Distribution Agreement

In presenting this Thesis as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my Thesis in whole or in part in all forms of media, now or hereafter known, including display on the World Wide Web. I understand that I may select some access restrictions as part of the online submission of this Thesis. I retain all ownership rights to the copyright of the Thesis. I also retain the right to use in future works (such as articles or books) all or part of this Thesis.

_____4/19/2012__

Signature of Student Date

HISTORY OF TREATMENT WITH ANTACID MEDICATION INCREASES PREVALENCE OF DIAGNOSIS OF FOOD ALLERGY IN CHILDREN

BY
Karen Ann DeMuth
Degree to be awarded: M.P.H.
Career MPH

4/19/2012
Kevin Sullivan PhD MPH, MHA Date

4/19/2012
Arlene Stecenko, MD Date

4/19/2012
Melissa Alperin, MPH, CHES Date

HISTORY OF TREATMENT WITH ANTACID MEDICATION INCREASE PREVALENCE OF DIAGNOSIS OF FOOD ALLERGY IN CHILDREN

BY

Karen Ann DeMuth
M.P.H., Emory University, 2012
M.D., Ross University School of Medicine, 1999
B.S.N., University of Virginia, 1992

Thesis Committee Chair: Kevin Sullivan PhD MPH, MHA

An abstract of
A Thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements of the degree of
Master of Public Health in the Career MPH program
2012

Abstract

HISTORY OF TREATMENT WITH ANTACID MEDICATION INCREASE PREVALENCE OF DIAGNOSIS OF FOOD ALLERGY IN CHILDREN

BY
Karen Ann DeMuth

Background: Food allergy affects 6-8% of preschool children, but factors responsible for food allergy in children are poorly understood. Use of antacid medication may be a contributing factor.

Objective: The purpose of this study was to determine if parent-reported antacid medication use was associated with higher prevalence of food allergy in atopic children.

Methods: In this cross-sectional study, parents of children with atopic diseases completed a questionnaire relating to a history of treatment with antacid medication and food allergy. Charts were independently reviewed for food specific IgE and/or skin prick test results. Food allergy was defined as a reaction to a food consistent with the anaphylaxis consensus statement and either an elevated food specific IgE or a positive food skin prick test.

Results: 104 questionnaires were completed. Mean age of the participating children was 7.0 ± 4.3 years (Range 5 months to 18 years of age). Fifty-four children (41%) were reported to have taken an antacid medication in the past. History of taking antacid medication was associated with an increased prevalence [57% (27/47) versus 32% (18/57) p 0.008] and higher prevalence of food allergy of having food allergy [aPR 1.7 (1.1 – 2.5)]. Mean peanut food specific IgE was higher in those with a history of taking antacid medication (11.0 ± 5.0 versus 1.0 ± 5.5 $p = 0.01$).

Conclusion: History of treatment with antacid medication is associated with an increased prevalence of having food allergy.

Length: 231 words

HISTORY OF TREATMENT WITH ANTACID MEDICATION INCREASE PREVALENCE OF DIAGNOSIS OF FOOD

BY

Karen Ann DeMuth
M.P.H., Emory University, 2012
M.D., Ross University School of Medicine, 1999
B.S.N., University of Virginia, 1992

Thesis Committee Chair: Thesis Committee Chair: Kevin Sullivan PhD MPH, MHA

A Thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements of the degree of
Master of Public Health in the Career MPH program
2012

ACKNOWLEDGEMENTS

Many people contributed to the success of this project. I would like to acknowledge them. I would like to thank my Thesis Committee Chair, Kevin Sullivan PhD MPH, MHA for his help during all stages of this thesis. Without his help and guidance throughout this project were invaluable. I would like to thank Arlene Stecenko, MD for her input and support as my field advisor. I would also like to thank Anne Mentro Fitzpatrick PhD, MSCR, APRN who has been a wonderful mentor and role model.

Several faculty members also assisted me with this project. Lisa Kobrynski, MD MPH provided input into the development of the study design, and plan of statistical analysis. Gina Watts, RN, Patience Jackson, LPN and Shaeshe Schuler helped identify appropriate clinic patients, and facilitated collection of data. Barbara Reynolds, assisted with the preparation of the manuscript.

Finally, I would also like to acknowledge the families and children who participated in this project. Without their time and dedication this project would never have been completed.

Table of Contents

1. Thesis Pages 8 - 21
2. Tables Pages 22 - 23
3. References Page 24 - 25
4. Appendix
    a. Questionnaire Pages 26
    b. SAS Results with Annotations Page 27 - 228

Introduction:

Food Allergy is estimated to affect 8% of children ≤ 4 years old.[1-3] It is the most common cause of anaphylaxis in children presenting to the emergency room, with approximately 150 deaths reported in the US due to food allergy each year.[4] The prevalence of food allergy has increased 18% since 1997.[5] The reasons for the increase in prevalence are poorly defined. Although some risk factors have been proposed (antacid medication, delay in introduction of foods, etc.), definitive evidence linking these risk factors to the development of food allergy is lacking especially in children.

Gastroesophageal reflux (GER) is also very common in this same age group (infants and young children) and affects 10-30% of that population.[6, 7] Treatment of GER includes use of antacid medications (Proton Pump inhibitors and H_2 blockers), which reduce the amount of hydrochloric acid produced by the parietal cells in the stomach thereby increasing gastric pH.

There is some evidence linking treatment with antacid medications to development of food allergy in humans. Use of antacid medication is known to increase sensitization to food (either skin prick testing or food-specific IgE) in adults.[8] Milk allergy appears to be more prevalent (41%) in children diagnosed with GERD than what is typically expected in children (2.5%).[9,10] Development of food allergy to hazelnut has been associated with antacid therapy in

both a murine models and human adults.[9] In murine models of food allergy development of food allergy to seafood and egg has been shown to be related to raising gastric pH.[10, 11] However, in a recent abstract no association between antacid medication (H2 blockers) and prevalence of food allergy was found in a cohort of healthy children. Since these studies varied in methods, population, and definition of food allergy, we felt it was important to determine if the relationship between antacid medication and food allergy would be maintained in children since they typically have a higher prevalence of food allergy. We hypothesized that parental report of antacid medications in children will be associated an increased prevalence of physician-diagnosed food allergy in children, and conducted a proof of concept study.

Methods:

Study Design: A cross-sectional study design was used to test our hypothesis with the primary outcome measure was whether parental report of treatment with antacid medication was associated with increased prevalence in physician diagnosed food allergy.

Secondary measures include: 1. Determining if age at initiation of antacid therapy, or duration of antacid therapy are associated with increased prevalence of development of food allergy, and 2. determining if there was a difference in parental report of prevalence of life-threatening food reactions, total IgE levels, or specific IgE levels between those treated and untreated with antacid medications. We collected questionnaires by convenience sampling.

Subjects: A suggested sample size of 114 was obtained using a power calculation (8% prevalence rate, an α of 0.05 and 95% confidence level. All children (birth to 18 years of age) presenting to the Emory Children's Center Allergy-Immunology Clinic for evaluation for atopic diseases (asthma, allergic rhinitis, atopic dermatitis, asthma and food allergy) from 2009 to 2010 were eligible for inclusion. Exclusion criteria were: Children with chronic illness other than atopic diseases, including Eosinophilic Esophagitis without evidence of IgE mediated food allergy, and those not giving informed consent.

Study Definitions: Food allergy was defined as: a reaction consistent with anaphylaxis according

to the symposium on the definition and management of anaphylaxis summary statement:

[1. Acute onset of symptoms (minutes to hours) with involvement of skin/mucosal tissue and airway compromise or reduced BP or associated symptoms (e.g., hypotonia, syncope) 2. Two or more of the following after exposure (minutes to hours) to known allergen for that patient: skin/mucosal tissue involvement, airway compromise, reduced BP or associated symptoms (e.g., hypotonia, syncope), gastrointestinal symptoms, or 3. hypotension after exposure (min to hours) to known allergen for that patient)][14] and food specific IgE (either serum food specific IgE or skin prick test) or positive open graded food challenge as per practice parameters.[15]

Children were separated into two categories: 1. Food allergy as previously defined and 2. No history of food allergy.

Questionnaire: Parent(s) or guardian(s) of all children were asked to complete a questionnaire with 15 questions that included information on age, gender, diagnosis of GER, treatment with antacid medication (ever being treated with antacid medication, current treatment with antacid medication, type of antacid medication, age antacid medication was started, duration of treatment with antacid medication), diagnosis of food allergy, report of previous history of life-threatening reaction to a food, and reported physician diagnosis of atopic dermatitis, allergic rhinitis, and asthma. *See addendum.*

Additional Data Collected: History of previous reactions to foods was obtained during clinic visit. Total IgE and food specific IgE determination (egg, milk, peanut, shrimp, soy and wheat) by skin prick testing and/or serum food specific IgE), and outcome of open graded food challenges were obtained from the chart and other clinical records by the Primary Investigator (KD) independently of the completion of the questionnaire in an attempt to blind the investigator to the results of the questionnaire.

IRB Considerations: The study was approved by the Emory University IRB. Informed consent was obtained from the parent(s)/guardian(s) of all children participating in the study, verbal assent was obtained from children 6-10 years old, written assent was obtained from children 11-17 years old.

Statistical Analysis: Means, and frequency percents were calculated. Continuous data was examined for normal distribution. Data that were not normally distributed (total IgE level, and specific IgE level) were log transformed prior to analysis and the antilog of the results were presented. Chi-Square (dichotomous data) and t-test (continuous data) was used to determine differences between those with and without a history of treatment with antacid medication. Crude prevalence ratio of parental report of history of treatment with antacid medication and food allergy, probable food allergy and no food allergy was calculated. An adjusted model was

used to identify factors associated with food allergy. The dependant variable was food allergy category (food allergy, or no food allergy) and the independent variables included parental report that child was treated with antacid medication, age, gender, and history of atopic dermatitis. We used Proc Gen Mod with a backward elimination method. Variables included in the initial model were guided by previous knowledge of association with food allergy (e.g. young age, and history of atopic dermatitis). We removed the least significant variable until identifying the most parsimonious model. Confounding was defined as > 10% difference between the crude and adjusted estimate. We included all interaction terms (between exposure and all other variables of interest) to evaluate for interaction using a $p < 0.05$ to define significant interaction.

An ANOVA analysis was used to determine differences in age at initiation of and length of therapy with antacid medication between those with food allergy and no food allergy. Chi-Square (dichotomous data) and t-test (continuous data) were used to determine differences between those with a history of treatment with antacid medication and those without a history of treatment with antacid medication including percent of the population with food allergy, age at diagnosis of food allergy, length of diagnosis with food allergy (years), percent of the population with a history of life-threatening reactions to food, total IgE, and food specific IgE. All statistical analysis were computed using SAS 9.2 or OpenEpi.

Results:

One hundred and four participants were invited to complete the questionnaire and 100% completed the questionnaire. Forty-five percent (47/104) had a parental report of treatment with antacid medication, and 45% (47/104) had a diagnosis of food allergy. Demographic data for those with and without a history of taking antacid medication is shown in *Table 1*. There was no significant difference in age, gender, or percent of population with atopic diseases (atopic dermatitis, asthma, allergic rhinitis) between those who had ever been treated with antacid medications and those not treated. Children with a history of ever taking an antacid medication had a greater prevalence of food allergy 57% (27/47) versus 32% (18/57) $p = 0.008$. Crude prevalence ratio for factors potentially associated with prevalence of food allergy are presented in *Table 2*. Children with a history of treatment with antacid medication had greater prevalence of having food allergy. Crude prevalence ratio 1.8 (1.2, 2.9). Age ≤ 5 years of age [crude prevalence ratio 1.7 (1.1, 2.6)], and history of atopic dermatitis [crude prevalence ratio 2.5 (1.2, 4.9)] were also associated with greater prevalence of food allergy. All other variables examined were not associated with an increase in prevalence of food allergy. The results of an adjusted model are shown in *Table 2*. History of ever having an antacid medication was associated with increased prevalence of food allergy [adjusted

prevalence ratio 1.7 (1.1, 2.5)]. Atopic dermatitis was also associated with an increased prevalence of food allergy [adjusted prevalence ratio 2.4 (1.2, 4.7)], and age (≤ 5 years of age) was associated with a increased prevalence of food allergy [adjusted prevalence ratio 1.5 (1.03, 2.2)].

There was no difference in age at initiation of therapy with antacid medication (2.7 ± 4.8 years vs. 2.8 ± 3.4 years *p* 0.13) or length of therapy with antacid medication (1.2 ± 1.8 years vs. 1.3 ± 2.0 years *p* 0.15).

Results of the analysis of the subgroup of individuals with food allergy are presented in *Table 3*. Individuals who had ever taken an antacid medication had a higher mean peanut specific IgE than those who had never taken an antacid medication (11.0 ± 5.0 versus 2.0 ± 5.5 $p = 0.01$). We found no difference in: percent of food allergic individuals reporting life-threatening reactions to food, percent of population that are allergic to egg, milk, peanut, shrimp, soy or wheat, total IgE levels or food specific IgE levels to milk, egg, wheat, soy, or shrimp between individuals between those reporting ever being treated with antacid medication and never being treated with antacid medications.

Discussion:

This cross-sectional study in children demonstrates that treatment with antacid medication was associated with increased of prevalence of food allergy, and higher levels of peanut specific IgE. The importance of these data is that it strengthens the link between increased gastric pH and development of food allergy in humans, and has implications for clinical practice. Previous studies have demonstrated an association between treatment with antacid medication and development of food sensitization (i.e. positive skin tests and/or specific IgE) in human adults and mice.[9-11] In a study of 153 adults treated for 3 months with H_2 blockers or Proton Pump Inhibitor (PPI) demonstrated that 5/153 (3.3%) developed Hazelnut specific IgE, and 3/153 (1.9%) had a positive oral food challenge to hazelnuts as compared to that found in the general population (0.2-0.7%).[9] Using murine models of food allergy, it has been demonstrated that administration of antacid medication is crucial for the development of reactivity (reduced body temperature) after food challenge.[9, 11] Our data also lend support to the idea that treatment with antacid medication is associated with development of food allergy in children.

A recent abstract examining the effect of H2 blockers in a population of 259 children did not find any relationship between antacid use and food allergy[12]. There are important differences

between that analysis and the one reported here. That population was obtained mostly from the general pediatric clinic while this population was obtained from an allergy-immunology clinic and enriched for atopy, and they focused on use of H2 blockers and did not examine the effect of PPI's. There is some evidence that the histamine receptor gene is important in allergy[13-15], and that stimulation via the histamine H2 receptor reduces both eosinophil and neutrophil chemotaxis[16], enhances IL10 production[17], inhibits IL13 production[18], inhibits proliferation of both Th1 and Th2 T-cells[18]. It has been hypothesized that the H2 receptor may be an important regulator of H1 receptor induced allergic inflammation. We would have liked to look at the difference in effect between H2 blockers and PPI's but were unable to do this because of the small numbers, lack of access to pharmacy data, and inability to collect this data by recall since many parents were unable to remember the name of the medication used.

We were only able to replicate the increase in IgE levels that has been reported by other authors for peanut specific IgE. We did not find any differences in total IgE or other food specific IgE (milk, wheat, soy, or shrimp) between those reporting treatment with antacid medication and those with no exposure to antacid medication. This pilot study was not designed or powered to detect these differences, and the numbers of participants with complete laboratory data was small.

Threats to internal validity include: exposure (history of treatment with antacid medications) was determined in a retrospective fashion using parental report (possibly introducing reca65ull bias and making determination of whether the exposure preceded the disease difficult), the definition of food allergy was not based on double-blind placebo controlled food challenges (possibly adding misclassification bias), the fact the questionnaire was not validated, and the small numbers. We were unable to do further analysis on the subgroup that was currently taking antacid medication due the small numbers (n = 15). Generalization is also limited due to the fact that this is a pediatric population obtained from a tertiary care center allergy clinic which specializes in diagnosis and management of food allergy and the population consisted of children with a personal or family history of atopy.

We feel that the results from this pilot study are valid as the analysis demonstrates that report of treatment with antacid medication was independently associated with development of food allergy, and the data are in-line with what previous authors have found in both murine and human studies.

The results also have biologic plausibility, although the data is unable to elucidate the mechanism. Eating is known to be a complicated and delicate balance between tolerance and immune response.[19] Normally, immunologic responses to food protein in the gastrointestinal

(GI) tract are mediated by multiple factors including the strong physical barrier of the GI epithelium, digestive processes (pH & proteolytic enzymes), T-Cells in the lymphoid gut tissue, and secretory IgA.[19] Together these processes lead to a general immunosuppressed/tolerant environment in the gastrointestinal tract. Any abnormalities in this balancing act, such as that seen by the addition of antacid medication, may lead to lack of tolerance and development of food allergy. Increasing stomach pH could lead to conformational changes in important food allergen epitopes, and does lead to decrease efficiency of pepsinogen digestion. Any resultant changes in protein structure (either conformational or via protein digestion) could lead to enhanced binding (humoral or cellular) and increased recognition.

The data supports the need for prospective studies (clinical and basic science) to determine the effects of treatment with antacid medication on development of food allergy and the biologic mechanism responsible for this association. The clinical studies should address some of the questions this study raises: 1. Will the relationship be maintained in a more rigorous, prospective study, 2. Is the increased prevalence across all populations or just those with a personal/family history of atopy, 3. Is the effect due to treatment with antacid medication or the gastroesophageal reflux itself, 4. Is this effect related to any antacid medication or just to one class (such as H2 blockers or PPI's).

Additional basic science studies are necessary to define the mechanism by which antacid medications predispose to the development. If a relationship between treatment with antacid medication and development of food allergy can be clearly be demonstrated, clinicians will need to consider the risk of development of food allergy with the benefits from treating GER when starting a child on antacid medications.

Table 1: Demographic and background data*

All participants	Population Distribution n (%)	Population that had ever had antacid medication % (95% CI) n = 47	Population of those that had food allergy % (95% CI) n = 45
Overall population	104 (100)	45	43%
Diagnosis of food allergy?			
Yes	45 (43)	57 (46 - 74)	
No	59 (57)	32 (22 - 46)	
Ever having taken antacid medication?			
Yes	47 (45)		57 (43 - 72)
No	57 (55)		32 (20 - 44)
Child's Age			
≤ 5 years old	44 (42)	40 (28 - 53)	57 (42 - 71)
> 5 to 10 years of age	34 (33)	55 (40 - 70)	35 (19 - 51)
≥ 10 years of age	26 (25)	27 (12 - 41)	31 (13 - 49)
Child's Gender			
Female	32 (31)	46 (31 - 62)	47 (30 - 64)
Male	72 (69)	39 (29 - 49)	42 (30 - 53)
% Population with atopic dermatitis			
Yes	66 (63)	41 (30 - 51)	55 (43 - 67)
No	38 (37)	50 (33 - 67)	23 (8 - 37)
% Population with asthma			
Yes	69 (66)	43 (33 - 53)	45 (33 - 57)
No	35 (34)	43 (27 - 59)	34 (17 - 52)
% Population with allergic rhinitis			
Yes	46 (44)	43 (29 - 56)	50 (36 - 64)
No	58 (56)	43 (29 - 56)	33 (20 - 47)

*Data represents mean ± SD, or frequency %

Table 2: Factors associated with prevalence of food allergy

	Crude Prevalence Ratio (95% CI)	Adjusted Prevalence Ratio (95% CI)
History of taking antacid medication		
Yes	**1.8 (1.2, 2.9)**	**1.7 (1.1, 2.5)**
No (Reference)	1 (-)	1 (-)
History of Atopic Dermatitis		
Yes	**2.5 (1.2, 4.9)**	**2.4 (1.2, 4.7)**
No (Reference)	1 (-)	1 (-)
Age ≤ 5 years of age		
Yes	**1.7 (1.1, 2.6)**	**1.5 (1.03, 2.2)**
No (Reference)	1 (-)	1 (-)

*CI = Confidence Interval

Table 3: Subgroup analysis of participants with food allergy (n = 45) by history of treatment with antacid medication

	Never had antacid medication*	History of ever taking antacid medication *	*p*
N	18	27	
Age (years)	5.6 ± 5.1	6.1 ± 2.9	0.7
Age (years) at diagnosis of food allergy‡	2.4 ± 2.7	2.0 ± 1.6	0.6
Time (years) since diagnosis of food allergy	1.3 ± 3.0	3.0 ± 2.0	0.6
Egg allergic n (%)	6/18 (33%)	14/27 (52%)	0.2
Milk allergic n (%)	8/18 (44%)	11/27 (41%)	0.8
Peanut allergic n (%)	12/18 (67%)	13/27 (48%)	0.2
Shellfish allergic n (%)	7/18 (39%)	4/27 (11%)	0.07
Soy allergic n (%)	3/18 (17%)	6/27 (22%)	0.7
Wheat allergic n (%)	2/18 (11%)	6/27 (22%)	0.3
% with history of life-threatening reactions to food	8/18 (44.4%)	15/26 (56%)**	0.7
Food allergy considered severe by parent	11/16 (69%)**	18/24 (75%)‡‡	0.6
Total IgE‡	164 ± 4.1	244 ± 4.5	0.5
IgE Egg‡	2.2 ± 12.2	3.3 ± 5.5	0.7
IgE Milk‡	1.3 ± 20.1	7.4 ±6.7	0.2
IgE Peanut‡	**2.0 ± 5.5**	**11.0 ± 5.0**	**0.01**
IgE Soy	4.3 ± 5.0	0.7 ± 0.5	0.2
IgE Shrimp‡	2.7± 5.5	4.3 ± 24.5	0.8
IgE Wheat‡	1.5 ± 7.4	2.2 ± 6.7	0.7

*Data represents mean ± SD, or frequency %
‡ Log transformed prior to analysis
** 2 missing response, ‡‡ 3 missing responses

References

1. Sicherer, S.H., A. Munoz-Furlong, and H.A. Sampson, *Prevalence of peanut and tree nut allergy in the United States determined by means of a random digit dial telephone survey: a 5-year follow-up study.* J Allergy Clin Immunol, 2003. **112**(6): p. 1203-7.
2. Sampson, H.A., *Food allergy. Part 1: immunopathogenesis and clinical disorders.* J Allergy Clin Immunol, 1999. **103**(5 Pt 1): p. 717-28.
3. Burks, A.W., *Peanut allergy.* Lancet, 2008. **371**(9623): p. 1538-46.
4. Yocum, M.W., et al., *Epidemiology of anaphylaxis in Olmsted County: A population-based study.* J Allergy Clin Immunol, 1999. **104**(2 Pt 1): p. 452-6.
5. Branum, A.M. and S.L. Lukacs, *Food allergy among U.S. children: trends in prevalence and hospitalizations.* NCHS Data Brief, 2008(10): p. 1-8.
6. Sretenovic, A., et al., *Gastroesophageal reflux in infants and children.* Acta Chir Iugosl, 2008. **55**(1): p. 47-53.
7. Dent, J., et al., *Epidemiology of gastro-oesophageal reflux disease: a systematic review.* Gut, 2005. **54**(5): p. 710-7.
8. Untersmayr, E., et al., *Anti-ulcer drugs promote IgE formation toward dietary antigens in adult patients.* FASEB J, 2005. **19**(6): p. 656-8.
9. Scholl, I., et al., *Antiulcer drugs promote oral sensitization and hypersensitivity to hazelnut allergens in BALB/c mice and humans.* Am J Clin Nutr, 2005. **81**(1): p. 154-60.
10. Untersmayr, E., et al., *Antacid medication inhibits digestion of dietary proteins and causes food allergy: a fish allergy model in BALB/c mice.* J Allergy Clin Immunol, 2003. **112**(3): p. 616-23.
11. Diesner, S.C., et al., *Dose-dependent food allergy induction against ovalbumin under acid-suppression: a murine food allergy model.* Immunol Lett, 2008. **121**(1): p. 45-51.
12. Savides C, H.K., Gruenberg DA, *Does early H2 blocker use promote food allergy in children.* Journal of Allergy and Clinical Immunology, 2011. **127**(2): p. AB111.
13. Horio, S., et al., *Interleukin-4 up-regulates histamine H1 receptors by activation of H1 receptor gene transcription.* Naunyn Schmiedebergs Arch Pharmacol, 2010. **381**(4): p. 305-13.
14. Dinh, Q.T., et al., *Transcriptional up-regulation of histamine receptor-1 in epithelial, mucus and inflammatory cells in perennial allergic rhinitis.* Clin Exp Allergy, 2005. **35**(11): p. 1443-8.
15. Mizuguchi, H., et al., *[Histamine H receptor gene as an allergic diseases-sensitive gene and its impact on therapeutics for allergic diseases].* Yakugaku Zasshi, 2011. **131**(2): p. 171-8.
16. Akdis, C.A. and F.E. Simons, *Histamine receptors are hot in immunopharmacology.* Eur J Pharmacol, 2006. **533**(1-3): p. 69-76.
17. Osna, N., K. Elliott, and M.M. Khan, *Regulation of interleukin-10 secretion by histamine in TH2 cells and splenocytes.* Int Immunopharmacol, 2001. **1**(1): p. 85-96.

18. Jutel, M., et al., *Histamine regulates T-cell and antibody responses by differential expression of H1 and H2 receptors.* Nature, 2001. **413**(6854): p. 420-5.
19. Mayer, L., *Mucosal immunity.* Pediatrics, 2003. **111**(6 Pt 3): p. 1595-600.

□ New Patient □ Return Patient Age (months): _____

1. Was your child ever diagnosed with reflux? □ Yes □ No □ Don't know

2. Was your child ever given medication to treat reflux? □ Yes □ No □ Don't know
If No or Don't know skip to Question 7

3. What was the name of the medication given to treat reflux? _____

4. How old (months) was your child when he/she was given this medication? _____

5. How long (months) was your child treated for reflux? _____

6. Is your child still taking medication for reflux? □ Yes □ No □ Don't know

7. Has your child ever been diagnosed with:
A. Food Allergy: □ Yes □ No □ Don't know
B. Eczema: □ Yes □ No □ Don't know
C. Hay fever (allergic nose): □ Yes □ No □ Don't know
D. Asthma: □ Yes □ No □ Don't know
If no history of food allergy then stop.

8. What food(s) are you allergic to: _____

9. How were you diagnosed with food allergy?:
A. Lab testing
B. Skin testing
C. Other: _____

10. How old were you when you were diagnosed with food allergy? _____

11. How long (years)have you had food allergies: _____

Research Staff Only	
Food Allergy Diagnosis:	A. Clear (+ Test + History) B. Unclear C. No food allergy

```
*Data set imported using the File Input Data function*;
*Section of code to clean the data and look for normality*;
```


The CONTENTS Procedure

Data Set Name	WORK.FAR	Observations	131
Member Type	DATA	Variables	62
Engine	V9	Indexes	0
Created	Saturday, April 07, 2012 07:44:58 AM	Observation Length	528
Last Modified	Saturday, April 07, 2012 07:44:58 AM	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	WINDOWS_32		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information

Data Set Page Size	16384
Number of Data Set Pages	5
First Data Page	1
Max Obs per Page	30
Obs in First Data Page	16
Number of Data Set Repairs	0
Filename	C:\Users\demu2307\AppData\Local\Temp\SAS Temporary Files_TD5860\far.sas7bdat
Release Created	9.0201M0
Host Created	W32_VSPRO

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
	AMY	Char	1	$1.	$1.	AMY
	Age	Num	8			Age
	AgeFAYr	Num	8			AgeFAYr
	CTx	Num	8			CTx
	Disease	Num	8			Disease
	Disease1	Num	8			Disease1
	Disease2	Num	8			Disease2
	DxAD	Num	8			DxAD
	DxAR	Num	8			DxAR
	DxAsthma	Num	8			DxAsthma
	DxFA	Num	8			DxFA
	EPV_NPV	Char	3	$3.	$3.	EPV/NPV
	EggAllergy	Num	8			EggAllergy
	Exposure	Num	8			Exposure
	FA	Char	97	$97.	$97.	FA
	FA_Severe_	Num	8			FA Severe?
	FamHxAtopy	Num	8			FamHxAtopy
	Gender	Num	8			Gender
	HowDxFA	Char	10	$10.	$10.	HowDxFA
	IgE	Num	8			IgE
	IgEEgg	Num	8			IgEEgg
	IgEMilk	Num	8			IgEMilk
	IgEPeanut	Num	8			IgEPeanut
	IgESesame	Char	1	$1.	$1.	IgESesame
	IgEShrimp	Num	8			IgEShrimp
	IgETilapia	Num	8			IgETilapia
	IgEWalnut	Char	1	$1.	$1.	IgEWalnut
	IgEWheat	Num	8			IgEWheat
	LTR_food	Num	8			LTR food
	LengthFAYr	Num	8			LengthFAYr
	MilkAllergy	Num	8			MilkAllergy
	OtherAllergy	Num	8			OtherAllergy
	PeanutAllergy	Num	8			PeanutAllergy

ShellfishAllergy	Num	8	ShellfishAllergy
SoyAllergy	Num	8	SoyAllergy
Subject__	Num	8	Subject #
WheatAllergy	Num	8	WheatAllergy

```
*Looking for missing/missense data in the variable age*;
*After running code there was no missing or missense data noted.  See below;
```


The FREQ Procedure

Age

Age	Frequency	Percent	Cumulative Frequency	Cumulative Percent
8.5	1	0.76	88	67.18
8.75	1	0.76	89	67.94
8.83	1	0.76	90	68.70
9	2	1.53	92	70.23
9.08	1	0.76	93	70.99
9.34	1	0.76	94	71.76
9.67	1	0.76	95	72.52
9.75	1	0.76	96	73.28
10	1	0.76	97	74.05
10.17	1	0.76	98	74.81
10.6	1	0.76	99	75.57
10.75	1	0.76	100	76.34
11	5	3.82	105	80.15
11.58	1	0.76	106	80.92
11.75	1	0.76	107	81.68
12	4	3.05	111	84.73
12.75	1	0.76	112	85.50
13	4	3.05	116	88.55
13.34	1	0.76	117	89.31
13.84	1	0.76	118	90.08
13.96	1	0.76	119	90.84
14	4	3.05	123	93.89
14.5	1	0.76	124	94.66
14.75	1	0.76	125	95.42
15	1	0.76	126	96.18
16	1	0.76	127	96.95
16.83	1	0.76	128	97.71
17	1	0.76	129	98.47
17.5	1	0.76	130	99.24
18	1	0.76	131	100.00

```
*Looking for normality in the variable age*;
*After running code age appeared to be normally distributed.  See below;
```


The UNIVARIATE Procedure

Variable: Age (Age)

Moments

N	131	Sum Weights	131
Mean	7.00206107	Sum Observations	917.27
Std Deviation	4.33414222	Variance	18.7847888
Skewness	0.67953939	Kurtosis	-0.5532318
Uncorrected SS	8864.8031	Corrected SS	2442.02254
Coeff Variation	61.8980923	Std Error Mean	0.37867576

Basic Statistical Measures

Location		Variability	
Mean	7.002061	Std Deviation	4.33414
Median	6.000000	Variance	18.78479
Mode	7.000000	Range	17.58000

Interquartile Range 7.10000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	18.49091	Pr > |t|	<.0001
Sign	M	65.5	Pr >= |M|	<.0001
Signed Rank	S	4323	Pr >= |S|	<.0001

Tests for Normality

Test	--Statistic---		-----p Value------	
Shapiro-Wilk	W	0.928782	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.133778	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.545356	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	3.171663	Pr > A-Sq	<0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	18.00
99%	17.50
95%	14.75
90%	13.84
75% Q3	10.60
50% Median	6.00
25% Q1	3.50

```
*Looking for missing/missense data in the variable agefayr (age that food
allergy was diagnosed) in those children with a diagnosis of food allergy*;
*After running the code, there is 1 missing data point* I decided to leave
this data point in the analysis*;
```


The FREQ Procedure

AgeFAYr

AgeFAYr	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0.17	2	2.82	2	2.82
0.25	1	1.41	3	4.23
0.34	1	1.41	4	5.63
0.5	4	5.63	8	11.27
0.67	2	2.82	10	14.08
0.75	4	5.63	14	19.72
0.92	3	4.23	17	23.94
1	16	22.54	33	46.48
1.34	1	1.41	34	47.89
1.5	6	8.45	40	56.34
1.67	1	1.41	41	57.75
1.83	1	1.41	42	59.15
2	6	8.45	48	67.61
2.25	1	1.41	49	69.01
2.4	1	1.41	50	70.42
3	3	4.23	53	74.65
4	4	5.63	57	80.28
5	4	5.63	61	85.92
6	3	4.23	64	90.14
7	1	1.41	65	91.55
8	1	1.41	66	92.96
9	2	2.82	68	95.77
11	1	1.41	69	97.18
13	1	1.41	70	98.59

16 1 1.41 71 100.00

Frequency Missing = 1

The UNIVARIATE Procedure
Variable: AgeFAYr (AgeFAYr)

Moments

N	71	Sum Weights	71
Mean	2.7115493	Sum Observations	192.52
Std Deviation	3.11023961	Variance	9.67359042
Skewness	2.26011814	Kurtosis	5.57494451
Uncorrected SS	1199.1788	Corrected SS	677.15133
Coeff Variation	114.703414	Std Error Mean	0.36911753

Basic Statistical Measures

Location		Variability	
Mean	2.711549	Std Deviation	3.11024
Median	1.500000	Variance	9.67359
Mode	1.000000	Range	15.83000
		Interquartile Range	3.00000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t	7.346032	Pr > |t| <.0001
Sign	M	35.5	Pr >= |M| <.0001
Signed Rank	S	1278	Pr >= |S| <.0001

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W	0.712197	Pr < W <0.0001
Kolmogorov-Smirnov	D	0.266535	Pr > D <0.0100
Cramer-von Mises	W-Sq	1.329517	Pr > W-Sq <0.0050
Anderson-Darling	A-Sq	7.048368	Pr > A-Sq <0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	16.00
99%	16.00
95%	9.00
90%	6.00
75% Q3	4.00
50% Median	1.50
25% Q1	1.00

```
*Looking for normality in the variable AgeFAYr.  Only in those with Food
Allergy and Probable Food Allergy.*
*After running code: skewness = 2.26 and Kurtosis = 5.6 so data are not
normally distributed.  We will log transform the data to see if this improves
the curve.*;
```

The SAS System 07:09 Saturday, April 7, 2012 259

The UNIVARIATE Procedure

Variable: AgeFAYr (AgeFAYr)

Quantiles (Definition 5)

Quantile	Estimate
10%	0.50
5%	0.34
1%	0.17
0% Min	0.17

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
0.17	118	9	4
0.17	5	9	127
0.25	6	11	28
0.34	15	13	30
0.50	126	16	122

Moments

N	71	Sum Weights	71
Mean	0.50019332	Sum Observations	35.5137258
Std Deviation	0.99488615	Variance	0.98979845
Skewness	0.18872568	Kurtosis	-0.165521
Uncorrected SS	87.0496199	Corrected SS	69.2858915
Coeff Variation	198.900327	Std Error Mean	0.11807126

Basic Statistical Measures

Location		Variability	
Mean	0.500193	Std Deviation	0.99489
Median	0.405465	Variance	0.98980
Mode	0.000000	Range	4.54455
		Interquartile Range	1.38629

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------	
Student's t	t	4.236368	Pr > |t|	<.0001
Sign	M	10.5	Pr >= |M|	0.0065
Signed Rank	S	472	Pr >= |S|	<.0001

Tests for Normality

Test	--Statistic---		-----p Value------	
Shapiro-Wilk	W	0.967712	Pr < W	0.0643
Kolmogorov-Smirnov	D	0.157224	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.211691	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	1.085906	Pr > A-Sq	0.0075

Quantiles (Definition 5)

Quantile	Estimate
100% Max	2.772589
99%	2.772589
95%	2.197225
90%	1.791759
75% Q3	1.386294
50% Median	0.405465
25% Q1	0.000000

```
*Log transformed AgeFAYr, and then evaluated for normality in AgeFAYrLog*
**Skewness after log transformation = 0.19, Kurtosis = -0.17, so log
transformation was helpful so we will use the log transformed data in the
analysis and present the anti-log.*;
```


