.45 | | 57.42 | | |  | | --- | | 68 | | 63.381 | | 14.41 | | 24.55 | | 62.96 | | |  | | --- | | 277 | |  | | 58.69 | |  | |  | | | **Total** | |  | | --- | | 364 | | 77.12 | | |  | | --- | | 108 | | 22.88 | | |  | | --- | | 472 | | 100.00 | | |

Statistics for Table of oca by indic

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **1.2608** | 0.8101 | 1.9622 |
| **Cohort (Col1 Risk)** | **1.0535** | 0.9552 | 1.1619 |
| **Cohort (Col2 Risk)** | **0.8356** | 0.5918 | 1.1797 |

| **Odds Ratio (Case-Control Study)** | |
| --- | --- |
| **Odds Ratio** | 1.2608 |
|  |  |
| **Asymptotic Conf Limits** |  |
| **95% Lower Conf Limit** | 0.8101 |
| **95% Upper Conf Limit** | 1.9622 |
|  |  |
| **Exact Conf Limits** |  |
| **95% Lower Conf Limit** | 0.7933 |
| **95% Upper Conf Limit** | 2.0198 |

Sample Size = 472

Summary Statistics for oca by indic

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 1.0541 | 0.3046 |
| **2** | **Row Mean Scores Differ** | 1 | 1.0541 | 0.3046 |
| **3** | **General Association** | 1 | 1.0541 | 0.3046 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 1.2608 | 0.8101 | 1.9622 |
| **(Odds Ratio)** | **Logit** | 1.2608 | 0.8101 | 1.9622 |
| **Cohort** | **Mantel-Haenszel** | 1.0535 | 0.9552 | 1.1619 |
| **(Col1 Risk)** | **Logit** | 1.0535 | 0.9552 | 1.1619 |
| **Cohort** | **Mantel-Haenszel** | 0.8356 | 0.5918 | 1.1797 |
| **(Col2 Risk)** | **Logit** | 0.8356 | 0.5918 | 1.1797 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 1 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for gender=Female** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **ga** | |  | | --- | | 89 | | 81.164 | | 35.60 | | 86.41 | | 45.18 | | |  | | --- | | 14 | | 21.836 | | 5.60 | | 13.59 | | 26.42 | | |  | | --- | | 103 | |  | | 41.20 | |  | |  | | | **gg/aa** | |  | | --- | | 108 | | 115.84 | | 43.20 | | 73.47 | | 54.82 | | |  | | --- | | 39 | | 31.164 | | 15.60 | | 26.53 | | 73.58 | | |  | | --- | | 147 | |  | | 58.80 | |  | |  | | | **Total** | |  | | --- | | 197 | | 78.80 | | |  | | --- | | 53 | | 21.20 | | |  | | --- | | 250 | | 100.00 | | |

Statistics for Table 1 of oca by indic  
Controlling for gender=Female

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **2.2956** | 1.1723 | 4.4953 |
| **Cohort (Col1 Risk)** | **1.1761** | 1.0393 | 1.3310 |
| **Cohort (Col2 Risk)** | **0.5123** | 0.2937 | 0.8936 |

Sample Size = 250

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 2 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for gender=Male** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **ga** | |  | | --- | | 66 | | 69.207 | | 29.73 | | 71.74 | | 39.52 | | |  | | --- | | 26 | | 22.793 | | 11.71 | | 28.26 | | 47.27 | | |  | | --- | | 92 | |  | | 41.44 | |  | |  | | | **gg/aa** | |  | | --- | | 101 | | 97.793 | | 45.50 | | 77.69 | | 60.48 | | |  | | --- | | 29 | | 32.207 | | 13.06 | | 22.31 | | 52.73 | | |  | | --- | | 130 | |  | | 58.56 | |  | |  | | | **Total** | |  | | --- | | 167 | | 75.23 | | |  | | --- | | 55 | | 24.77 | | |  | | --- | | 222 | | 100.00 | | |

Statistics for Table 2 of oca by indic  
Controlling for gender=Male

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **0.7289** | 0.3946 | 1.3462 |
| **Cohort (Col1 Risk)** | **0.9234** | 0.7885 | 1.0813 |
| **Cohort (Col2 Risk)** | **1.2669** | 0.8021 | 2.0009 |

