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Report No. WIC-03-WICVM

***A Comparison of WIC Vendor
Management Practices in
1991 and 1998***



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A Comparison of WIC Vendor Management Practices in 1991 and 1998

Authors:

Anita Singh
Patricia McKinney
John Endahl
Dawn Aldridge
Jay Hirschman

Submitted by:

Office of Analysis, Nutrition and Evaluation
USDA, Food and Nutrition Service
3101 Park Center Drive, Room 1014
Alexandria, VA 22302-1500

This study is an in-house analysis by Food and Nutrition Service Staff.

This report is available on the Food and Nutrition Service website: <http://www.fns.usda.gov/oane>.

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I. Introduction and Overview:

The Food and Nutrition Service (FNS) published “*The WIC Vendor Management Study, 1998*” in July 2001 which examined, in part, the extent to which retail grocers, defined as “vendors” in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), were violating program rules and regulations. The 1998 study is a follow-up to the “*WIC Vendor Issues Study, 1991*” published by FNS in May 1993. From an operational and management perspective, it is important for FNS to know if there have been any changes in vendor management practices from 1991 to 1998. However, as there were differences in the way the data were collected, analyzed, and reported, the findings presented in the two published reports cannot be directly compared. This report presents a re-analysis of the data from the 1991 and 1998 studies, which allows comparisons of the findings.

Similarities as well as differences between the two studies are presented in Table 1. Major differences between the two studies include the manner in which compliance buys were conducted and the data analyzed. A compliance buy is an investigative technique wherein covert buyers, equipped with WIC food instruments, attempt to make WIC purchases at stores selected for the study. Four types of compliance buys were made: 1) safe buy in which the buyer attempted to purchase all items listed on the WIC food instrument in the exact quantity specified; 2) partial buy in which the buyer attempted to purchase some but not all items listed on the WIC food instrument; 3) minor substitution buy in which the buyer attempted to substitute an unauthorized food item within an approved food category; and 4) major substitution buy in which the buyer attempted to purchase an unauthorized item clearly outside an approved food category (see Table 1). In 1991, three “safe” buys were conducted for all vendors, but in 1998, only one “safe” buy was conducted (see Table 1). Furthermore, the percentage of vendors committing procedural and administrative errors and undercharging or overcharging the Program in the 1991 study is based on noting an occurrence during any one of the three safe buys. This type of data analysis resulted in higher percentages for the errors and program violations studied than those obtained by averaging across the three safe buys or by examining one safe buy. For example, “*WIC Vendor Issues Study, 1991*” reported that 22.2% of all vendors overcharged the Program at least once during the three safe buys (see Appendix A), whereas in this re-analysis, using only the first safe buy, 9.9% of vendors

overcharged the Program. The 1991 report did not present averages across the three safe buys. Thus, to compare the rates of vendor administrative errors and violations in 1991 and 1998, it was necessary to re-analyze the two data sets.

Table 1. Similarities and Differences in Characteristics of the 1991 and 1998 Samples

Characteristics	1991	1998
Study Population	<p>Includes vendors from 46 of the 48 contiguous States, plus Washington, DC, all of which have retail food delivery systems. Also, includes pharmacies and drug stores (2.2% of the sample)¹.</p> <p>Excludes Mississippi and Vermont. Also, excludes Indian Tribal Organizations and military commissaries.</p>	<p>Includes vendors operating in States with retail food delivery systems plus Washington DC.</p> <p>Excludes Mississippi, Vermont, North Dakota, and parts of Ohio and Illinois, military commissaries and pharmacies. Also, excludes Alaska, Hawaii, Puerto Rico, U.S. Territories and Indian Tribal Organizations.</p>
Sampling frame	<p>Vendors were selected using a two-stage probability selection: Primary sampling units (PSUs) then vendors within PSUs. PSU was defined as WIC vendors contained in a group of one or more contiguous counties in the same state. Each PSU had at least 80 vendors.</p> <p>The U.S. was divided into 60 strata. One PSU per strata was selected. About 20 vendors were selected from each PSU.</p> <p>Over-sampled other than large chain stores relative to large chain stores in order to test the hypothesis that small to medium-sized “independent” vendors abuse the Program at higher incidence than major chain stores. The overall sampling rates for these groups were set so they did not vary by more than 3:1.</p> <p>Vendors had participated in the Program for at least 12 months.</p>	<p>Used Geographic Information System (GIS) computer program to form 366 PSUs in contiguous geographic areas. Most PSUs had at least 70 vendors. Selected 100 PSUs using probability non-replacement sampling with probabilities proportional to the size of the PSU. Selected about 18 vendors each from the 100 PSUs.</p> <p>Over -sampled PSUs at the rate of 2:1 from Vendor-Specific Food Instrument (FI) States versus States that operate an Open FI system.</p> <p>Length of Program participation varied and could not be ascertained from the data files that were submitted to FNS.</p>

¹ Note: Pharmacies and drugstores could not be excluded from the sample for the re-analysis because these vendors were not identified separately when the data files were created and submitted to FNS.