The UNIVARIATE Procedure
Variable: AgeFAYRLog

Moments

N	71	Sum Weights	71
Mean	0.50019332	Sum Observations	35.5137258
Std Deviation	0.99488615	Variance	0.98979845
Skewness	0.18872568	Kurtosis	-0.165521
Uncorrected SS	87.0496199	Corrected SS	69.2858915
Coeff Variation	198.900327	Std Error Mean	0.11807126

Basic Statistical Measures

Location		Variability	
Mean	0.500193	Std Deviation	0.99489
Median	0.405465	Variance	0.98980
Mode	0.000000	Range	4.54455
		Interquartile Range	1.38629

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t	4.236368	Pr > |t| <.0001
Sign	M	10.5	Pr >= |M| 0.0065
Signed Rank	S	472	Pr >= |S| <.0001

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W	0.967712	Pr < W 0.0643
Kolmogorov-Smirnov	D	0.157224	Pr > D <0.0100
Cramer-von Mises	W-Sq	0.211691	Pr > W-Sq <0.0050
Anderson-Darling	A-Sq	1.085906	Pr > A-Sq 0.0075

Quantiles (Definition 5)

Quantile	Estimate
100% Max	2.772589
99%	2.772589
95%	2.197225
90%	1.791759
75% Q3	1.386294
50% Median	0.405465

25% Q1 0.000000

Quantiles (Definition 5)

Quantile	Estimate
10%	-0.693147
5%	-1.078810
1%	-1.771957
0% Min	-1.771957

Extreme Observations

------Lowest------		-----Highest-----	
Value	Obs	Value	Obs
-1.771957	118	2.19722	4
-1.771957	5	2.19722	127
-1.386294	6	2.39790	28
-1.078810	15	2.56495	30
-0.693147	126	2.77259	122

```
*Looking for missing/missense data in the variable lengthfayr (length of
diagnosis of food allergy) in those children with a diagnosis of food
allergy*;
*After running the code, there were 6 missing data points for this variable.*;
```


The FREQ Procedure

LengthFAYr

LengthFAYr	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0.13	1	1.52	1	1.52
0.5	3	4.55	4	6.06
0.84	1	1.52	5	7.58
1	8	12.12	13	19.70
1.25	1	1.52	14	21.21
1.34	1	1.52	15	22.73
1.5	3	4.55	18	27.27
1.67	1	1.52	19	28.79
1.75	1	1.52	20	30.30
2	8	12.12	28	42.42
2.5	1	1.52	29	43.94
2.67	1	1.52	30	45.45
3	9	13.64	39	59.09
3.75	1	1.52	40	60.61
4	3	4.55	43	65.15
4.25	1	1.52	44	66.67
4.5	3	4.55	47	71.21
5	3	4.55	50	75.76
6	2	3.03	52	78.79
7	2	3.03	54	81.82
8	1	1.52	55	83.33
8.75	1	1.52	56	84.85
9	4	6.06	60	90.91
9.25	1	1.52	61	92.42
10	1	1.52	62	93.94
10.75	1	1.52	63	95.45
12	1	1.52	64	96.97
13	1	1.52	65	98.48
15.3	1	1.52	66	100.00

Frequency Missing = 6

```
*Skewness 1.3, Kurtosis 1.1 so normally distributed*;
```

The UNIVARIATE Procedure
Variable: LengthFAYr (LengthFAYr)

Moments

N	66	Sum Weights	66
Mean	4.04090909	Sum Observations	266.7
Std Deviation	3.44797141	Variance	11.8885069
Skewness	1.307607	Kurtosis	1.13520083
Uncorrected SS	1850.4634	Corrected SS	772.752945
Coeff Variation	85.3266266	Std Error Mean	0.42441594

Basic Statistical Measures

Location		Variability	
Mean	4.040909	Std Deviation	3.44797
Median	3.000000	Variance	11.88851
Mode	3.000000	Range	15.17000
		Interquartile Range	3.50000

Tests for Location: Mu0=0

Test	-Statistic-	-----p Value------
Student's t	t 9.521106	Pr > |t| <.0001
Sign	M 33	Pr >= |M| <.0001
Signed Rank	S 1105.5	Pr >= |S| <.0001

Tests for Normality

Test	--Statistic---	-----p Value------
Shapiro-Wilk	W 0.85241	Pr < W <0.0001
Kolmogorov-Smirnov	D 0.209541	Pr > D <0.0100
Cramer-von Mises	W-Sq 0.608724	Pr > W-Sq <0.0050
Anderson-Darling	A-Sq 3.415469	Pr > A-Sq <0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	15.30
99%	15.30
95%	10.75
90%	9.00
75% Q3	5.00
50% Median	3.00
25% Q1	1.50

The UNIVARIATE Procedure
Variable: LengthFAYr (LengthFAYr)

Quantiles (Definition 5)

Quantile	Estimate
10%	1.00
5%	0.50
1%	0.13
0% Min	0.13

Extreme Observations

----Lowest----		----Highest----	
Value	Obs	Value	Obs
0.13	17	10.00	23
0.50	19	10.75	112
0.50	14	12.00	89
0.50	13	13.00	18
0.84	107	15.30	5

The FREQ Procedure
IgE

IgE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	1.79	1	1.79
6	2	3.57	3	5.36
11	2	3.57	5	8.93
24	1	1.79	6	10.71
29	1	1.79	7	12.50
36	1	1.79	8	14.29
44	1	1.79	9	16.07
52	1	1.79	10	17.86
58.3	1	1.79	11	19.64
62	1	1.79	12	21.43
73	1	1.79	13	23.21
85	1	1.79	14	25.00
90	1	1.79	15	26.79
93	1	1.79	16	28.57
98	1	1.79	17	30.36
100	1	1.79	18	32.14
100.5	1	1.79	19	33.93
101	1	1.79	20	35.71
102	1	1.79	21	37.50
155	1	1.79	22	39.29
163	1	1.79	23	41.07
203	1	1.79	24	42.86
220	1	1.79	25	44.64
252	1	1.79	26	46.43
265	2	3.57	28	50.00
311	1	1.79	29	51.79
312	1	1.79	30	53.57
314	1	1.79	31	55.36
321	1	1.79	32	57.14
329	1	1.79	33	58.93
364	1	1.79	34	60.71

366	1	1.79	35	62.50
419	1	1.79	36	64.29
454	2	3.57	38	67.86
476	1	1.79	39	69.64
485	1	1.79	40	71.43
621	1	1.79	41	73.21
636	1	1.79	42	75.00
808	1	1.79	43	76.79
810	1	1.79	44	78.57
855	1	1.79	45	80.36
863	1	1.79	46	82.14
1120	1	1.79	47	83.93
1281	1	1.79	48	85.71
1585	1	1.79	49	87.50
1923	1	1.79	50	89.29
1951	1	1.79	51	91.07
1959	1	1.79	52	92.86
2530	1	1.79	53	94.64
3676	1	1.79	54	96.43
4212	1	1.79	55	98.21
5511	1	1.79	56	100.00

Frequency Missing = 16

```
*Looking for normality in the variable IgE (total IgE) in those children with
a diagnosis of food allergy*;
*Skewness 2.6, Kurtosis = 6.9, so not normally distributed.  We will log
transform the variable and present the anti-log.*;
```

The UNIVARIATE Procedure
Variable: IgE (IgE)
Moments

N	57	Sum Weights	57
Mean	712.961404	Sum Observations	40638.8
Std Deviation	1122.47634	Variance	1259953.13
Skewness	2.56795961	Kurtosis	6.93454499
Uncorrected SS	99531271.1	Corrected SS	70557375.3
Coeff Variation	157.438584	Std Error Mean	148.675623

Basic Statistical Measures

Location		Variability	
Mean	712.9614	Std Deviation	1122
Median	311.0000	Variance	1259953
Mode	6.0000	Range	5510
		Interquartile Range	718.00000

NOTE: The mode displayed is the smallest of 4 modes with a count of 2.

Tests for Location: Mu0=0

Test	-Statistic-	-----p Value------	
Student's t	t 4.795416	Pr > |t|	<.0001
Sign	M 28.5	Pr >= |M|	<.0001
Signed Rank	S 826.5	Pr >= |S|	<.0001

Tests for Normality

Test	--Statistic---	-----p Value------	
Shapiro-Wilk	W 0.64194	Pr < W	<0.0001
Kolmogorov-Smirnov	D 0.282221	Pr > D	<0.0100
Cramer-von Mises	W-Sq 1.408704	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq 7.324406	Pr > A-Sq	<0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5511
99%	5511
95%	3676
90%	1959
75% Q3	808

Quantiles (Definition 5)

Quantile	Estimate
50% Median	311
25% Q1	90
10%	24
5%	6
1%	1
0% Min	1

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
1	119	2530	21
6	120	2987	58
6	118	3676	23
11	99	4212	110
11	10	5511	122

```
*After running code new Skewness -0.6, Kurtosis = 0.6, so improved.
*We will use the log transformed variable *;
```


The UNIVARIATE Procedure
Variable: LogIgE

Moments

N	57	Sum Weights	57
Mean	5.42207765	Sum Observations	309.058426
Std Deviation	1.77877254	Variance	3.16403174
Skewness	-0.6095957	Kurtosis	0.57035853
Uncorrected SS	1852.92456	Corrected SS	177.185777
Coeff Variation	32.8061059	Std Error Mean	0.23560418

Basic Statistical Measures

Location		Variability	
Mean	5.422078	Std Deviation	1.77877
Median	5.739793	Variance	3.16403
Mode	1.791759	Range	8.61450
		Interquartile Range	2.19475

NOTE: The mode displayed is the smallest of 4 modes with a count of 2.

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t	23.0135	Pr > |t| <.0001
Sign	M	28	Pr >= |M| <.0001
Signed Rank	S	798	Pr >= |S| <.0001

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W	0.972023	Pr < W 0.2082
Kolmogorov-Smirnov	D	0.085466	Pr > D >0.1500
Cramer-von Mises	W-Sq	0.059178	Pr > W-Sq >0.2500
Anderson-Darling	A-Sq	0.388632	Pr > A-Sq >0.2500

Quantiles (Definition 5)

Quantile	Estimate
100% Max	8.61450
99%	8.61450
95%	8.20958
90%	7.58019
75% Q3	6.69456

Quantiles (Definition 5)

Quantile	Estimate
50% Median	5.73979
25% Q1	4.49981
10%	3.17805
5%	1.79176
1%	0.00000
0% Min	0.00000

Extreme Observations

------Lowest-----		-----Highest-----	
Value	Obs	Value	Obs
0.00000	119	7.83597	21
1.79176	120	8.00202	58
1.79176	118	8.20958	23
2.39790	99	8.34569	110
2.39790	10	8.61450	122

```
*Looking for missing/missense data in the variable IgEEgg (Egg Specific IgE)
in those children with a diagnosis of food allergy to egg*;
*After running code, there are 6 missing data points, and 26 with data.*;
```


The FREQ Procedure

IgEEgg

IgEEgg	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	7.69	2	7.69
0.08	1	3.85	3	11.54
0.2	1	3.85	4	15.38
0.37	1	3.85	5	19.23
0.72	1	3.85	6	23.08
0.93	1	3.85	7	26.92
1.22	1	3.85	8	30.77
1.39	1	3.85	9	34.62
1.87	1	3.85	10	38.46
2.59	1	3.85	11	42.31
3.24	1	3.85	12	46.15
3.98	1	3.85	13	50.00
4.22	1	3.85	14	53.85
4.57	1	3.85	15	57.69
8.16	1	3.85	16	61.54
11.3	1	3.85	17	65.38
13.3	1	3.85	18	69.23
14.2	1	3.85	19	73.08
15.3	1	3.85	20	76.92
17.3	1	3.85	21	80.77
19.9	1	3.85	22	84.62
21.8	1	3.85	23	88.46
30.79	1	3.85	24	92.31
55	1	3.85	25	96.15
55.7	1	3.85	26	100.00

Frequency Missing = 6

```
*Looking for normality in the variable IgEEgg (Egg Specific IgE) in those
children with a diagnosis of food allergy to Egg*;
*After running the code, Skewness 2.3, Kurtosis 5.3 so not normally
distributed*;
*We will log transform the variable and present the anti-log.
```

The UNIVARIATE Procedure

Variable: IgEEgg (IgEEgg)

Moments

N	35	Sum Weights	35
Mean	9.07714286	Sum Observations	317.7
Std Deviation	14.0410383	Variance	197.150756

Skewness	2.27160946	Kurtosis	5.33965449
Uncorrected SS	9586.934	Corrected SS	6703.12571
Coeff Variation	154.685659	Std Error Mean	2.37336865

Basic Statistical Measures

Location		Variability	
Mean	9.077143	Std Deviation	14.04104
Median	2.590000	Variance	197.15076
Mode	0.000000	Range	55.70000
		Interquartile Range	14.10000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t 3.824582	Pr > |t|	0.0005
Sign	M 14.5	Pr >= |M|	<.0001
Signed Rank	S 217.5	Pr >= |S|	<.0001

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W 0.678529	Pr < W	<0.0001
Kolmogorov-Smirnov	D 0.258987	Pr > D	<0.0100
Cramer-von Mises	W-Sq 0.643956	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq 3.747415	Pr > A-Sq	<0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	55.70
99%	55.70
95%	55.00
90%	21.80
75% Q3	14.20
50% Median	2.59
25% Q1	0.10

Quantiles (Definition 5)

Quantile	Estimate
10%	0.00
5%	0.00
1%	0.00
0% Min	0.00

Extreme Observations

----Lowest----		----Highest----	
Value	Obs	Value	Obs
0	122	19.90	20
0	116	21.80	126
0	100	30.79	107
0	99	55.00	25
0	27	55.70	110

*After log transforming data and running the code. The new Skewness -0.6, and Kurtosis -0.7, which is improved. We will use the log transformed variable.

Moments

N	29	Sum Weights	29
Mean	1.15329051	Sum Observations	33.4454248
Std Deviation	2.01192119	Variance	4.04782688
Skewness	-0.5737844	Kurtosis	-0.6879783
Uncorrected SS	151.911444	Corrected SS	113.339153
Coeff Variation	174.450511	Std Error Mean	0.37360439

Basic Statistical Measures

Location		Variability	
Mean	1.153291	Std Deviation	2.01192
Median	1.439835	Variance	4.04783
Mode	.	Range	7.01571
		Interquartile Range	2.80042

Tests for Location: Mu0=0

Test	-Statistic-	-----p Value------
Student's t	t 3.08693	Pr > |t| 0.0045
Sign	M 6.5	Pr >= |M| 0.0241
Signed Rank	S 124.5	Pr >= |S| 0.0049

Tests for Normality

Test	--Statistic---	-----p Value------
Shapiro-Wilk	W 0.937267	Pr < W 0.0850
Kolmogorov-Smirnov	D 0.144211	Pr > D 0.1240
Cramer-von Mises	W-Sq 0.097092	Pr > W-Sq 0.1201
Anderson-Darling	A-Sq 0.617865	Pr > A-Sq 0.0981

Quantiles (Definition 5)

Quantile	Estimate
100% Max	4.0199801
99%	4.0199801
95%	4.0073332
90%	3.4271900
75% Q3	2.7278528
50% Median	1.4398351
25% Q1	-0.0725

Quantiles (Definition 5)

Quantile	Estimate
10%	-2.3025851
5%	-2.5257286
1%	-2.9957323
0% Min	-2.9957323

Extreme Observations

------Lowest-----		-----Highest-----	
Value	Obs	Value	Obs
-2.99573	4	2.99072	20
-2.52573	119	3.08191	126
-2.30259	3	3.42719	107
-1.60944	120	4.00733	25
-1.51413	95	4.01998	110

```
*Looking for missing/missense data in the variable IgEMilk (Milk Specific IgE)
in those children with a diagnosis of food allergy*;
*There are 8 missing data for children with food allergy to milk.*;
```


The FREQ Procedure

IgEMilk

IgEMilk	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	5.88	1	5.88
0.05	1	5.88	2	11.76
0.45	1	5.88	3	17.65
1.09	1	5.88	4	23.53
2.36	1	5.88	5	29.41
6.11	1	5.88	6	35.29
17.1	1	5.88	7	41.18
17.2	1	5.88	8	47.06
17.4	1	5.88	9	52.94
19.9	1	5.88	10	58.82
30.8	1	5.88	11	64.71
46.2	1	5.88	12	70.59
48.1	1	5.88	13	76.47
51.07	1	5.88	14	82.35
96	1	5.88	15	88.24
100	2	11.76	17	100.00

Frequency Missing = 8

```
*Looking for normality in the variable IgEMilk (Milk Specific IgE) in those
children with a diagnosis of food allergy to Milk*;
*After running the code, *Skewness 1.7, Kurtosis 1.9, so +/- normal
distribution*;
*We will log transform the variable and present the anti-log.
```


The UNIVARIATE Procedure

Variable: IgEMilk (IgEMilk)

Moments

N	27	Sum Weights	27
Mean	21.0522222	Sum Observations	568.41
Std Deviation	32.0150177	Variance	1024.96136
Skewness	1.70370624	Kurtosis	1.85425256
Uncorrected SS	38615.2889	Corrected SS	26648.9953
Coeff Variation	152.074291	Std Error Mean	6.16129302

Basic Statistical Measures

Location		Variability	
Mean	21.05222	Std Deviation	32.01502
Median	4.23000	Variance	1025
Mode	0.00000	Range	100.00000
		Interquartile Range	30.70000

Tests for Location: Mu0=0

Test	-Statistic-	-----p Value------
Student's t	t 3.416851	Pr > |t| 0.0021
Sign	M 11.5	Pr >= |M| <.0001
Signed Rank	S 138	Pr >= |S| <.0001

Tests for Normality

Test	--Statistic---	-----p Value------
Shapiro-Wilk	W 0.68926	Pr < W <0.0001
Kolmogorov-Smirnov	D 0.271014	Pr > D <0.0100
Cramer-von Mises	W-Sq 0.589306	Pr > W-Sq <0.0050
Anderson-Darling	A-Sq 3.332742	Pr > A-Sq <0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	100.00
99%	100.00
95%	100.00
90%	96.00
75% Q3	30.80
50% Median	4.23
25% Q1	0.10

Quantiles (Definition 5)

Quantile	Estimate
10%	0.00
5%	0.00
1%	0.00
0% Min	0.00

Extreme Observations

----Lowest----		-----Highest----	
Value	Obs	Value	Obs
0.00	116	48.10	104
0.00	100	51.07	90
0.00	99	96.00	20
0.00	27	100.00	25
0.05	8	100.00	106

*After log transforming data and running the code. The new Skewness is -0.6, Kurtosis -0.6, which is improved. We will use the log transformed data in analysis, and present the antilog.

The UNIVARIATE Procedure
Variable: LogIgEMilk

Moments

N	23	Sum Weights	23
Mean	1.64134636	Sum Observations	37.7509662
Std Deviation	2.39035395	Variance	5.71379203
Skewness	-0.6168923	Kurtosis	-0.6062491
Uncorrected SS	187.665835	Corrected SS	125.703425
Coeff Variation	145.633732	Std Error Mean	0.49842325

Basic Statistical Measures

Location		Variability	
Mean	1.64135	Std Deviation	2.39035
Median	1.82777	Variance	5.71379
Mode	-2.99573	Range	7.60090
		Interquartile Range	3.74680

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

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t 3.293077	Pr > |t|	0.0033
Sign	M 6.5	Pr >= |M|	0.0106
Signed Rank	S 89	Pr >= |S|	0.0041

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W 0.922045	Pr < W	0.0737
Kolmogorov-Smirnov	D 0.1701	Pr > D	0.0834
Cramer-von Mises	W-Sq 0.074627	Pr > W-Sq	0.2368
Anderson-Darling	A-Sq 0.530838	Pr > A-Sq	0.1616

Quantiles (Definition 5)

Quantile	Estimate
100% Max	4.6051702
99%	4.6051702
95%	4.6051702
90%	4.5643482

75% Q3 3.8329798

Quantiles (Definition 5)

Quantile	Estimate
50% Median	1.8277699
25% Q1	0.0861777
10%	-2.3025851
5%	-2.9957323
1%	-2.9957323
0% Min	-2.9957323

Extreme Observations

------Lowest------		-----Highest-----	
Value	Obs	Value	Obs
-2.995732	8	3.87328	104
-2.995732	4	3.93320	90
-2.302585	3	4.56435	20
-0.798508	103	4.60517	25
-0.527633	122	4.60517	106

```
*Looking for normality in the variable IgEPeanut (Peanut Specific IgE) in
those children with a diagnosis of food allergy to Peanut*;
*After running the code, *Skewness 1.7, Kurtosis 1.9, so +/- normal
distribution*;
*We will log transform the variable and present the anti-log.
```

The SAS System 14:54 Saturday, April 7, 2012 32

The UNIVARIATE Procedure

Variable: IgEPeanut (IgEPeanut)

Moments

N	47	Sum Weights	47
Mean	18.9765957	Sum Observations	891.9
Std Deviation	31.0822844	Variance	966.108406
Skewness	1.99586954	Kurtosis	2.7201757
Uncorrected SS	61366.2124	Corrected SS	44440.9867
Coeff Variation	163.792731	Std Error Mean	4.53381715

Basic Statistical Measures

Location		Variability	
Mean	18.97660	Std Deviation	31.08228
Median	4.57000	Variance	966.10841
Mode	0.00000	Range	100.00000
		Interquartile Range	19.24000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t	4.185567	Pr > |t| 0.0001
Sign	M	20	Pr >= |M| <.0001
Signed Rank	S	410	Pr >= |S| <.0001

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W	0.624412	Pr < W <0.0001
Kolmogorov-Smirnov	D	0.289674	Pr > D <0.0100
Cramer-von Mises	W-Sq	1.279535	Pr > W-Sq <0.0050
Anderson-Darling	A-Sq	7.119778	Pr > A-Sq <0.0050

Quantiles (Definition 5)

Quantile	Estimate
10%	0.00
5%	0.00

1%	0.00
0% Min	0.00

Extreme Observations

----Lowest----		----Highest---	
Value	Obs	Value	Obs
0	116	100	20
0	100	100	29
0	99	100	95
0	31	100	102
0	27	100	117

*After log transforming data and running the code. The new Skewness is -0.2, Kurtosis -0.5, which is improved. We will use the log transformed data in analysis, and present the antilog.

The UNIVARIATE Procedure
Variable: LogIgEPeanut

Moments

N	40	Sum Weights	40
Mean	1.84122988	Sum Observations	73.6491953
Std Deviation	1.92457276	Variance	3.70398031
Skewness	-0.5080622	Kurtosis	-0.1913541
Uncorrected SS	280.060331	Corrected SS	144.455232
Coeff Variation	104.526479	Std Error Mean	0.30430167

Basic Statistical Measures

Location		Variability	
Mean	1.841230	Std Deviation	1.92457
Median	2.062013	Variance	3.70398
Mode	4.605170	Range	7.60090
		Interquartile Range	2.35756

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t	6.050673	Pr > |t| <.0001
Sign	M	13	Pr >= |M| <.0001
Signed Rank	S	333	Pr >= |S| <.0001

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W	0.960741	Pr < W 0.1775
Kolmogorov-Smirnov	D	0.109571	Pr > D >0.1500
Cramer-von Mises	W-Sq	0.053154	Pr > W-Sq >0.2500
Anderson-Darling	A-Sq	0.385477	Pr > A-Sq >0.2500

Quantiles (Definition 5)

Quantile	Estimate
100% Max	4.605170
99%	4.605170
95%	4.605170
90%	4.605170
75% Q3	3.170409
50% Median	2.062013
25% Q1	0.812852

Quantiles (Definition 5)

Quantile	Estimate
10%	-0.913175
5%	-1.568648
1%	-2.995732
0% Min	-2.995732

Extreme Observations

------Lowest------		-----Highest-----	
Value	Obs	Value	Obs
-2.995732	8	4.60517	20

-1.966113 119 4.60517 29
-1.171183 4 4.60517 95
-1.049822 9 4.60517 102
-0.776529 120 4.60517 117

```
*Looking for missing/missense data in the variable IgEShrimp (Shrimp Specific
IgE) in those children with a diagnosis of food allergy to Shrimp*;
*There are 7 missing data for children with food allergy to shrimp.*;
```


The FREQ Procedure

IgEShrimp

IgEShrimp	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	8.33	1	8.33
0.05	1	8.33	2	16.67
0.86	1	8.33	3	25.00
1.1	1	8.33	4	33.33
1.24	1	8.33	5	41.67
4.82	1	8.33	6	50.00
6.97	1	8.33	7	58.33
10.4	1	8.33	8	66.67
24.4	1	8.33	9	75.00
25	1	8.33	10	83.33
100	2	16.67	12	100.00

Frequency Missing = 7

```
*Looking for normality in the variable IgEShrimp (Shrimp Specific IgE) in
those children with a diagnosis of food allergy to Shrimp*;
*After running the code, *Skewness 1.7, Kurtosis 1.9, so +/- normal
distribution*;
*We will log transform the variable and present the anti-log.
```

The UNIVARIATE Procedure

Variable: IgEShrimp (IgEShrimp)

Moments

N	18	Sum Weights	18
Mean	16.3766667	Sum Observations	294.78
Std Deviation	31.4680798	Variance	990.240047
Skewness	2.39842016	Kurtosis	4.80358264
Uncorrected SS	21661.5946	Corrected SS	16834.0808
Coeff Variation	192.151922	Std Error Mean	7.41709754

Basic Statistical Measures

Location		Variability	
Mean	16.37667	Std Deviation	31.46808
Median	2.89000	Variance	990.24005
Mode	0.00000	Range	100.00000
		Interquartile Range	15.40000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t 2.207962	Pr > |t|	0.0413
Sign	M 6.5	Pr >= |M|	0.0002
Signed Rank	S 45.5	Pr >= |S|	0.0002

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W 0.561009	Pr < W	<0.0001
Kolmogorov-Smirnov	D 0.301385	Pr > D	<0.0100
Cramer-von Mises	W-Sq 0.607354	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq 3.336033	Pr > A-Sq	<0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	100.00
99%	100.00
95%	100.00
90%	100.00

75% Q3	15.40
50% Median	2.89
25% Q1	0.00

Quantiles (Definition 5)

Quantile	Estimate
10%	0.00
5%	0.00
1%	0.00
0% Min	0.00

Extreme Observations

----Lowest----		----Highest----	
Value	Obs	Value	Obs
0	109	15.4	91
0	100	24.4	124
0	89	25.0	122
0	28	100.0	123
0	27	100.0	127

*After log transforming data and running the code. The new Skewness is -0.7, Kurtosis 0.8, which is improved. We will use the log transformed data in analysis, and present the antilog.

The UNIVARIATE Procedure
Variable: LogIgEShrimp

Moments

N	13	Sum Weights	13
Mean	1.76085809	Sum Observations	22.8911552
Std Deviation	2.10593218	Variance	4.43495034
Skewness	-0.7354708	Kurtosis	0.83477967
Uncorrected SS	93.5274799	Corrected SS	53.2194041
Coeff Variation	119.596928	Std Error Mean	0.5840805

Basic Statistical Measures

Location		Variability	
Mean	1.760858	Std Deviation	2.10593
Median	1.941615	Variance	4.43495
Mode	4.605170	Range	7.60090
		Interquartile Range	2.97947

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t 3.014752	Pr > |t|	0.0108
Sign	M 4.5	Pr >= |M|	0.0225
Signed Rank	S 34.5	Pr >= |S|	0.0134

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W 0.945136	Pr < W	0.5267
Kolmogorov-Smirnov	D 0.145449	Pr > D	>0.1500
Cramer-von Mises	W-Sq 0.035771	Pr > W-Sq	>0.2500
Anderson-Darling	A-Sq 0.274324	Pr > A-Sq	>0.2500

Quantiles (Definition 5)

Quantile	Estimate
100% Max	4.605170
99%	4.605170
95%	4.605170
90%	4.605170
75% Q3	3.194583
50% Median	1.941615
25% Q1	0.215111

Quantiles (Definition 5)

Quantile	Estimate
10%	-0.150823
5%	-2.995732
1%	-2.995732

0% Min -2.995732

Extreme Observations

-------Lowest------		-----Highest-----	
Value	Obs	Value	Obs
-2.9957323	4	2.73437	91
-0.1508229	115	3.19458	124
0.0953102	95	3.21888	122
0.2151114	110	4.60517	123
1.5129270	117	4.60517	127

```
*Looking for missing/missense data in the variable IgESoy (Soy Specific IgE)
in those children with a diagnosis of food allergy to Soy*;
*There are 5 missing data for children with food allergy to soy.*;
```

The SAS System 14:54 Saturday, April 7, 2012 41

The FREQ Procedure

IgESoy

IgESoy	Frequency	Cumulative Percent	Cumulative Frequency	Cumulative Percent
0.94	1	20.00	1	20.00
1.19	1	20.00	2	40.00
6.75	1	20.00	3	60.00
10.1	1	20.00	4	80.00
15.8	1	20.00	5	100.00

Frequency Missing = 5

```
*Looking for normality in the variable IgESoy (Soy Specific IgE) in those
children with a diagnosis of food allergy to Soy*;
*After running the code, *Skewness 1.0, Kurtosis -0.3, so normally
distributed*;
```

The SAS System 14:54 Saturday, April 7, 2012 43

The UNIVARIATE Procedure

Variable: IgESoy (IgESoy)

Moments

N	16	Sum Weights	16
Mean	5.985	Sum Observations	95.76
Std Deviation	6.94241937	Variance	48.1971867
Skewness	1.01380963	Kurtosis	-0.2551547
Uncorrected SS	1296.0814	Corrected SS	722.9578
Coeff Variation	115.996982	Std Error Mean	1.73560484

Basic Statistical Measures

Location		Variability	
Mean	5.985000	Std Deviation	6.94242
Median	2.360000	Variance	48.19719
Mode	0.000000	Range	20.30000
		Interquartile Range	9.27000

Tests for Location: Mu0=0

Test	-Statistic-		-----p Value------
Student's t	t	3.448366	Pr > |t| 0.0036
Sign	M	6.5	Pr >= |M| 0.0002
Signed Rank	S	45.5	Pr >= |S| 0.0002

Tests for Normality

Test	--Statistic---		-----p Value------
Shapiro-Wilk	W	0.821854	Pr < W 0.0054
Kolmogorov-Smirnov	D	0.233352	Pr > D 0.0202
Cramer-von Mises	W-Sq	0.184849	Pr > W-Sq 0.0073
Anderson-Darling	A-Sq	1.114632	Pr > A-Sq <0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	20.30
99%	20.30
95%	20.30
90%	18.10
75% Q3	9.77
50% Median	2.36
25% Q1	0.50

Variable: IgESoy (IgESoy)

Quantiles (Definition 5)

Quantile	Estimate
10%	0.00
5%	0.00
1%	0.00
0% Min	0.00

Extreme Observations

----Lowest----		----Highest----	
Value	Obs	Value	Obs
0.0	99	9.44	25
0.0	27	10.10	125
0.0	9	15.80	26
0.3	4	18.10	117
0.7	110	20.30	58

```
*Looking for missing/missense data in the variable IgEWheat (Wheat Specific
IgE) in those children with a diagnosis of food allergy to Wheat*;
*There are 4 missing data for children with food allergy to Wheat.*;
```


The FREQ Procedure

IgEWheat

IgEWheat	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0.37	1	12.50	1	12.50
0.94	1	12.50	2	25.00
1.03	1	12.50	3	37.50
2.49	1	12.50	4	50.00
16.3	1	12.50	5	62.50
19.3	1	12.50	6	75.00
52.2	1	12.50	7	87.50
100	1	12.50	8	100.00

Frequency Missing = 4

```
*Looking for normality in the variable IgEWheat (Wheat Specific IgE) in those
children with a diagnosis of food allergy to Wheat*;
*After running the code, *Skewness 2.9, Kurtosis 8.8, so not normally
distributed*;
* We will log transform to improve the normality.
```

Variable: IgEWheat (IgEWheat)

Moments

N	19	Sum Weights	19
Mean	13.1357895	Sum Observations	249.58
Std Deviation	24.7354438	Variance	611.842181
Skewness	2.8500803	Kurtosis	8.76927178
Uncorrected SS	14291.5896	Corrected SS	11013.1593
Coeff Variation	188.305727	Std Error Mean	5.6747

Basic Statistical Measures

Location		Variability	
Mean	13.13579	Std Deviation	24.73544
Median	2.49000	Variance	611.84218
Mode	0.00000	Range	100.00000

Interquartile Range 18.93000

Tests for Location: Mu0=0

Test	-Statistic-	-----p Value------
Student's t	t 2.314799	Pr > |t| 0.0326
Sign	M 8	Pr >= |M| <.0001
Signed Rank	S 68	Pr >= |S| <.0001

Tests for Normality

Test	--Statistic---	-----p Value------
Shapiro-Wilk	W 0.585055	Pr < W <0.0001
Kolmogorov-Smirnov	D 0.297692	Pr > D <0.0100
Cramer-von Mises	W-Sq 0.557126	Pr > W-Sq <0.0050
Anderson-Darling	A-Sq 2.979067	Pr > A-Sq <0.0050

Quantiles (Definition 5)

Quantile	Estimate
100% Max	100.00
99%	100.00
95%	100.00
90%	52.20
75% Q3	19.30
50% Median	2.49
25% Q1	0.37

Variable: IgEWheat (IgEWheat)

Quantiles (Definition 5)

Quantile	Estimate
10%	0.00
5%	0.00
1%	0.00
0% Min	0.00

Extreme Observations

----Lowest----		----Highest----	
Value	Obs	Value	Obs
0.00	116	19.3	125
0.00	99	20.4	58
0.00	27	20.9	25
0.23	4	52.2	90
0.37	103	100.0	126

*After log transforming data and running the code. The new Skewness is 0.8, Kurtosis -1.1, which is improved. We will use the log transformed data in analysis, and present the antilog.