Sample Size = 222

|  |
| --- |
| The SAS System |

The FREQ Procedure

Summary Statistics for oca by indic  
Controlling for gender

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 1.0584 | 0.3036 |
| **2** | **Row Mean Scores Differ** | 1 | 1.0584 | 0.3036 |
| **3** | **General Association** | 1 | 1.0584 | 0.3036 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 1.2589 | 0.8102 | 1.9561 |
| **(Odds Ratio)** | **Logit** | 1.2279 | 0.7805 | 1.9317 |
| **Cohort** | **Mantel-Haenszel** | 1.0536 | 0.9549 | 1.1625 |
| **(Col1 Risk)** | **Logit** | 1.0727 | 0.9732 | 1.1824 |
| **Cohort** | **Mantel-Haenszel** | 0.8352 | 0.5905 | 1.1812 |
| **(Col2 Risk)** | **Logit** | 0.8796 | 0.6179 | 1.2521 |

| **Breslow-Day Test for Homogeneity of the Odds Ratios** | |
| --- | --- |
| **Chi-Square** | 6.2069 |
| **DF** | 1 |
| **Pr > ChiSq** | 0.0127 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 1 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for hispanic=No** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **ga** | |  | | --- | | 124 | | 121.26 | | 30.24 | | 76.07 | | 40.66 | | |  | | --- | | 39 | | 41.744 | | 9.51 | | 23.93 | | 37.14 | | |  | | --- | | 163 | |  | | 39.76 | |  | |  | | | **gg/aa** | |  | | --- | | 181 | | 183.74 | | 44.15 | | 73.28 | | 59.34 | | |  | | --- | | 66 | | 63.256 | | 16.10 | | 26.72 | | 62.86 | | |  | | --- | | 247 | |  | | 60.24 | |  | |  | | | **Total** | |  | | --- | | 305 | | 74.39 | | |  | | --- | | 105 | | 25.61 | | |  | | --- | | 410 | | 100.00 | | |

Statistics for Table 1 of oca by indic  
Controlling for hispanic=No

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **1.1594** | 0.7340 | 1.8311 |
| **Cohort (Col1 Risk)** | **1.0381** | 0.9259 | 1.1639 |
| **Cohort (Col2 Risk)** | **0.8954** | 0.6355 | 1.2617 |

Sample Size = 410

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 2 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for hispanic=Yes** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **ga** | |  | | --- | | 31 | | 30.452 | | 50.00 | | 96.88 | | 52.54 | | |  | | --- | | 1 | | 1.5484 | | 1.61 | | 3.13 | | 33.33 | | |  | | --- | | 32 | |  | | 51.61 | |  | |  | | | **gg/aa** | |  | | --- | | 28 | | 28.548 | | 45.16 | | 93.33 | | 47.46 | | |  | | --- | | 2 | | 1.4516 | | 3.23 | | 6.67 | | 66.67 | | |  | | --- | | 30 | |  | | 48.39 | |  | |  | | | **Total** | |  | | --- | | 59 | | 95.16 | | |  | | --- | | 3 | | 4.84 | | |  | | --- | | 62 | | 100.00 | | |

Statistics for Table 2 of oca by indic  
Controlling for hispanic=Yes

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **2.2143** | 0.1903 | 25.7690 |
| **Cohort (Col1 Risk)** | **1.0379** | 0.9260 | 1.1634 |
| **Cohort (Col2 Risk)** | **0.4688** | 0.0448 | 4.9063 |

Sample Size = 62

|  |
| --- |
| The SAS System |

The FREQ Procedure

Summary Statistics for oca by indic  
Controlling for hispanic

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 0.5565 | 0.4557 |
| **2** | **Row Mean Scores Differ** | 1 | 0.5565 | 0.4557 |
| **3** | **General Association** | 1 | 0.5565 | 0.4557 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 1.1863 | 0.7573 | 1.8585 |
| **(Odds Ratio)** | **Logit** | 1.1848 | 0.7560 | 1.8569 |
| **Cohort** | **Mantel-Haenszel** | 1.0381 | 0.9420 | 1.1440 |
| **(Col1 Risk)** | **Logit** | 1.0380 | 0.9575 | 1.1254 |
| **Cohort** | **Mantel-Haenszel** | 0.8793 | 0.6263 | 1.2344 |
| **(Col2 Risk)** | **Logit** | 0.8834 | 0.6292 | 1.2403 |