Sample Size	Nationally representative sample. Total 1,205 (unweighted) vendors weighted up to 34,033 vendors. 58% were from a metropolitan area.	Nationally representative sample. Total 1,600 (unweighted) vendors weighted up to 36,754 vendors. 72% were from a metropolitan area.
Definition of Vendor Size	Small = 1 to 5 cash registers (accounted for 75% of the sample). Large = 6 or more cash registers (accounted for 25 % of the sample.)	Small = 2 or fewer cash registers; Medium = 3 to 7 cash registers; and Large \geq 8 or more cash registers. Redefined for this report as Small = 1 to 5 cash registers (51% of the sample) and large = 6 or more cash registers (49% of the sample.)
Compliance Buy Methodology	Three safe buys (Buy 1, 2 and 3) were conducted at all vendors. The sample was then divided into 3 groups of 400 vendors each. The 1 st group received two additional safe buys for a total of 5 safe buys. The 2 nd group did not receive any more compliance buys. The 3 rd group received a major substitution buy wherein the buyer attempted to purchase a non-WIC food item. During all safe buys, the buyer attempted to purchase all items listed on the WIC food instrument in the exact quantity specified.	Three buys (Buy # 1, Buy # 2 and either Buy # 3A or 3B) were conducted at each vendor: Buy # 1 = safe buy (buyer attempted to purchase all food listed on the food instrument in the quantities and types specified.) Buy # 2 = partial buy (buyer attempted to purchase some, but not all of the items listed on the food instrument.) Buy # 3A = minor substitution (buyer attempted to substitute an unauthorized food item within an approved food category.) Buy # 3B = major substitution (buyer attempted to substitute an unauthorized item clearly outside an approved food category)
Presentation of findings in the two published reports.	Percentages are based on occurrence on at least one of three safe buys. Not an average of the three safe buys. Also presented data on major substitution buy. Re-analysed for this report and compared first safe buy in 1991 to first buy in 1998 (safe buy).	Only one safe buy – the first buy. Data for partial buy, minor and major substitution buys were also presented.

In this re-analysis, the first buy in 1998, which was the only safe buy, was compared to the first safe buy in 1991. Only one safe buy was conducted in 1998 because the 1991 study did

not find a familiarization effect across the 3 safe buys. Specifically the following comparisons were made:

1. The extent to which vendors commit procedural and administrative errors when conducting a WIC transaction at the point of sale.
2. The extent to which vendors overcharge and undercharge the WIC Program.
3. The extent to which vendors allowed participants to substitute unauthorized items for authorized items on the food instrument.

II. Data Analyses:

Raw data sets provided by the contractors, who had conducted the 1991 (Aspen Systems Corporation) and the 1998 (Health Systems Research, Inc.) studies for FNS, were re-analyzed using the Statistical Analysis System (SAS version 8). The first safe buy in 1991 was compared to first and only safe buy in 1998. Frequencies were computed on data that had been weighted. Chi-squares were computed on weighted data to test for statistical significance. The level of significance was set at $p < 0.05$.

III. Findings:

In the following sections, a comparison of administrative errors, rates of overcharging and undercharging, as well the percentage of vendors accepting major substitutions, are presented.

A. Comparison of Administrative Error Rates

In both studies, similar information was collected on two types of administrative errors, insufficient stock and improper recording of the purchase price at the time of the transaction. For each of these two variables, information was analyzed by vendor size (small and large) and by type of food package (woman, infant, and child). As previously stated, the data were re-analyzed and comparisons were made between the first safe buy in 1991 and the only safe buy in 1998.

1. Insufficient Stock

Most States require vendors to maintain sufficient stocks of WIC-authorized foods to ensure that participants can purchase their prescribed foods in one visit. Insufficient stock violations include not having sufficient stock or correct brand or size of a particular WIC-authorized food item to fill a participant's food instrument. As shown in Figure 1, there was a significant decrease in the overall percentage of vendors with insufficient stocks of WIC-authorized foods from 8.8% in 1991 to 4.6% in 1998.

Findings related to insufficient stock by food package type are shown in Figure 2. There was a statistically significant ($p < 0.001$) decrease in the percentage of vendors who were not meeting stocking requirements for the woman and child food packages. The percentages decreased from 10% in 1991 to 2.6% in 1998 for the woman package and from 9% in 1991 to 1.7% in 1998 for the child package. In contrast, significantly more vendors in 1998 (9.3%) were out-of-stock on items in the infant food package as compared to 1991 (7.9%).

Figure 3 displays the percentage of vendors who did not meet stocking requirements by vendor size. In 1991 and 1998, more small vendors than large vendors did not have sufficient stock. Overall the percentages of small and large vendors that were not meeting stocking requirements were significantly ($p < 0.001$) lower in 1998 as compared to 1991.

2. Purchase Price Procedures

In both studies, violating the countersignature regulations was a predictor of vendor abuse. The 1991 study measured whether the purchase price was entered on the Food Instrument (FI) at the time of the transaction. The 1998 study measured whether the vendor deviated from countersignature regulations by either requiring the buyer to sign the FI prior to the cashier entering the purchase price or if the buyer was not asked sign the FI. In the 1998 study, there was a response category "don't know." Vendors' responses coded under "don't know" accounted for 3% of all the responses for the nationally representative 1998 sample and were excluded from the analysis.