The UNIVARIATE Procedure

Variable: LogIgEWheat

Moments

N	16	Sum Weights	16
Mean	1.43324803	Sum Observations	22.9319684
Std Deviation	1.8290189	Variance	3.34531015
Skewness	0.07544846	Kurtosis	-1.0183463
Uncorrected SS	83.0468507	Corrected SS	50.1796522
Coeff Variation	127.613565	Std Error Mean	0.45725473

Basic Statistical Measures

Location		Variability	
Mean	1.433248	Std Deviation	1.82902
Median	1.110471	Variance	3.34531
Mode	.	Range	6.07485
		Interquartile Range	3.00398

Tests for Location: Mu0=0

Test	-Statistic-	-----p Value------
Student's t	t 3.134463	Pr > |t| 0.0068
Sign	M 4	Pr >= |M| 0.0768
Signed Rank	S 47	Pr >= |S| 0.0131

Tests for Normality

Test	--Statistic---		-----p Value------	
Shapiro-Wilk	W	0.960786	Pr < W	0.6761
Kolmogorov-Smirnov	D	0.146086	Pr > D	>0.1500
Cramer-von Mises	W-Sq	0.043721	Pr > W-Sq	>0.2500
Anderson-Darling	A-Sq	0.267672	Pr > A-Sq	>0.2500

Quantiles (Definition 5)

Quantile	Estimate
100% Max	4.6051702
99%	4.6051702
95%	4.6051702
90%	3.9550825
75% Q3	2.9878200
50% Median	1.1104706
25% Q1	-0.0161583

Variable: LogIgEWheat

Quantiles (Definition 5)

Quantile	Estimate
10%	-0.9942523
5%	-1.4696760
1%	-1.4696760
0% Min	-1.4696760

Extreme Observations

-------Lowest------		-----Highest-----	
Value	Obs	Value	Obs
-1.4696760	4	2.96011	125
-0.9942523	103	3.01553	58
-0.7765288	9	3.03975	25
-0.0618754	91	3.95508	90
0.0295588	108	4.60517	126

```
*Looking for missing/missense data in the variable Disease*;
*After running code there was no missing or missense data noted.  See below;
```


The FREQ Procedure

Disease

Disease	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No Disease	59	45.04	59	45.04
Possible Food Allergy	27	20.61	86	65.65
Food Allergy	45	34.35	131	100.00

```
*Looking for missing/missense data in the variable Exposure*;
*After running code there was no missing or missense data noted.  See below;
```


The FREQ Procedure

Exposure

Exposure	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Never treated with antacid medications	77	58.78	77	58.78
Treated with antacid medications	54	41.22	131	100.00

```
*Looking for missing/missense data in the variable Gender*;
*After running code there was no missing or missense data noted.  See below;
```

The SAS System

The FREQ Procedure

Gender

Gender	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Female	39	29.77	39	29.77
Male	92	70.23	131	100.00

```
*Looking for missing/missense data in the variable DxAD*;
*After running code there were 11 missing or missense data noted (4 responses
of unknown and 7 missing). See below.;
```

The SAS System

The FREQ Procedure

DxAD

DxAD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No history of Atopic Dermatitis	34	27.42	34	27.42
History of Atopic Dermatitis	86	69.35	120	96.77
2	4	3.23	124	100.00

Frequency Missing = 7

```
*We created a variable DxADClean that codes all missing or nonsense data as
missing, and use this in further analysis (see below).;
```

The SAS System

The FREQ Procedure

DxADClean	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No history of Atopic Dermatitis	34	28.33	34	28.33
History of Atopic Dermatitis	86	71.67	120	100.00

Frequency Missing = 11

```
*Looking for missing/missense data in the variable DxAsthma*;
*After running code there were 8 missing or missense data noted (5 unknown and
3 missing).  See below.
```

The SAS System

The FREQ Procedure

DxAsthma

DxAsthma	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No history of asthma	37	28.91	37	28.91
History of asthma	86	67.19	123	96.09
2	5	3.91	128	100.00

```
*We created a variable DxAsthmaClean that codes all missing or nonsense data
as missing, and use this in further analysis (see below).;
```

The SAS System

The FREQ Procedure

DxAsthmaClean	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No history of asthma	37	30.08	37	30.08
History of asthma	86	69.92	123	100.00

Frequency Missing = 8

```
*Looking for missing/missense data in the variable DxAR*;
*After running code there were 23 missing or missense data noted (9 unknown
and 14 missing).  See below.
```

The SAS System

The FREQ Procedure

DxAR

DxAR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No history of allergic rhinitis	54	46.15	54	46.15
History of allergic rhinitis	54	46.15	108	92.31
2	9	7.69	117	100.00

Frequency Missing = 14

```
*We created a variable DxARClean that codes all missing or nonsense data as
missing, and use this in further analysis (see below).;
```

The FREQ Procedure

DxARClean	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No history of allergic rhinitis	54	50.00	54	50.00
History of allergic rhinitis	54	50.00	108	100.00

Frequency Missing = 23

```
*Looking for missing/missense data in the variable FA_Severe_*;
*After running code there were 8 missing or missense data noted (0 unknown and
8 missing).  See below.
```


The FREQ Procedure

FA Severe?

FA_Severe_	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Parents do not consider the food allergy to be severe	19	29.69	19	29.69
Parents consider the food allergy to be severe	45	70.31	64	100.00

Frequency Missing = 8

```
*We created a variable FA_Severe_Clean that codes all missing or nonsense data
as missing, and use this in further analysis (see below).;
```


The FREQ Procedure

FA_Severe_Clean	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Parents do not consider the food allergy to be severe	19	29.69	19	29.69
Parents consider the food allergy to be severe	45	70.31	64	100.00

Frequency Missing = 8

```
*Looking for missing/missense data in the variable LTR_Food.*;
*After running code there were 1 missing or missense data noted (0 unknown and
1 missing).  See below.
```

The SAS System

The FREQ Procedure

LTR food

LTR_food	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No report of life threatening reactions to food	42	59.15	42	59.15
Report of life threatening reactions to food	29	40.85	71	100.00

Frequency Missing = 1

```
*We created a variable LTR_FoodClean that codes all missing or nonsense data
as missing, and use this in further analysis (see below).;
```

The SAS System

The FREQ Procedure

LTR_FoodClean	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No report of life threatening reactions to food	42	59.15	42	59.15
Report of life threatening reactions to food	29	40.85	71	100.00

Frequency Missing = 1

```
*Univariate analysis of association of exposure and disease unadjusted model.
*We will use the Prevalence Ratio to look for significance.*;
* Mantel-Haenszel Chi-Square 0.0107
* So there is a significant association between exposure and disease.*;
```

The SAS System

The FREQ Procedure

Table of ExposureFinal by Disease

Frequency Percent Row Pct Col Pct	Disease(Disease)			
ExposureFinal	Food Allergy	No Disease	Possible Food Allergy	Total

Had taken antacid medication	27	20	7	54
	20.61	15.27	5.34	41.22
	50.00	37.04	12.96	
	60.00	33.90	25.93	
Never took antacid medication	18	39	20	77
	13.74	29.77	15.27	58.78
	23.38	50.65	25.97	
	40.00	66.10	74.07	
Total	45	59	27	131
	34.35	45.04	20.61	100.00

Statistics for Table of ExposureFinal by Disease

Statistic	DF	Value	Prob
Chi-Square	2	10.4622	0.0053
Likelihood Ratio Chi-Square	2	10.5089	0.0052
Mantel-Haenszel Chi-Square	1	6.5169	0.0107
Phi Coefficient		0.2826	
Contingency Coefficient		0.2720	
Cramer's V		0.2826	

Statistic	Value	ASE
Gamma	0.4484	0.1273
Kendall's Tau-b	0.2589	0.0789
Stuart's Tau-c	0.2876	0.0882
Somers' D C|R	0.2968	0.0905
Somers' D R|C	0.2259	0.0690
Pearson Correlation	-0.2239	0.0863
Spearman Correlation	0.2729	0.0832
Lambda Asymmetric C|R	0.0972	0.0905

Statistic	Value	ASE
Lambda Asymmetric R|C	0.1667	0.1134
Lambda Symmetric	0.1270	0.0910
Uncertainty Coefficient C|R	0.0381	0.0231
Uncertainty Coefficient R|C	0.0592	0.0358
Uncertainty Coefficient Symmetric	0.0464	0.0281

Sample Size = 131

Summary Statistics for ExposureFinal by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	6.5169	0.0107
2	Row Mean Scores Differ	1	6.5169	0.0107
3	General Association	2	10.3824	0.0056

Total Sample Size = 131

```
*Because Disease is a 3 level variable it is unclear where the association
lies (ie between those with food allergy, possible food allergy and/or no food
allergy).*;
*We will now determine where the association is.*;
*There is an association between those with food allergy and no food allergy
and antacid medication.*;
*Mantel-Haenszel Chi Square 0.5/Prevalence Ratio 1.8 (1.2, 2.9)
```

The SAS System

The FREQ Procedure

Table of ExposureFinal by Disease

ExposureFinal	Disease(Disease)		
	No Disease	Food Allergy	Total
Had taken antacid medication	20	27	47
	19.23	25.96	45.19
	42.55	57.45	
	33.90	60.00	

Frequency
Percent
Row Pct
Col Pct

Never took antacid medication	39	18	57
	37.50	17.31	54.81
	68.42	31.58	
	66.10	40.00	
Total	59	45	104
	56.73	43.27	100.00

Statistics for Table of ExposureFinal by Disease

Statistic	DF	Value	Prob
Chi-Square	1	7.0220	0.0081
Likelihood Ratio Chi-Square	1	7.0782	0.0078
Continuity Adj. Chi-Square	1	6.0078	0.0142
Mantel-Haenszel Chi-Square	1	6.9545	0.0084
Phi Coefficient		-0.2598	
Contingency Coefficient		0.2515	
Cramer's V		-0.2598	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	20
Left-sided Pr <= F	0.0070
Right-sided Pr >= F	0.9979
Table Probability (P)	0.0049
Two-sided Pr <= P	0.0101

Statistic	Value	ASE
Gamma	-0.4904	0.1558
Kendall's Tau-b	-0.2598	0.0951
Stuart's Tau-c	-0.2563	0.0941
Somers' D C|R	-0.2587	0.0948
Somers' D R|C	-0.2610	0.0956

Statistic	Value	ASE
Pearson Correlation	-0.2598	0.0951
Spearman Correlation	-0.2598	0.0951
Lambda Asymmetric C|R	0.1556	0.1400
Lambda Asymmetric R|C	0.1915	0.1283
Lambda Symmetric	0.1739	0.1220
Uncertainty Coefficient C|R	0.0497	0.0368
Uncertainty Coefficient R|C	0.0494	0.0366
Uncertainty Coefficient Symmetric	0.0496	0.0367

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**0.3419**	0.1530	0.7638
Cohort (Col1 Risk)	**0.6219**	0.4270	0.9059
Cohort (Col2 Risk)	**1.8191**	1.1547	2.8658

Sample Size = 104

Summary Statistics for ExposureFinal by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	6.9545	0.0084
2	**Row Mean Scores Differ**	1	6.9545	0.0084
3	**General Association**	1	6.9545	0.0084

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	0.3419	0.1530	0.7638
(Odds Ratio)	**Logit**	0.3419	0.1530	0.7638
Cohort	**Mantel-Haenszel**	0.6219	0.4270	0.9059
(Col1 Risk)	**Logit**	0.6219	0.4270	0.9059

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Cohort	**Mantel-Haenszel**	1.8191	1.1547	2.8658
(Col2 Risk)	**Logit**	1.8191	1.1547	2.8658

Total Sample Size = 104

```
*There is no association between those with no food allergy and possible food
allergy and antacid medication.*;
*Mantel-Haenszel Chi Square 0.5/Prevalence Ratio 0.8 (0.4, 1.6)
```

The SAS System

The FREQ Procedure

Frequency
Percent
Row Pct
Col Pct

Table of ExposureFinal by Disease1

ExposureFinal	Disease1(Disease1)		
	Possible Food Allergy	**No Food Allergy**	**Total**
Had taken antacid medication	7	20	27
	8.14	23.26	31.40
	25.93	74.07	
	25.93	33.90	
Never took antacid medication	20	39	59
	23.26	45.35	68.60
	33.90	66.10	
	74.07	66.10	
Total	27	59	86
	31.40	68.60	100.00

Frequency Missing = 45

Statistics for Table of ExposureFinal by Disease1

Statistic	DF	Value	Prob
Chi-Square	1	0.5466	0.4597

Statistic	DF	Value	Prob
Likelihood Ratio Chi-Square	1	0.5576	0.4552
Continuity Adj. Chi-Square	1	0.2391	0.6248
Mantel-Haenszel Chi-Square	1	0.5403	0.4623
Phi Coefficient		-0.0797	
Contingency Coefficient		0.0795	
Cramer's V		-0.0797	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	7
Left-sided Pr <= F	0.3160
Right-sided Pr >= F	0.8387
Table Probability (P)	0.1547
Two-sided Pr <= P	0.6175

Statistic	Value	ASE
Gamma	-0.1887	0.2499
Kendall's Tau-b	-0.0797	0.1043
Stuart's Tau-c	-0.0687	0.0902
Somers' D C|R	-0.0797	0.1045
Somers' D R|C	-0.0797	0.1045
Pearson Correlation	-0.0797	0.1043
Spearman Correlation	-0.0797	0.1043
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0052	0.0138
Uncertainty Coefficient R|C	0.0052	0.0138
Uncertainty Coefficient Symmetric	0.0052	0.0138

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	0.6825	0.2472	1.8844
Cohort (Col1 Risk)	0.7648	0.3684	1.5877
Cohort (Col2 Risk)	1.1206	0.8398	1.4952

Effective Sample Size = 86
Frequency Missing = 45

WARNING: 34% of the data are missing.

Summary Statistics for ExposureFinal by Disease1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.5403	0.4623
2	Row Mean Scores Differ	1	0.5403	0.4623
3	General Association	1	0.5403	0.4623

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	0.6825	0.2472	1.8844
(Odds Ratio)	Logit	0.6825	0.2472	1.8844
Cohort	Mantel-Haenszel	0.7648	0.3684	1.5877
(Col1 Risk)	Logit	0.7648	0.3684	1.5877
Cohort	Mantel-Haenszel	1.1206	0.8398	1.4952
(Col2 Risk)	Logit	1.1206	0.8398	1.4952

Effective Sample Size = 86
Frequency Missing = 45

WARNING: 34% of the data are missing.

Total Sample Size = 86

```
*There is an association between those with food allergy and possible food
allergy and antacid medication.*;
*Mantel-Haenszel Chi Square 0.005/Prevalence Ratio 1.7 (1.2, 2.4).* See
below.*;
```

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of ExposureFinal by Disease Disease(Disease)		
ExposureFinal	**Food Allergy**	**Possible Food Allergy**	**Total**
Had taken antacid medication	27	7	34
	37.50	9.72	47.22
	79.41	20.59	
	60.00	25.93	
Never took antacid medication	18	20	38
	25.00	27.78	52.78
	47.37	52.63	
	40.00	74.07	
Total	45	27	72
	62.50	37.50	100.00

Statistics for Table of ExposureFinal by Disease

Statistic	DF	Value	Prob
Chi-Square	1	7.8613	0.0051
Likelihood Ratio Chi-Square	1	8.1166	0.0044
Continuity Adj. Chi-Square	1	6.5536	0.0105
Mantel-Haenszel Chi-Square	1	7.7521	0.0054
Phi Coefficient		0.3304	
Contingency Coefficient		0.3137	
Cramer's V		0.3304	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	27
Left-sided Pr <= F	0.9990
Right-sided Pr >= F	0.0048
Table Probability (P)	0.0038
Two-sided Pr <= P	0.0072

Statistic	Value	ASE
Gamma	0.6216	0.1639
Kendall's Tau-b	0.3304	0.1085
Stuart's Tau-c	0.3194	0.1064
Somers' D C|R	0.3204	0.1066
Somers' D R|C	0.3407	0.1116
Pearson Correlation	-0.3304	0.1085
Spearman Correlation	0.3304	0.1085
Lambda Asymmetric C|R	0.0741	0.2197
Lambda Asymmetric R|C	0.2647	0.1692
Lambda Symmetric	0.1803	0.1676
Uncertainty Coefficient C|R	0.0852	0.0573
Uncertainty Coefficient R|C	0.0815	0.0550
Uncertainty Coefficient Symmetric	0.0833	0.0561

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**4.2857**	1.5040	12.2123
Cohort (Col1 Risk)	**1.6765**	1.1507	2.4425
Cohort (Col2 Risk)	**0.3912**	0.1893	0.8083

Sample Size = 72

Summary Statistics for ExposureFinal by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	7.7521	0.0054
2	Row Mean Scores Differ	1	7.7521	0.0054
3	General Association	1	7.7521	0.0054

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	4.2857	1.5040	12.2123
(Odds Ratio)	Logit	4.2857	1.5040	12.2123
Cohort	Mantel-Haenszel	1.6765	1.1507	2.4425
(Col1 Risk)	Logit	1.6765	1.1507	2.4425
Cohort	Mantel-Haenszel	0.3912	0.1893	0.8083
(Col2 Risk)	Logit	0.3912	0.1893	0.8083

Total Sample Size = 72

```
*In the following section we will determine if there is any additional
differences between the disease groups: food allergy, possible food allergy,
and no food allergy.*;
*We will start with the continuous variables. Beginning with Age.*;
* There is a significant difference between those with food allergy and those
with no food allergy (p = 0.03). *;
* There is no significant difference between those with food allergy and
possible food allergy (p  = 0.2).*;
* There is no significant difference between those with no food allergy and
possible food allergy (p = 0.7).*;
```

The SAS System

The TTEST Procedure
Variable: Age (Age)

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	59	7.7232	4.4089	0.5740	0.4200	18.0000
2	45	5.8989	3.8953	0.5807	1.0000	16.8300
Diff (1-2)		1.8243	4.1951	0.8303		

Disease	Method	Mean	95% CL Mean	Std Dev	95% CL Std Dev

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		7.7232	6.5742	8.8722	4.4089	3.7323	5.3875
2		5.8989	4.7286	7.0692	3.8953	3.2247	4.9205
Diff (1-2)	Pooled	1.8243	0.1775	3.4712	4.1951	3.6899	4.8617
Diff (1-2)	Satterthwaite	1.8243	0.2044	3.4443			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	102	2.20	0.0303
Satterthwaite	Unequal	99.748	2.23	0.0277

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	58	44	1.28	0.3937

The TTEST Procedure
Variable: Age (Age)

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	27	7.2648	4.6395	0.8929	1.7900	17.0000
2	45	5.8989	3.8953	0.5807	1.0000	16.8300
Diff (1-2)		1.3659	4.1872	1.0193		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		7.2648	5.4295	9.1001	4.6395	3.6537	6.3581
2		5.8989	4.7286	7.0692	3.8953	3.2247	4.9205
Diff (1-2)	Pooled	1.3659	-0.6670	3.3988	4.1872	3.5938	5.0171
Diff (1-2)	Satterthwaite	1.3659	-0.7760	3.5079			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	70	1.34	0.1846
Satterthwaite	Unequal	47.611	1.28	0.2059

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	26	44	1.42	0.3007

The SAS System

The TTEST Procedure
Variable: Age (Age)

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	59	7.7232	4.4089	0.5740	0.4200	18.0000
1	27	7.2648	4.6395	0.8929	1.7900	17.0000
Diff (1-2)		0.4584	4.4816	1.0413		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		7.7232	6.5742	8.8722	4.4089	3.7323	5.3875
1		7.2648	5.4295	9.1001	4.6395	3.6537	6.3581
Diff (1-2)	**Pooled**	0.4584	-1.6123	2.5291	4.4816	3.8943	5.2790
Diff (1-2)	**Satterthwaite**	0.4584	-1.6755	2.5923			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	84	0.44	0.6609
Satterthwaite	Unequal	48.237	0.43	0.6678

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	26	58	1.11	0.7278

```
* There is no significant difference between those with food allergy and
possible food allergy (p  = 0.2) for the variable AgeFAYrLog.*;
* I did not run this analysis for those with no food allergy.*;
```

The SAS System

The TTEST Procedure
Variable: AgeFAYRLog

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	26	0.7057	1.1552	0.2266	-1.7720	2.7726

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
2	45	0.3815	0.8815	0.1314	-1.7720	2.1972
Diff (1-2)		0.3242	0.9895	0.2437		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		0.7057	0.2391	1.1723	1.1552	0.9060	1.5946
2		0.3815	0.1166	0.6463	0.8815	0.7298	1.1135
Diff (1-2)	**Pooled**	0.3242	-0.1620	0.8105	0.9895	0.8484	1.1873
Diff (1-2)	**Satterthwaite**	0.3242	-0.2043	0.8528			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	69	1.33	0.1878
Satterthwaite	Unequal	41.954	1.24	0.2226

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	25	44	1.72	0.1148

```
* There is no significant difference between those with food allergy and
possible food allergy (p = 0.7) for the variable LengthFAYrLog.*;
* I did not run this analysis for those with no food allergy.*;
```


The TTEST Procedure
Variable: LengthFAYr (LengthFAYr)

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	23	3.7974	2.9609	0.6174	0.5000	10.0000
2	43	4.1712	3.7090	0.5656	0.1300	15.3000
Diff (1-2)		-0.3738	3.4701	0.8964		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		3.7974	2.5170	5.0778	2.9609	2.2900	4.1908
2		4.1712	3.0297	5.3126	3.7090	3.0582	4.7142
Diff (1-2)	**Pooled**	-0.3738	-2.1646	1.4170	3.4701	2.9592	4.1958

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev
Diff (1-2)	Satterthwaite	-0.3738	-2.0522	1.3047		

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	64	-0.42	0.6781
Satterthwaite	Unequal	54.366	-0.45	0.6571

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	42	22	1.57	0.2585

```
* There is no significant difference between those with food allergy and
possible food allergy (p = 0.8) for the variable LogIgE.*;
* I did not run this analysis for those with no food allergy.*;
```

The SAS System

The TTEST Procedure
Variable: LogIgE

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	19	5.4517	2.2688	0.5205	0	8.6145
2	37	5.3371	1.4681	0.2414	2.3979	8.3457
Diff (1-2)		0.1146	1.7756	0.5011		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		5.4517	4.3582	6.5452	2.2688	1.7143	3.3551
2		5.3371	4.8476	5.8266	1.4681	1.1939	1.9071
Diff (1-2)	Pooled	0.1146	-0.8901	1.1193	1.7756	1.4948	2.1872
Diff (1-2)	Satterthwaite	0.1146	-1.0648	1.2940			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	54	0.23	0.8200
Satterthwaite	Unequal	25.973	0.20	0.8432

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	18	36	2.39	0.0257

```
* There is no significant difference between those with food allergy and
possible food allergy (p = 0.8) for the variable LogIgEEgg.*;
* I did not run this analysis for those with no food allergy.*;
```

The SAS System

The TTEST Procedure
Variable: LogIgEEgg

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	11	1.2050	2.1961	0.6622	-2.5257	4.0073
2	17	1.0471	1.9900	0.4826	-2.9957	4.0200
Diff (1-2)		0.1579	2.0717	0.8017		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		1.2050	-0.2704	2.6804	2.1961	1.5345	3.8541
2		1.0471	0.0240	2.0703	1.9900	1.4821	3.0286
Diff (1-2)	**Pooled**	0.1579	-1.4899	1.8057	2.0717	1.6315	2.8391
Diff (1-2)	**Satterthwaite**	0.1579	-1.5517	1.8675			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	26	0.20	0.8454
Satterthwaite	Unequal	19.932	0.19	0.8492

```
* There is no significant difference between those with food allergy and
possible food allergy (p = 0.7) for the variable LogIgEMilk.*;
* I did not run this analysis for those with no food allergy.*;
```

The SAS System

The TTEST Procedure
Variable: LogIgEMilk

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	6	2.6148	2.0850	0.8512	-0.5276	4.6052
2	16	1.2887	2.5331	0.6333	-2.9957	4.6052

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
Diff (1-2)		1.3261	2.4289	1.1627		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		2.6148	0.4267	4.8029	2.0850	1.3015	5.1137
2		1.2887	-0.0611	2.6385	2.5331	1.8712	3.9205
Diff (1-2)	Pooled	1.3261	-1.0993	3.7515	2.4289	1.8582	3.5075
Diff (1-2)	Satterthwaite	1.3261	-1.0103	3.6626			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	20	1.14	0.2675
Satterthwaite	Unequal	10.949	1.25	0.2374

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	15	5	1.48	0.7057

```
* There is no significant difference between those with food allergy and
possible food allergy (p = 0.7) for the variable LogIgEPeanut.*;
* I did not run this analysis for those with no food allergy.*;
```

The SAS System

The TTEST Procedure
Variable: LogIgEPeanut

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	15	2.2395	2.0209	0.5218	-1.9661	4.6052
2	25	1.6023	1.8649	0.3730	-2.9957	4.6052
Diff (1-2)		0.6372	1.9239	0.6283		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		2.2395	1.1203	3.3587	2.0209	1.4796	3.1872
2		1.6023	0.8325	2.3721	1.8649	1.4562	2.5944
Diff (1-2)	Pooled	0.6372	-0.6348	1.9092	1.9239	1.5723	2.4794

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
Diff (1-2)	Satterthwaite	0.6372	-0.6772	1.9516			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	38	1.01	0.3169
Satterthwaite	Unequal	27.737	0.99	0.3291

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	14	24	1.17	0.7057

```
* There is no significant difference between those with food allergy and
possible food allergy (p = 0.4) for the variable LogIgEShrimp.*;
* I did not run this analysis for those with no food allergy.*;
```


The TTEST Procedure
Variable: LogIgEShrimp

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	6	2.3256	1.6798	0.6858	-0.1508	4.6052
2	7	1.2768	2.4344	0.9201	-2.9957	4.6052
Diff (1-2)		1.0488	2.1249	1.1822		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		2.3256	0.5627	4.0885	1.6798	1.0486	4.1200
2		1.2768	-0.9746	3.5282	2.4344	1.5687	5.3606
Diff (1-2)	Pooled	1.0488	-1.5532	3.6507	2.1249	1.5052	3.6078
Diff (1-2)	Satterthwaite	1.0488	-1.4888	3.5864			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	11	0.89	0.3940
Satterthwaite	Unequal	10.595	0.91	0.3811

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	6	5	2.10	0.4329

```
* There is no significant difference between those with food allergy and
possible food allergy (p = 0.08) for the variable LogIgESoy.*;
* I did not run this analysis for those with no food allergy.*;
```

The SAS System

The TTEST Procedure
Variable: IgESoy (IgESoy)

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	7	7.9257	6.9979	2.6449	0	18.1000
2	8	2.4975	3.7901	1.3400	0	10.1000
Diff (1-2)		5.4282	5.5078	2.8506		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		7.9257	1.4538	14.3977	6.9979	4.5094	15.4098
2		2.4975	-0.6711	5.6661	3.7901	2.5059	7.7138
Diff (1-2)	Pooled	5.4282	-0.7301	11.5865	5.5078	3.9929	8.8734
Diff (1-2)	Satterthwaite	5.4282	-1.2827	12.1391			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	13	1.90	0.0792
Satterthwaite	Unequal	8.9688	1.83	0.1005

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	6	7	3.41	0.1336

```
* There is no significant difference between those with food allergy and
possible food allergy (p = 0.08) for the variable LogIgEWheat.*;
* I did not run this analysis for those with no food allergy.*;
```

The SAS System

The TTEST Procedure
Variable: LogIgEWheat

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum

Disease	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	6	2.3468	1.4335	0.5852	0.8329	4.6052
2	9	0.6484	1.8320	0.6107	-1.4697	3.9551
Diff (1-2)		1.6984	1.6899	0.8907		

Disease	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		2.3468	0.8424	3.8512	1.4335	0.8948	3.5158
2		0.6484	-0.7598	2.0566	1.8320	1.2374	3.5097
Diff (1-2)	Pooled	1.6984	-0.2257	3.6225	1.6899	1.2251	2.7225
Diff (1-2)	Satterthwaite	1.6984	-0.1358	3.5326			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	13	1.91	0.0789
Satterthwaite	Unequal	12.531	2.01	0.0667

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	8	5	1.63	0.6108

```
* In this next section we will look for differences in dichotomous data
between those with food allergy, possible food allergy, and no food allergy.*;
* We will begin with the variable, Gender*;
* There was no association between those with no food allergy and possible
food allergy M-H Chi Square 0.8, PR 0.8 (0.4, 1.9).*;
* There was no association between those with food allergy and no food allergy
M-H Chi Square 0.6, PR 1.1 (0.7, 1.8)
* There was no association between those with food allergy and possible food
allergy.  M-H Chi Square 0.5, PR 1.1 (0.8, 1.6).*;
* So, overall no difference in gender for any of the disease categories.*;
```

The FREQ Procedure

Frequency
Percent
Row Pct
Col Pct

Table of Gender by Disease1

Gender(Gender)	Disease1(Disease1)		
	Possible Food Allergy	No Food Allergy	Total
Female	7	17	24
	8.14	19.77	27.91

	29.17	70.83	
	25.93	28.81	
Male	20	42	62
	23.26	48.84	72.09
	32.26	67.74	
	74.07	71.19	
Total	27	59	86
	31.40	68.60	100.00

Frequency Missing = 45

Statistics for Table of Gender by Disease1

Statistic	DF	Value	Prob
Chi-Square	1	0.0768	0.7817
Likelihood Ratio Chi-Square	1	0.0774	0.7808
Continuity Adj. Chi-Square	1	0.0003	0.9856
Mantel-Haenszel Chi-Square	1	0.0759	0.7830
Phi Coefficient		-0.0299	
Contingency Coefficient		0.0299	
Cramer's V		-0.0299	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	7
Left-sided Pr <= F	0.4986
Right-sided Pr >= F	0.7000
Table Probability (P)	0.1986
Two-sided Pr <= P	1.0000

Statistic	Value	ASE
Gamma	-0.0726	0.2611

Statistic	Value	ASE
Kendall's Tau-b	-0.0299	0.1064
Stuart's Tau-c	-0.0249	0.0887
Somers' D C|R	-0.0309	0.1101
Somers' D R|C	-0.0289	0.1029
Pearson Correlation	-0.0299	0.1064
Spearman Correlation	-0.0299	0.1064
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0007	0.0052
Uncertainty Coefficient R|C	0.0008	0.0054
Uncertainty Coefficient Symmetric	0.0007	0.0053

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**0.8647**	0.3091	2.4190
Cohort (Col1 Risk)	**0.9042**	0.4400	1.8581
Cohort (Col2 Risk)	**1.0456**	0.7678	1.4241

Effective Sample Size = 86
Frequency Missing = 45
WARNING: 34% of the data are missing.

Summary Statistics for Gender by Disease1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	0.0759	0.7830
2	**Row Mean Scores Differ**	1	0.0759	0.7830
3	**General Association**	1	0.0759	0.7830

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	0.8647	0.3091	2.4190
(Odds Ratio)	**Logit**	0.8647	0.3091	2.4190
Cohort	**Mantel-Haenszel**	0.9042	0.4400	1.8581
(Col1 Risk)	**Logit**	0.9042	0.4400	1.8581
Cohort	**Mantel-Haenszel**	1.0456	0.7678	1.4241
(Col2 Risk)	**Logit**	1.0456	0.7678	1.4241

Effective Sample Size = 86
Frequency Missing = 45
WARNING: 34% of the data are missing.

The SAS System

The FREQ Procedure

Frequency **Percent** **Row Pct** **Col Pct**	**Table of Gender by Disease**		
Gender(Gender)	**Disease(Disease)**		
	Food Allergy	**No Disease**	**Total**
Female	15	17	32
	14.42	16.35	30.77
	46.88	53.13	
	33.33	28.81	
Male	30	42	72
	28.85	40.38	69.23
	41.67	58.33	
	66.67	71.19	
Total	45	59	104
	43.27	56.73	100.00

Statistics for Table of Gender by Disease

Statistic	**DF**	**Value**	**Prob**

Statistic	DF	Value	Prob
Chi-Square	1	0.2448	0.6207
Likelihood Ratio Chi-Square	1	0.2441	0.6213
Continuity Adj. Chi-Square	1	0.0786	0.7792
Mantel-Haenszel Chi-Square	1	0.2425	0.6224
Phi Coefficient		0.0485	
Contingency Coefficient		0.0485	
Cramer's V		0.0485	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	15
Left-sided Pr <= F	0.7613
Right-sided Pr >= F	0.3884
Table Probability (P)	0.1497
Two-sided Pr <= P	0.6714

Statistic	Value	ASE
Gamma	0.1053	0.2113
Kendall's Tau-b	0.0485	0.0984
Stuart's Tau-c	0.0444	0.0901
Somers' D C|R	0.0521	0.1056
Somers' D R|C	0.0452	0.0917
Pearson Correlation	-0.0485	0.0984
Spearman Correlation	0.0485	0.0984
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0017	0.0070
Uncertainty Coefficient R|C	0.0019	0.0077
Uncertainty Coefficient Symmetric	0.0018	0.0073

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**1.2353**	0.5346	2.8545
Cohort (Col1 Risk)	**1.1250**	0.7109	1.7804
Cohort (Col2 Risk)	**0.9107**	0.6231	1.3311

Sample Size = 104

Summary Statistics for Gender by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	0.2425	0.6224
2	**Row Mean Scores Differ**	1	0.2425	0.6224
3	**General Association**	1	0.2425	0.6224

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	1.2353	0.5346	2.8545
(Odds Ratio)	**Logit**	1.2353	0.5346	2.8545
Cohort	**Mantel-Haenszel**	1.1250	0.7109	1.7804
(Col1 Risk)	**Logit**	1.1250	0.7109	1.7804
Cohort	**Mantel-Haenszel**	0.9107	0.6231	1.3311
(Col2 Risk)	**Logit**	0.9107	0.6231	1.3311

Total Sample Size = 104

The SAS System

The FREQ Procedure

Frequency **Percent** **Row Pct**	**Table of Gender by Disease**		
Gender(Gender)	**Disease(Disease)**		
	Food Allergy	**Possible Food Allergy**	**Total**

Col Pct	**Female**	15	7	22
		20.83	9.72	30.56
		68.18	31.82	
		33.33	25.93	
	Male	30	20	50
		41.67	27.78	69.44
		60.00	40.00	
		66.67	74.07	
	Total	45	27	72
		62.50	37.50	100.00

Statistics for Table of Gender by Disease

Statistic	DF	Value	Prob
Chi-Square	1	0.4364	0.5089
Likelihood Ratio Chi-Square	1	0.4423	0.5060
Continuity Adj. Chi-Square	1	0.1571	0.6918
Mantel-Haenszel Chi-Square	1	0.4303	0.5118
Phi Coefficient		0.0778	
Contingency Coefficient		0.0776	
Cramer's V		0.0778	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	15
Left-sided Pr <= F	0.8220
Right-sided Pr >= F	0.3490
Table Probability (P)	0.1710
Two-sided Pr <= P	0.6022

Statistic	Value	ASE

Statistic	Value	ASE
Gamma	0.1765	0.2622
Kendall's Tau-b	0.0778	0.1152
Stuart's Tau-c	0.0694	0.1030
Somers' D C|R	0.0818	0.1211
Somers' D R|C	0.0741	0.1098
Pearson Correlation	-0.0778	0.1152
Spearman Correlation	0.0778	0.1152
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0046	0.0138
Uncertainty Coefficient R|C	0.0050	0.0149
Uncertainty Coefficient Symmetric	0.0048	0.0143

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**1.4286**	0.4946	4.1261
Cohort (Col1 Risk)	**1.1364**	0.7894	1.6358
Cohort (Col2 Risk)	**0.7955**	0.3952	1.6012

Sample Size = 72

Summary Statistics for Gender by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	0.4303	0.5118
2	**Row Mean Scores Differ**	1	0.4303	0.5118
3	**General Association**	1	0.4303	0.5118

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	1.4286	0.4946	4.1261
(Odds Ratio)	Logit	1.4286	0.4946	4.1261
Cohort	Mantel-Haenszel	1.1364	0.7894	1.6358
(Col1 Risk)	Logit	1.1364	0.7894	1.6358
Cohort	Mantel-Haenszel	0.7955	0.3952	1.6012
(Col2 Risk)	Logit	0.7955	0.3952	1.6012

Total Sample Size = 72

```
* We next look at the variable, FamHxAtopy.*;
* There was no difference in the variable FamHxAtopy.*;
```

The FREQ Procedure

Table of FamHxAtopy by Disease

Frequency Percent Row Pct Col Pct	FamHxAtopy(FamHxAtopy) / Disease(Disease)			
	Food Allergy	No Disease	Possible Food Allergy	Total
No	5	14	0	19
	4.95	13.86	0.00	18.81
	26.32	73.68	0.00	
	11.63	24.14	.	
Yes	38	44	0	82
	37.62	43.56	0.00	81.19
	46.34	53.66	0.00	
	88.37	75.86	.	
Total	43	58	0	101
	42.57	57.43	0.00	100.00

Frequency Missing = 30

Statistics for Table of FamHxAtopy by Disease

(Rows and Columns with Zero Totals Excluded)

Statistic	DF	Value	Prob
Chi-Square	1	2.5303	0.1117
Likelihood Ratio Chi-Square	1	2.6423	0.1041
Continuity Adj. Chi-Square	1	1.7775	0.1825
Mantel-Haenszel Chi-Square	1	2.5052	0.1135
Phi Coefficient		-0.1583	
Contingency Coefficient		0.1563	
Cramer's V		-0.1583	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	5
Left-sided Pr <= F	0.0897
Right-sided Pr >= F	0.9702
Table Probability (P)	0.0599
Two-sided Pr <= P	0.1297

Statistic	Value	ASE
Gamma	-0.4149	0.2343
Kendall's Tau-b	-0.1583	0.0917
Stuart's Tau-c	-0.1223	0.0729
Somers' D C|R	-0.2003	0.1151
Somers' D R|C	-0.1251	0.0745
Pearson Correlation	0.1583	0.0917
Spearman Correlation	-0.1583	0.0917
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0192	0.0229
Uncertainty Coefficient R|C	0.0271	0.0320

Statistic	Value	ASE
Uncertainty Coefficient Symmetric	0.0224	0.0267

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**0.4135**	0.1363	1.2542
Cohort (Col1 Risk)	**0.5679**	0.2583	1.2483
Cohort (Col2 Risk)	**1.3732**	0.9817	1.9209

Effective Sample Size = 101
Frequency Missing = 30

WARNING: 23% of the data are missing.