| **Breslow-Day Test for Homogeneity of the Odds Ratios** | |
| --- | --- |
| **Chi-Square** | 0.2652 |
| **DF** | 1 |
| **Pr > ChiSq** | 0.6066 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

| **Obs** | **oca** | **gender** | **hispanic** | **indic** | **count** |
| --- | --- | --- | --- | --- | --- |
| **1** | aa | Female | No | - | 11 |
| **2** | aa | Female | No | 1 | 4 |
| **3** | aa | Female | Yes | - | 6 |
| **4** | aa | Female | Yes | 1 | 0 |
| **5** | aa | Male | No | - | 15 |
| **6** | aa | Male | No | 1 | 3 |
| **7** | aa | Male | Yes | - | 10 |
| **8** | aa | Male | Yes | 1 | 0 |
| **9** | gg/ga | Female | No | - | 162 |
| **10** | gg/ga | Female | No | 1 | 46 |
| **11** | gg/ga | Female | Yes | - | 18 |
| **12** | gg/ga | Female | Yes | 1 | 3 |
| **13** | gg/ga | Male | No | - | 117 |
| **14** | gg/ga | Male | No | 1 | 52 |
| **15** | gg/ga | Male | Yes | - | 25 |
| **16** | gg/ga | Male | Yes | 1 | 0 |

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table of oca by indic** | | | | | --- | --- | --- | --- | | **oca** | **indic** | | | | **0** | **1** | **Total** | | **2** | |  | | --- | | 42 | | 37.788 | | 8.90 | | 85.71 | | 11.54 | | |  | | --- | | 7 | | 11.212 | | 1.48 | | 14.29 | | 6.48 | | |  | | --- | | 49 | |  | | 10.38 | |  | |  | | | **5** | |  | | --- | | 322 | | 326.21 | | 68.22 | | 76.12 | | 88.46 | | |  | | --- | | 101 | | 96.788 | | 21.40 | | 23.88 | | 93.52 | | |  | | --- | | 423 | |  | | 89.62 | |  | |  | | | **Total** | |  | | --- | | 364 | | 77.12 | | |  | | --- | | 108 | | 22.88 | | |  | | --- | | 472 | | 100.00 | | |

Statistics for Table of oca by indic

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **1.8820** | 0.8200 | 4.3194 |
| **Cohort (Col1 Risk)** | **1.1260** | 0.9925 | 1.2774 |
| **Cohort (Col2 Risk)** | **0.5983** | 0.2951 | 1.2129 |

| **Odds Ratio (Case-Control Study)** | |
| --- | --- |
| **Odds Ratio** | 1.8820 |
|  |  |
| **Asymptotic Conf Limits** |  |
| **95% Lower Conf Limit** | 0.8200 |
| **95% Upper Conf Limit** | 4.3194 |
|  |  |
| **Exact Conf Limits** |  |
| **95% Lower Conf Limit** | 0.8033 |
| **95% Upper Conf Limit** | 5.1154 |

Sample Size = 472

Summary Statistics for oca by indic

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 2.2845 | 0.1307 |
| **2** | **Row Mean Scores Differ** | 1 | 2.2845 | 0.1307 |
| **3** | **General Association** | 1 | 2.2845 | 0.1307 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 1.8820 | 0.8200 | 4.3194 |
| **(Odds Ratio)** | **Logit** | 1.8820 | 0.8200 | 4.3194 |
| **Cohort** | **Mantel-Haenszel** | 1.1260 | 0.9925 | 1.2774 |
| **(Col1 Risk)** | **Logit** | 1.1260 | 0.9925 | 1.2774 |
| **Cohort** | **Mantel-Haenszel** | 0.5983 | 0.2951 | 1.2129 |
| **(Col2 Risk)** | **Logit** | 0.5983 | 0.2951 | 1.2129 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 1 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for gender=Female** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **aa** | |  | | --- | | 17 | | 16.548 | | 6.80 | | 80.95 | | 8.63 | | |  | | --- | | 4 | | 4.452 | | 1.60 | | 19.05 | | 7.55 | | |  | | --- | | 21 | |  | | 8.40 | |  | |  | | | **gg/ga** | |  | | --- | | 180 | | 180.45 | | 72.00 | | 78.60 | | 91.37 | | |  | | --- | | 49 | | 48.548 | | 19.60 | | 21.40 | | 92.45 | | |  | | --- | | 229 | |  | | 91.60 | |  | |  | | | **Total** | |  | | --- | | 197 | | 78.80 | | |  | | --- | | 53 | | 21.20 | | |  | | --- | | 250 | | 100.00 | | |