Figure 4 displays the percentage of WIC vendors who did not follow proper procedures for entering the price at the time of sale by type of food package. As stated above vendor responses that were coded under “don’t know” in the 1998 sample were excluded from the analysis (less than 3 percent of the sample was excluded). As shown in Figure 4, the percentage of vendors who did not record the price on the FI for the woman food package significantly ($p < 0.001$) decreased from 12% in 1991 to 9.5% in 1998. The percentage of vendors who did not follow the correct procedures for recording the purchase price for the infant and child packages in 1991 and 1998 were similar.

Both studies examined the occurrences of vendors not recording the purchase price by vendor size. As previously stated vendor responses that were coded under “don’t know” in the 1998 sample were excluded from the analysis. Thus, 3.6% of small vendors and 1.5% of large vendors were excluded from the analyses. As shown in Figure 5, the percentage of small and large vendors not following purchase price recording procedures was similar in 1991 and 1998. In 1991 and 1998 large vendors demonstrated lower occurrences of violations compared to small vendors.

B. Vendor Overcharge and Undercharge

An overcharge occurred if the vendor redeemed more than the current, verified shelf price for WIC-authorized foods that were purchased with food instruments. Whether a vendor’s overcharges were deliberate actions or error was not determined. An undercharge was noted if the vendor redeemed a food instrument at less than the shelf price for the WIC-authorized foods provided. An overall distribution of vendors who overcharged, undercharged, and correctly charged the Program during the first safe buy in 1991 and the only safe buy in 1998 is presented in Figure 6. The percentage of vendors who did not overcharge or undercharge WIC increased from 81.8% in 1991 to 86% in 1998. Overcharging and undercharging are discussed in the following sections.

1. Overcharging by Vendors

The percentage of vendors who overcharged the Program decreased significantly ($p < 0.001$) from 9.9% in 1991 to 7% in 1998. The overcharge rate was also analyzed by vendor size (see Figure 7). In both 1991 and 1998, a greater percentage of small vendors overcharged as

compared to large vendors. However, the percentage of small and large vendors who overcharged the Program decreased significantly ($p < 0.001$) from 1991 to 1998.

As shown in Figure 8, the rate of overcharging was also analyzed by location to determine if there were differences in overcharging between vendors in metropolitan areas versus those in non-metropolitan areas. The percentage of metropolitan and non-metropolitan vendors who overcharged decreased significantly ($p < 0.001$) from 1991 to 1998.

In Figure 9, the comparison of overcharging in 1991 and 1998 by type of food package is presented. In this analysis the woman and child packages were combined. The percentage of vendors overcharging the Program decreased significantly ($p < 0.001$) from 1991 to 1998 for the woman and child as well as for the infant package.

2. Undercharging by Vendors

When comparing undercharging on the first safe buy in 1991 to the only safe buy conducted in 1998, the percentage of vendors undercharging the Program decreased significantly ($p < 0.001$) from 1991 to 1998 (8.3 % vs. 7.0 %) (see Figure 6). As shown in Figure 10, the data also were analyzed to determine if vendor location, metropolitan versus non-metropolitan, affected the rate of undercharging. Significantly ($p < 0.001$) fewer metropolitan vendors in 1998 (6.1%) undercharged the Program as compared to 1991 (8.1%). In contrast, the rate for undercharging by non-metropolitan vendors increased, though not significantly, from 8.5% in 1991 to 9.3% in 1998.

3. Estimating Net Cost to WIC of Overcharging and Undercharging by Vendors

In 1991, the total federal dollar loss from overcharging was the total estimated dollar amount lost during one year among all authorized retail vendors. Estimates for overcharging and undercharging were calculated for each vendor in the WIC vendor universe. The data were weighted to generate national estimates for overcharging and undercharging. Unlike the 1991 study, the 1998 study was not weighted to generate a dollar amount to use to calculate a true national estimate for the net cost to the Program. Given the differences in the methodology for generating the overcharging and undercharging estimates, it is not possible to directly compare the dollar estimates of the 1991 study to the 1998 study. The estimated amount and rate of

overcharging and undercharging during first safe buy in 1991 and the only safe buy in 1998 are presented below. However, as stated above, the differences in the methodology for generating these estimates preclude any comparisons of the 1991 and 1998 findings for overcharging and undercharging.

Based on the first safe buy in 1991, the estimated cost of overcharging was \$ 30.73 million with 1.47 percent of WIC redemptions, nationally, attributed to overcharging. The corresponding estimated cost for undercharging was \$ 9.98 million with a rate of 0.5 percent nationally. Thus, the estimated net loss to WIC from overcharging and undercharging errors was \$20.75 million.