Summary Statistics for FamHxAtopy by Disease

(Rows and Columns with Zero Totals Excluded)

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	2.5052	0.1135
2	**Row Mean Scores Differ**	1	2.5052	0.1135
3	**General Association**	1	2.5052	0.1135

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	0.4135	0.1363	1.2542
(Odds Ratio)	**Logit**	0.4135	0.1363	1.2542
Cohort	**Mantel-Haenszel**	0.5679	0.2583	1.2483
(Col1 Risk)	**Logit**	0.5679	0.2583	1.2483
Cohort	**Mantel-Haenszel**	1.3732	0.9817	1.9209

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
(Col2 Risk)	**Logit**	1.3732	0.9817	1.9209

```
* We next look at the variable, DxADClean.*;
* There was an overall significant difference in the variable DxADClean (p =
0.001).*;
* There was a significant difference between those with no food allergy and
possible food allergy (Fischer Exact test due to a cell with n = 3) p =
0.005). PR 3.8 (1.2, 11.5)*;
* There was a significant difference between those with food allergy and no
food allergy.  MH Chi Square 0.003 PR 2.5 (1.2, 4.9).*;
* There was no difference between those with food allergy and possible food
allergy.  MH Chi Square 0.7.  PR 0.9 (0.6, 1.4)
```

The SAS System

The FREQ Procedure

Table of DxADClean by Disease

DxADClean	**Disease(Disease)**			
	Food Allergy	**No Disease**	**Possible Food Allergy**	**Total**
History of Atopic Dermatitis	36	29	21	86
	30.00	24.17	17.50	71.67
	41.86	33.72	24.42	
	83.72	54.72	87.50	
No history of Atopic Dermatitis	7	24	3	34
	5.83	20.00	2.50	28.33
	20.59	70.59	8.82	
	16.28	45.28	12.50	
Total	43	53	24	120
	35.83	44.17	20.00	100.00

Frequency Missing = 11

Frequency
Percent
Row Pct
Col Pct

Statistics for Table of DxADClean by Disease

Statistic	DF	Value	Prob
Chi-Square	2	13.5388	0.0011
Likelihood Ratio Chi-Square	2	13.7645	0.0010
Mantel-Haenszel Chi-Square	1	10.2991	0.0013
Phi Coefficient		0.3359	
Contingency Coefficient		0.3184	
Cramer's V		0.3359	

Statistic	Value	ASE
Gamma	0.1072	0.1477
Kendall's Tau-b	0.0560	0.0779
Stuart's Tau-c	0.0569	0.0791
Somers' D C|R	0.0701	0.0972
Somers' D R|C	0.0447	0.0625
Pearson Correlation	0.2942	0.0854
Spearman Correlation	0.0590	0.0820
Lambda Asymmetric C|R	0.1045	0.1139
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0693	0.0771
Uncertainty Coefficient C|R	0.0546	0.0285
Uncertainty Coefficient R|C	0.0962	0.0495
Uncertainty Coefficient Symmetric	0.0697	0.0361

Effective Sample Size = 120
Frequency Missing = 11

Summary Statistics for DxADClean by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	10.2991	0.0013

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
2	Row Mean Scores Differ	1	10.2991	0.0013
3	General Association	2	13.4260	0.0012

Effective Sample Size = 120
Frequency Missing = 11

The FREQ Procedure

Frequency
Percent
Row Pct
Col Pct

Table of DxADCleanFinal by Disease1

DxADCleanFinal	Disease1(Disease1) Possible Food Allergy	No Food Allergy	Total
History of Atopic Dermatitis	21	29	50
	27.27	37.66	64.94
	42.00	58.00	
	87.50	54.72	
No History of Atopic Dermatitis	3	24	27
	3.90	31.17	35.06
	11.11	88.89	
	12.50	45.28	
Total	24	53	77
	31.17	68.83	100.00

Frequency Missing = 54

Statistics for Table of DxADCleanFinal by Disease1

Statistic	DF	Value	Prob
Chi-Square	1	7.7973	0.0052

Statistic	DF	Value	Prob
Likelihood Ratio Chi-Square	1	8.6824	0.0032
Continuity Adj. Chi-Square	1	6.4239	0.0113
Mantel-Haenszel Chi-Square	1	7.6960	0.0055
Phi Coefficient		0.3182	
Contingency Coefficient		0.3032	
Cramer's V		0.3182	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	21
Left-sided Pr <= F	0.9994
Right-sided Pr >= F	0.0042
Table Probability (P)	0.0036
Two-sided Pr <= P	0.0052

Statistic	Value	ASE
Gamma	0.7056	0.1698
Kendall's Tau-b	0.3182	0.0918
Stuart's Tau-c	0.2813	0.0865
Somers' D C|R	0.3089	0.0924
Somers' D R|C	0.3278	0.0961
Pearson Correlation	0.3182	0.0918
Spearman Correlation	0.3182	0.0918
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0909	0.0556
Uncertainty Coefficient R|C	0.0870	0.0535
Uncertainty Coefficient Symmetric	0.0889	0.0544

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	**5.7931**	1.5396	21.7973
Cohort (Col1 Risk)	**3.7800**	1.2389	11.5330
Cohort (Col2 Risk)	**0.6525**	0.4976	0.8556

Effective Sample Size = 77
Frequency Missing = 54

WARNING: 41% of the data are missing.

Summary Statistics for DxADCleanFinal by Disease1

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	**Nonzero Correlation**	1	7.6960	0.0055
2	**Row Mean Scores Differ**	1	7.6960	0.0055
3	**General Association**	1	7.6960	0.0055

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	**Mantel-Haenszel**	5.7931	1.5396	21.7973
(Odds Ratio)	**Logit**	5.7931	1.5396	21.7973
Cohort	**Mantel-Haenszel**	3.7800	1.2389	11.5330
(Col1 Risk)	**Logit**	3.7800	1.2389	11.5330
Cohort	**Mantel-Haenszel**	0.6525	0.4976	0.8556
(Col2 Risk)	**Logit**	0.6525	0.4976	0.8556

Effective Sample Size = 77
Frequency Missing = 54
WARNING: 41% of the data are missing.

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of DxADClean by Disease DxADClean	Disease(Disease) Food Allergy	 No Disease	 Total
	History of Atopic Dermatitis	36	29	65
		37.50	30.21	67.71
		55.38	44.62	
		83.72	54.72	
	No history of Atopic Dermatitis	7	24	31
		7.29	25.00	32.29
		22.58	77.42	
		16.28	45.28	
	Total	43	53	96
		44.79	55.21	100.00
	Frequency Missing = 8			

Statistics for Table of DxADClean by Disease

Statistic	DF	Value	Prob
Chi-Square	1	9.1339	0.0025
Likelihood Ratio Chi-Square	1	9.5690	0.0020
Continuity Adj. Chi-Square	1	7.8555	0.0051
Mantel-Haenszel Chi-Square	1	9.0387	0.0026
Phi Coefficient		0.3085	
Contingency Coefficient		0.2948	
Cramer's V		0.3085	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	36
Left-sided Pr <= F	0.9996

Fisher's Exact Test	
Right-sided Pr >= F	0.0022
Table Probability (P)	0.0017
Two-sided Pr <= P	0.0040

Statistic	Value	ASE
Gamma	0.6195	0.1531
Kendall's Tau-b	0.3085	0.0918
Stuart's Tau-c	0.2869	0.0878
Somers' D C|R	0.3280	0.0972
Somers' D R|C	0.2900	0.0886
Pearson Correlation	0.3085	0.0918
Spearman Correlation	0.3085	0.0918
Lambda Asymmetric C|R	0.1628	0.1716
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0946	0.1038
Uncertainty Coefficient C|R	0.0725	0.0447
Uncertainty Coefficient R|C	0.0792	0.0485
Uncertainty Coefficient Symmetric	0.0757	0.0465

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**4.2562**	1.6075	11.2687
Cohort (Col1 Risk)	**2.4527**	1.2335	4.8772
Cohort (Col2 Risk)	**0.5763**	0.4139	0.8023

Effective Sample Size = 96
Frequency Missing = 8

Summary Statistics for DxADClean by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	9.0387	0.0026
2	Row Mean Scores Differ	1	9.0387	0.0026
3	General Association	1	9.0387	0.0026

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	4.2562	1.6075	11.2687
(Odds Ratio)	Logit	4.2562	1.6075	11.2687
Cohort	Mantel-Haenszel	2.4527	1.2335	4.8772
(Col1 Risk)	Logit	2.4527	1.2335	4.8772
Cohort	Mantel-Haenszel	0.5763	0.4139	0.8023
(Col2 Risk)	Logit	0.5763	0.4139	0.8023

Effective Sample Size = 96
Frequency Missing = 8

The FREQ Procedure

Table of DxADClean by Disease

Frequency Percent Row Pct Col Pct	DxADClean	Disease(Disease)		
		Food Allergy	No Disease	Total
	History of Atopic Dermatitis	36	29	65
		37.50	30.21	67.71
		55.38	44.62	
		83.72	54.72	
	No history of Atopic Dermatitis	7	24	31
		7.29	25.00	32.29
		22.58	77.42	
		16.28	45.28	

Total	43	53	96
	44.79	55.21	100.00

Frequency Missing = 8

Statistics for Table of DxADClean by Disease

Statistic	DF	Value	Prob
Chi-Square	1	9.1339	0.0025
Likelihood Ratio Chi-Square	1	9.5690	0.0020
Continuity Adj. Chi-Square	1	7.8555	0.0051
Mantel-Haenszel Chi-Square	1	9.0387	0.0026
Phi Coefficient		0.3085	
Contingency Coefficient		0.2948	
Cramer's V		0.3085	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	36
Left-sided Pr <= F	0.9996
Right-sided Pr >= F	0.0022
Table Probability (P)	0.0017
Two-sided Pr <= P	0.0040

Statistic	Value	ASE
Gamma	0.6195	0.1531
Kendall's Tau-b	0.3085	0.0918
Stuart's Tau-c	0.2869	0.0878
Somers' D C|R	0.3280	0.0972
Somers' D R|C	0.2900	0.0886
Pearson Correlation	0.3085	0.0918
Spearman Correlation	0.3085	0.0918
Lambda Asymmetric C|R	0.1628	0.1716

Statistic	Value	ASE
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0946	0.1038
Uncertainty Coefficient C|R	0.0725	0.0447
Uncertainty Coefficient R|C	0.0792	0.0485
Uncertainty Coefficient Symmetric	0.0757	0.0465

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**4.2562**	1.6075	11.2687
Cohort (Col1 Risk)	**2.4527**	1.2335	4.8772
Cohort (Col2 Risk)	**0.5763**	0.4139	0.8023

Effective Sample Size = 96
Frequency Missing = 8

Summary Statistics for DxADClean by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	9.0387	0.0026
2	**Row Mean Scores Differ**	1	9.0387	0.0026
3	**General Association**	1	9.0387	0.0026

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	4.2562	1.6075	11.2687
(Odds Ratio)	**Logit**	4.2562	1.6075	11.2687
Cohort	**Mantel-Haenszel**	2.4527	1.2335	4.8772
(Col1 Risk)	**Logit**	2.4527	1.2335	4.8772
Cohort	**Mantel-Haenszel**	0.5763	0.4139	0.8023
(Col2 Risk)	**Logit**	0.5763	0.4139	0.8023

Effective Sample Size = 96
Frequency Missing = 8

The FREQ Procedure

Table of DxADClean by Disease

DxADClean	Disease(Disease)		
	Food Allergy	**Possible Food Allergy**	**Total**
History of Atopic Dermatitis	36	21	57
	53.73	31.34	85.07
	63.16	36.84	
	83.72	87.50	
No history of Atopic Dermatitis	7	3	10
	10.45	4.48	14.93
	70.00	30.00	
	16.28	12.50	
Total	43	24	67
	64.18	35.82	100.00

Frequency Missing = 5

Statistics for Table of DxADClean by Disease

Statistic	DF	Value	Prob
Chi-Square	1	0.1732	0.6772
Likelihood Ratio Chi-Square	1	0.1772	0.6738
Continuity Adj. Chi-Square	1	0.0034	0.9532
Mantel-Haenszel Chi-Square	1	0.1707	0.6795
Phi Coefficient		-0.0508	
Contingency Coefficient		0.0508	
Cramer's V		-0.0508	

Statistic	DF	Value	Prob
WARNING: 25% of the cells have expected counts less than 5. Chi-Square may not be a valid test.			

Fisher's Exact Test	
Cell (1,1) Frequency (F)	36
Left-sided Pr <= F	0.4867
Right-sided Pr >= F	0.7763
Table Probability (P)	0.2630
Two-sided Pr <= P	1.0000

Statistic	Value	ASE
Gamma	-0.1529	0.3627
Kendall's Tau-b	-0.0508	0.1178
Stuart's Tau-c	-0.0348	0.0809
Somers' D C|R	-0.0684	0.1584
Somers' D R|C	-0.0378	0.0879
Pearson Correlation	-0.0508	0.1178
Spearman Correlation	-0.0508	0.1178
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0020	0.0095
Uncertainty Coefficient R|C	0.0031	0.0147
Uncertainty Coefficient Symmetric	0.0025	0.0115

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**0.7347**	0.1714	3.1498
Cohort (Col1 Risk)	**0.9023**	0.5744	1.4173
Cohort (Col2 Risk)	**1.2281**	0.4491	3.3581

Effective Sample Size = 67
Frequency Missing = 5

Summary Statistics for DxADClean by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.1707	0.6795
2	Row Mean Scores Differ	1	0.1707	0.6795
3	General Association	1	0.1707	0.6795

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	0.7347	0.1714	3.1498
(Odds Ratio)	Logit	0.7347	0.1714	3.1498
Cohort	Mantel-Haenszel	0.9023	0.5744	1.4173
(Col1 Risk)	Logit	0.9023	0.5744	1.4173
Cohort	Mantel-Haenszel	1.2281	0.4491	3.3581
(Col2 Risk)	Logit	1.2281	0.4491	3.3581

Effective Sample Size = 67
Frequency Missing = 5

```
* We next look at the variable, DxAsthmaClean.*;
* There was no overall significant difference in the variable DxAsthmaClean (p
= 0.5).*;
```

The SAS System

The FREQ Procedure

Table of DxAsthmaClean by Disease

Frequency Percent Row Pct Col Pct	Disease(Disease)			
DxAsthmaClean	Food Allergy	No Disease	Possible Food Allergy	Total

History of asthma	31	38	17	86
	25.20	30.89	13.82	69.92
	36.05	44.19	19.77	
	75.61	66.67	68.00	
No history of asthma	10	19	8	37
	8.13	15.45	6.50	30.08
	27.03	51.35	21.62	
	24.39	33.33	32.00	
Total	41	57	25	123
	33.33	46.34	20.33	100.00

Frequency Missing = 8

Statistics for Table of DxAsthmaClean by Disease

Statistic	DF	Value	Prob
Chi-Square	2	0.9617	0.6182
Likelihood Ratio Chi-Square	2	0.9816	0.6121
Mantel-Haenszel Chi-Square	1	0.8619	0.3532
Phi Coefficient		0.0884	
Contingency Coefficient		0.0881	
Cramer's V		0.0884	

Statistic	Value	ASE
Gamma	0.1331	0.1606
Kendall's Tau-b	0.0687	0.0836
Stuart's Tau-c	0.0709	0.0864
Somers' D C|R	0.0842	0.1025
Somers' D R|C	0.0560	0.0683
Pearson Correlation	0.0841	0.0881
Spearman Correlation	0.0724	0.0881

Statistic	Value	ASE
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0038	0.0076
Uncertainty Coefficient R|C	0.0065	0.0130
Uncertainty Coefficient Symmetric	0.0048	0.0096

Effective Sample Size = 123
Frequency Missing = 8

Summary Statistics for DxAsthmaClean by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	**Nonzero Correlation**	1	0.8619	0.3532
2	**Row Mean Scores Differ**	1	0.8619	0.3532
3	**General Association**	2	0.9539	0.6207

Effective Sample Size = 123
Frequency Missing = 8

```
* We next look at the variable, DxARClean.*;
* There was no overall significant difference in the variable DxARClean (p =
0.1).*;
```

The SAS System

The FREQ Procedure

Frequency
Percent
Row Pct
Col Pct

Table of DxARClean by Disease

DxARClean	Disease(Disease)			
	Food Allergy	**No Disease**	**Possible Food Allergy**	**Total**
History of allergic rhinitis	23	23	8	54
	21.30	21.30	7.41	50.00

	42.59	42.59	14.81	
	60.53	43.40	47.06	
No history of allergic rhinitis	15	30	9	54
	13.89	27.78	8.33	50.00
	27.78	55.56	16.67	
	39.47	56.60	52.94	
Total	38	53	17	108
	35.19	49.07	15.74	100.00

Frequency Missing = 23

Statistics for Table of DxARClean by Disease

Statistic	DF	Value	Prob
Chi-Square	2	2.6676	0.2635
Likelihood Ratio Chi-Square	2	2.6830	0.2615
Mantel-Haenszel Chi-Square	1	2.5070	0.1133
Phi Coefficient		0.1572	
Contingency Coefficient		0.1553	
Cramer's V		0.1572	

Statistic	Value	ASE
Gamma	0.2206	0.1596
Kendall's Tau-b	0.1238	0.0912
Stuart's Tau-c	0.1368	0.1008
Somers' D C|R	0.1368	0.1008
Somers' D R|C	0.1120	0.0826
Pearson Correlation	0.1531	0.0948
Spearman Correlation	0.1297	0.0955
Lambda Asymmetric C|R	0.0000	0.1233
Lambda Asymmetric R|C	0.1481	0.1430

Statistic	Value	ASE
Lambda Symmetric	0.0734	0.1137
Uncertainty Coefficient C|R	0.0123	0.0149
Uncertainty Coefficient R|C	0.0179	0.0217
Uncertainty Coefficient Symmetric	0.0146	0.0177

Effective Sample Size = 108
Frequency Missing = 23

WARNING: 18% of the data are missing.

Summary Statistics for DxARClean by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	**Nonzero Correlation**	1	2.5070	0.1133
2	**Row Mean Scores Differ**	1	2.5070	0.1133
3	**General Association**	2	2.6429	0.2668

Effective Sample Size = 108
Frequency Missing = 23

WARNING: 18% of the data are missing.

```
* We next look at the variable, FA_Severe_Clean.*;
* There was no overall significant difference in the variable FA_Severe_Clean
(p = 0.6).*;
```

The SAS System

The FREQ Procedure

Table of FA_Severe_Clean by Disease

Frequency **Percent** **Row Pct** **Col Pct**	**Disease(Disease)**		
FA_Severe_Clean	**Food Allergy**	**Possible Food Allergy**	**Total**
Parents consider the food allergy to be severe	29	16	45
	45.31	25.00	70.31

	64.44	35.56	
	72.50	66.67	
Parents do not consider the food allergy to be severe	11	8	19
	17.19	12.50	29.69
	57.89	42.11	
	27.50	33.33	
Total	40	24	64
	62.50	37.50	100.00

Frequency Missing = 8

Statistics for Table of FA_Severe_Clean by Disease

Statistic	DF	Value	Prob
Chi-Square	1	0.2445	0.6210
Likelihood Ratio Chi-Square	1	0.2425	0.6224
Continuity Adj. Chi-Square	1	0.0449	0.8322
Mantel-Haenszel Chi-Square	1	0.2407	0.6237
Phi Coefficient		0.0618	
Contingency Coefficient		0.0617	
Cramer's V		0.0618	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	29
Left-sided Pr <= F	0.7823
Right-sided Pr >= F	0.4126
Table Probability (P)	0.1950
Two-sided Pr <= P	0.7783

Statistic	Value	ASE
Gamma	0.1373	0.2744

Statistic	Value	ASE
Kendall's Tau-b	0.0618	0.1263
Stuart's Tau-c	0.0547	0.1119
Somers' D C|R	0.0655	0.1339
Somers' D R|C	0.0583	0.1193
Pearson Correlation	0.0618	0.1263
Spearman Correlation	0.0618	0.1263
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0029	0.0117
Uncertainty Coefficient R|C	0.0031	0.0127
Uncertainty Coefficient Symmetric	0.0030	0.0122

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**1.3182**	0.4404	3.9456
Cohort (Col1 Risk)	**1.1131**	0.7165	1.7294
Cohort (Col2 Risk)	**0.8444**	0.4374	1.6303

Effective Sample Size = 64
Frequency Missing = 8

WARNING: 11% of the data are missing.

Summary Statistics for FA_Severe_Clean by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	0.2407	0.6237
2	**Row Mean Scores Differ**	1	0.2407	0.6237

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
3	General Association	1	0.2407	0.6237

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	1.3182	0.4404	3.9456
(Odds Ratio)	Logit	1.3182	0.4404	3.9456
Cohort	Mantel-Haenszel	1.1131	0.7165	1.7294
(Col1 Risk)	Logit	1.1131	0.7165	1.7294
Cohort	Mantel-Haenszel	0.8444	0.4374	1.6303
(Col2 Risk)	Logit	0.8444	0.4374	1.6303

Effective Sample Size = 64
Frequency Missing = 8

WARNING: 11% of the data are missing.

```
* We next look at the variable, LTR_FoodCleanFinal.*;
* There was an overall significant difference in the variable
LTR_FoodCleanFinal (MH Chi Square p = 0.0.01) PR 1.6 (1.1, 2.3).*;
```

The SAS System

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of LTR_FoodCleanFinal by Disease LTR_FoodCleanFinal / Disease(Disease)		
	Food Allergy	Possible Food Allergy	Total
History of Life Threatening Reaction to Food	23	6	29
	32.39	8.45	40.85
	79.31	20.69	

	52.27	22.22	
No History of Life Threatening Reaction to Food	21	21	42
	29.58	29.58	59.15
	50.00	50.00	
	47.73	77.78	
Total	44	27	71
	61.97	38.03	100.00

Frequency Missing = 1

Statistics for Table of LTR_FoodCleanFinal by Disease

Statistic	DF	Value	Prob
Chi-Square	1	6.2536	0.0124
Likelihood Ratio Chi-Square	1	6.5230	0.0106
Continuity Adj. Chi-Square	1	5.0717	0.0243
Mantel-Haenszel Chi-Square	1	6.1655	0.0130
Phi Coefficient		0.2968	
Contingency Coefficient		0.2845	
Cramer's V		0.2968	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	23
Left-sided Pr <= F	0.9975
Right-sided Pr >= F	0.0112
Table Probability (P)	0.0087
Two-sided Pr <= P	0.0144

Statistic	Value	ASE
Gamma	0.5862	0.1814
Kendall's Tau-b	0.2968	0.1081

Statistic	Value	ASE
Stuart's Tau-c	0.2833	0.1049
Somers' D C|R	0.2931	0.1078
Somers' D R|C	0.3005	0.1099
Pearson Correlation	-0.2968	0.1081
Spearman Correlation	0.2968	0.1081
Lambda Asymmetric C|R	0.0000	0.2400
Lambda Asymmetric R|C	0.0690	0.2207
Lambda Symmetric	0.0357	0.1996
Uncertainty Coefficient C|R	0.0692	0.0518
Uncertainty Coefficient R|C	0.0679	0.0510
Uncertainty Coefficient Symmetric	0.0685	0.0514

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	**3.8333**	1.2977	11.3230
Cohort (Col1 Risk)	**1.5862**	1.1122	2.2622
Cohort (Col2 Risk)	**0.4138**	0.1908	0.8974

Effective Sample Size = 71
Frequency Missing = 1

Summary Statistics for LTR_FoodCleanFinal by Disease

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	6.1655	0.0130
2	Row Mean Scores Differ	1	6.1655	0.0130
3	General Association	1	6.1655	0.0130

Estimates of the Common Relative Risk (Row1/Row2)			
Type of Study	Method	Value	95% Confidence Limits

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	3.8333	1.2977	11.3230
(Odds Ratio)	**Logit**	3.8333	1.2977	11.3230
Cohort	**Mantel-Haenszel**	1.5862	1.1122	2.2622
(Col1 Risk)	**Logit**	1.5862	1.1122	2.2622
Cohort	**Mantel-Haenszel**	0.4138	0.1908	0.8974
(Col2 Risk)	**Logit**	0.4138	0.1908	0.8974

Effective Sample Size = 71
Frequency Missing = 1

```
*After the above analysis, and due to the fact that those with possible food
allergy did not appear to significantly
affect the association between antacid medication and prevalence of food
allergy, I decided to exclude the Possible
Food Allergy group from analysis to improve the ease of analysis and clarity
of results.*;
*Univariate analysis of FAR13 dataset using only those with food allergy
defined as consistent history and Ige
(Disease = 2) and those without disease (Disease = 0)*;
*We will now define the populations (Those who were exposed to antacid
medication, and those who had food allergy). Beginning with those who were
exposed to antacid medication.*;
*Starting with DiseaseFinal.*;
```

The SAS System

The FREQ Procedure
DiseaseFinal=1

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	27	60.00	27	60.00
2	18	40.00	45	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.6000
ASE	0.0730

Type	95% Confidence Limits	
Wald	0.4569	0.7431
Wilson	0.4545	0.7298
Agresti-Coull	0.4543	0.7300
Jeffreys	0.4543	0.7333
Clopper-Pearson (Exact)	0.4433	0.7430

Test of H0: Proportion = 0.5	
ASE under H0	0.0745
Z	1.3416
One-sided Pr > Z	0.0899
Two-sided Pr > |Z|	0.1797
Exact Test	
One-sided Pr >= P	0.1163
Two-sided = 2 * One-sided	0.2327

Sample Size = 45

```
* We will start with the variable, Disease.*;
```

The SAS System

The FREQ Procedure
DiseaseFinal=0

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	20	33.90	20	33.90
2	39	66.10	59	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.3390
ASE	0.0616

Type	95% Confidence Limits	
Wald	0.2182	0.4598

Type	95% Confidence Limits	
Wilson	0.2314	0.4663
Agresti-Coull	0.2310	0.4667
Jeffreys	0.2282	0.4652
Clopper-Pearson (Exact)	0.2208	0.4739

Test of H0: Proportion = 0.5	
ASE under H0	0.0651
Z	-2.4736
One-sided Pr < Z	0.0067
Two-sided Pr > |Z|	0.0134
Exact Test	
One-sided Pr <= P	0.0092
Two-sided = 2 * One-sided	0.0183

Sample Size = 59

The SAS System

The FREQ Procedure
DiseaseFinal=1

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	27	60.00	27	60.00
2	18	40.00	45	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.6000
ASE	0.0730

Type	95% Confidence Limits	
Wald	0.4569	0.7431

Type	95% Confidence Limits	
Wilson	0.4545	0.7298
Agresti-Coull	0.4543	0.7300
Jeffreys	0.4543	0.7333
Clopper-Pearson (Exact)	0.4433	0.7430

Test of H0: Proportion = 0.5	
ASE under H0	0.0745
Z	1.3416
One-sided Pr > Z	0.0899
Two-sided Pr > |Z|	0.1797
Exact Test	
One-sided Pr >= P	0.1163
Two-sided = 2 * One-sided	0.2327

Sample Size = 45

```
* Next variable, AgeGroup.*;
```

The SAS System

The FREQ Procedure
AgeGroup=0

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	23	40.35	23	40.35
2	34	59.65	57	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.4035
ASE	0.0650

Type	95% Confidence Limits	

Type	95% Confidence Limits	
Wald	0.2761	0.5309
Wilson	0.2862	0.5330
Agresti-Coull	0.2860	0.5332
Jeffreys	0.2835	0.5330
Clopper-Pearson (Exact)	0.2756	0.5418

Test of H0: Proportion = 0.5	
ASE under H0	0.0662
Z	-1.4570
One-sided Pr < Z	0.0726
Two-sided Pr > |Z|	0.1451
Exact Test	
One-sided Pr <= P	0.0924
Two-sided = 2 * One-sided	0.1849

Sample Size = 57

The SAS System

The FREQ Procedure
AgeGroup=1

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	22	55.00	22	55.00
2	18	45.00	40	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.5500
ASE	0.0787

Type	95% Confidence Limits	
Wald	0.3958	0.7042

Type	95% Confidence Limits	
Wilson	0.3983	0.6929
Agresti-Coull	0.3982	0.6930
Jeffreys	0.3969	0.6962
Clopper-Pearson (Exact)	0.3849	0.7074

Test of H0: Proportion = 0.5	
ASE under H0	0.0791
Z	0.6325
One-sided Pr > Z	0.2635
Two-sided Pr > |Z|	0.5271
Exact Test	
One-sided Pr >= P	0.3179
Two-sided = 2 * One-sided	0.6358

Sample Size = 40

The SAS System

The FREQ Procedure
AgeGroup=2

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	9	26.47	9	26.47
2	25	73.53	34	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.2647
ASE	0.0757

Type	95% Confidence Limits	
Wald	0.1164	0.4130
Wilson	0.1460	0.4312

Type	95% Confidence Limits	
Agresti-Coull	0.1442	0.4330
Jeffreys	0.1398	0.4278
Clopper-Pearson (Exact)	0.1288	0.4436

Test of H0: Proportion = 0.5	
ASE under H0	0.0857
Z	-2.7440
One-sided Pr < Z	0.0030
Two-sided Pr > |Z|	0.0061
Exact Test	
One-sided Pr <= P	0.0045
Two-sided = 2 * One-sided	0.0090

Sample Size = 34

```
* Next variable, Gender.*;
```

The SAS System

The FREQ Procedure
Gender=0

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	18	46.15	18	46.15
2	21	53.85	39	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.4615
ASE	0.0798

Type	95% Confidence Limits	
Wald	0.3051	0.6180

Type	95% Confidence Limits	
Wilson	0.3157	0.6143
Agresti-Coull	0.3156	0.6143
Jeffreys	0.3125	0.6160
Clopper-Pearson (Exact)	0.3009	0.6282

Test of H0: Proportion = 0.5	
ASE under H0	0.0801
Z	-0.4804
One-sided Pr < Z	0.3155
Two-sided Pr > |Z|	0.6310
Exact Test	
One-sided Pr <= P	0.3746
Two-sided = 2 * One-sided	0.7493

Sample Size = 39

The SAS System

The FREQ Procedure
Gender=1

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	36	39.13	36	39.13
2	56	60.87	92	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.3913
ASE	0.0509

Type	95% Confidence Limits	
Wald	0.2916	0.4910
Wilson	0.2979	0.4935

Type	95% Confidence Limits	
Agresti-Coull	0.2978	0.4936
Jeffreys	0.2962	0.4931
Clopper-Pearson (Exact)	0.2912	0.4986

Test of H0: Proportion = 0.5	
ASE under H0	0.0521
Z	-2.0851
One-sided Pr < Z	0.0185
Two-sided Pr > |Z|	0.0371
Exact Test	
One-sided Pr <= P	0.0235
Two-sided = 2 * One-sided	0.0470

Sample Size = 92

```
* Next variable, ADClean.*;
```

The SAS System

The FREQ Procedure
DxADClean=0

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	17	50.00	17	50.00
2	17	50.00	34	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.5000
ASE	0.0857

Type	95% Confidence Limits	
Wald	0.3319	0.6681
Wilson	0.3407	0.6593

Type	95% Confidence Limits	
Agresti-Coull	0.3407	0.6593
Jeffreys	0.3377	0.6623
Clopper-Pearson (Exact)	0.3243	0.6757

Test of H0: Proportion = 0.5	
ASE under H0	0.0857
Z	0.0000
One-sided Pr < Z	0.5000
Two-sided Pr > |Z|	1.0000
Exact Test	
One-sided Pr <= P	0.5679
Two-sided = 2 * One-sided	1.0000

Sample Size = 34

The SAS System

The FREQ Procedure
DxADClean=1

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	35	40.70	35	40.70
2	51	59.30	86	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.4070
ASE	0.0530

Type	95% Confidence Limits	
Wald	0.3031	0.5108
Wilson	0.3093	0.5126
Agresti-Coull	0.3092	0.5127

Type	95% Confidence Limits	
Jeffreys	0.3076	0.5125
Clopper-Pearson (Exact)	0.3022	0.5183

Test of H0: Proportion = 0.5	
ASE under H0	0.0539
Z	-1.7253
One-sided Pr < Z	0.0422
Two-sided Pr > |Z|	0.0845
Exact Test	
One-sided Pr <= P	0.0526
Two-sided = 2 * One-sided	0.1052

Sample Size = 86

```
* Next variable, AsthmaClean.*;
```

The SAS System

The FREQ Procedure
DxAsthmaClean=.

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	12.50	1	12.50
2	7	87.50	8	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.1250
ASE	0.1169

Type	95% Confidence Limits	
Wald	0.0000	0.3542
Wilson	0.0224	0.4709

Type	95% Confidence Limits	
Agresti-Coull	0.0011	0.4922
Jeffreys	0.0138	0.4537
Clopper-Pearson (Exact)	0.0032	0.5265

Test of H0: Proportion = 0.5	
ASE under H0	0.1768
Z	-2.1213
One-sided Pr < Z	0.0169
Two-sided Pr > |Z|	0.0339
Exact Test	
One-sided Pr <= P	0.0352
Two-sided = 2 * One-sided	0.0703

Sample Size = 8

The SAS System

The FREQ Procedure
DxAsthmaClean=0

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	16	43.24	16	43.24
2	21	56.76	37	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.4324
ASE	0.0814

Type	95% Confidence Limits	
Wald	0.2728	0.5921
Wilson	0.2867	0.5909
Agresti-Coull	0.2866	0.5910

Type	95% Confidence Limits	
Jeffreys	0.2829	0.5921
Clopper-Pearson (Exact)	0.2710	0.6051

Test of H0: Proportion = 0.5	
ASE under H0	0.0822
Z	-0.8220
One-sided Pr < Z	0.2055
Two-sided Pr > |Z|	0.4111
Exact Test	
One-sided Pr <= P	0.2557
Two-sided = 2 * One-sided	0.5114

Sample Size = 37

The SAS System

The FREQ Procedure
DxAsthmaClean=1

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	37	43.02	37	43.02
2	49	56.98	86	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.4302
ASE	0.0534

Type	95% Confidence Limits	
Wald	0.3256	0.5349
Wilson	0.3308	0.5356
Agresti-Coull	0.3308	0.5357
Jeffreys	0.3293	0.5357

Type	95% Confidence Limits	
Clopper-Pearson (Exact)	0.3239	0.5415

Test of H0: Proportion = 0.5	
ASE under H0	0.0539
Z	-1.2940
One-sided Pr < Z	0.0978
Two-sided Pr > |Z|	0.1957
Exact Test	
One-sided Pr <= P	0.1177
Two-sided = 2 * One-sided	0.2354

```
* Next variable, ARClean.*;
```

The SAS System

The FREQ Procedure
DxARClean=.