Statistics for Table 1 of oca by indic  
Controlling for gender=Female

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **1.1569** | 0.3722 | 3.5960 |
| **Cohort (Col1 Risk)** | **1.0299** | 0.8280 | 1.2810 |
| **Cohort (Col2 Risk)** | **0.8902** | 0.3562 | 2.2248 |

Sample Size = 250

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 2 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for gender=Male** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **aa** | |  | | --- | | 25 | | 21.063 | | 11.26 | | 89.29 | | 14.97 | | |  | | --- | | 3 | | 6.9369 | | 1.35 | | 10.71 | | 5.45 | | |  | | --- | | 28 | |  | | 12.61 | |  | |  | | | **gg/ga** | |  | | --- | | 142 | | 145.94 | | 63.96 | | 73.20 | | 85.03 | | |  | | --- | | 52 | | 48.063 | | 23.42 | | 26.80 | | 94.55 | | |  | | --- | | 194 | |  | | 87.39 | |  | |  | | | **Total** | |  | | --- | | 167 | | 75.23 | | |  | | --- | | 55 | | 24.77 | | |  | | --- | | 222 | | 100.00 | | |

Statistics for Table 2 of oca by indic  
Controlling for gender=Male

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **3.0516** | 0.8840 | 10.5345 |
| **Cohort (Col1 Risk)** | **1.2198** | 1.0457 | 1.4229 |
| **Cohort (Col2 Risk)** | **0.3997** | 0.1338 | 1.1939 |

Sample Size = 222

|  |
| --- |
| The SAS System |

The FREQ Procedure

Summary Statistics for oca by indic  
Controlling for gender

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 2.4673 | 0.1162 |
| **2** | **Row Mean Scores Differ** | 1 | 2.4673 | 0.1162 |
| **3** | **General Association** | 1 | 2.4673 | 0.1162 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 1.9146 | 0.8378 | 4.3754 |
| **(Odds Ratio)** | **Logit** | 1.8003 | 0.7799 | 4.1556 |
| **Cohort** | **Mantel-Haenszel** | 1.1329 | 0.9960 | 1.2885 |
| **(Col1 Risk)** | **Logit** | 1.1531 | 1.0168 | 1.3077 |
| **Cohort** | **Mantel-Haenszel** | 0.5888 | 0.2913 | 1.1904 |
| **(Col2 Risk)** | **Logit** | 0.6400 | 0.3171 | 1.2920 |

| **Breslow-Day Test for Homogeneity of the Odds Ratios** | |
| --- | --- |
| **Chi-Square** | 1.3251 |
| **DF** | 1 |
| **Pr > ChiSq** | 0.2497 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

The FREQ Procedure

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 1 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for hispanic=No** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **aa** | |  | | --- | | 26 | | 24.549 | | 6.34 | | 78.79 | | 8.52 | | |  | | --- | | 7 | | 8.4512 | | 1.71 | | 21.21 | | 6.67 | | |  | | --- | | 33 | |  | | 8.05 | |  | |  | | | **gg/ga** | |  | | --- | | 279 | | 280.45 | | 68.05 | | 74.01 | | 91.48 | | |  | | --- | | 98 | | 96.549 | | 23.90 | | 25.99 | | 93.33 | | |  | | --- | | 377 | |  | | 91.95 | |  | |  | | | **Total** | |  | | --- | | 305 | | 74.39 | | |  | | --- | | 105 | | 25.61 | | |  | | --- | | 410 | | 100.00 | | |

Statistics for Table 1 of oca by indic  
Controlling for hispanic=No

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Case-Control (Odds Ratio)** | **1.3047** | 0.5489 | 3.1008 |
| **Cohort (Col1 Risk)** | **1.0646** | 0.8832 | 1.2834 |
| **Cohort (Col2 Risk)** | **0.8160** | 0.4137 | 1.6095 |