The 1998 study reported that the estimated rate for overcharging was 0.9 percent and the rate of undercharging was 0.4 percent during the only safe buy that was conducted. Recently, when responding to requests to estimate the costs to the Program in 2001, the Food and Nutrition Service (FNS) applied rates from the 1998 study for estimating the net loss to WIC from overcharging and undercharging errors. Using the rate of overcharging based on all three buys (1 safe, 1 partial, and 1 substitution buy), it was estimated that 1.6 percent of 1998 WIC redemptions nationally were attributed to overcharging. Using only the safe buy to calculate the estimate, the percentage drops to 0.9 percent. Using the rate of undercharging based on all three buys, it was estimated that 0.6 percent of 1998 WIC redemptions nationally were attributed to undercharging; whereas, using only the safe buy to calculate the estimate, the percentage of undercharge drops to 0.4 percent. Therefore, based on fiscal year 2001 annual retail redemptions of \$4.48 billion and applying the rate of 0.9 percent for the safe buy and 1.6 percent for all three buys, FNS estimated the cost of overcharging to the Program to range from about \$40 million to \$72 million. After accounting for undercharging at the rate of 0.4 percent for the safe buy to 0.6 percent for all three buys the estimated range for undercharging is about \$18 million to \$27 million. Based on these estimates, FNS estimated that the net loss to WIC from overcharging and undercharging errors ranges between \$22 million and \$45 million.

C. Vendors Allowing Major Substitutions

In this section, a comparison is made between the percentage of vendors who allowed

compliance buyers to substitute an unauthorized item for a WIC-authorized one. As indicated in Table 1, there were differences in the method in which major substitution buys were conducted in 1991 and 1998. A larger sample of vendors received a major substitution compliance buy in 1998 than in 1991. In 1991, only 396 vendors or about one third of the sample were visited, but in 1998, 747 vendors were studied. In 1991, all the major substitution compliance buyers attempted to purchase one six-pack of soda to replace one item on the food instrument. In 1998, compliance buyers were provided with a list of unauthorized foods, such as soda, pretzels, cheese doodles, and canned pasta, and were instructed on which item to substitute. Overall findings, as well as percentages by vendor size and location, are presented and discussed below.

Unlike 1998, in 1991 a separate vendor weight was not developed for the major substitution buy. Therefore, the comparisons shown in Figures 11 and 12 are made on unweighted data. Although the overall percentage of vendors who allowed major substitutions to be made is small (1.5% in 1991 and 4.0% in 1998), the percentage was significantly ($p < 0.001$) higher in 1998 compared to 1991 (see Figure 11). The percentage of small and large vendors who allowed compliance buyers to substitute WIC-authorized foods also was significantly ($p < 0.001$) higher in 1998 than in 1991 (see Figure 11). The highest percentage (5.5%) was noted for small vendors in 1998.

In Figure 12, data are shown by vendor location, metropolitan versus non-metropolitan. A significantly ($p < 0.001$) higher percentage of metropolitan vendors in 1998 (4.3%) allowed a major substitution than in 1991 (0.9%). The percentage of non-metropolitan vendors who committed this violation in 1998 (3.1%) was also higher than in 1991 (2.3%), but the difference was not significant.

IV. Summary of Findings:

Overall, the percentage of vendors committing administrative and procedural errors and mischarging the Program declined from 1991 to 1998.

- More vendors maintained sufficient stocks of WIC-authorized foods for women and

children in 1998 than in 1991. The reverse was true for the infant package wherein the percentage of vendors with insufficient stock was significantly ($p<0.001$) higher in 1998 than 1991 (9.3% versus 7.9%).

- In 1991 and 1998, small vendors were more likely than large vendors to have insufficient stocks of WIC-authorized foods. Nonetheless, the percentage of small and large vendors with insufficient stocks declined significantly ($p<0.001$) from 1991 to 1998.
- Some improvements were noted in the percentage of vendors who did not record the purchase price at the time of the transaction. The percentage of vendors committing this error on the woman package receipts decreased from 1991 to 1998. However, over 13% of small vendors and over 5% of large vendors in 1991 and 1998 failed to record the purchase price at the time of the transaction.
- Accuracy in charging WIC improved from 1991 to 1998. The percentage of vendors overcharging or undercharging the Program decreased significantly ($p<0.001$).
- In 1991 and 1998, small vendors were more likely to overcharge WIC than large vendors. Overcharging was also more prevalent in metropolitan areas than non-metropolitan areas.
- Although the percentage of vendors allowing the compliance buyer to substitute an unauthorized item for a WIC-authorized food item was low, this practice increased significantly ($p<0.001$) from 1991 to 1998. A higher percentage of small and metropolitan vendors allowed a major substitution than large or non-metropolitan vendors.

Finally, the findings of this comparison study indicate that, overall, vendor management practices improved between 1991 and 1998. Notable improvements were noted in the maintenance of sufficient stocks of WIC-authorized foods by vendors and in vendor accuracy of charging the Program. An area that did not show improvement in 1998 was the practice of accepting buyer-initiated substitutions for WIC-authorized foods. Although the percentage of vendors allowing substitution buys is small, it is an area that needs improvement.