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	34.78	8	34.78
2	15	65.22	23	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.3478
ASE	0.0993

Type	95% Confidence Limits	
Wald	0.1532	0.5425
Wilson	0.1881	0.5511
Agresti-Coull	0.1870	0.5522
Jeffreys	0.1802	0.5511
Clopper-Pearson (Exact)	0.1638	0.5727

Test of H0: Proportion = 0.5	
ASE under H0	0.1043
Z	-1.4596
One-sided Pr < Z	0.0722
Two-sided Pr > |Z|	0.1444
Exact Test	
One-sided Pr <= P	0.1050
Two-sided = 2 * One-sided	0.2100

Sample Size = 23

The SAS System

The FREQ Procedure
DxARClean=0

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	23	42.59	23	42.59
2	31	57.41	54	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.4259
ASE	0.0673

Type	95% Confidence Limits	
Wald	0.2940	0.5578
Wilson	0.3033	0.5584
Agresti-Coull	0.3032	0.5585
Jeffreys	0.3007	0.5588
Clopper-Pearson (Exact)	0.2923	0.5679

Test of H0: Proportion = 0.5

Test of H0: Proportion = 0.5	
ASE under H0	0.0680
Z	-1.0887
One-sided Pr < Z	0.1382
Two-sided Pr > |Z|	0.2763
Exact Test	
One-sided Pr <= P	0.1704
Two-sided = 2 * One-sided	0.3409

Sample Size = 54

The FREQ Procedure
DxARClean=1

Exposure1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	23	42.59	23	42.59
2	31	57.41	54	100.00

Binomial Proportion for Exposure1 = 1	
Proportion (P)	0.4259
ASE	0.0673

Type	95% Confidence Limits	
Wald	0.2940	0.5578
Wilson	0.3033	0.5584
Agresti-Coull	0.3032	0.5585
Jeffreys	0.3007	0.5588
Clopper-Pearson (Exact)	0.2923	0.5679

Test of H0: Proportion = 0.5	
ASE under H0	0.0680

Test of H0: Proportion = 0.5	
Z	-1.0887
One-sided Pr < Z	0.1382
Two-sided Pr > |Z|	0.2763
Exact Test	
One-sided Pr <= P	0.1704
Two-sided = 2 * One-sided	0.3409

Sample Size = 54

```
*Now we will look at the population with food allergy.  We will Recode Disease
in order to get 95% confidence intervals for those who were exposed.*;
```

The SAS System

The FREQ Procedure
Exposure=0

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	18	31.58	18	31.58
2	39	68.42	57	100.00

Frequency Missing = 20

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.3158
ASE	0.0616

Type	95% Confidence Limits	
Wald	0.1951	0.4365
Wilson	0.2100	0.4448
Agresti-Coull	0.2095	0.4453
Jeffreys	0.2065	0.4433
Clopper-Pearson (Exact)	0.1991	0.4524

Test of H0: Proportion = 0.5	
ASE under H0	0.0662
Z	-2.7815
One-sided Pr < Z	0.0027
Two-sided Pr > |Z|	0.0054
Exact Test	
One-sided Pr <= P	0.0038
Two-sided = 2 * One-sided	0.0075

Effective Sample Size = 57
Frequency Missing = 20
WARNING: 26% of the data are missing.

The FREQ Procedure
Exposure=1

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	27	57.45	27	57.45
2	20	42.55	47	100.00

Frequency Missing = 7

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.5745
ASE	0.0721

Type	95% Confidence Limits	
Wald	0.4331	0.7158
Wilson	0.4328	0.7049
Agresti-Coull	0.4327	0.7050
Jeffreys	0.4322	0.7079
Clopper-Pearson (Exact)	0.4218	0.7174

Test of H0: Proportion = 0.5	
ASE under H0	0.0729
Z	1.0211
One-sided Pr > Z	0.1536
Two-sided Pr > |Z|	0.3072
Exact Test	
One-sided Pr >= P	0.1908
Two-sided = 2 * One-sided	0.3817

Effective Sample Size = 47
Frequency Missing = 7
WARNING: 13% of the data are missing.

```
*Now we will look at the variable AgeGroup.*;
```

The SAS System

The FREQ Procedure
AgeGroup=0

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	25	56.82	25	56.82
2	19	43.18	44	100.00

Frequency Missing = 13

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.5682
ASE	0.0747

Type	95% Confidence Limits	
Wald	0.4218	0.7145
Wilson	0.4222	0.7032
Agresti-Coull	0.4221	0.7033
Jeffreys	0.4214	0.7063
Clopper-Pearson (Exact)	0.4103	0.7165

Test of H0: Proportion = 0.5	
ASE under H0	0.0754
Z	0.9045
One-sided Pr > Z	0.1829
Two-sided Pr > |Z|	0.3657
Exact Test	
One-sided Pr >= P	0.2257
Two-sided = 2 * One-sided	0.4514

Effective Sample Size = 44
Frequency Missing = 13
WARNING: 23% of the data are missing.

The FREQ Procedure
AgeGroup=1

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	35.29	12	35.29
2	22	64.71	34	100.00

Frequency Missing = 6

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.3529
ASE	0.0820

Type	95% Confidence Limits	
Wald	0.1923	0.5136
Wilson	0.2149	0.5209
Agresti-Coull	0.2142	0.5215
Jeffreys	0.2095	0.5203
Clopper-Pearson (Exact)	0.1975	0.5351

Test of H0: Proportion = 0.5	
ASE under H0	0.0857
Z	-1.7150
One-sided Pr < Z	0.0432
Two-sided Pr > |Z|	0.0863
Exact Test	
One-sided Pr <= P	0.0607
Two-sided = 2 * One-sided	0.1214

Effective Sample Size = 34
Frequency Missing = 6
WARNING: 15% of the data are missing.

The FREQ Procedure
AgeGroup=2

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	30.77	8	30.77
2	18	69.23	26	100.00

Frequency Missing = 8

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.3077
ASE	0.0905

Type	95% Confidence Limits	
Wald	0.1303	0.4851
Wilson	0.1650	0.4999
Agresti-Coull	0.1634	0.5015
Jeffreys	0.1575	0.4980
Clopper-Pearson (Exact)	0.1433	0.5179

Test of H0: Proportion = 0.5	
ASE under H0	0.0981
Z	-1.9612
One-sided Pr < Z	0.0249
Two-sided Pr > |Z|	0.0499
Exact Test	
One-sided Pr <= P	0.0378
Two-sided = 2 * One-sided	0.0755

Effective Sample Size = 26
Frequency Missing = 8
WARNING: 24% of the data are missing

```
*Now we will look at the variable Gender.*;
```

The SAS System

The FREQ Procedure
Gender=0

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	15	46.88	15	46.88
2	17	53.13	32	100.00

Frequency Missing = 7

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.4688
ASE	0.0882

Type	95% Confidence Limits	
Wald	0.2959	0.6416
Wilson	0.3087	0.6355
Agresti-Coull	0.3087	0.6355
Jeffreys	0.3048	0.6380
Clopper-Pearson (Exact)	0.2909	0.6526

Test of H0: Proportion = 0.5	
ASE under H0	0.0884
Z	-0.3536
One-sided Pr < Z	0.3618
Two-sided Pr > |Z|	0.7237
Exact Test	
One-sided Pr <= P	0.4300
Two-sided = 2 * One-sided	0.8601

Effective Sample Size = 32
Frequency Missing = 7
WARNING: 18% of the data are missing.

The FREQ Procedure
Gender=1

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	30	41.67	30	41.67
2	42	58.33	72	100.00

Frequency Missing = 20

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.4167
ASE	0.0581

Type	95% Confidence Limits	
Wald	0.3028	0.5305
Wilson	0.3099	0.5319
Agresti-Coull	0.3098	0.5320
Jeffreys	0.3079	0.5320

Type	95% Confidence Limits	
Clopper-Pearson (Exact)	0.3015	0.5389

Test of H0: Proportion = 0.5	
ASE under H0	0.0589
Z	-1.4142
One-sided Pr < Z	0.0786
Two-sided Pr > |Z|	0.1573
Exact Test	
One-sided Pr <= P	0.0973
Two-sided = 2 * One-sided	0.1945

Effective Sample Size = 72
Frequency Missing = 20
WARNING: 22% of the data are missing.

```
*Now we will look at the variable Gender.*;
```

The SAS System

The FREQ Procedure
DxADClean=.

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	25.00	2	25.00
2	6	75.00	8	100.00

Frequency Missing = 3

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.2500
ASE	0.1531

Type	95% Confidence Limits	
Wald	0.0000	0.5501
Wilson	0.0715	0.5907

Type	95% Confidence Limits	
Agresti-Coull	0.0631	0.5991
Jeffreys	0.0560	0.5916
Clopper-Pearson (Exact)	0.0319	0.6509

Test of H0: Proportion = 0.5	
ASE under H0	0.1768
Z	-1.4142
One-sided Pr < Z	0.0786
Two-sided Pr > |Z|	0.1573
Exact Test	
One-sided Pr <= P	0.1445
Two-sided = 2 * One-sided	0.2891

Effective Sample Size = 8
Frequency Missing = 3
WARNING: 27% of the data are missing.

The SAS System

The FREQ Procedure
DxADClean=0

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	22.58	7	22.58
2	24	77.42	31	100.00

Frequency Missing = 3

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.2258
ASE	0.0751

Type	95% Confidence Limits	
Wald	0.0786	0.3730

Type	95% Confidence Limits	
Wilson	0.1140	0.3981
Agresti-Coull	0.1111	0.4010
Jeffreys	0.1071	0.3930
Clopper-Pearson (Exact)	0.0959	0.4110

Test of H0: Proportion = 0.5	
ASE under H0	0.0898
Z	-3.0533
One-sided Pr < Z	0.0011
Two-sided Pr > |Z|	0.0023
Exact Test	
One-sided Pr <= P	0.0017
Two-sided = 2 * One-sided	0.0033

Effective Sample Size = 31
Frequency Missing = 3

The FREQ Procedure
DxADClean=1

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	36	55.38	36	55.38
2	29	44.62	65	100.00

Frequency Missing = 21

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.5538
ASE	0.0617

Type	95% Confidence Limits	

Type	95% Confidence Limits	
Wald	0.4330	0.6747
Wilson	0.4334	0.6683
Agresti-Coull	0.4333	0.6683
Jeffreys	0.4329	0.6702
Clopper-Pearson (Exact)	0.4253	0.6773

Test of H0: Proportion = 0.5	
ASE under H0	0.0620
Z	0.8682
One-sided Pr > Z	0.1926
Two-sided Pr > |Z|	0.3853
Exact Test	
One-sided Pr >= P	0.2285
Two-sided = 2 * One-sided	0.4570

Effective Sample Size = 65
Frequency Missing = 21
WARNING: 24% of the data are missing.

```
*Now we will look at the variable DxAsthmaClean.*;
```

The SAS System

The FREQ Procedure
DxAsthmaClean=0

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	10	34.48	10	34.48
2	19	65.52	29	100.00

Frequency Missing = 8

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.3448
ASE	0.0883

Type	95% Confidence Limits	
Wald	0.1718	0.5178
Wilson	0.1994	0.5265
Agresti-Coull	0.1985	0.5274
Jeffreys	0.1930	0.5259
Clopper-Pearson (Exact)	0.1794	0.5433

Test of H0: Proportion = 0.5	
ASE under H0	0.0928
Z	-1.6713
One-sided Pr < Z	0.0473
Two-sided Pr > |Z|	0.0947
Exact Test	
One-sided Pr <= P	0.0680
Two-sided = 2 * One-sided	0.1360

Effective Sample Size = 29
Frequency Missing = 8
WARNING: 22% of the data are missing.

The FREQ Procedure
DxAsthmaClean=1

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	31	44.93	31	44.93
2	38	55.07	69	100.00

Frequency Missing = 17

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.4493
ASE	0.0599

Type	95% Confidence Limits	
Wald	0.3319	0.5666
Wilson	0.3377	0.5662
Agresti-Coull	0.3377	0.5662
Jeffreys	0.3360	0.5667
Clopper-Pearson (Exact)	0.3292	0.5738

Test of H0: Proportion = 0.5	
ASE under H0	0.0602
Z	-0.8427
One-sided Pr < Z	0.1997
Two-sided Pr > |Z|	0.3994
Exact Test	
One-sided Pr <= P	0.2352
Two-sided = 2 * One-sided	0.4704

Effective Sample Size = 69
Frequency Missing = 17
WARNING: 20% of the data are missing.

```
*Now we will look at the variable DxARClean.*;
```

The SAS System

The FREQ Procedure
DxARClean=.

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	53.85	7	53.85
2	6	46.15	13	100.00

Frequency Missing = 10

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.5385
ASE	0.1383

Type	95% Confidence Limits	
Wald	0.2675	0.8095
Wilson	0.2914	0.7679
Agresti-Coull	0.2913	0.7681
Jeffreys	0.2829	0.7789
Clopper-Pearson (Exact)	0.2513	0.8078

Test of H0: Proportion = 0.5	
ASE under H0	0.1387
Z	0.2774
One-sided Pr > Z	0.3908
Two-sided Pr > |Z|	0.7815
Exact Test	
One-sided Pr >= P	0.5000
Two-sided = 2 * One-sided	1.0000

Effective Sample Size = 13
Frequency Missing = 10
WARNING: 43% of the data are missing.

The SAS System

The FREQ Procedure
DxARClean=0

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	15	33.33	15	33.33
2	30	66.67	45	100.00

Frequency Missing = 9

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.3333
ASE	0.0703

Type	95% Confidence Limits	
Wald	0.1956	0.4711
Wilson	0.2136	0.4793
Agresti-Coull	0.2130	0.4799
Jeffreys	0.2093	0.4780
Clopper-Pearson (Exact)	0.2000	0.4895

Test of H0: Proportion = 0.5	
ASE under H0	0.0745
Z	-2.2361
One-sided Pr < Z	0.0127
Two-sided Pr > |Z|	0.0253
Exact Test	
One-sided Pr <= P	0.0178
Two-sided = 2 * One-sided	0.0357

Effective Sample Size = 45
Frequency Missing = 9
WARNING: 17% of the data are missing.

The FREQ Procedure
DxARClean=1

Disease3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	23	50.00	23	50.00
2	23	50.00	46	100.00

Frequency Missing = 8

Binomial Proportion for Disease3 = 1	
Proportion (P)	0.5000
ASE	0.0737

Type	95% Confidence Limits	
Wald	0.3555	0.6445
Wilson	0.3612	0.6388
Agresti-Coull	0.3612	0.6388
Jeffreys	0.3592	0.6408
Clopper-Pearson (Exact)	0.3490	0.6510

Test of H0: Proportion = 0.5	
ASE under H0	0.0737
Z	0.0000
One-sided Pr < Z	0.5000
Two-sided Pr > |Z|	1.0000
Exact Test	
One-sided Pr <= P	0.5585
Two-sided = 2 * One-sided	1.0000

Effective Sample Size = 46
Frequency Missing = 8
WARNING: 15% of the data are missing.

```
*Univariate analysis of continuous variables between those with food allergy
and those with no food allergy.*;
```

The SAS System

The TTEST Procedure
Variable: Age (Age)

DiseaseFinal	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	59	7.7232	4.4089	0.5740	0.4200	18.0000
1	45	5.8989	3.8953	0.5807	1.0000	16.8300
Diff (1-2)		1.8243	4.1951	0.8303		

DiseaseFinal	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		7.7232	6.5742	8.8722	4.4089	3.7323	5.3875
1		5.8989	4.7286	7.0692	3.8953	3.2247	4.9205

DiseaseFinal	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
Diff (1-2)	Pooled	1.8243	0.1775	3.4712	4.1951	3.6899	4.8617
Diff (1-2)	Satterthwaite	1.8243	0.2044	3.4443			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	102	2.20	0.0303
Satterthwaite	Unequal	99.748	2.23	0.0277

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	58	44	1.28	0.3937

```
**Univariate analysis of dichotomous variables between those with and without
food allergy*;
*Mantel-Haenszel Chi-Square 1 6.9545 0.0084
Unadjusted Case-Control (Prevalence Ratio)      1..8 (1.5, 2.9)*
This represents significant difference*;
```

The SAS System

The FREQ Procedure

Frequency
Percent
Row Pct
Col Pct

Table of Exposure1 by DiseaseFinal

Exposure1	DiseaseFinal		
	Food Allergy	No Food Allergy	Total
Had taken antacid medication	27	20	47
	25.96	19.23	45.19
	57.45	42.55	
	60.00	33.90	
Never took antacid medication	18	39	57
	17.31	37.50	54.81
	31.58	68.42	
	40.00	66.10	

Total	45	59	104
	43.27	56.73	100.00

Frequency Missing = 27

Statistics for Table of Exposure1 by DiseaseFinal

Statistic	DF	Value	Prob
Chi-Square	1	7.0220	0.0081
Likelihood Ratio Chi-Square	1	7.0782	0.0078
Continuity Adj. Chi-Square	1	6.0078	0.0142
Mantel-Haenszel Chi-Square	1	6.9545	0.0084
Phi Coefficient		0.2598	
Contingency Coefficient		0.2515	
Cramer's V		0.2598	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	27
Left-sided Pr <= F	0.9979
Right-sided Pr >= F	0.0070
Table Probability (P)	0.0049
Two-sided Pr <= P	0.0101

Statistic	Value	ASE
Gamma	0.4904	0.1558
Kendall's Tau-b	0.2598	0.0951
Stuart's Tau-c	0.2563	0.0941
Somers' D C|R	0.2587	0.0948
Somers' D R|C	0.2610	0.0956
Pearson Correlation	-0.2598	0.0951
Spearman Correlation	0.2598	0.0951

Statistic	Value	ASE
Lambda Asymmetric C|R	0.1556	0.1400
Lambda Asymmetric R|C	0.1915	0.1283
Lambda Symmetric	0.1739	0.1220
Uncertainty Coefficient C|R	0.0497	0.0368
Uncertainty Coefficient R|C	0.0494	0.0366
Uncertainty Coefficient Symmetric	0.0496	0.0367

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**2.9250**	1.3092	6.5352
Cohort (Col1 Risk)	**1.8191**	1.1547	2.8658
Cohort (Col2 Risk)	**0.6219**	0.4270	0.9059

Effective Sample Size = 104
Frequency Missing = 27
WARNING: 21% of the data are missing.

Summary Statistics for Exposure1 by DiseaseFinal

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	6.9545	0.0084
2	**Row Mean Scores Differ**	1	6.9545	0.0084
3	**General Association**	1	6.9545	0.0084

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	2.9250	1.3092	6.5352
(Odds Ratio)	**Logit**	2.9250	1.3092	6.5352
Cohort	**Mantel-Haenszel**	1.8191	1.1547	2.8658
(Col1 Risk)	**Logit**	1.8191	1.1547	2.8658
Cohort	**Mantel-Haenszel**	0.6219	0.4270	0.9059
(Col2 Risk)	**Logit**	0.6219	0.4270	0.9059

Effective Sample Size = 104
Frequency Missing = 27
WARNING: 21% of the data are missing.

```
*Examining the variable, Gender *;
*Mantel-Haenszel Chi-Square 1 0.2425 0.6224 Prevalence Ratio 1.1250 0.7109
1.7804*;
```

The SAS System

The FREQ Procedure

Table of Gender by DiseaseFinal

Frequency Percent Row Pct Col Pct	Gender(Gender)	DiseaseFinal		
		Food Allergy	No Food Allergy	Total
	Female	15	17	32
		14.42	16.35	30.77
		46.88	53.13	
		33.33	28.81	
	Male	30	42	72
		28.85	40.38	69.23
		41.67	58.33	
		66.67	71.19	
	Total	45	59	104
		43.27	56.73	100.00

Frequency Missing = 27

Statistics for Table of Gender by DiseaseFinal

Statistic	DF	Value	Prob
Chi-Square	1	0.2448	0.6207
Likelihood Ratio Chi-Square	1	0.2441	0.6213
Continuity Adj. Chi-Square	1	0.0786	0.7792
Mantel-Haenszel Chi-Square	1	0.2425	0.6224

Statistic	DF	Value	Prob
Phi Coefficient		0.0485	
Contingency Coefficient		0.0485	
Cramer's V		0.0485	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	15
Left-sided Pr <= F	0.7613
Right-sided Pr >= F	0.3884
Table Probability (P)	0.1497
Two-sided Pr <= P	0.6714

Statistic	Value	ASE
Gamma	0.1053	0.2113
Kendall's Tau-b	0.0485	0.0984
Stuart's Tau-c	0.0444	0.0901
Somers' D C|R	0.0521	0.1056
Somers' D R|C	0.0452	0.0917
Pearson Correlation	-0.0485	0.0984
Spearman Correlation	0.0485	0.0984
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0017	0.0070
Uncertainty Coefficient R|C	0.0019	0.0077
Uncertainty Coefficient Symmetric	0.0018	0.0073

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	**1.2353**	0.5346	2.8545
Cohort (Col1 Risk)	**1.1250**	0.7109	1.7804

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Cohort (Col2 Risk)	**0.9107**	0.6231	1.3311

Effective Sample Size = 104
Frequency Missing = 27
WARNING: 21% of the data are missing.

Summary Statistics for Gender by DiseaseFinal

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	0.2425	0.6224
2	**Row Mean Scores Differ**	1	0.2425	0.6224
3	**General Association**	1	0.2425	0.6224

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	1.2353	0.5346	2.8545
(Odds Ratio)	**Logit**	1.2353	0.5346	2.8545
Cohort	**Mantel-Haenszel**	1.1250	0.7109	1.7804
(Col1 Risk)	**Logit**	1.1250	0.7109	1.7804
Cohort	**Mantel-Haenszel**	0.9107	0.6231	1.3311
(Col2 Risk)	**Logit**	0.9107	0.6231	1.3311

Effective Sample Size = 104
Frequency Missing = 27
WARNING: 21% of the data are missing.

```
*Examining the variable, AgeGroup;
*There was a significant difference in AgeGroupm byt this was largely between
those 5 and younger and those older than 5.  So we will reclassify the
variable ≤5 and > 5 (Ages) and use this in further analysis.
```

The SAS System

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of AgeGroup by DiseaseFinal DiseaseFinal		
AgeGroup	**Food Allergy**	**No Food Allergy**	**Total**
> 5 to <= 10 years of age	12	22	34
	11.54	21.15	32.69
	35.29	64.71	
	26.67	37.29	
0 to <= 5 years of age	25	19	44
	24.04	18.27	42.31
	56.82	43.18	
	55.56	32.20	
> 10 years of age	8	18	26
	7.69	17.31	25.00
	30.77	69.23	
	17.78	30.51	
Total	45	59	104
	43.27	56.73	100.00

Frequency Missing = 27

Statistics for Table of AgeGroup by DiseaseFinal

Statistic	DF	Value	Prob
Chi-Square	2	5.8265	0.0543
Likelihood Ratio Chi-Square	2	5.8626	0.0533
Mantel-Haenszel Chi-Square	1	5.1185	0.0237
Phi Coefficient		0.2367	
Contingency Coefficient		0.2303	
Cramer's V		0.2367	

Statistic	Value	ASE

Statistic	Value	ASE
Gamma	0.0090	0.1588
Kendall's Tau-b	0.0052	0.0920
Stuart's Tau-c	0.0059	0.1041
Somers' D C|R	0.0045	0.0798
Somers' D R|C	0.0060	0.1060
Pearson Correlation	-0.2229	0.0945
Spearman Correlation	0.0055	0.0973
Lambda Asymmetric C|R	0.1333	0.1372
Lambda Asymmetric R|C	0.0500	0.1040
Lambda Symmetric	0.0857	0.1026
Uncertainty Coefficient C|R	0.0412	0.0336
Uncertainty Coefficient R|C	0.0262	0.0214
Uncertainty Coefficient Symmetric	0.0320	0.0261

Effective Sample Size = 104
Frequency Missing = 27

WARNING: 21% of the data are missing.

Summary Statistics for AgeGroup by DiseaseFinal

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	5.1185	0.0237
2	**Row Mean Scores Differ**	2	5.7705	0.0558
3	**General Association**	2	5.7705	0.0558

Effective Sample Size = 104
Frequency Missing = 27

WARNING: 21% of the data are missing.

The FREQ Procedure

Table of AgeGroup by DiseaseFinal

Frequency / Percent / Row Pct / Col Pct	DiseaseFinal: Food Allergy	DiseaseFinal: No Food Allergy	Total
AgeGroup			
> 5 to <= 10 years of age	12	22	34
	15.38	28.21	43.59
	35.29	64.71	
	32.43	53.66	
0 to <= 5 years of age	25	19	44
	32.05	24.36	56.41
	56.82	43.18	
	67.57	46.34	
Total	37	41	78
	47.44	52.56	100.00

Frequency Missing = 19

Statistics for Table of AgeGroup by DiseaseFinal

Statistic	DF	Value	Prob
Chi-Square	1	3.5636	0.0591
Likelihood Ratio Chi-Square	1	3.6006	0.0578
Continuity Adj. Chi-Square	1	2.7526	0.0971
Mantel-Haenszel Chi-Square	1	3.5179	0.0607
Phi Coefficient		-0.2137	
Contingency Coefficient		0.2090	
Cramer's V		-0.2137	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	12
Left-sided Pr <= F	0.0481
Right-sided Pr >= F	0.9833
Table Probability (P)	0.0314
Two-sided Pr <= P	0.0706

Statistic	Value	ASE
Gamma	-0.4139	0.1950
Kendall's Tau-b	-0.2137	0.1101
Stuart's Tau-c	-0.2117	0.1092
Somers' D C|R	-0.2152	0.1109
Somers' D R|C	-0.2123	0.1095
Pearson Correlation	-0.2137	0.1101
Spearman Correlation	-0.2137	0.1101
Lambda Asymmetric C|R	0.1622	0.1641
Lambda Asymmetric R|C	0.0882	0.1798
Lambda Symmetric	0.1268	0.1495
Uncertainty Coefficient C|R	0.0334	0.0347
Uncertainty Coefficient R|C	0.0337	0.0350
Uncertainty Coefficient Symmetric	0.0335	0.0349

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**0.4145**	0.1648	1.0426
Cohort (Col1 Risk)	**0.6212**	0.3682	1.0479
Cohort (Col2 Risk)	**1.4985**	0.9844	2.2809

Effective Sample Size = 78
Frequency Missing = 19

WARNING: 20% of the data are missing.

Summary Statistics for AgeGroup by DiseaseFinal

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	3.5179	0.0607
2	Row Mean Scores Differ	1	3.5179	0.0607
3	General Association	1	3.5179	0.0607

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	0.4145	0.1648	1.0426
(Odds Ratio)	Logit	0.4145	0.1648	1.0426
Cohort	Mantel-Haenszel	0.6212	0.3682	1.0479
(Col1 Risk)	Logit	0.6212	0.3682	1.0479
Cohort	Mantel-Haenszel	1.4985	0.9844	2.2809
(Col2 Risk)	Logit	1.4985	0.9844	2.2809

Effective Sample Size = 78
Frequency Missing = 19

WARNING: 20% of the data are missing.

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Food Allergy	No Food Allergy	Total
Table of AgeGroup by DiseaseFinal			
AgeGroup	**DiseaseFinal**		
0 to <= 5 years of age	25	19	44
	35.71	27.14	62.86
	56.82	43.18	
	75.76	51.35	
> 10 years of age	8	18	26
	11.43	25.71	37.14
	30.77	69.23	
	24.24	48.65	
Total	33	37	70
	47.14	52.86	100.00

Frequency Missing = 21

Statistics for Table of AgeGroup by DiseaseFinal

Statistic	DF	Value	Prob
Chi-Square	1	4.4503	0.0349
Likelihood Ratio Chi-Square	1	4.5391	0.0331
Continuity Adj. Chi-Square	1	3.4663	0.0626
Mantel-Haenszel Chi-Square	1	4.3867	0.0362
Phi Coefficient		0.2521	
Contingency Coefficient		0.2445	
Cramer's V		0.2521	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	25
Left-sided Pr <= F	0.9914
Right-sided Pr >= F	0.0306
Table Probability (P)	0.0220
Two-sided Pr <= P	0.0481

Statistic	Value	ASE
Gamma	0.4950	0.1973
Kendall's Tau-b	0.2521	0.1138
Stuart's Tau-c	0.2433	0.1107
Somers' D C|R	0.2605	0.1173
Somers' D R|C	0.2441	0.1110
Pearson Correlation	-0.2521	0.1138
Spearman Correlation	0.2521	0.1138
Lambda Asymmetric C|R	0.1818	0.1818
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.1017	0.1068
Uncertainty Coefficient C|R	0.0469	0.0430
Uncertainty Coefficient R|C	0.0491	0.0450
Uncertainty Coefficient Symmetric	0.0480	0.0440

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**2.9605**	1.0628	8.2465
Cohort (Col1 Risk)	**1.8466**	0.9820	3.4724
Cohort (Col2 Risk)	**0.6237**	0.4078	0.9540

Effective Sample Size = 70
Frequency Missing = 21

WARNING: 23% of the data are missing.

Summary Statistics for AgeGroup by DiseaseFinal

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	4.3867	0.0362
2	Row Mean Scores Differ	1	4.3867	0.0362
3	General Association	1	4.3867	0.0362

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	2.9605	1.0628	8.2465
(Odds Ratio)	Logit	2.9605	1.0628	8.2465
Cohort	Mantel-Haenszel	1.8466	0.9820	3.4724
(Col1 Risk)	Logit	1.8466	0.9820	3.4724
Cohort	Mantel-Haenszel	0.6237	0.4078	0.9540
(Col2 Risk)	Logit	0.6237	0.4078	0.9540

Effective Sample Size = 70
Frequency Missing = 21

WARNING: 23% of the data are missing.

The FREQ Procedure

Table of AgeGroup by DiseaseFinal

Frequency / Percent / Row Pct / Col Pct	DiseaseFinal: Food Allergy	DiseaseFinal: No Food Allergy	Total
AgeGroup			
> 5 to <= 10 years of age	12	22	34
	20.00	36.67	56.67
	35.29	64.71	
	60.00	55.00	
> 10 years of age	8	18	26
	13.33	30.00	43.33
	30.77	69.23	
	40.00	45.00	
Total	20	40	60
	33.33	66.67	100.00

Frequency Missing = 14

Statistics for Table of AgeGroup by DiseaseFinal

Statistic	DF	Value	Prob
Chi-Square	1	0.1357	0.7125
Likelihood Ratio Chi-Square	1	0.1362	0.7120
Continuity Adj. Chi-Square	1	0.0085	0.9266
Mantel-Haenszel Chi-Square	1	0.1335	0.7148
Phi Coefficient		0.0476	
Contingency Coefficient		0.0475	
Cramer's V		0.0476	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	12
Left-sided Pr <= F	0.7393
Right-sided Pr >= F	0.4651
Table Probability (P)	0.2044
Two-sided Pr <= P	0.7867

Statistic	Value	ASE
Gamma	0.1020	0.2752
Kendall's Tau-b	0.0476	0.1283
Stuart's Tau-c	0.0444	0.1199
Somers' D C|R	0.0452	0.1221
Somers' D R|C	0.0500	0.1349
Pearson Correlation	-0.0476	0.1283
Spearman Correlation	0.0476	0.1283
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0018	0.0096
Uncertainty Coefficient R|C	0.0017	0.0090
Uncertainty Coefficient Symmetric	0.0017	0.0093

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**1.2273**	0.4126	3.6506
Cohort (Col1 Risk)	**1.1471**	0.5503	2.3911
Cohort (Col2 Risk)	**0.9346**	0.6542	1.3353

Effective Sample Size = 60
Frequency Missing = 14

WARNING: 19% of the data are missing.

Summary Statistics for AgeGroup by DiseaseFinal

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.1335	0.7148
2	Row Mean Scores Differ	1	0.1335	0.7148
3	General Association	1	0.1335	0.7148

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	1.2273	0.4126	3.6506
(Odds Ratio)	Logit	1.2273	0.4126	3.6506
Cohort	Mantel-Haenszel	1.1471	0.5503	2.3911
(Col1 Risk)	Logit	1.1471	0.5503	2.3911
Cohort	Mantel-Haenszel	0.9346	0.6542	1.3353
(Col2 Risk)	Logit	0.9346	0.6542	1.3353

Effective Sample Size = 60
Frequency Missing = 14

WARNING: 19% of the data are missing.

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of Ages by DiseaseFinal DiseaseFinal		
Ages	Food Allergy	No Food Allergy	Total
0	25	19	44
	24.04	18.27	42.31
	56.82	43.18	
	55.56	32.20	
1	20	40	60
	19.23	38.46	57.69
	33.33	66.67	
	44.44	67.80	
Total	45	59	104
	43.27	56.73	100.00

Frequency Missing = 27

Statistics for Table of Ages by DiseaseFinal

Statistic	DF	Value	Prob
Chi-Square	1	5.7036	0.0169
Likelihood Ratio Chi-Square	1	5.7263	0.0167
Continuity Adj. Chi-Square	1	4.7870	0.0287
Mantel-Haenszel Chi-Square	1	5.6487	0.0175
Phi Coefficient		0.2342	
Contingency Coefficient		0.2280	
Cramer's V		0.2342	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	25
Left-sided Pr <= F	0.9953
Right-sided Pr >= F	0.0143
Table Probability (P)	0.0095
Two-sided Pr <= P	0.0270

Statistic	Value	ASE
Gamma	0.4493	0.1634
Kendall's Tau-b	0.2342	0.0960
Stuart's Tau-c	0.2293	0.0943
Somers' D C|R	0.2348	0.0963
Somers' D R|C	0.2335	0.0959
Pearson Correlation	-0.2342	0.0960
Spearman Correlation	0.2342	0.0960
Lambda Asymmetric C|R	0.1333	0.1372
Lambda Asymmetric R|C	0.1136	0.1435
Lambda Symmetric	0.1236	0.1261
Uncertainty Coefficient C|R	0.0402	0.0332
Uncertainty Coefficient R|C	0.0404	0.0334
Uncertainty Coefficient Symmetric	0.0403	0.0333

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**2.6316**	1.1795	5.8711
Cohort (Col1 Risk)	**1.7045**	1.0968	2.6491
Cohort (Col2 Risk)	**0.6477**	0.4415	0.9503

Effective Sample Size = 104
Frequency Missing = 27

WARNING: 21% of the data are missing.

Summary Statistics for Ages by DiseaseFinal

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	5.6487	0.0175
2	Row Mean Scores Differ	1	5.6487	0.0175
3	General Association	1	5.6487	0.0175

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	2.6316	1.1795	5.8711
(Odds Ratio)	Logit	2.6316	1.1795	5.8711
Cohort	Mantel-Haenszel	1.7045	1.0968	2.6491
(Col1 Risk)	Logit	1.7045	1.0968	2.6491
Cohort	Mantel-Haenszel	0.6477	0.4415	0.9503
(Col2 Risk)	Logit	0.6477	0.4415	0.9503

Effective Sample Size = 104
Frequency Missing = 27
WARNING: 21% of the data are missing.

```
*Examining the variable, FamHxAtopyFinal.*;
*We found no significant difference.*;
```

The SAS System

The FREQ Procedure

Frequency
Percent
Row Pct
Col Pct

Table of FamHxAtopyFinal by Disease3

FamHxAtopyFinal	Disease3		
	Food Allergy	No Food Allergy	Total
Family History of Atopy	38	44	82

	37.62	43.56	81.19
	46.34	53.66	
	88.37	75.86	
No Family History of Atopy	5	14	19
	4.95	13.86	18.81
	26.32	73.68	
	11.63	24.14	
Total	43	58	101
	42.57	57.43	100.00

Frequency Missing = 30

Statistics for Table of FamHxAtopyFinal by Disease3

Statistic	DF	Value	Prob
Chi-Square	1	2.5303	0.1117
Likelihood Ratio Chi-Square	1	2.6423	0.1041
Continuity Adj. Chi-Square	1	1.7775	0.1825
Mantel-Haenszel Chi-Square	1	2.5052	0.1135
Phi Coefficient		0.1583	
Contingency Coefficient		0.1563	
Cramer's V		0.1583	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	38
Left-sided Pr <= F	0.9702
Right-sided Pr >= F	0.0897
Table Probability (P)	0.0599
Two-sided Pr <= P	0.1297

Statistic	Value	ASE

Statistic	Value	ASE
Gamma	0.4149	0.2343
Kendall's Tau-b	0.1583	0.0917
Stuart's Tau-c	0.1223	0.0729
Somers' D C|R	0.2003	0.1151
Somers' D R|C	0.1251	0.0745
Pearson Correlation	0.1583	0.0917
Spearman Correlation	0.1583	0.0917
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0192	0.0229
Uncertainty Coefficient R|C	0.0271	0.0320
Uncertainty Coefficient Symmetric	0.0224	0.0267

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**2.4182**	0.7973	7.3343
Cohort (Col1 Risk)	**1.7610**	0.8011	3.8709
Cohort (Col2 Risk)	**0.7282**	0.5206	1.0187

Effective Sample Size = 101
Frequency Missing = 30
WARNING: 23% of the data are missing.