Sample Size = 410

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **Frequency** | | **Expected** | | **Percent** | | **Row Pct** | | **Col Pct** | | | | **Table 2 of oca by indic** | | | | | --- | --- | --- | --- | | **Controlling for hispanic=Yes** | | | | | **oca** | **indic** | | | | **-** | **1** | **Total** | | **aa** | |  | | --- | | 16 | | 15.226 | | 25.81 | | 100.00 | | 27.12 | | |  | | --- | | 0 | | 0.7742 | | 0.00 | | 0.00 | | 0.00 | | |  | | --- | | 16 | |  | | 25.81 | |  | |  | | | **gg/ga** | |  | | --- | | 43 | | 43.774 | | 69.35 | | 93.48 | | 72.88 | | |  | | --- | | 3 | | 2.2258 | | 4.84 | | 6.52 | | 100.00 | | |  | | --- | | 46 | |  | | 74.19 | |  | |  | | | **Total** | |  | | --- | | 59 | | 95.16 | | |  | | --- | | 3 | | 4.84 | | |  | | --- | | 62 | | 100.00 | | |

Statistics for Table 2 of oca by indic  
Controlling for hispanic=Yes

| **Estimates of the Relative Risk (Row1/Row2)** | | | |
| --- | --- | --- | --- |
| **Type of Study** | **Value** | **95% Confidence Limits** | |
| **Cohort (Col1 Risk)** | **1.0698** | 0.9912 | 1.1546 |

One or more risk estimates not computed --- zero cell.

Sample Size = 62

|  |
| --- |
| The SAS System |

The FREQ Procedure

Summary Statistics for oca by indic  
Controlling for hispanic

| **Cochran-Mantel-Haenszel Statistics (Based on Table Scores)** | | | | |
| --- | --- | --- | --- | --- |
| **Statistic** | **Alternative Hypothesis** | **DF** | **Value** | **Prob** |
| **1** | **Nonzero Correlation** | 1 | 0.7798 | 0.3772 |
| **2** | **Row Mean Scores Differ** | 1 | 0.7798 | 0.3772 |
| **3** | **General Association** | 1 | 0.7798 | 0.3772 |

| **Estimates of the Common Relative Risk (Row1/Row2)** | | | | |
| --- | --- | --- | --- | --- |
| **Type of Study** | **Method** | **Value** | **95% Confidence Limits** | |
| **Case-Control** | **Mantel-Haenszel** | 1.4672 | 0.6248 | 3.4453 |
| **(Odds Ratio)** | **Logit \*\*** | 1.3771 | 0.5992 | 3.1650 |
| **Cohort** | **Mantel-Haenszel** | 1.0663 | 0.9387 | 1.2113 |
| **(Col1 Risk)** | **Logit** | 1.0690 | 0.9961 | 1.1473 |
| **Cohort** | **Mantel-Haenszel** | 0.7431 | 0.3772 | 1.4639 |
| **(Col2 Risk)** | **Logit \*\*** | 0.7860 | 0.4056 | 1.5230 |

\*\* These logit estimators use a correction of 0.5 in every cell   
of those tables that contain a zero.

| **Breslow-Day Test for Homogeneity of the Odds Ratios** | |
| --- | --- |
| **Chi-Square** | 0.8239 |
| **DF** | 1 |
| **Pr > ChiSq** | 0.3641 |

Total Sample Size = 472

|  |
| --- |
| The SAS System |

The GLM Procedure

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **oca2\_status** | 3 | gg ga aa |

|  |  |
| --- | --- |
| **Number of Observations Read** | 250 |
| **Number of Observations Used** | 241 |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2007 molecount2007

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 2 | 3349.8006 | 1674.9003 | 2.68 | 0.0708 |
| **Error** | 238 | 148869.8259 | 625.5035 |  |  |
| **Corrected Total** | 240 | 152219.6266 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2007 Mean** |
| --- | --- | --- | --- |
| 0.022006 | 64.47135 | 25.01007 | 38.79253 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 2 | 3349.800646 | 1674.900323 | 2.68 | 0.0708 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 2 | 3349.800646 | 1674.900323 | 2.68 | 0.0708 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 32.65000000 | B | 5.59242108 | 5.84 | <.0001 |
| **oca2\_status gg** | 9.82899160 | B | 6.04412981 | 1.63 | 0.1052 |
| **oca2\_status ga** | 3.04607843 | B | 6.11617204 | 0.50 | 0.6189 |
| **oca2\_status aa** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