V. References:

1. U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis and Evaluation. *WIC Vendor Issues Study, 1991: Final Report*, by Lilly B. Gardner, et. al. Project Officers, Jay Hirschman, Ken Offerman, Steven Gale. Alexandria, VA: 1993.
2. U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition, and Evaluation. *WIC Vendor Management Study, 1998: Final Report*, by Loren Bell, et.al. Project Officers, Patricia McKinney, Boyd Kowal. Alexandria, VA: 2001. This report can be downloaded from <http://www.fns.usda.gov/oane/MENU/Published/WIC/WIC.HTM>

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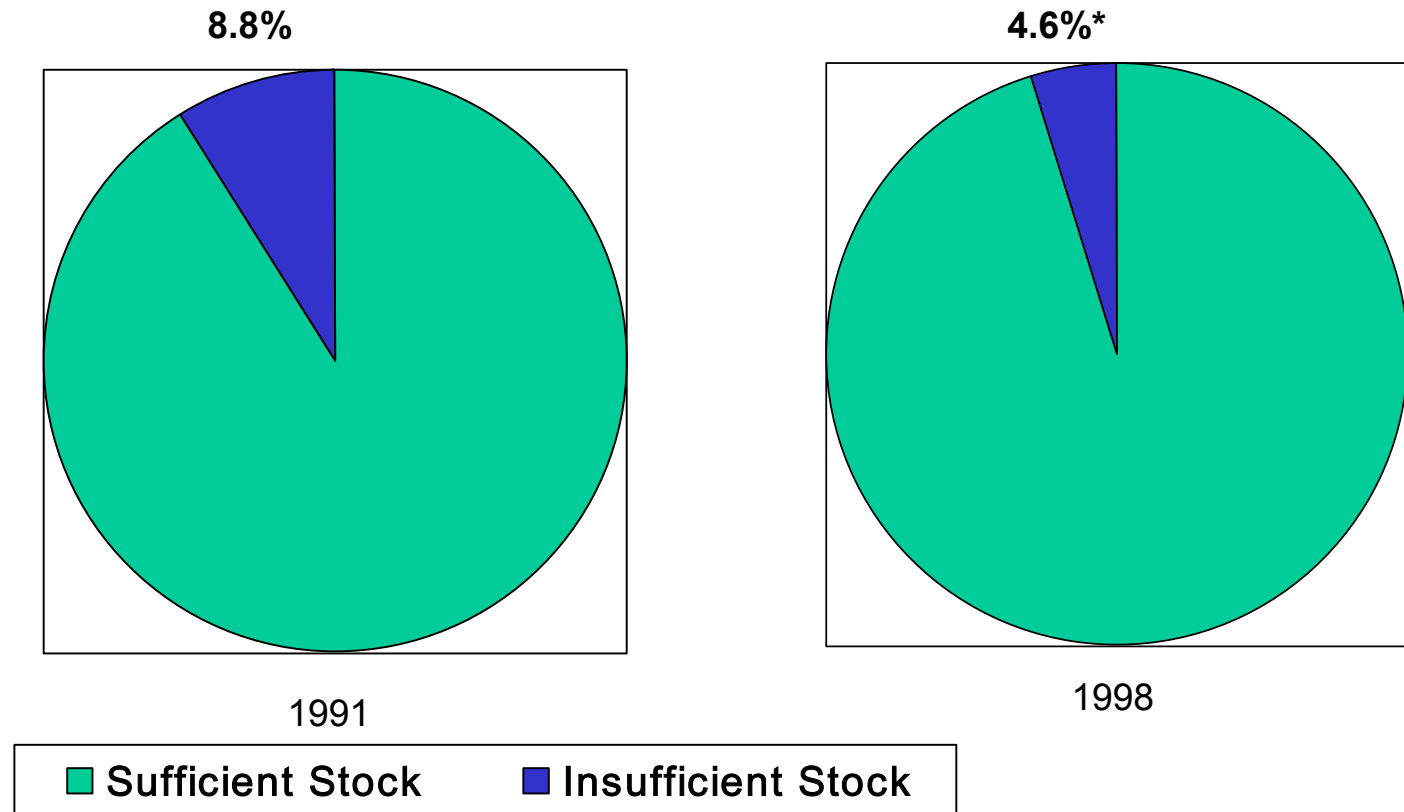
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Figure 12: Comparison of the Percentage of Vendors Who Accepted A Buyer-Initiated Major Substitution by Location