Summary Statistics for FamHxAtopyFinal by Disease3

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	2.5052	0.1135
2	**Row Mean Scores Differ**	1	2.5052	0.1135
3	**General Association**	1	2.5052	0.1135

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	2.4182	0.7973	7.3343
(Odds Ratio)	Logit	2.4182	0.7973	7.3343
Cohort	Mantel-Haenszel	1.7610	0.8011	3.8709
(Col1 Risk)	Logit	1.7610	0.8011	3.8709
Cohort	Mantel-Haenszel	0.7282	0.5206	1.0187
(Col2 Risk)	Logit	0.7282	0.5206	1.0187

Effective Sample Size = 101
Frequency Missing = 30
WARNING: 23% of the data are missing.

```
*Examining the variable, DxADClean.*;
*We found a significant difference between those who had food allergy and
those who did not.*;
*Mantel-Haenszel Chi-Square 1 9.0387 0.0026*;
*Prevalence Ratio: 2.5 (1.2, 4.87
```

The SAS System

The FREQ Procedure

Table of DxADClean by Disease3

DxADClean	Disease3		
	Food Allergy	No Food Allergy	Total
History of Atopic Dermatitis	36	29	65
	37.50	30.21	67.71
	55.38	44.62	
	83.72	54.72	
No history of Atopic Dermatitis	7	24	31
	7.29	25.00	32.29
	22.58	77.42	
	16.28	45.28	
Total	43	53	96
	44.79	55.21	100.00

Frequency
Percent
Row Pct
Col Pct

Frequency Missing = 35

Statistics for Table of DxADClean by Disease3

Statistic	DF	Value	Prob
Chi-Square	1	9.1339	0.0025
Likelihood Ratio Chi-Square	1	9.5690	0.0020
Continuity Adj. Chi-Square	1	7.8555	0.0051
Mantel-Haenszel Chi-Square	1	9.0387	0.0026
Phi Coefficient		0.3085	
Contingency Coefficient		0.2948	
Cramer's V		0.3085	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	36
Left-sided Pr <= F	0.9996
Right-sided Pr >= F	0.0022
Table Probability (P)	0.0017
Two-sided Pr <= P	0.0040

Statistic	Value	ASE
Gamma	0.6195	0.1531
Kendall's Tau-b	0.3085	0.0918
Stuart's Tau-c	0.2869	0.0878
Somers' D C|R	0.3280	0.0972
Somers' D R|C	0.2900	0.0886
Pearson Correlation	-0.3085	0.0918
Spearman Correlation	0.3085	0.0918
Lambda Asymmetric C|R	0.1628	0.1716
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0946	0.1038

Statistic	Value	ASE
Uncertainty Coefficient C|R	0.0725	0.0447
Uncertainty Coefficient R|C	0.0792	0.0485
Uncertainty Coefficient Symmetric	0.0757	0.0465

Estimates of the Relative Risk (Row1/Row2)

Type of Study	Value	95% Confidence Limits	
Case-Control (Odds Ratio)	**4.2562**	1.6075	11.2687
Cohort (Col1 Risk)	**2.4527**	1.2335	4.8772
Cohort (Col2 Risk)	**0.5763**	0.4139	0.8023

Effective Sample Size = 96
Frequency Missing = 35
WARNING: 27% of the data are missing.
Summary Statistics for DxADClean by Disease3

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	**Nonzero Correlation**	1	9.0387	0.0026
2	**Row Mean Scores Differ**	1	9.0387	0.0026
3	**General Association**	1	9.0387	0.0026

Estimates of the Common Relative Risk (Row1/Row2)

Type of Study	Method	Value	95% Confidence Limits	
Case-Control	**Mantel-Haenszel**	4.2562	1.6075	11.2687
(Odds Ratio)	**Logit**	4.2562	1.6075	11.2687
Cohort	**Mantel-Haenszel**	2.4527	1.2335	4.8772
(Col1 Risk)	**Logit**	2.4527	1.2335	4.8772
Cohort	**Mantel-Haenszel**	0.5763	0.4139	0.8023
(Col2 Risk)	**Logit**	0.5763	0.4139	0.8023

Effective Sample Size = 96
Frequency Missing = 35
WARNING: 27% of the data are missing.

```
*Examining the variable, DxAsthmaClean.*;
*We found no significant difference between those who had food allergy and
those who did not.*;
```

The FREQ Procedure

Table of DxAsthmaClean by Disease3

Frequency / Percent / Row Pct / Col Pct	Disease3: Food Allergy	Disease3: No Food Allergy	Total
DxAsthmaClean			
History of asthma	31	38	69
	31.63	38.78	70.41
	44.93	55.07	
	75.61	66.67	
No history of asthma	10	19	29
	10.20	19.39	29.59
	34.48	65.52	
	24.39	33.33	
Total	41	57	98
	41.84	58.16	100.00

Frequency Missing = 33

Statistics for Table of DxAsthmaClean by Disease3

Statistic	DF	Value	Prob
Chi-Square	1	0.9154	0.3387
Likelihood Ratio Chi-Square	1	0.9272	0.3356
Continuity Adj. Chi-Square	1	0.5365	0.4639
Mantel-Haenszel Chi-Square	1	0.9061	0.3412
Phi Coefficient		0.0966	
Contingency Coefficient		0.0962	
Cramer's V		0.0966	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	31
Left-sided Pr <= F	0.8817
Right-sided Pr >= F	0.2329
Table Probability (P)	0.1146
Two-sided Pr <= P	0.3771

Statistic	Value	ASE
Gamma	0.2157	0.2191
Kendall's Tau-b	0.0966	0.0987
Stuart's Tau-c	0.0870	0.0892
Somers' D C|R	0.1044	0.1067
Somers' D R|C	0.0894	0.0916
Pearson Correlation	-0.0966	0.0987
Spearman Correlation	0.0966	0.0987
Lambda Asymmetric C|R	0.0000	0.0000
Lambda Asymmetric R|C	0.0000	0.0000
Lambda Symmetric	0.0000	0.0000
Uncertainty Coefficient C|R	0.0070	0.0143
Uncertainty Coefficient R|C	0.0078	0.0160
Uncertainty Coefficient Symmetric	0.0074	0.0151

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**1.5500**	0.6297	3.8152
Cohort (Col1 Risk)	**1.3029**	0.7401	2.2938
Cohort (Col2 Risk)	**0.8406**	0.5987	1.1802

Effective Sample Size = 98
Frequency Missing = 33
WARNING: 25% of the data are missing.
Summary Statistics for DxAsthmaClean by Disease3

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.9061	0.3412
2	Row Mean Scores Differ	1	0.9061	0.3412
3	General Association	1	0.9061	0.3412

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	Method	Value	95% Confidence Limits	
Case-Control	Mantel-Haenszel	1.5500	0.6297	3.8152
(Odds Ratio)	Logit	1.5500	0.6297	3.8152
Cohort	Mantel-Haenszel	1.3029	0.7401	2.2938
(Col1 Risk)	Logit	1.3029	0.7401	2.2938
Cohort	Mantel-Haenszel	0.8406	0.5987	1.1802
(Col2 Risk)	Logit	0.8406	0.5987	1.1802

Effective Sample Size = 98
Frequency Missing = 33

```
*Examining the variable, DxARClean.*;
*We found no significant difference between those who had food allergy and
those who did not.*;
```

The SAS System

The FREQ Procedure

Frequency
Percent
Row Pct
Col Pct

Table of DxARClean by Disease3			
DxARClean	Disease3		
	Food Allergy	No Food Allergy	Total
History of allergic rhinitis	23	23	46
	25.27	25.27	50.55
	50.00	50.00	
	60.53	43.40	
No history of allergic rhinitis	15	30	45

	16.48	32.97	49.45
	33.33	66.67	
	39.47	56.60	
Total	38	53	91
	41.76	58.24	100.00

Frequency Missing = 40

Statistics for Table of DxARClean by Disease3

Statistic	DF	Value	Prob
Chi-Square	1	2.5981	0.1070
Likelihood Ratio Chi-Square	1	2.6131	0.1060
Continuity Adj. Chi-Square	1	1.9580	0.1617
Mantel-Haenszel Chi-Square	1	2.5695	0.1089
Phi Coefficient		0.1690	
Contingency Coefficient		0.1666	
Cramer's V		0.1690	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	23
Left-sided Pr <= F	0.9663
Right-sided Pr >= F	0.0807
Table Probability (P)	0.0470
Two-sided Pr <= P	0.1378

Statistic	Value	ASE
Gamma	0.3333	0.1922
Kendall's Tau-b	0.1690	0.1031
Stuart's Tau-c	0.1666	0.1018
Somers' D C|R	0.1667	0.1018
Somers' D R|C	0.1713	0.1045

Statistic	Value	ASE
Pearson Correlation	-0.1690	0.1031
Spearman Correlation	0.1690	0.1031
Lambda Asymmetric C|R	0.0000	0.1785
Lambda Asymmetric R|C	0.1556	0.1487
Lambda Symmetric	0.0843	0.1410
Uncertainty Coefficient C|R	0.0211	0.0259
Uncertainty Coefficient R|C	0.0207	0.0254
Uncertainty Coefficient Symmetric	0.0209	0.0257

Estimates of the Relative Risk (Row1/Row2)			
Type of Study	**Value**	**95% Confidence Limits**	
Case-Control (Odds Ratio)	**2.0000**	0.8570	4.6674
Cohort (Col1 Risk)	**1.5000**	0.9060	2.4835
Cohort (Col2 Risk)	**0.7500**	0.5258	1.0699

Effective Sample Size = 91
Frequency Missing = 40
WARNING: 31% of the data are missing.

Summary Statistics for DxARClean by Disease3

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	**Alternative Hypothesis**	**DF**	**Value**	**Prob**
1	**Nonzero Correlation**	1	2.5695	0.1089
2	**Row Mean Scores Differ**	1	2.5695	0.1089
3	**General Association**	1	2.5695	0.1089

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Case-Control	**Mantel-Haenszel**	2.0000	0.8570	4.6674
(Odds Ratio)	**Logit**	2.0000	0.8570	4.6674
Cohort	**Mantel-Haenszel**	1.5000	0.9060	2.4835
(Col1 Risk)	**Logit**	1.5000	0.9060	2.4835

Estimates of the Common Relative Risk (Row1/Row2)				
Type of Study	**Method**	**Value**	**95% Confidence Limits**	
Cohort	**Mantel-Haenszel**	0.7500	0.5258	1.0699
(Col2 Risk)	**Logit**	0.7500	0.5258	1.0699

Effective Sample Size = 91
Frequency Missing = 40
WARNING: 31% of the data are missing.

```
*We will to need run a regression analysis, and will use proc gen mod.  We
will begin by using a basic, unadjusted model to compare to the unadjusted
prevalence ratio we previously calculated.*;
```

The SAS System

The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	104
Number of Events	45
Number of Trials	104
Missing Values	27

Class Level Information		
Class	**Value**	**Design Variables**
Exposure	**0**	0
	1	1

Response Profile

Ordered Value	DiseaseFinal	Total Frequency
1	1	45
2	0	59

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Parameter Information		
Parameter	**Effect**	**Exposure**
Prm1	Intercept	
Prm2	Exposure	1

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-67.6030	
Full Log Likelihood		-67.6030	
AIC (smaller is better)		139.2060	
AICC (smaller is better)		139.3249	
BIC (smaller is better)		144.4948	

Algorithm converged.

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-1.1527	0.1950	-1.5348	-0.7706	34.95	<.0001
Exposure	**1**	1	0.5984	0.2319	0.1439	1.0529	6.66	0.0099
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

Contrast Estimate Results								
Label	**Mean Estimate**	**Mean Confidence Limits**	**L'Beta Estimate**	**Standard Error**	**Alpha**	**L'Beta Confidence Limits**	**Chi-Square**	**Pr > ChiSq**

Contrast Estimate Results

Label	Mean Estimate	Mean Confidence Limits		L'Beta Estimate	Standard Error	Alpha	L'Beta Confidence Limits		Chi-Square	Pr > ChiSq
Exposure	1.8191	1.1547	2.8658	0.5984	0.2319	0.05	0.1439	1.0529	6.66	0.0099
Exp(Exposure)				1.8191	0.4218	0.05	1.1547	2.8658		

```
*We run a regression model with all variables and interaction terms to
evaluate for confounding and interaction.  We will use backwards elimination
starting with interaction terms.*;
*After running the model (see below) we will remove Exposure*ADClean from the
next model p = 0.9422.
```


The GENMOD Procedure

Model Information

Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	81
Number of Events	34
Number of Trials	81
Missing Values	50

Class Level Information

Class	Value	Design Variables
Exposure	**0**	0
	1	1
Ages	**0**	1

Class Level Information		
Class	**Value**	**Design Variables**
	1	0
Gender	**0**	1
	1	0
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1
DxAsthmaClean	**0**	0
	1	1
DxARClean	**0**	0
	1	1

Response Profile		
Ordered Value	**DiseaseFinal**	**Total Frequency**
1	1	34
2	0	47

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-50.7166	
Full Log Likelihood		-50.7166	
AIC (smaller is better)		129.4333	
AICC (smaller is better)		135.7969	
BIC (smaller is better)		162.9556	

WARNING: The relative Hessian convergence criterion of 0.5221076385 is greater than the limit of 0.0001. The convergence is questionable.

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter			**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Intercept			1	-3.0788	1.4819	-5.9834	-0.1743	4.32	0.0377
Exposure	**1**		1	2.3640	1.5162	-0.6078	5.3357	2.43	0.1190
Ages	**0**		1	0.2241	0.2320	-0.2306	0.6788	0.93	0.3341
Gender	**0**		1	-0.0196	0.2111	-0.4333	0.3942	0.01	0.9262
FamHxAtopy	**1**		1	2.2463	1.4489	-0.5935	5.0861	2.40	0.1211
DxADClean	**1**		1	0.2429	0.2247	-0.1974	0.6833	1.17	0.2796
DxAsthmaClean	**1**		1	0.0207	0.2439	-0.4574	0.4988	0.01	0.9324
DxARClean	**1**		1	0.2077	0.2395	-0.2617	0.6771	0.75	0.3858
Exposure*Gender	**1**	**0**	1	-0.0271	0.2731	-0.5623	0.5082	0.01	0.9211
Exposure*Ages	**1**	**0**	1	-0.0568	0.3834	-0.8082	0.6946	0.02	0.8822
Exposure*FamHxAtopy	**1**	**1**	1	-2.0581	1.4707	-4.9405	0.8244	1.96	0.1617
Exposure*DxADClean	**1**	**1**	1	-0.0245	0.3383	-0.6876	0.6386	0.01	0.9422
Exposure*DxAsthmaCle	**1**	**1**	1	0.1098	0.3403	-0.5571	0.7767	0.10	0.7469
Exposure*DxARClean	**1**	**1**	1	-0.1972	0.3140	-0.8126	0.4181	0.39	0.5299
Scale			0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

```
*After running the new model (see below) we will remove Exposure*Gender from
the next model p = 0.9281.
```

The SAS System

The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	81
Number of Events	34
Number of Trials	81
Missing Values	50

Class Level Information		
Class	**Value**	**Design Variables**
Exposure	**0**	0
	1	1
Ages	**0**	1
	1	0
Gender	**0**	1
	1	0
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1
DxAsthmaClean	**0**	0
	1	1

Class Level Information		
Class	**Value**	**Design Variables**
DxARClean	**0**	0
	1	1

Response Profile		
Ordered Value	**DiseaseFinal**	**Total Frequency**
1	1	34
2	0	47

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-50.8874	
Full Log Likelihood		-50.8874	
AIC (smaller is better)		127.7748	
AICC (smaller is better)		133.2076	
BIC (smaller is better)		158.9026	

WARNING: The relative Hessian convergence criterion of 0.4817507877 is greater than the limit of 0.0001. The convergence is questionable.

Analysis Of Maximum Likelihood Parameter Estimates							
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-3.0620	1.4783	-5.9594	-0.1645	4.29	0.0383
Exposure	**1**	1	2.3448	1.5005	-0.5961	5.2858	2.44	0.1181
Ages	**0**	1	0.2208	0.2240	-0.2183	0.6599	0.97	0.3244

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Gender	**0**	1	-0.0225	0.2109	-0.4357	0.3908	0.01	0.9151
FamHxAtopy	**1**	1	2.2551	1.4535	-0.5936	5.1039	2.41	0.1208
DxADClean	**1**	1	0.2175	0.1654	-0.1066	0.5417	1.73	0.1884
DxAsthmaClean	**1**	1	0.0159	0.2431	-0.4606	0.4923	0.00	0.9480
DxARClean	**1**	1	0.2125	0.2350	-0.2480	0.6731	0.82	0.3658
Exposure*Gender	**1 0**	1	-0.0247	0.2735	-0.5607	0.5113	0.01	0.9281
Exposure*Ages	**1 0**	1	-0.0524	0.3389	-0.7166	0.6119	0.02	0.8772
Exposure*FamHxAtopy	**1 1**	1	-2.0656	1.4749	-4.9564	0.8252	1.96	0.1614
Exposure*DxAsthmaCle	**1 1**	1	0.1171	0.3396	-0.5486	0.7827	0.12	0.7303
Exposure*DxARClean	**1 1**	1	-0.2039	0.3109	-0.8132	0.4054	0.43	0.5119
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

```
*After running the new model (see below) we will remove Exposure*Ages from the
next model p = 0.8917.
```

The SAS System

The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial

Model Information	
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	81
Number of Events	34
Number of Trials	81
Missing Values	50

Class Level Information		
Class	**Value**	**Design Variables**
Exposure	**0**	0
	1	1
Ages	**0**	1
	1	0
Gender	**0**	1
	1	0
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1
DxAsthmaClean	**0**	0
	1	1
DxARClean	**0**	0
	1	1

Response Profile		
Ordered Value	**DiseaseFinal**	**Total Frequency**
1	1	34

Response Profile		
Ordered Value	DiseaseFinal	Total Frequency
2	0	47

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Criteria For Assessing Goodness Of Fit			
Criterion	DF	Value	Value/DF
Log Likelihood		-50.9123	
Full Log Likelihood		-50.9123	
AIC (smaller is better)		125.8245	
AICC (smaller is better)		130.4128	
BIC (smaller is better)		154.5579	

WARNING: The relative Hessian convergence criterion of 0.4781799913 is greater than the limit of 0.0001. The convergence is questionable.

Analysis Of Maximum Likelihood Parameter Estimates							
Parameter		DF	Estimate	Standard Error	Wald 95% Confidence Limits		Wald Chi-Square	Pr > ChiSq
Intercept		1	-3.0575	1.4782	-5.9547	-0.1604	4.28	0.0386
Exposure	1	1	2.3341	1.4986	-0.6031	5.2713	2.43	0.1194
Ages	0	1	0.2161	0.2190	-0.2130	0.6453	0.97	0.3236
Gender	0	1	-0.0383	0.1343	-0.3014	0.2248	0.08	0.7755
FamHxAtopy	1	1	2.2598	1.4549	-0.5917	5.1113	2.41	0.1204
DxADClean	1	1	0.2201	0.1649	-0.1030	0.5433	1.78	0.1818
DxAsthmaClean	1	1	0.0142	0.2402	-	0.4850	0.00	0.952

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter			**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
						0.4565			7
DxARClean	**1**		1	0.2076	0.2321	-0.2473	0.6626	0.80	0.3711
Exposure*Ages	**1**	**0**	1	-0.0454	0.3335	-0.6990	0.6082	0.02	0.8917
Exposure*FamHxAtopy	**1**	**1**	1	-2.0691	1.4762	-4.9624	0.8242	1.96	0.1610
Exposure*DxAsthmaCle	**1**	**1**	1	0.1174	0.3370	-0.5430	0.7778	0.12	0.7276
Exposure*DxARClean	**1**	**1**	1	-0.1973	0.3075	-0.8001	0.4055	0.41	0.5212
Scale			0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

```
*After running the new model (see below) we will remove Exposure*DxAsthmaClean
from the next model p = 0.6997.
```


The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	81
Number of Events	34
Number of Trials	81

Missing Values	50

Class Level Information		
Class	**Value**	**Design Variables**
Exposure	**0**	0
	1	1
Ages	**0**	1
	1	0
Gender	**0**	1
	1	0
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1
DxAsthmaClean	**0**	0
	1	1
DxARClean	**0**	0
	1	1

Response Profile		
Ordered Value	**DiseaseFinal**	**Total Frequency**
1	1	34
2	0	47

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-51.1767	
Full Log Likelihood		-51.1767	
AIC (smaller is better)		124.3534	

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
AICC (smaller is better)		128.1795	
BIC (smaller is better)		150.6924	

WARNING: The relative Hessian convergence criterion of 0.4519802115 is greater than the limit of 0.0001. The convergence is questionable.

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter			**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Intercept			1	-3.0204	1.4724	-5.9063	-0.1345	4.21	0.0402
Exposure	**1**		1	2.2926	1.4868	-0.6215	5.2066	2.38	0.1231
Ages	**0**		1	0.1812	0.1771	-0.1658	0.5282	1.05	0.3061
Gender	**0**		1	-0.0392	0.1341	-0.3020	0.2235	0.09	0.7698
FamHxAtopy	**1**		1	2.2530	1.4525	-0.5938	5.0998	2.41	0.1209
DxADClean	**1**		1	0.2168	0.1595	-0.0958	0.5293	1.85	0.1741
DxAsthmaClean	**1**		1	0.0032	0.2351	-0.4576	0.4640	0.00	0.9891
DxARClean	**1**		1	0.2069	0.2203	-0.2249	0.6388	0.88	0.3476
Exposure*FamHxAtopy	**1**	**1**	1	-2.0656	1.4747	-4.9559	0.8248	1.96	0.1613
Exposure*DxAsthmaCle	**1**	**1**	1	0.1284	0.3328	-0.5239	0.7806	0.15	0.6997
Exposure*DxARClean	**1**	**1**	1	-0.1961	0.2820	-0.7488	0.3565	0.48	0.4867
Scale			0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

```
*After running the new model (see below) we will remove Exposure*DxARClean
from the next model p = 0.5374.
```

The SAS System

The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	81
Number of Events	34
Number of Trials	81
Missing Values	50

Class Level Information		
Class	**Value**	**Design Variables**
Exposure	**0**	0
	1	1
Ages	**0**	1
	1	0
Gender	**0**	1
	1	0
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1

Class Level Information		
Class	**Value**	**Design Variables**
DxAsthmaClean	**0**	0
	1	1
DxARClean	**0**	0
	1	1

Response Profile		
Ordered Value	**DiseaseFinal**	**Total Frequency**
1	1	34
2	0	47

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-54.5370	
Full Log Likelihood		-54.5370	
AIC (smaller is better)		127.0740	
AICC (smaller is better)		129.6093	
BIC (smaller is better)		148.6241	

WARNING: The relative Hessian convergence criterion of 0.3971594656 is greater than the limit of 0.0001. The convergence is questionable.

Analysis Of Maximum Likelihood Parameter Estimates							
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-2.9190	1.4084	-5.6794	-0.1587	4.30	0.0382
Exposure	**1**	1	2.2568	1.4122	-	5.0246	2.55	0.110

Analysis Of Maximum Likelihood Parameter Estimates

Parameter		DF	Estimate	Standard Error	Wald 95% Confidence Limits		Wald Chi-Square	Pr > ChiSq
					0.5111			0
Ages	**0**	1	0.1637	0.1489	-0.1281	0.4554	1.21	0.2716
Gender	**0**	1	-0.0262	0.1216	-0.2645	0.2121	0.05	0.8295
FamHxAtopy	**1**	1	2.2514	1.3973	-0.4872	4.9900	2.60	0.1071
DxADClean	**1**	1	0.1971	0.1319	-0.0614	0.4556	2.23	0.1350
DxAsthmaClean	**1**	1	0.0741	0.1456	-0.2113	0.3596	0.26	0.6107
DxARClean	**1**	1	0.0627	0.1336	-0.1991	0.3246	0.22	0.6386
Exposure*FamHxAtopy	**1 1**	1	-2.0868	1.4171	-4.8642	0.6907	2.17	0.1409
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

```
*After running the new model (see below) we will remove Exposure*FamHxAtopy
from the next model p = 0.1409.*;
*This section I will begin elimination of variables to determine the final
model. This will be the most parsimonious model*
*After running the code (See Below) we will remove Gender (p = 0.77)*;
```


The GENMOD Procedure

Model Information

Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	81
Number of Events	34
Number of Trials	81
Missing Values	50

Class Level Information

Class	Value	Design Variables
Exposure	**0**	0
	1	1
Ages	**0**	1
	1	0
Gender	**0**	0
	1	1
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1
DxAsthmaClean	**0**	0
	1	1
DxARClean	**0**	0
	1	1

Response Profile

Ordered Value	DiseaseFinal	Total Frequency
1	1	34
2	0	47

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Parameter Information

Parameter	Effect	Exposure	Ages	Gender	FamHxAtopy	DxADClean	DxAsthmaClean	DxARClean
Prm1	Intercept							
Prm2	Exposure	1						
Prm3	Ages		0					
Prm4	Gender			1				
Prm5	FamHxAtopy				1			
Prm6	DxADClean					1		
Prm7	DxAsthmaClean						1	
Prm8	DxARClean							1

Criteria For Assessing Goodness Of Fit

Criterion	DF	Value	Value/DF
Log Likelihood		-60.5625	
Full Log Likelihood		-60.5625	
AIC (smaller is better)		137.1251	
AICC (smaller is better)		139.1251	
BIC (smaller is better)		156.2807	

WARNING: The relative Hessian convergence criterion of 0.3973090352 is greater than the limit of 0.0001. The convergence is questionable.

Analysis Of Maximum Likelihood Parameter Estimates

Parameter		DF	Estimate	Standard Error	Wald 95% Confidence Limits		Wald Chi-Square	Pr > ChiSq
Intercept		1	-0.8695	0.2435	-1.3467	-0.3923	12.75	0.0004
Exposure	**1**	1	0.1713	0.1083	-0.0409	0.3835	2.50	0.1136
Ages	**0**	1	0.1448	0.1285	-0.1071	0.3966	1.27	0.2599
Gender	**1**	1	0.0244	0.1128	-0.1966	0.2455	0.05	0.8284

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter		DF	Estimate	Standard Error	Wald 95% Confidence Limits		Wald Chi-Square	Pr > ChiSq
FamHxAtopy	1	1	0.2245	0.1615	-0.0920	0.5410	1.93	0.1645
DxADClean	1	1	0.1787	0.1198	-0.0561	0.4135	2.22	0.1359
DxAsthmaClean	1	1	0.0683	0.1278	-0.1823	0.3188	0.29	0.5932
DxARClean	1	1	0.0576	0.1186	-0.1750	0.2901	0.24	0.6275
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

Contrast Estimate Results									
Label	Mean Estimate	Mean Confidence Limits		L'Beta Estimate	Standard Error	Alpha	L'Beta Confidence Limits		Chi-Square	Pr > ChiSq
Exposure	1.1869	0.9599	1.4674	0.1713	0.1083	0.05	-0.0409	0.3835	2.50	0.1136
Exp(Exposure)				1.1869	0.1285	0.05	0.9599	1.4674		
Ages	1.1558	0.8984	1.4868	0.1448	0.1285	0.05	-0.1071	0.3966	1.27	0.2599
Exp(Ages)				1.1558	0.1485	0.05	0.8984	1.4868		
Gender	1.0247	0.8215	1.2782	0.0244	0.1128	0.05	-0.1966	0.2455	0.05	0.8284
Exp(Gender)				1.0247	0.1156	0.05	0.8215	1.2782		
FamHxAtopy	1.2517	0.9121	1.7176	0.2245	0.1615	0.05	-0.0920	0.5410	1.93	0.1645
Exp(FamHxAtopy)				1.2517	0.2021	0.05	0.9121	1.7176		

Contrast Estimate Results									
Label	Mean Estimate	Mean Confidence Limits		L'Beta Estimate	Standard Error	Alpha	L'Beta Confidence Limits		Chi-Square	Pr > ChiSq
DxADClean	1.1957	0.9454	1.5122	0.1787	0.1198	0.05	-0.0561	0.4135	2.22	0.1359
Exp(DxADClean)				1.1957	0.1433	0.05	0.9454	1.5122		
DxAsthmaClean	1.0707	0.8334	1.3755	0.0683	0.1278	0.05	-0.1823	0.3188	0.29	0.5932
Exp(DxAsthmaClean)				1.0707	0.1369	0.05	0.8334	1.3755		
DxARClean	1.0593	0.8395	1.3366	0.0576	0.1186	0.05	-0.1750	0.2901	0.24	0.6275
Exp(DxARClean)				1.0593	0.1257	0.05	0.8395	1.3366		

```
*After running the code (See Below) we will remove Gender (p = 0.77) from the
next model.*;
```


The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	81
Number of Events	34
Number of Trials	81

Missing Values	50

Class Level Information

Class	Value	Design Variables
Exposure	**0**	0
	1	1
Ages	**0**	1
	1	0
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1
DxAsthmaClean	**0**	0
	1	1
DxARClean	**0**	0
	1	1

Response Profile

Ordered Value	DiseaseFinal	Total Frequency
1	1	34
2	0	47

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Parameter Information

Parameter	Effect	Exposure	Ages	FamHxAtopy	DxADClean	DxAsthmaClean	DxARClean
Prm1	Intercept						
Prm2	Exposure	1					
Prm3	Ages		0				
Prm4	FamHxAtop			1			

Parameter Information							
Parameter	**Effect**	**Exposure**	**Ages**	**FamHxAtopy**	**DxADClean**	**DxAsthmaClean**	**DxARClean**
	y						
Prm5	DxADClean				1		
Prm6	DxAsthmaClean					1	
Prm7	DxARClean						1

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-55.5191	
Full Log Likelihood		-55.5191	
AIC (smaller is better)		125.0381	
AICC (smaller is better)		126.5724	
BIC (smaller is better)		141.7993	

WARNING: The relative Hessian convergence criterion of 0.3967820559 is greater than the limit of 0.0001. The convergence is questionable.

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-1.0114	0.2723	-1.5450	-0.4778	13.80	0.0002
Exposure	**1**	1	0.2088	0.1252	-0.0366	0.4541	2.78	0.0954
Ages	**0**	1	0.1740	0.1497	-0.1193	0.4674	1.35	0.2449
FamHxAtopy	**1**	1	0.2537	0.1886	-0.1160	0.6235	1.81	0.1786
DxADClean	**1**	1	0.2285	0.1430	-0.0518	0.5088	2.55	0.1101
DxAsthmaClean	**1**	1	0.0747	0.1506	-0.2204	0.3698	0.25	0.6197
DxARClean	**1**	1	0.0716	0.1405	-0.2038	0.3470	0.26	0.6103
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

Contrast Estimate Results									
Label	Mean Estimate	Mean Confidence Limits		L'Beta Estimate	Standard Error	Alpha	L'Beta Confidence Limits		Chi-Square	Pr > ChiSq
Exposure	1.2322	0.9641	1.5748	0.2088	0.1252	0.05	-0.0366	0.4541	2.78	0.0954
Exp(Exposure)				1.2322	0.1542	0.05	0.9641	1.5748		
Ages	1.1901	0.8875	1.5959	0.1740	0.1497	0.05	-0.1193	0.4674	1.35	0.2449
Exp(Ages)				1.1901	0.1781	0.05	0.8875	1.5959		
FamHxAtopy	1.2888	0.8905	1.8654	0.2537	0.1886	0.05	-0.1160	0.6235	1.81	0.1786
Exp(FamHxAtopy)				1.2888	0.2431	0.05	0.8905	1.8654		
DxADClean	1.2567	0.9495	1.6633	0.2285	0.1430	0.05	-0.0518	0.5088	2.55	0.1101
Exp(DxADClean)				1.2567	0.1797	0.05	0.9495	1.6633		
DxAsthmaClean	1.0776	0.8022	1.4474	0.0747	0.1506	0.05	-0.2204	0.3698	0.25	0.6197
Exp(DxAsthmaClean)				1.0776	0.1622	0.05	0.8022	1.4474		
DxARClean	1.0742	0.8157	1.4148	0.0716	0.1405	0.05	-0.2038	0.3470	0.26	0.6103
Exp(DxARClean)				1.0742	0.1509	0.05	0.8157	1.4148		

```
*After running the code (See Below) we will remove DxARClean (p = 0.6275) from
the next model.*;
```

The SAS System

The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	88
Number of Events	38
Number of Trials	88
Missing Values	43

Class Level Information

Class	Value	Design Variables
Exposure	**0**	0
	1	1
Ages	**0**	1
	1	0
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1
DxAsthmaClean	**0**	0
	1	1

Response Profile

Ordered Value	DiseaseFinal	Total Frequency
1	1	38
2	0	50

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Parameter Information

Parameter	Effect	Exposure	Ages	FamHxAtopy	DxADClean	DxAsthmaClean
Prm1	Intercept					
Prm2	Exposure	1				
Prm3	Ages		0			
Prm4	FamHxAtopy			1		
Prm5	DxADClean				1	
Prm6	DxAsthmaClean					1

Criteria For Assessing Goodness Of Fit

Criterion	DF	Value	Value/DF
Log Likelihood		-49.5937	
Full Log Likelihood		-49.5937	
AIC (smaller is better)		111.1875	
AICC (smaller is better)		112.2245	
BIC (smaller is better)		126.0515	

WARNING: The relative Hessian convergence criterion of 0.2426241531 is greater than the limit of 0.0001. The convergence is questionable.

Analysis Of Maximum Likelihood Parameter Estimates

Parameter		DF	Estimate	Standard Error	Wald 95% Confidence Limits		Wald Chi-Square	Pr > ChiSq
Intercept		1	-1.6469	0.4280	-2.4857	-0.8080	14.81	0.0001
Exposure	**1**	1	0.3461	0.1894	-0.0251	0.7172	3.34	0.0676

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Ages	**0**	1	0.3023	0.1939	-0.0778	0.6824	2.43	0.1190
FamHxAtopy	**1**	1	0.2658	0.2498	-0.2238	0.7553	1.13	0.2873
DxADClean	**1**	1	0.5098	0.2254	0.0681	0.9514	5.12	0.0237
DxAsthmaClean	**1**	1	0.2230	0.2149	-0.1982	0.6441	1.08	0.2994
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

Contrast Estimate Results									
Label	**Mean Estimate**	**Mean Confidence Limits**		**L'Beta Estimate**	**Standard Error**	**Alpha**	**L'Beta Confidence Limits**		**Chi-Square**	**Pr > ChiSq**
Exposure	1.4135	0.9752	2.0488	0.3461	0.1894	0.05	-0.0251	0.7172	3.34	0.0676
Exp(Exposure)				1.4135	0.2677	0.05	0.9752	2.0488		
Ages	1.3530	0.9252	1.9785	0.3023	0.1939	0.05	-0.0778	0.6824	2.43	0.1190
Exp(Ages)				1.3530	0.2624	0.05	0.9252	1.9785		
FamHxAtopy	1.3045	0.7995	2.1283	0.2658	0.2498	0.05	-0.2238	0.7553	1.13	0.2873
Exp(FamHxAtopy)				1.3045	0.3258	0.05	0.7995	2.1283		
DxADClean	1.6649	1.0704	2.5894	0.5098	0.2254	0.05	0.0681	0.9514	5.12	0.0237
Exp(DxADClean)				1.6649	0.3752	0.05	1.0704	2.5894		
DxAsthmaClea	1.249	0.82	1.90	0.223	0.2149	0.05	-	0.64	1.08	0.29

Contrast Estimate Results									
Label	Mean Estimate	Mean Confidence Limits		L'Beta Estimate	Standard Error	Alpha	L'Beta Confidence Limits		Chi-Square	Pr > ChiSq
n	8	02	43	0			0.1982	41		94
Exp(DxAsthmaClean)				1.2498	0.2685	0.05	0.8202	1.9043		

```
*After running the code (See Below) we will remove FamHxAtopy (p = 0.2974)
from the next model.*;
* MH Chi Square: 0.0127. Our adjusted Prevalence Ratio for Exposure is: 1.7
(1.1, 2.5)
```


The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	94
Number of Events	42
Number of Trials	94
Missing Values	37

Class Level Information		
Class	Value	Design Variables
Exposure	0	0
	1	1
Ages	0	1
	1	0

Class Level Information		
Class	**Value**	**Design Variables**
FamHxAtopy	**0**	0
	1	1
DxADClean	**0**	0
	1	1

Response Profile		
Ordered Value	**DiseaseFinal**	**Total Frequency**
1	1	42
2	0	52

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Parameter Information					
Parameter	**Effect**	**Exposure**	**Ages**	**FamHxAtopy**	**DxADClean**
Prm1	Intercept				
Prm2	Exposure	1			
Prm3	Ages		0		
Prm4	FamHxAtopy			1	
Prm5	DxADClean				1

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-51.3767	
Full Log Likelihood		-51.3767	
AIC (smaller is better)		112.7535	
AICC (smaller is better)		113.4353	
BIC (smaller is better)		125.4699	

Algorithm converged.