The GLM Procedure

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **oca2\_status** | 3 | gg ga aa |

|  |  |
| --- | --- |
| **Number of Observations Read** | 222 |
| **Number of Observations Used** | 209 |

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| The SAS System |

The GLM Procedure

Dependent Variable: molecount2007 molecount2007

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 2 | 4683.0815 | 2341.5407 | 3.40 | 0.0354 |
| **Error** | 206 | 142027.4735 | 689.4538 |  |  |
| **Corrected Total** | 208 | 146710.5550 |  |  |  |

| **R-Square** | **Coeff Var** | **Root MSE** | **molecount2007 Mean** |
| --- | --- | --- | --- |
| 0.031921 | 60.59189 | 26.25745 | 43.33493 |

| **Source** | **DF** | **Type I SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 2 | 4683.081486 | 2341.540743 | 3.40 | 0.0354 |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **oca2\_status** | 2 | 4683.081486 | 2341.540743 | 3.40 | 0.0354 |

| **Parameter** | **Estimate** |  | **Standard Error** | **t Value** | **Pr > |t|** |
| --- | --- | --- | --- | --- | --- |
| **Intercept** | 30.54166667 | B | 5.35977983 | 5.70 | <.0001 |
| **oca2\_status gg** | 15.57412281 | B | 5.99872051 | 2.60 | 0.0101 |
| **oca2\_status ga** | 13.26944444 | B | 6.03223317 | 2.20 | 0.0289 |
| **oca2\_status aa** | 0.00000000 | B | . | . | . |

|  |  |
| --- | --- |
| **Note:** | **The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.** |

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| The SAS System |

The GLM Procedure

Tukey's Studentized Range (HSD) Test for molecount2007

|  |  |
| --- | --- |
| **Note:** | **This test controls the Type I experimentwise error rate.** |

|  |  |
| --- | --- |
| **Alpha** | 0.05 |
| **Error Degrees of Freedom** | 206 |
| **Error Mean Square** | 689.4538 |
| **Critical Value of Studentized Range** | 3.33865 |

| **Comparisons significant at the 0.05 level are indicated by \*\*\*.** | | | | |
| --- | --- | --- | --- | --- |
| **oca2\_status Comparison** | **Difference Between Means** | **Simultaneous 95% Confidence Limits** | |  |
| **gg - ga** | 2.305 | -6.814 | 11.423 |  |
| **gg - aa** | 15.574 | 1.412 | 29.736 | \*\*\* |
| **ga - gg** | -2.305 | -11.423 | 6.814 |  |
| **ga - aa** | 13.269 | -0.971 | 27.510 |  |
| **aa - gg** | -15.574 | -29.736 | -1.412 | \*\*\* |
| **aa - ga** | -13.269 | -27.510 | 0.971 |  |

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| The SAS System |

The GLM Procedure

Bonferroni (Dunn) t Tests for molecount2007

|  |  |
| --- | --- |
| **Note:** | **This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than Tukey's for all pairwise comparisons.** |

|  |  |
| --- | --- |
| **Alpha** | 0.05 |
| **Error Degrees of Freedom** | 206 |
| **Error Mean Square** | 689.4538 |
| **Critical Value of t** | 2.41369 |

| **Comparisons significant at the 0.05 level are indicated by \*\*\*.** | | | | |
| --- | --- | --- | --- | --- |
| **oca2\_status Comparison** | **Difference Between Means** | **Simultaneous 95% Confidence Limits** | |  |
| **gg - ga** | 2.305 | -7.018 | 11.627 |  |
| **gg - aa** | 15.574 | 1.095 | 30.053 | \*\*\* |
| **ga - gg** | -2.305 | -11.627 | 7.018 |  |
| **ga - aa** | 13.269 | -1.290 | 27.829 |  |
| **aa - gg** | -15.574 | -30.053 | -1.095 | \*\*\* |
| **aa - ga** | -13.269 | -27.829 | 1.290 |  |