Figure 1

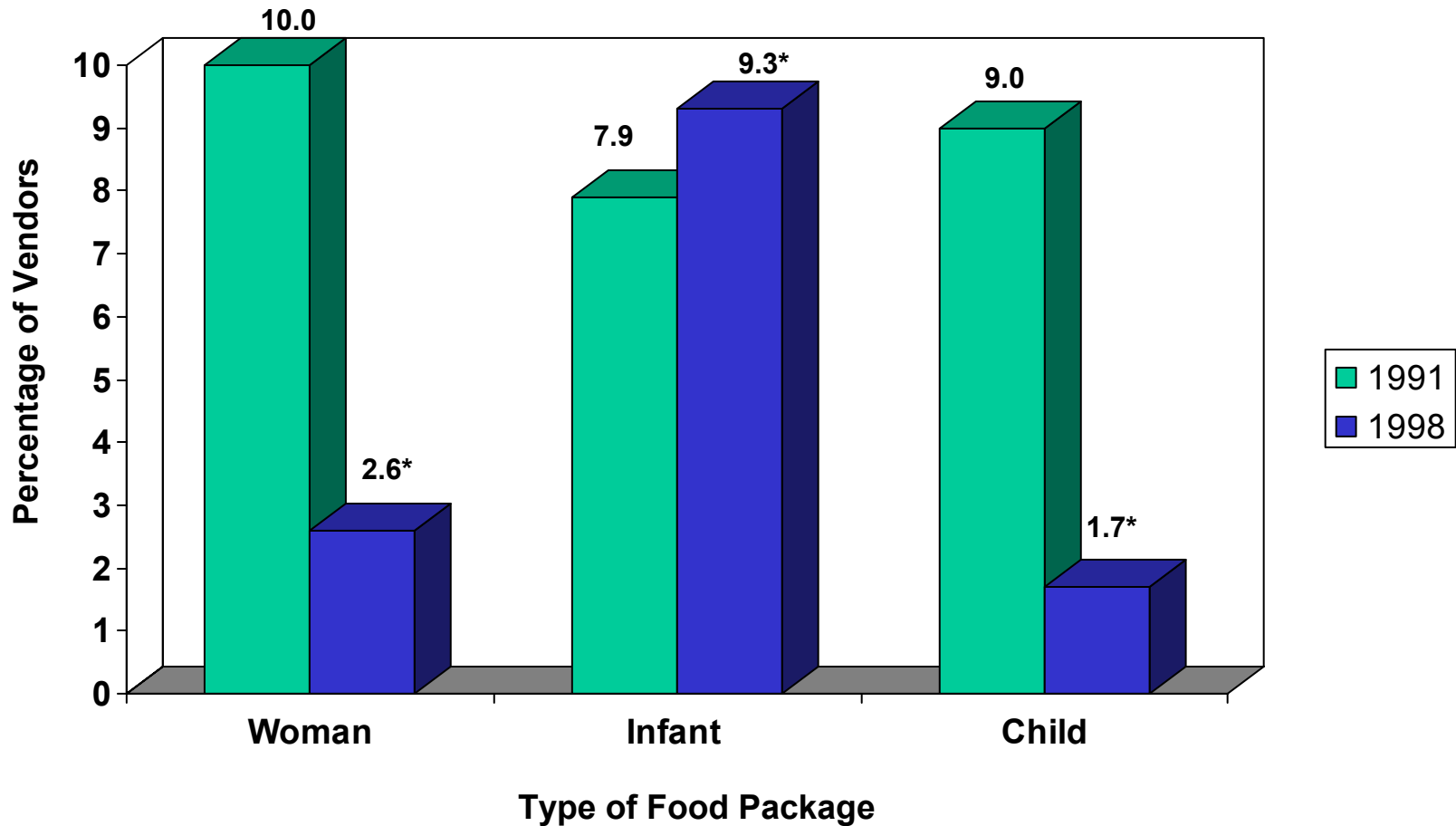
Comparison of the National Estimate of the Percentage of WIC Vendors with Insufficient Stock



***p<0.001 1991 versus 1998**

Figure 2

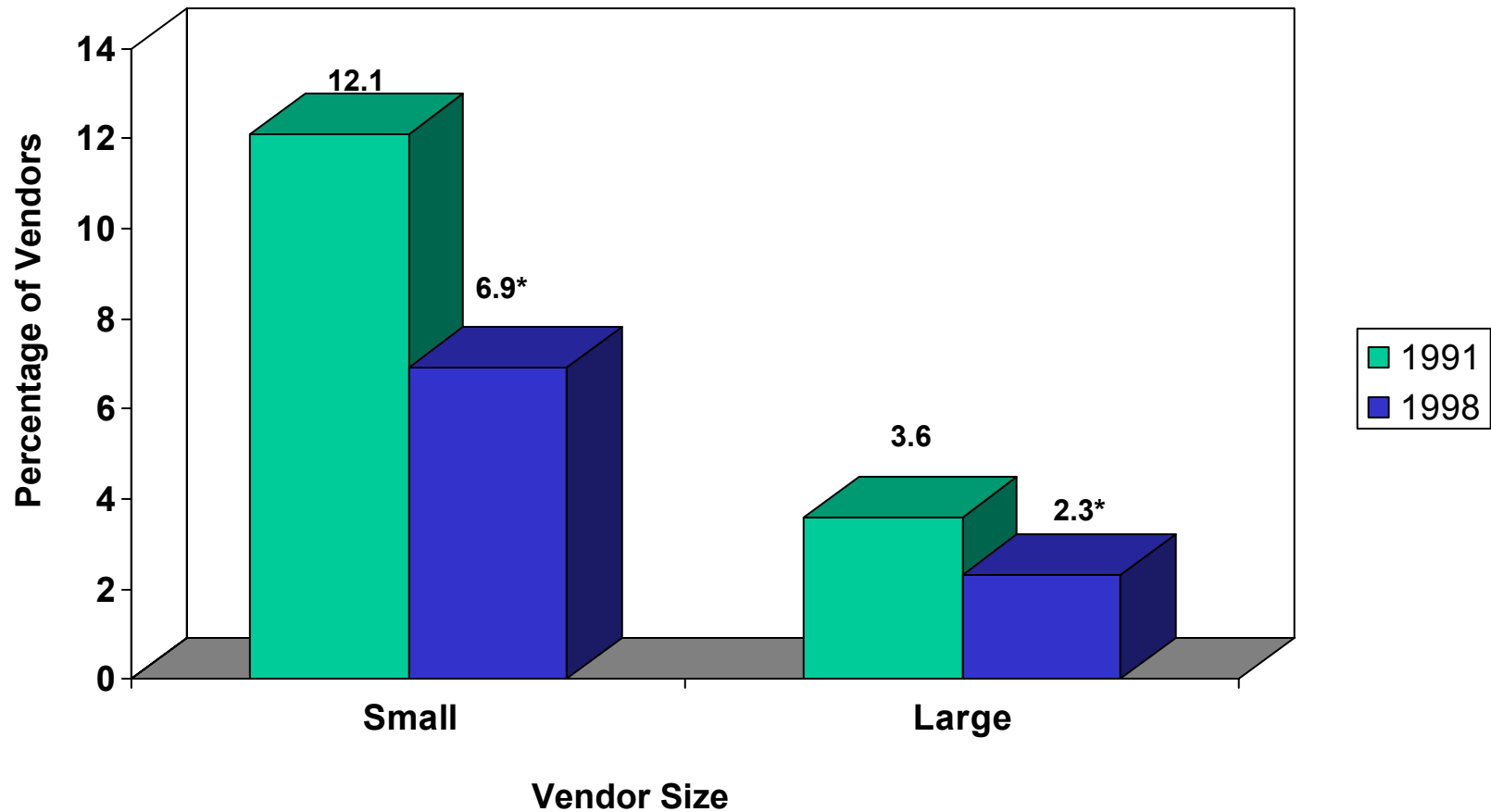
Comparison of the National Estimate of the Percentage of Vendors with Insufficient Stock by Type of Food Package