Analysis Of Maximum Likelihood Parameter Estimates

Parameter		DF	Estimate	Standard Error	Wald 95% Confidence Limits		Wald Chi-Square	Pr > ChiSq
Intercept		1	-2.4070	0.4867	-3.3609	-1.4532	24.46	<.0001
Exposure	1	1	0.5113	0.2052	0.1090	0.9135	6.21	0.0127
Ages	0	1	0.4209	0.2001	0.0288	0.8130	4.43	0.0354
FamHxAtopy	1	1	0.3956	0.3797	-0.3486	1.1398	1.09	0.2974
DxADClean	1	1	1.0048	0.3684	0.2828	1.7268	7.44	0.0064
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

Contrast Estimate Results

Label	Mean Estimate	Mean Confidence Limits		L'Beta Estimate	Standard Error	Alpha	L'Beta Confidence Limits		Chi-Square	Pr > ChiSq
Exposure	1.6674	1.1152	2.4931	0.5113	0.2052	0.05	0.1090	0.9135	6.21	0.0127
Exp(Exposure)				1.6674	0.3422	0.05	1.1152	2.4931		
Ages	1.5234	1.0293	2.2547	0.4209	0.2001	0.05	0.0288	0.8130	4.43	0.0354
Exp(Ages)				1.5234	0.3048	0.05	1.0293	2.2547		
FamHxAtopy	1.4853	0.7057	3.1261	0.3956	0.3797	0.05	-0.3486	1.1398	1.09	0.2974
Exp(FamHxAtopy)				1.4853	0.5639	0.05	0.7057	3.1261		
DxADClean	2.7312	1.3268	5.6224	1.0048	0.3684	0.05	0.2828	1.7268	7.44	0.0064
Exp(DxADClean)				2.7312	1.0061	0.05	1.3268	5.6224		

```
*This is the most parsimonious and best model*;
```

The GENMOD Procedure

Model Information	
Data Set	WORK.FAR15
Distribution	Binomial
Link Function	Log
Dependent Variable	DiseaseFinal

Number of Observations Read	131
Number of Observations Used	96
Number of Events	43
Number of Trials	96
Missing Values	35

Class Level Information		
Class	**Value**	**Design Variables**
Exposure	**0**	0
	1	1
Ages	**0**	1
	1	0
DxADClean	**0**	0
	1	1

Response Profile		
Ordered Value	**DiseaseFinal**	**Total Frequency**
1	1	43
2	0	53

PROC GENMOD is modeling the probability that DiseaseFinal='1'.

Parameter Information

Parameter	Effect	Exposure	Ages	DxADClean
Prm1	Intercept			
Prm2	Exposure	1		
Prm3	Ages		0	
Prm4	DxADClean			1

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Log Likelihood		-55.8027	
Full Log Likelihood		-55.8027	
AIC (smaller is better)		119.6055	
AICC (smaller is better)		120.0450	
BIC (smaller is better)		129.8629	

Algorithm converged.

Analysis Of Maximum Likelihood Parameter Estimates								
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald 95% Confidence Limits**		**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-1.9584	0.3628	-2.6694	-1.2474	29.14	<.0001
Exposure	**1**	1	0.5228	0.2095	0.1121	0.9335	6.22	0.0126
Ages	**0**	1	0.4141	0.1978	0.0264	0.8018	4.38	0.0363
DxADClean	**1**	1	0.8713	0.3402	0.2044	1.5382	6.56	0.0104
Scale		0	1.0000	0.0000	1.0000	1.0000		

Note: The scale parameter was held fixed.

Contrast Estimate Results										
Label	**Mean Estimate**	**Mean Confidence Limits**		**L'Beta Estimate**	**Standard Error**	**Alpha**	**L'Beta Confidence Limits**		**Chi-Square**	**Pr > ChiSq**
Exposure	1.6867	1.1186	2.5433	0.5228	0.2095	0.05	0.1121	0.9335	6.22	0.0126

Contrast Estimate Results

Label	Mean Estimate	Mean Confidence Limits		L'Beta Estimate	Standard Error	Alpha	L'Beta Confidence Limits		Chi-Square	Pr > ChiSq
Exp(Exposure)				1.6867	0.3534	0.05	1.1186	2.5433		
Ages	1.5130	1.0267	2.2295	0.4141	0.1978	0.05	0.0264	0.8018	4.38	0.0363
Exp(Ages)				1.5130	0.2993	0.05	1.0267	2.2295		
DxADClean	2.3900	1.2268	4.6560	0.8713	0.3402	0.05	0.2044	1.5382	6.56	0.0104
Exp(DxADClean)				2.3900	0.8132	0.05	1.2268	4.6560		

```
*Focusing on the subgroup that were food allergic, and looking for differences
in continuous variables.*;
```

The SAS System 11:39 Thursday, April 12, 2012 712

The TTEST Procedure

Variable: Age (Age)

Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	18	5.6489	5.0947	1.2008	1.0000	16.8300
1	27	6.0656	2.9385	0.5655	2.0000	13.3400
Diff (1-2)		-0.4167	3.9348	1.1973		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		5.6489	3.1154	8.1824	5.0947	3.8230	7.6376
1		6.0656	4.9031	7.2280	2.9385	2.3141	4.0270
Diff (1-2)	Pooled	-0.4167	-2.8313	1.9979	3.9348	3.2510	4.9855
Diff (1-2)	Satterthwaite	-0.4167	-3.1527	2.3193			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	43	-0.35	0.7295
Satterthwaite	Unequal	24.586	-0.31	0.7562

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	17	26	3.01	0.0114

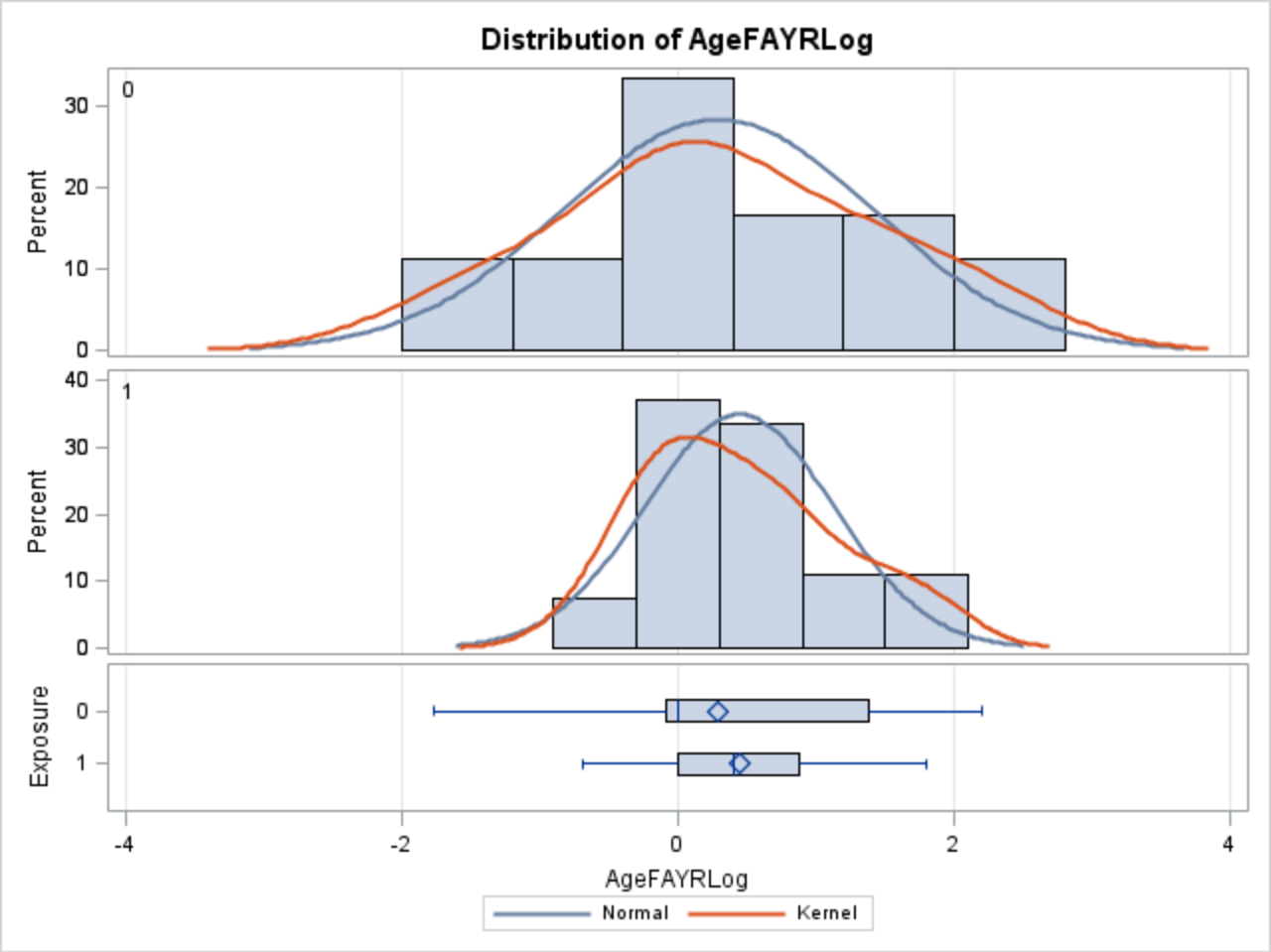
The TTEST Procedure
Variable: AgeFAYRLog

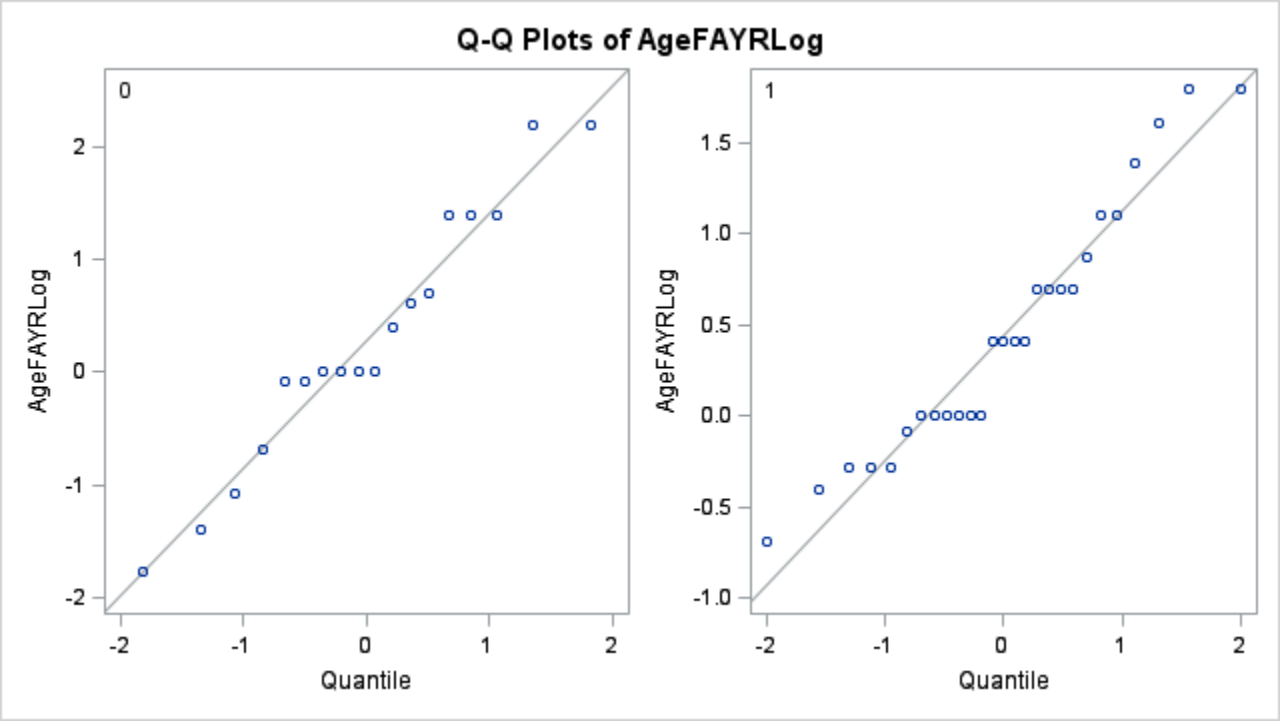
Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	18	0.2866	1.1291	0.2661	-1.7720	2.1972
1	27	0.4447	0.6864	0.1321	-0.6931	1.7918
Diff (1-2)		-0.1581	0.8882	0.2703		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.2866	-0.2749	0.8481	1.1291	0.8473	1.6927
1		0.4447	0.1731	0.7162	0.6864	0.5406	0.9407
Diff (1-2)	**Pooled**	-0.1581	-0.7031	0.3870	0.8882	0.7338	1.1254
Diff (1-2)	**Satterthwaite**	-0.1581	-0.7695	0.4534			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	43	-0.58	0.5617
Satterthwaite	Unequal	25.401	-0.53	0.5994

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	17	26	2.71	0.0218


Distribution of AgeFAYRLog
0
1
Percent
Exposure
AgeFAYRLog
Normal
Kernel


Q-Q Plots of AgeFAYRLog
0
1
AgeFAYRLog
Quantile

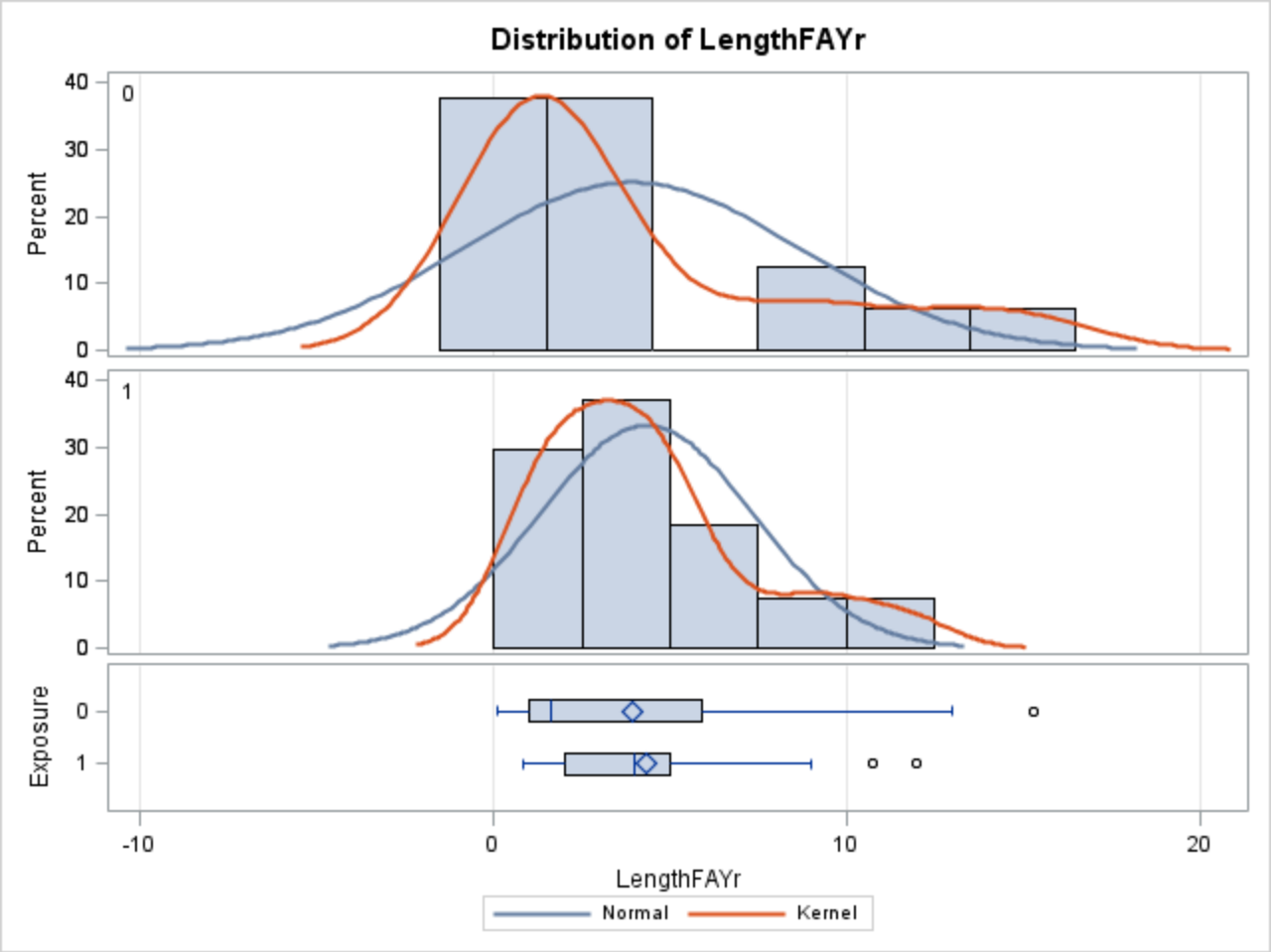
The TTEST Procedure
Variable: LengthFAYr (LengthFAYr)

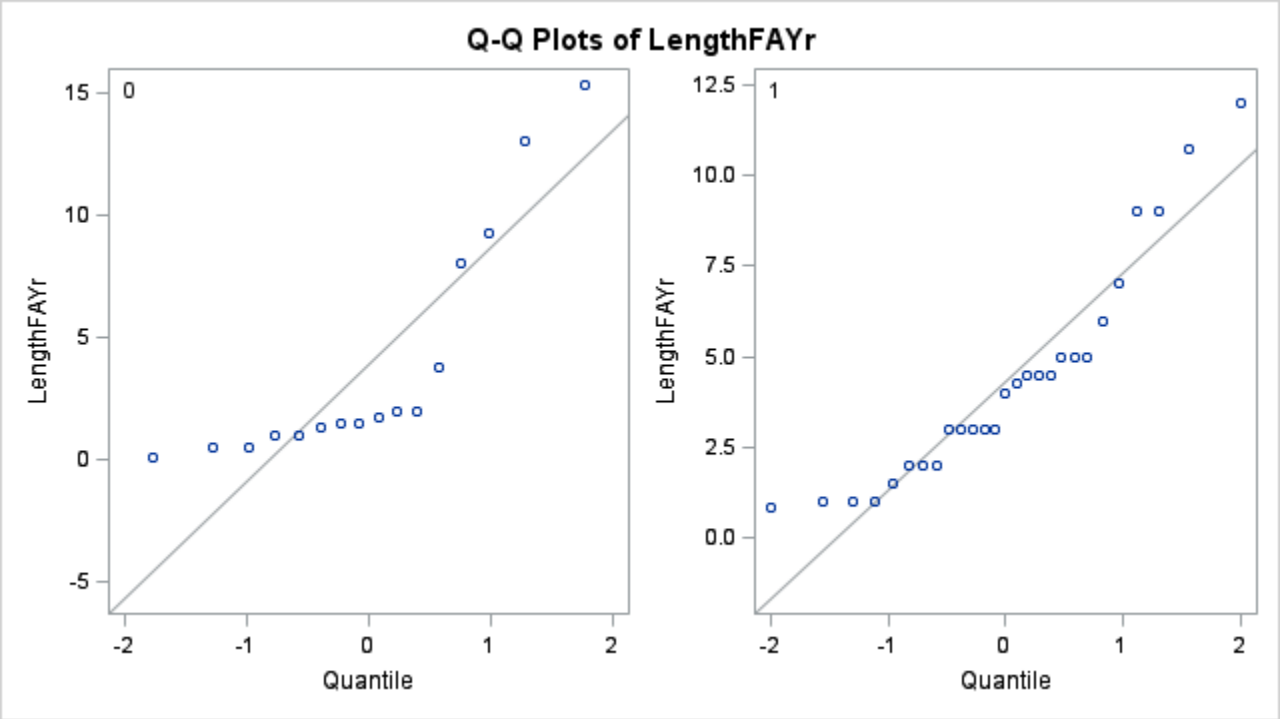
Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	16	3.9075	4.7770	1.1942	0.1300	15.3000
1	27	4.3274	2.9982	0.5770	0.8400	12.0000
Diff (1-2)		-0.4199	3.7482	1.1825		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		3.9075	1.3620	6.4530	4.7770	3.5288	7.3933
1		4.3274	3.1414	5.5134	2.9982	2.3611	4.1088
Diff (1-2)	**Pooled**	-0.4199	-2.8081	1.9683	3.7482	3.0840	4.7796
Diff (1-2)	**Satterthwaite**	-0.4199	-3.1696	2.3298			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	41	-0.36	0.7243
Satterthwaite	Unequal	22.125	-0.32	0.7545

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	15	26	2.54	0.0360


Distribution of LengthFAYr
0
1
Percent
Exposure
LengthFAYr
Normal
Kernel


Q-Q Plots of LengthFAYr
0
1
LengthFAYr
Quantile

---------- Exposure=0 ----------

The FREQ Procedure

EggAllergy

EggAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	23	60.53	23	60.53
1	15	39.47	38	100.00

Frequency Missing = 39

Chi-Square Test
for Equal Proportions

Chi-Square	1.6842
DF	1
Pr > ChiSq	0.1944

Effective Sample Size = 38
Frequency Missing = 39

WARNING: 51% of the data are missing.

---------- Exposure=1 ----------

The FREQ Procedure

EggAllergy

EggAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	15	46.88	15	46.88
1	17	53.13	32	100.00

Frequency Missing = 22

Chi-Square Test for Equal Proportions

Chi-Square	0.1250
DF	1
Pr > ChiSq	0.7237

Effective Sample Size = 32
Frequency Missing = 22

WARNING: 41% of the data are missing.

2 x 2 Table Statistics

Single Table Analysis

		Egg Allergy (+)	Egg Allergy (-)	
Exposure	(+)	14	13	27
	(-)	6	12	18
		20	25	45

Chi Square and Exact Measures of Association

Test	Value	p-value(1-tail)	p-value(2-tail)
Uncorrected chi square	1.5	0.1106	0.2211
Yates corrected chi square	0.8438	0.1792	0.3583
Mantel-Haenszel chi square	1.467	0.1132	0.2264
Fisher exact		0.1795	0.3589
Mid-P exact		0.1207	0.2414

All expected values (row total*column total/grand total) are >=5
OK to use chi square.

---------- Exposure=0 ----------

The FREQ Procedure

MilkAllergy

MilkAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	55.56	10	55.56
1	8	44.44	18	100.00

Chi-Square Test for Equal Proportions

Chi-Square	0.2222
DF	1
Pr > ChiSq	0.6374

Sample Size = 18

---------- Exposure=1 ----------

The FREQ Procedure

MilkAllergy

MilkAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	14	56.00	14	56.00
1	11	44.00	25	100.00

Frequency Missing = 2

Chi-Square Test for Equal Proportions

Chi-Square	0.3600
DF	1
Pr > ChiSq	0.5485

Effective Sample Size = 25

Frequency Missing = 2

2 x 2 Table Statistics

Single Table Analysis

		Milk Allergy (+)	Milk Allergy (-)	
Exposure	(+)	11	16	27
	(-)	8	10	18

19	26	45

Chi Square and Exact Measures of Association

Test	Value	p-value(1-tail)	p-value(2-tail)
Uncorrected chi square	0.06073	0.4027	0.8053
Yates corrected chi square	0.003796	0.4754	0.9509
Mantel-Haenszel chi square	0.05938	0.4037	0.8075
Fisher exact		0.5232(P)	>0.9999999
Mid-P exact		0.4062(P)	0.8124

All expected values (row total*column total/grand total) are >=5

---------- Exposure=0 ----------

The FREQ Procedure

PeanutAllergy

PeanutAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	33.33	6	33.33
1	12	66.67	18	100.00

Chi-Square Test for Equal Proportions

Chi-Square	2.0000
DF	1
Pr > ChiSq	0.1573

Sample Size = 18

---------- Exposure=1 ----------

The FREQ Procedure

PeanutAllergy

PeanutAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	48.00	12	48.00
1	13	52.00	25	100.00

Frequency Missing = 2

Chi-Square Test
for Equal Proportions
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square 0.0400
DF 1
Pr > ChiSq 0.8415

Effective Sample Size = 25

Frequency Missing = 2

2 x 2 Table Statistics

Single Table Analysis

		Peanut Allergy (+)	Peanut Allergy (-)	
Exposure	(+)	13	14	27
	(-)	12	6	18
		25	20	45

Chi Square and Exact Measures of Association

Test	Value	p-value(1-tail)	p-value(2-tail)
Uncorrected chi square	1.5	0.1106	0.2211
Yates corrected chi square	0.8438	0.1792	0.3583
Mantel-Haenszel chi square	1.467	0.1132	0.2264
Fisher exact		0.1795(P)	0.3589
Mid-P exact		0.1207(P)	0.2414

---------- Exposure=0 ----------

The FREQ Procedure

ShellfishAllergy

ShellfishAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	11	61.11	11	61.11
1	7	38.89	18	100.00

Chi-Square Test

for Equal Proportions
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square 0.8889
DF 1
Pr > ChiSq 0.3458

Sample Size = 18

---------- Exposure=1 ----------

The FREQ Procedure

ShellfishAllergy

ShellfishAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	21	84.00	21	84.00
1	4	16.00	25	100.00

Frequency Missing = 2

Chi-Square Test
for Equal Proportions
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square 11.5600
DF 1
Pr > ChiSq 0.0007

Effective Sample Size = 25

Frequency Missing = 2

2 x 2 Table Statistics

Single Table Analysis

		Shellfish Allergy (+)	Shellfish Allergy (-)	
Exposure	(+)	4	23	27
	(-)	7	11	18
		11	34	45

Chi Square and Exact Measures of Association

Test	Value	p-value(1-tail)	p-value(2-tail)
Uncorrected chi square	3.389	0.03282	0.06564
Yates corrected chi square	2.211	0.06856	0.1371
Mantel-Haenszel chi square	3.314	0.03436	0.06871
Fisher exact		0.06943(P)	0.1389
Mid-P exact		0.04192(P)	0.08384

---------- Exposure=0 ----------

The FREQ Procedure

SoyAllergy

SoyAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	15	83.33	15	83.33
1	3	16.67	18	100.00

Chi-Square Test for Equal Proportions

Chi-Square	8.0000
DF	1
Pr > ChiSq	0.0047

Sample Size = 18

---------- Exposure=1 ----------

The FREQ Procedure

SoyAllergy

SoyAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	19	76.00	19	76.00
1	6	24.00	25	100.00

Frequency Missing = 2

Chi-Square Test for Equal Proportions

Chi-Square	6.7600
DF	1
Pr > ChiSq	0.0093

Effective Sample Size = 25

Frequency Missing = 2

2 x 2 Table Statistics

Single Table Analysis

		Soy Allergy (+)	Soy Allergy (-)	
Exposure	(+)	6	21	27
	(-)	3	15	18
		9	36	45

Chi Square and Exact Measures of Association

Test	Value	p-value(1-tail)	p-value(2-tail)
Uncorrected chi square	0.2083	0.3240	0.6481
Yates corrected chi square	0.005787	0.4697	0.9394
Mantel-Haenszel chi square	0.2037	0.3259	0.6517
Fisher exact		0.4763	0.9526
Mid-P exact		0.3400	0.6800

---------- Exposure=0 ----------

The FREQ Procedure

WheatAllergy

WheatAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	16	88.89	16	88.89
1	2	11.11	18	100.00

Chi-Square Test for Equal Proportions

Chi-Square	10.8889
DF	1
Pr > ChiSq	0.0010

Sample Size = 18

The SAS System 11:39 Thursday, April 12, 2012 748

---------- Exposure=1 ----------

The FREQ Procedure

WheatAllergy

WheatAllergy	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	19	76.00	19	76.00
1	6	24.00	25	100.00

Frequency Missing = 2

Chi-Square Test for Equal Proportions

Chi-Square	6.7600
DF	1
Pr > ChiSq	0.0093

Effective Sample Size = 25

Frequency Missing = 2

2 x 2 Table Statistics

Single Table Analysis

	Wheat Allergic (+)	Wheat Allergic (-)	
(+)	6	21	27

Exposure	(-)	2	16	18
		8	37	45

Chi Square and Exact Measures of Association

Test	Value	p-value(1-tail)	p-value(2-tail)
Uncorrected chi square	0.9122	0.1698	0.3395
Yates corrected chi square	0.3104	0.2887	0.5774
Mantel-Haenszel chi square	0.8919	0.1725	0.3450
Fisher exact		0.2946	0.5891
Mid-P exact		0.1895	0.3790

The SAS System 11:39 Thursday, April 12, 2012 729

---------- Exposure=0 ----------

The FREQ Procedure

LTR food

LTR_food	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	55.56	10	55.56
1	8	44.44	18	100.00

Chi-Square Test for Equal Proportions

Chi-Square	0.2222
DF	1
Pr > ChiSq	0.6374

Sample Size = 18

The SAS System 11:39 Thursday, April 12, 2012 730

---------- Exposure=1 ----------

The FREQ Procedure

LTR food

LTR_food	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	11	42.31	11	42.31
1	15	57.69	26	100.00

Frequency Missing = 1

Chi-Square Test
for Equal Proportions
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square 0.6154
DF 1
Pr > ChiSq 0.4328

Effective Sample Size = 26
Frequency Missing = 1

2 x 2 Table Statistics

Single Table Analysis

		Life Threatening Reaction (+)	Life Threatening Reaction (-)	
Exposure	(+)	15	11	26
	(-)	8	10	18
		23	21	44

Chi Square and Exact Measures of Association

Test	Value	p-value(1-tail)	p-value(2-tail)
Uncorrected chi square	0.7482	0.1935	0.3870
Yates corrected chi square	0.3114	0.2884	0.5768
Mantel-Haenszel chi square	0.7312	0.1962	0.3925
Fisher exact		0.2885	0.5771
Mid-P exact		0.2046	0.4091

---------- Exposure=0 ----------

The FREQ Procedure

FA Severe?

FA_Severe_	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	31.25	5	31.25
1	11	68.75	16	100.00

Frequency Missing = 2

Chi-Square Test
for Equal Proportions

ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square 2.2500
DF 1
Pr > ChiSq 0.1336

Effective Sample Size = 16
Frequency Missing = 2

WARNING: 11% of the data are missing.

---------- Exposure=1 ----------

The FREQ Procedure

FA Severe?

FA_Severe_	Frequency	Cumulative Percent	Cumulative Frequency	Cumulative Percent
0	6	25.00	6	25.00
1	18	75.00	24	100.00

Frequency Missing = 3

Chi-Square Test
for Equal Proportions
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square 6.0000
DF 1
Pr > ChiSq 0.0143

Effective Sample Size = 24
Frequency Missing = 3

WARNING: 11% of the data are missing.

2 x 2 Table Statistics

Single Table Analysis

		Food Allergy Severe (+)	Food Allergy Severe (-)	
Exposure	(+)	15	9	24
	(-)	11	5	16
		26	14	40

Chi Square and Exact Measures of Association

Test	Value	p-value(1-tail)	p-value(2-tail)
Uncorrected chi square	0.1648	0.3424	0.6847
Yates corrected chi square	0.004579	0.4730	0.9461
Mantel-Haenszel chi	0.1607	0.3442	0.6885

square		
Fisher exact	0.4759(P)	0.9519
Mid-P exact	0.3529(P)	0.7058

The SAS System

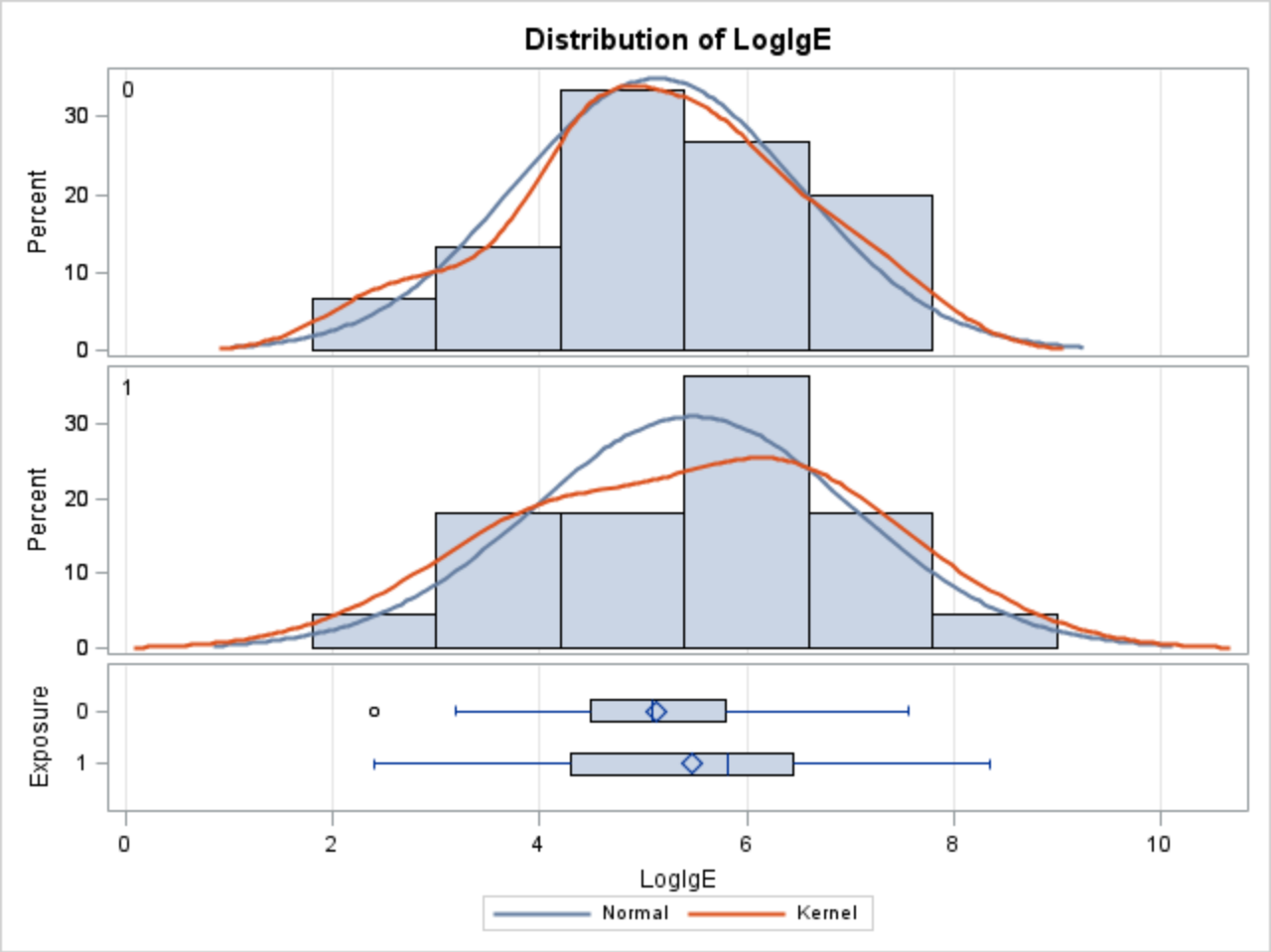
The TTEST Procedure
Variable: LogIgE

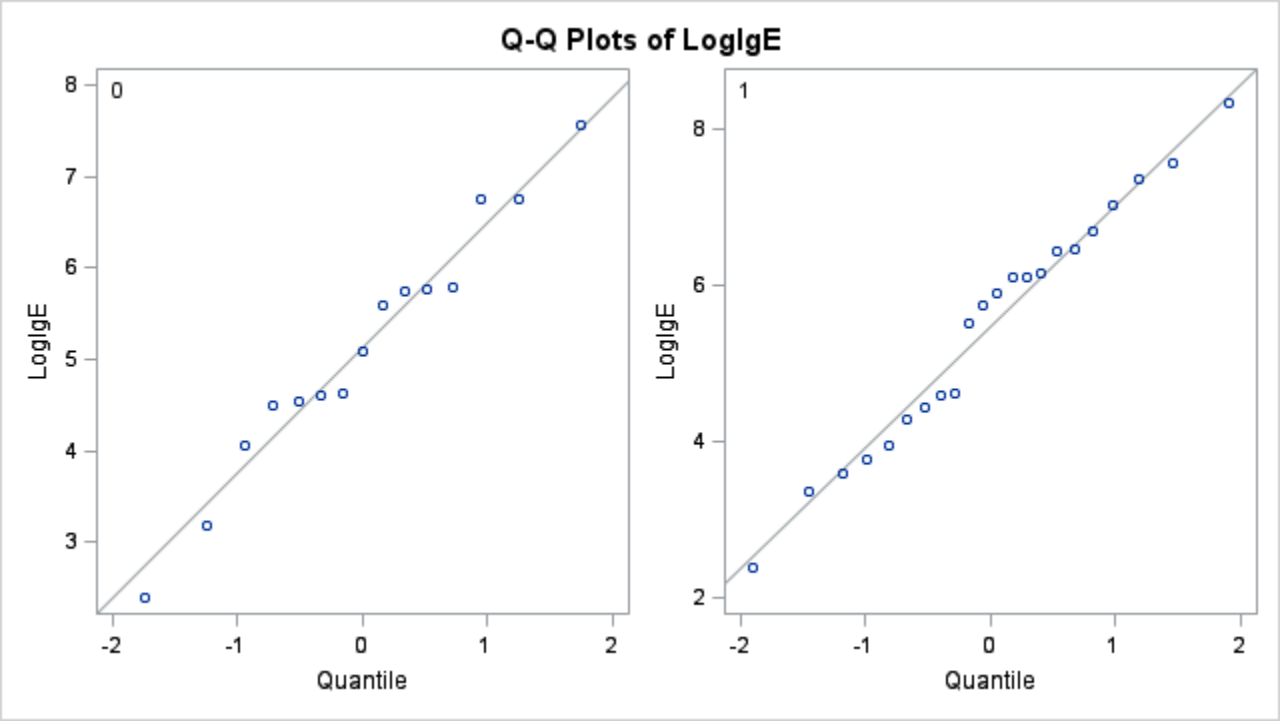
Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	15	5.1311	1.3711	0.3540	2.3979	7.5616
1	22	5.4776	1.5462	0.3296	2.3979	8.3457
Diff (1-2)		-0.3465	1.4787	0.4951		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		5.1311	4.3718	5.8904	1.3711	1.0038	2.1624
1		5.4776	4.7921	6.1631	1.5462	1.1896	2.2096
Diff (1-2)	**Pooled**	-0.3465	-1.3517	0.6586	1.4787	1.1993	1.9288
Diff (1-2)	**Satterthwaite**	-0.3465	-1.3313	0.6382			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	35	-0.70	0.4886
Satterthwaite	Unequal	32.509	-0.72	0.4789

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	21	14	1.27	0.6540


Distribution of LogIgE
0
1
Percent
Exposure
LogIgE
Normal
Kernel


Q-Q Plots of LogIgE
0
1
LogIgE
Quantile

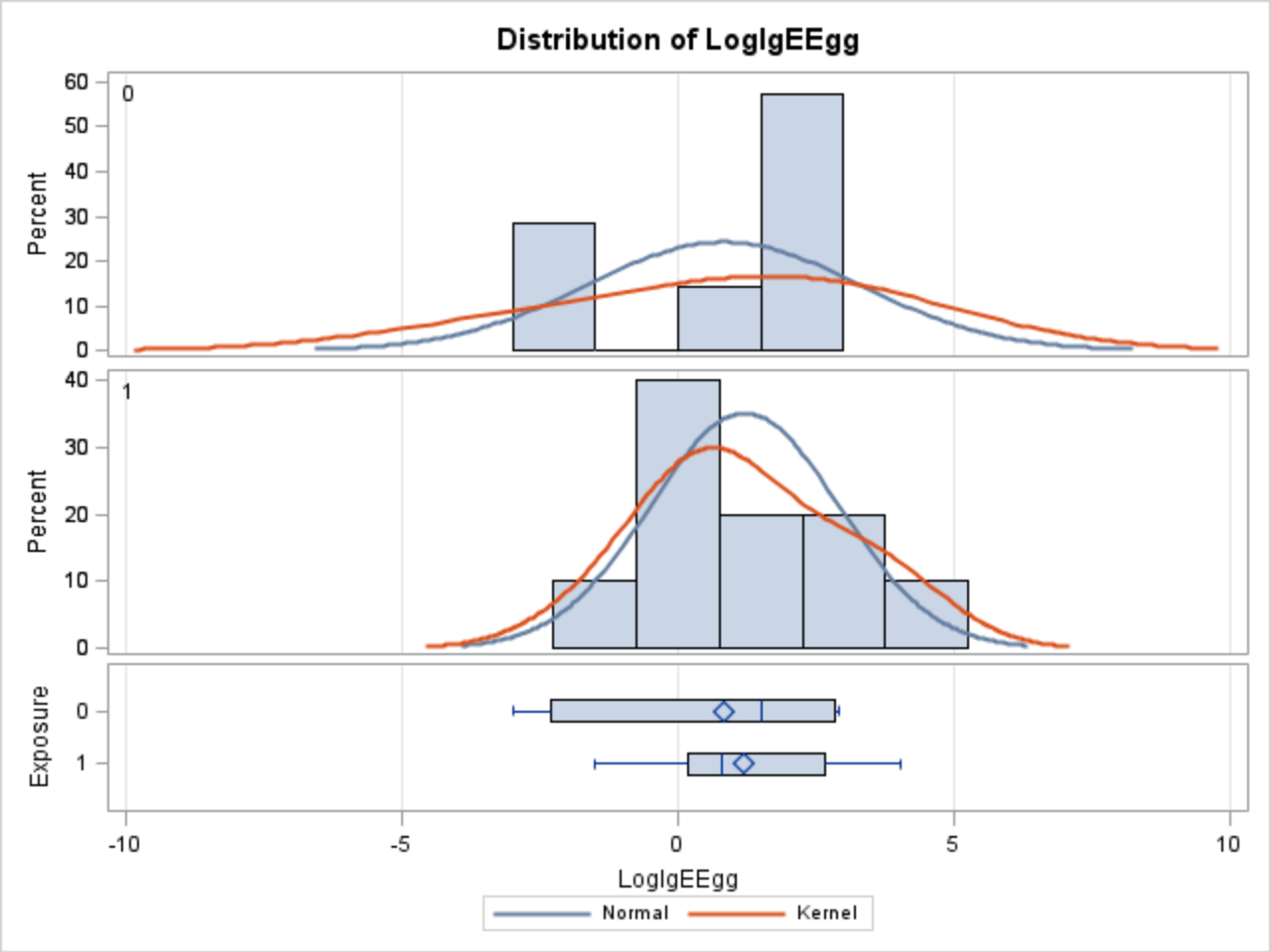
The TTEST Procedure
Variable: LogIgEEgg

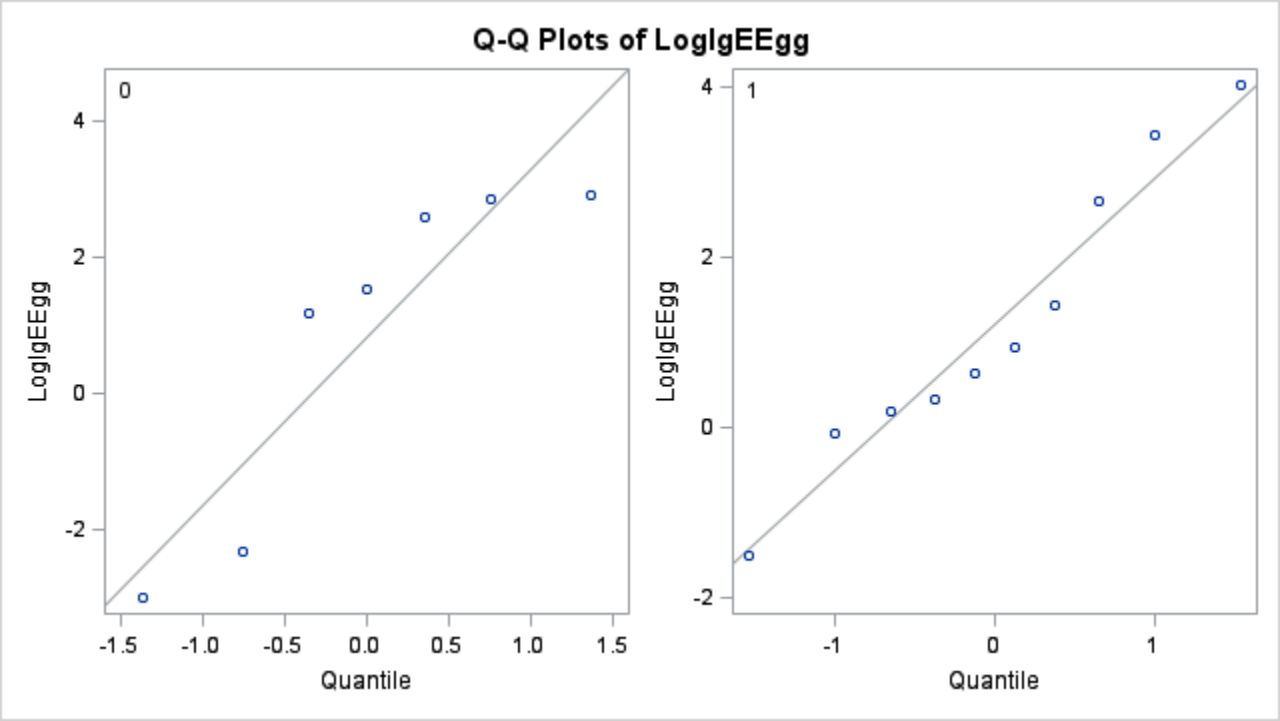
Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	7	0.8203	2.4675	0.9326	-2.9957	2.9069
1	10	1.2059	1.7068	0.5397	-1.5141	4.0200
Diff (1-2)		-0.3856	2.0453	1.0079		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.8203	-1.4617	3.1023	2.4675	1.5900	5.4335
1		1.2059	-0.0151	2.4269	1.7068	1.1740	3.1160
Diff (1-2)	**Pooled**	-0.3856	-2.5340	1.7627	2.0453	1.5109	3.1655
Diff (1-2)	**Satterthwaite**	-0.3856	-2.7882	2.0170			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	15	-0.38	0.7074
Satterthwaite	Unequal	9.9484	-0.36	0.7279

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	6	9	2.09	0.3079


Distribution of LogIgEEgg
0
1
Percent
Exposure
LogIgEEgg
Normal
Kernel


Q-Q Plots of LogIgEEgg
0
1
LogIgEEgg
Quantile

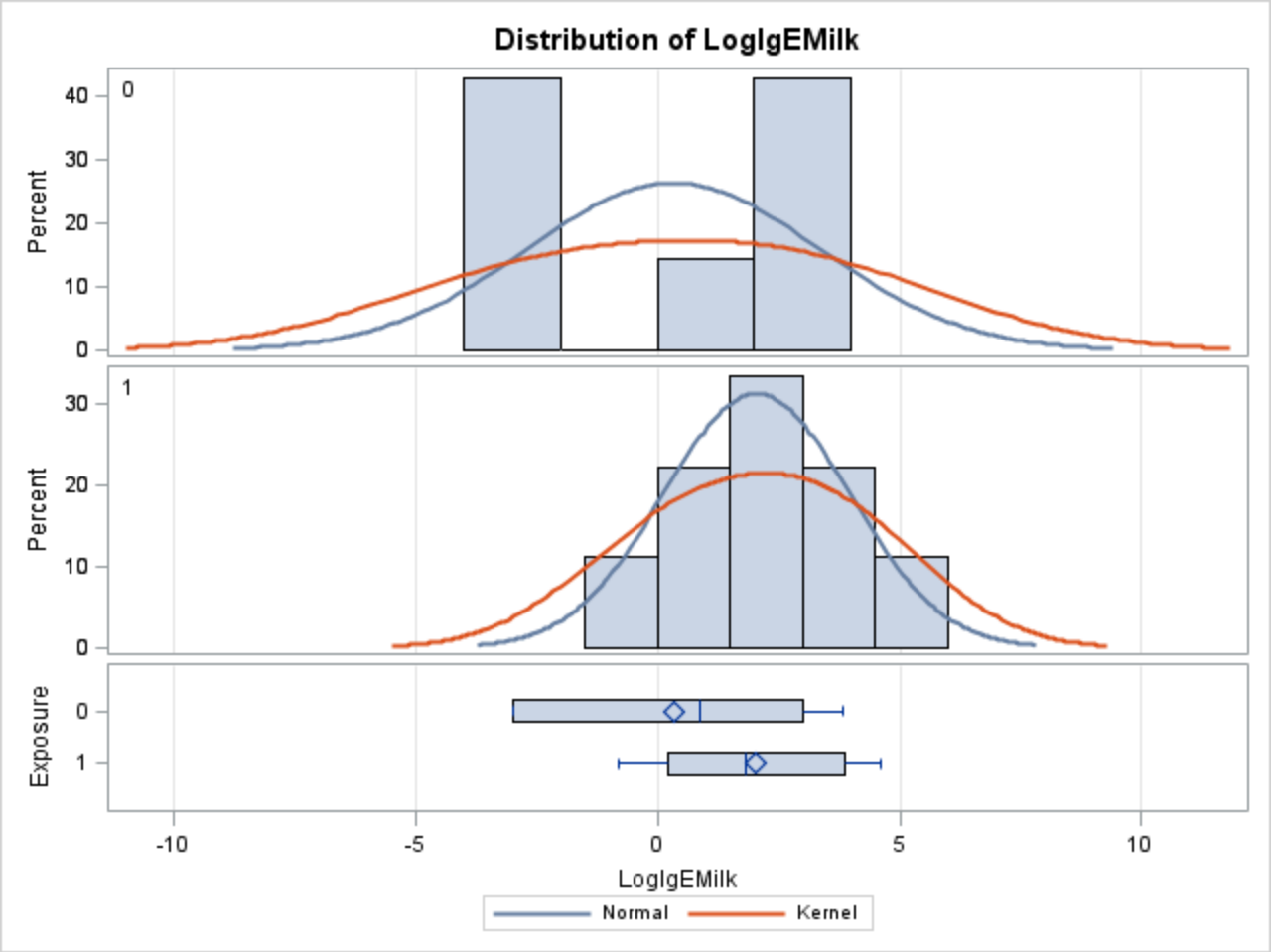
The TTEST Procedure
Variable: LogIgEMilk

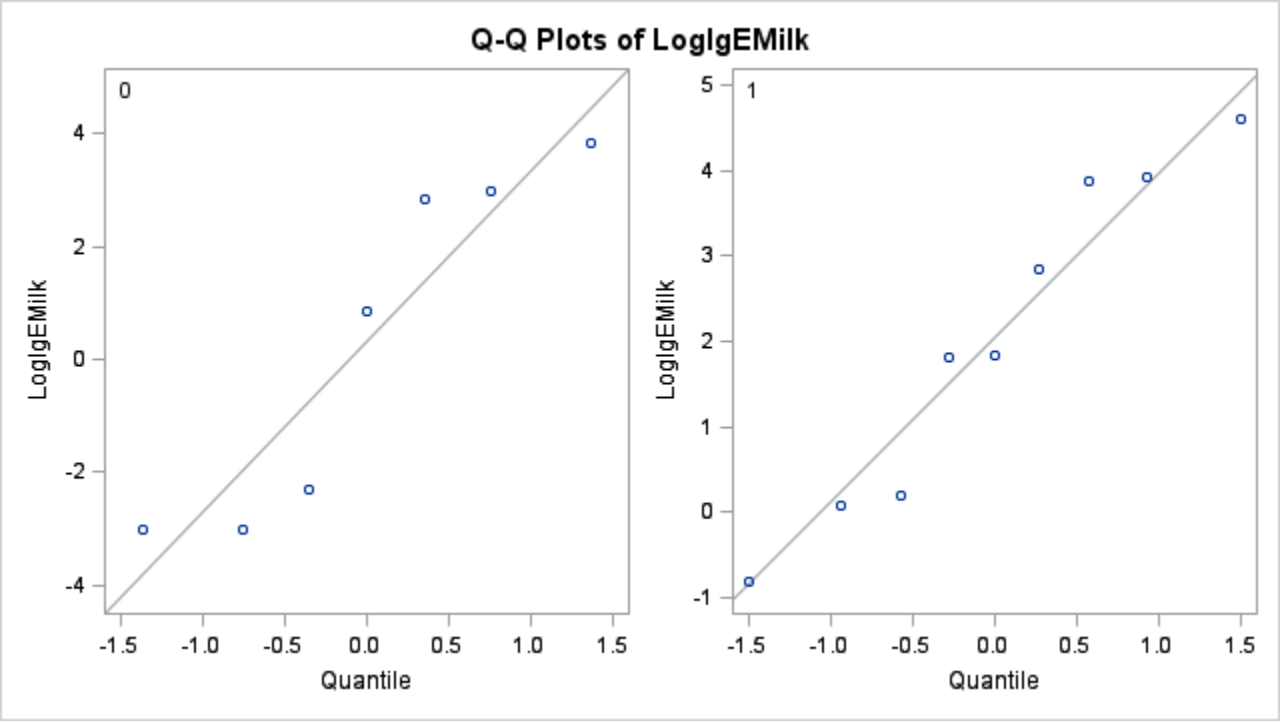
Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	7	0.3207	3.0294	1.1450	-2.9957	3.8330
1	9	2.0417	1.9211	0.6404	-0.7985	4.6052
Diff (1-2)		-1.7210	2.4581	1.2388		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.3207	-2.4810	3.1224	3.0294	1.9521	6.6709
1		2.0417	0.5649	3.5184	1.9211	1.2976	3.6805
Diff (1-2)	**Pooled**	-1.7210	-4.3778	0.9359	2.4581	1.7996	3.8766
Diff (1-2)	**Satterthwaite**	-1.7210	-4.6592	1.2173			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	14	-1.39	0.1864
Satterthwaite	Unequal	9.6336	-1.31	0.2200

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	6	8	2.49	0.2328


Distribution of LogIgEMilk
0
1
Percent
Exposure
LogIgEMilk
Normal
Kernel


Q-Q Plots of LogIgEMilk
0
1
LogIgEMilk
Quantile

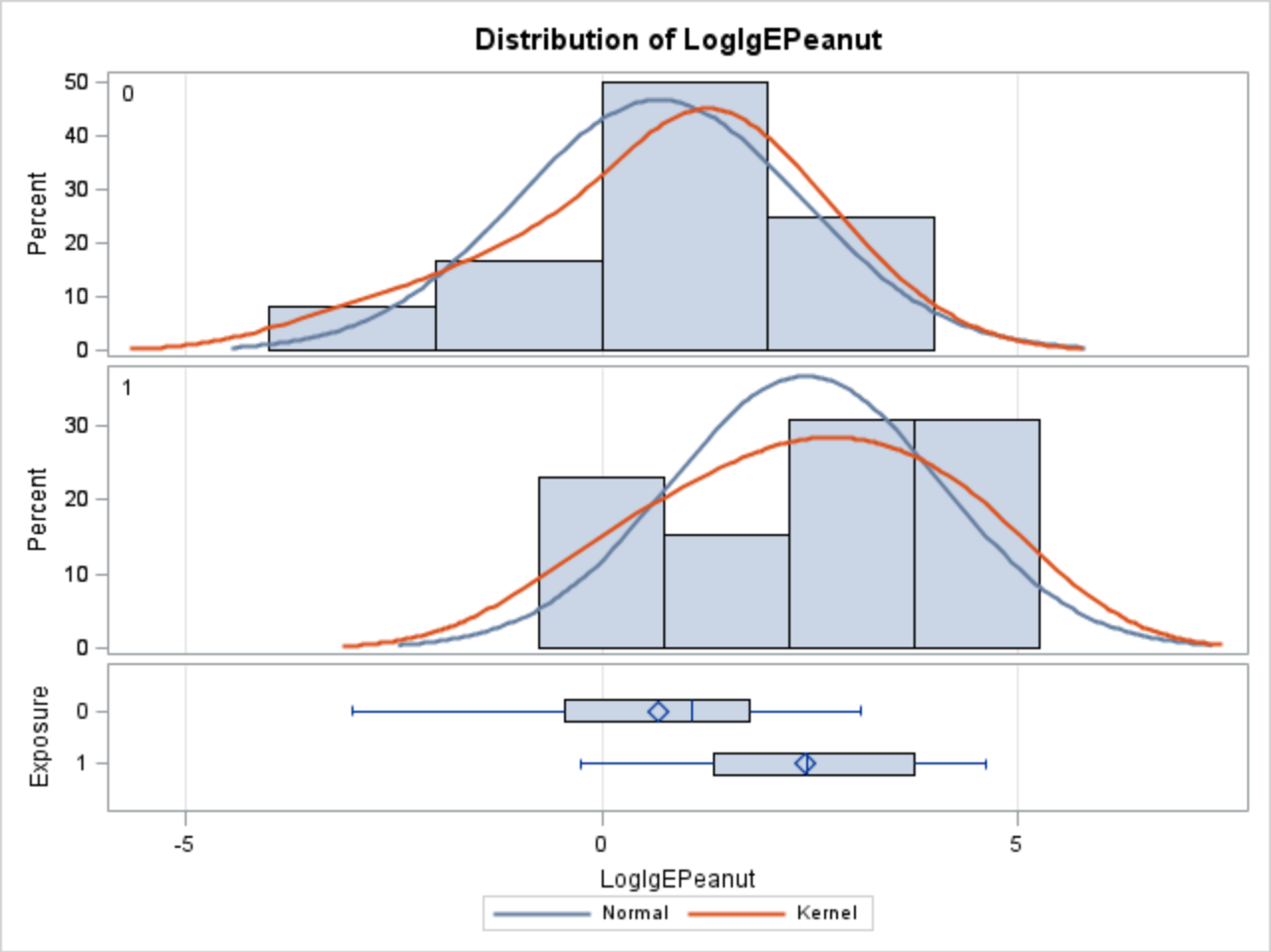
The TTEST Procedure
Variable: LogIgEPeanut

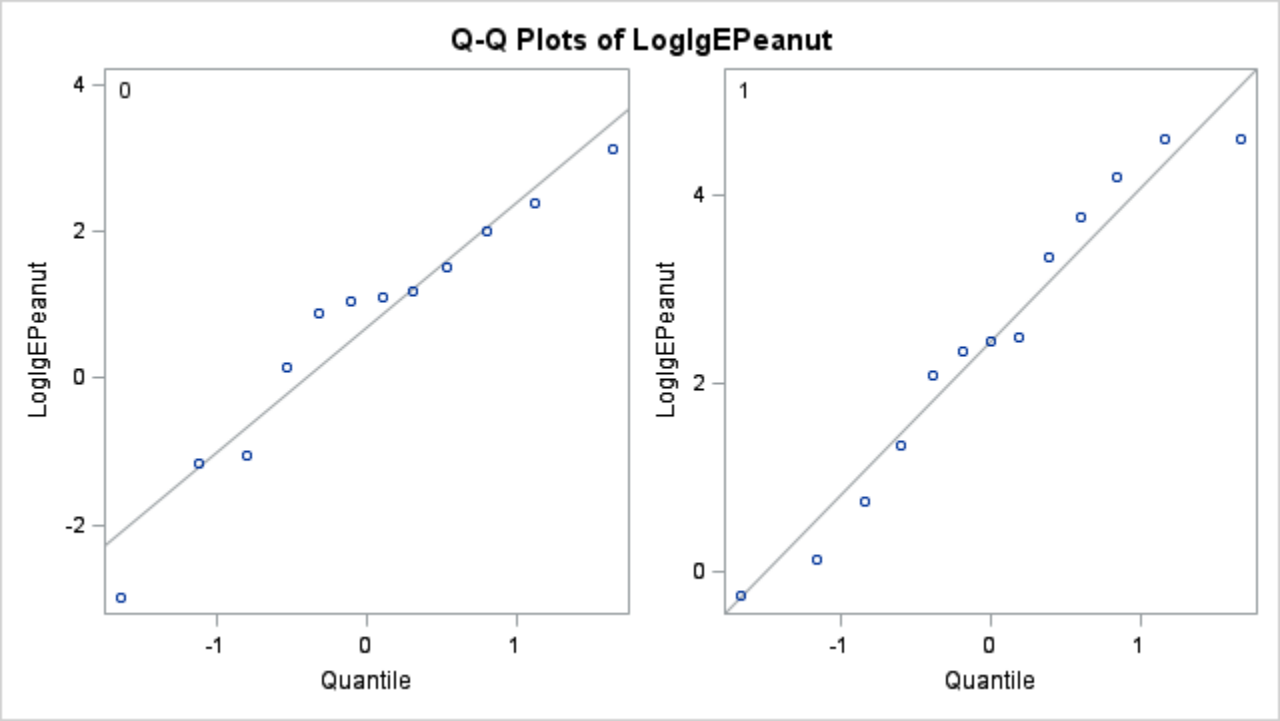
Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	12	0.6846	1.7100	0.4936	-2.9957	3.1179
1	13	2.4494	1.6296	0.4520	-0.2614	4.6052
Diff (1-2)		-1.7648	1.6686	0.6680		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.6846	-0.4019	1.7711	1.7100	1.2114	2.9034
1		2.4494	1.4646	3.4342	1.6296	1.1686	2.6901
Diff (1-2)	**Pooled**	-1.7648	-3.1466	-0.3830	1.6686	1.2968	2.3406
Diff (1-2)	**Satterthwaite**	-1.7648	-3.1507	-0.3789			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	23	-2.64	0.0146
Satterthwaite	Unequal	22.609	-2.64	0.0149

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	11	12	1.10	0.8663


Distribution of LogIgEPeanut
0
1
Percent
Exposure
LogIgEPeanut
Normal
Kernel


Q-Q Plots of LogIgEPeanut
0
1
LogIgEPeanut
Quantile

The TTEST Procedure

Variable: LogIgEShrimp

Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	4	1.4732	3.2018	1.6009	-2.9957	4.6052
1	3	1.0149	1.4903	0.8604	0.0953	2.7344
Diff (1-2)		0.4583	2.6532	2.0264		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.4732	-3.6216	6.5680	3.2018	1.8138	11.9380
1		1.0149	-2.6871	4.7170	1.4903	0.7759	9.3660
Diff (1-2)	Pooled	0.4583	-4.7507	5.6673	2.6532	1.6561	6.5072
Diff (1-2)	Satterthwaite	0.4583	-4.4007	5.3173			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	5	0.23	0.8300
Satterthwaite	Unequal	4.4291	0.25	0.8122

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	3	2	4.62	0.3664

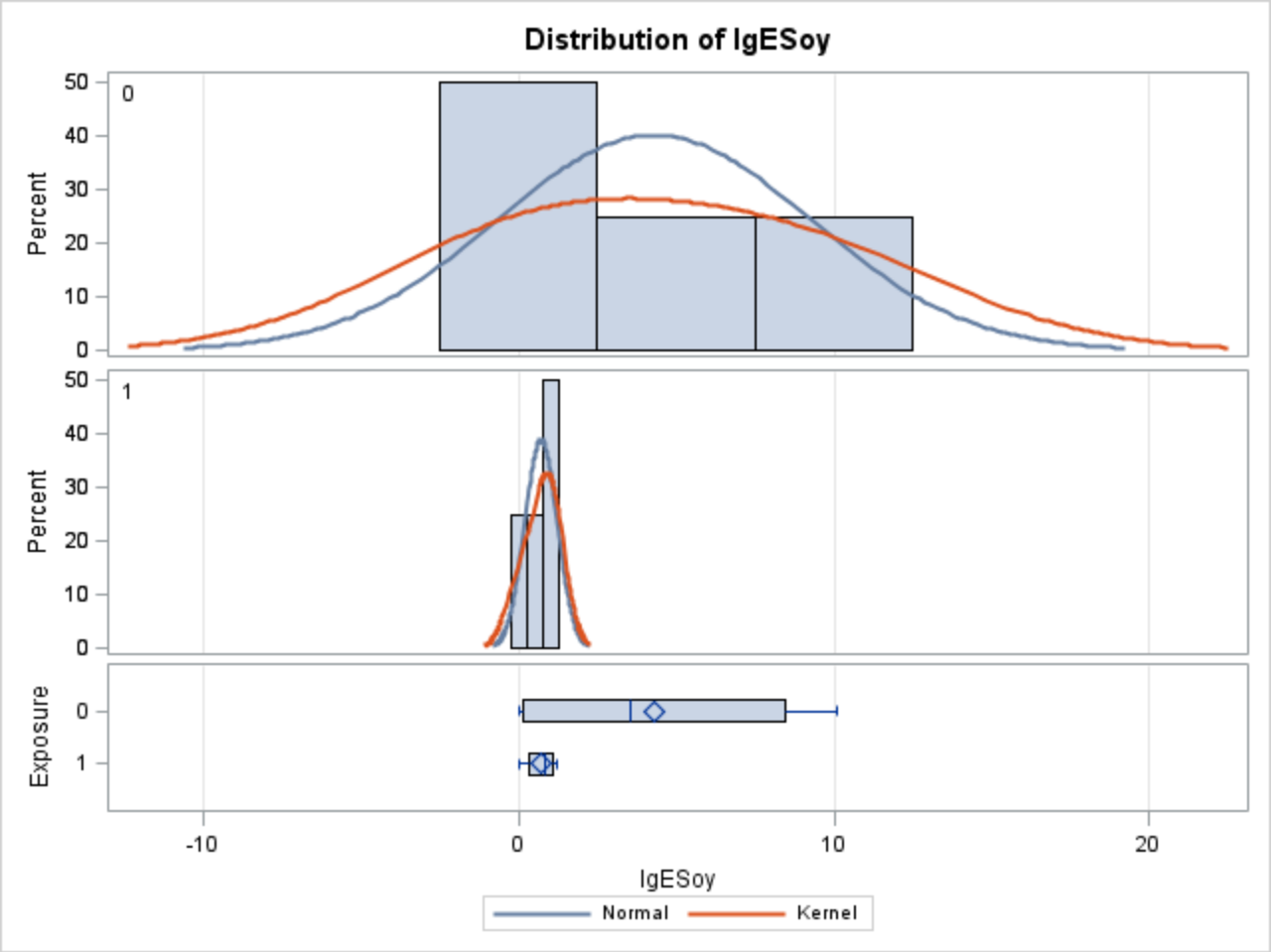
The TTEST Procedure
Variable: IgESoy (IgESoy)

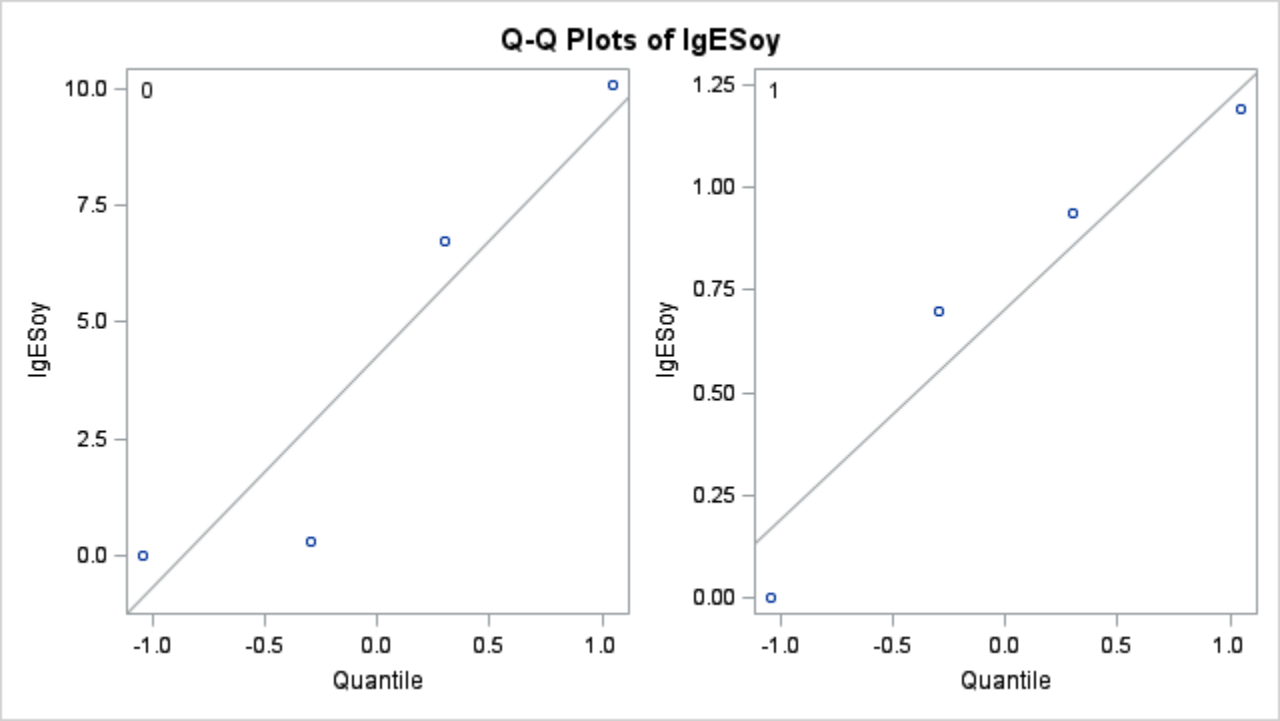
Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	4	4.2875	4.9710	2.4855	0	10.1000
1	4	0.7075	0.5123	0.2562	0	1.1900
Diff (1-2)		3.5800	3.5336	2.4987		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		4.2875	-3.6224	12.1974	4.9710	2.8160	18.5345
1		0.7075	-0.1077	1.5227	0.5123	0.2902	1.9103
Diff (1-2)	**Pooled**	3.5800	-2.5340	9.6940	3.5336	2.2770	7.7813
Diff (1-2)	**Satterthwaite**	3.5800	-4.2791	11.4391			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	6	1.43	0.2019
Satterthwaite	Unequal	3.0637	1.43	0.2456

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	3	3	94.14	0.0036


Distribution of lgESoy
0
1
Percent
Exposure
lgESoy
Normal
Kernel


Q-Q Plots of lgESoy
0
1
lgESoy
Quantile

The TTEST Procedure

Variable: LogIgEWheat

Exposure	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	4	0.4065	1.9745	0.9873	-1.4697	2.9601
1	5	0.8419	1.9192	0.8583	-0.9943	3.9551
Diff (1-2)		-0.4353	1.9431	1.3035		

Exposure	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.4065	-2.7354	3.5485	1.9745	1.1186	7.3621
1		0.8419	-1.5411	3.2249	1.9192	1.1498	5.5148
Diff (1-2)	Pooled	-0.4353	-3.5175	2.6469	1.9431	1.2847	3.9547
Diff (1-2)	Satterthwaite	-0.4353	-3.5803	2.7096			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	7	-0.33	0.7482
Satterthwaite	Unequal	6.4745	-0.33	0.7498

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	3	4	1.06	0.9188