*p<0.001 1991 versus 1998

Figure 3

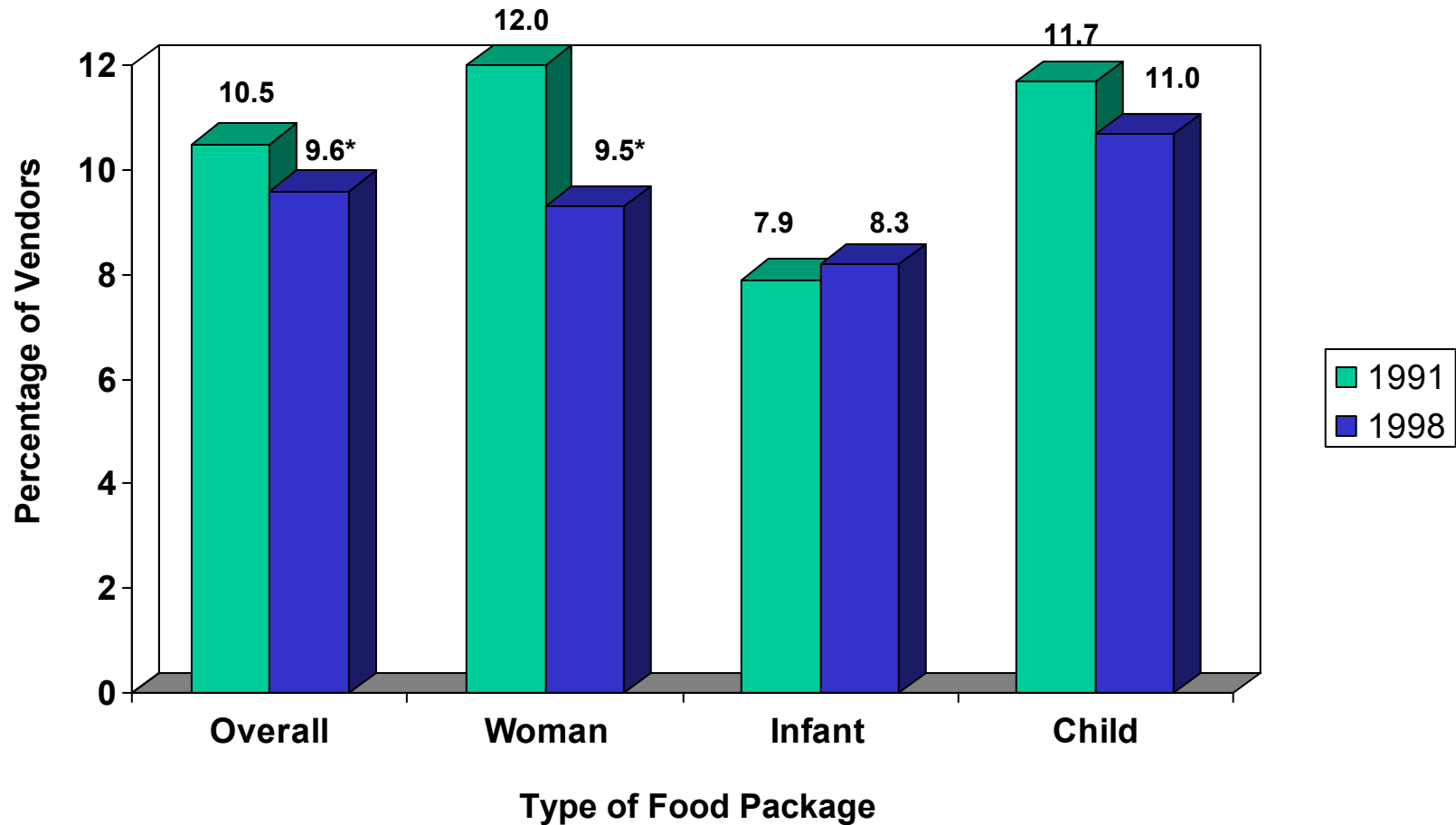
Comparison of the National Estimate of the Percentage of Vendors with Insufficient Stock by Size of Vendor



*p<0.001 1991 versus 1998

Figure 4

Comparison of the National Estimate of the Percentage of Vendors Who Did Not Record the Purchase Price at the Time of Transaction by Type of Food Package



*p<0.001 1991 versus 1998

Figure 5

Comparison of the National Estimate of the Percentage of Vendors Who Did Not Record the Purchase Price at the Time of Sale by Size of Vendor

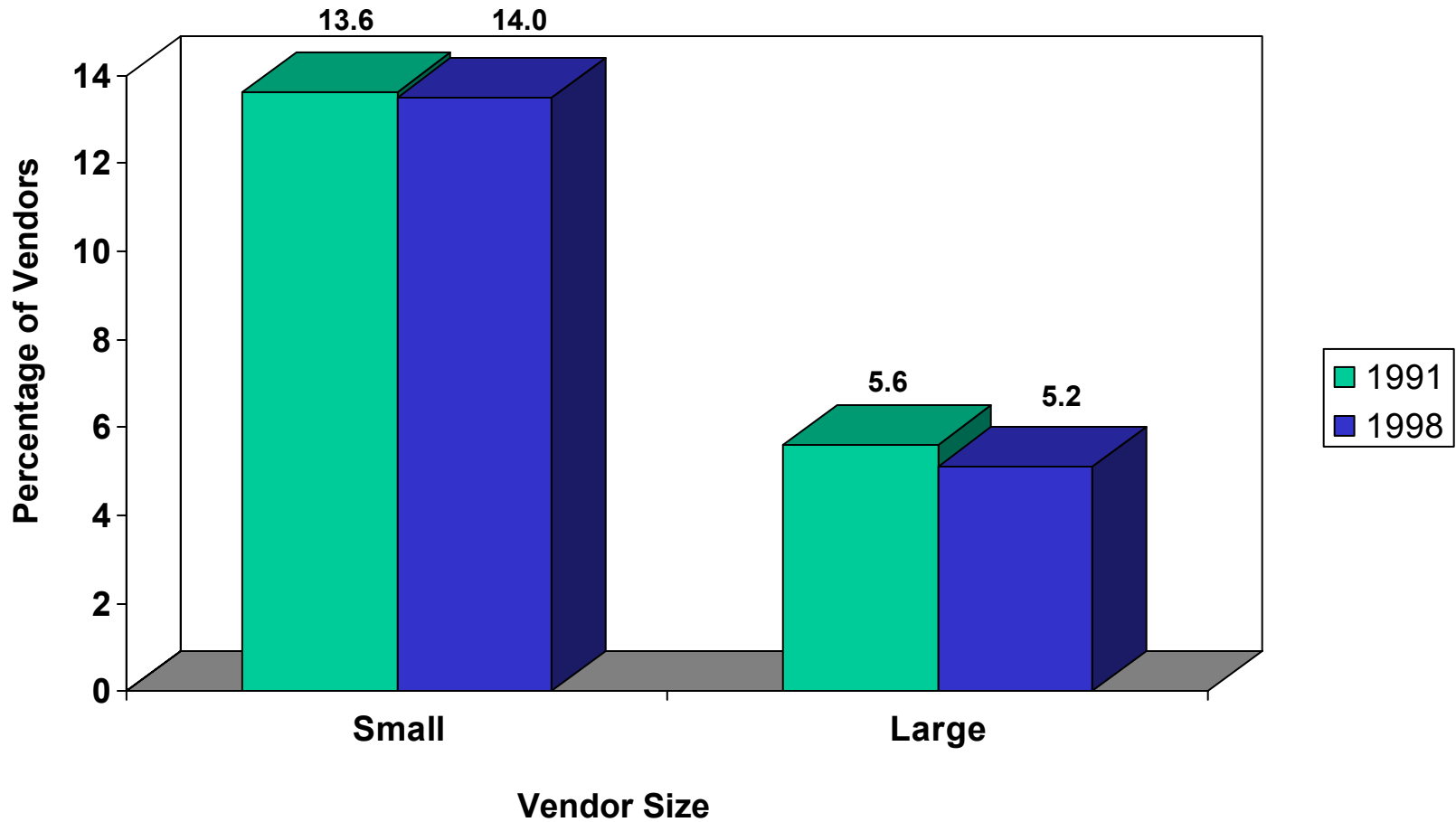
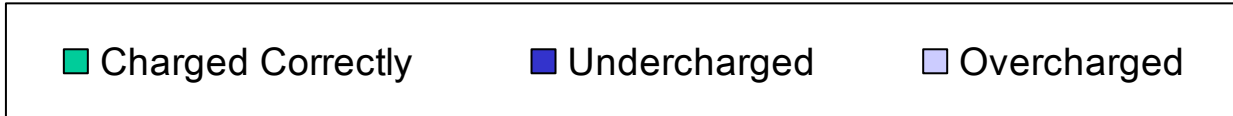
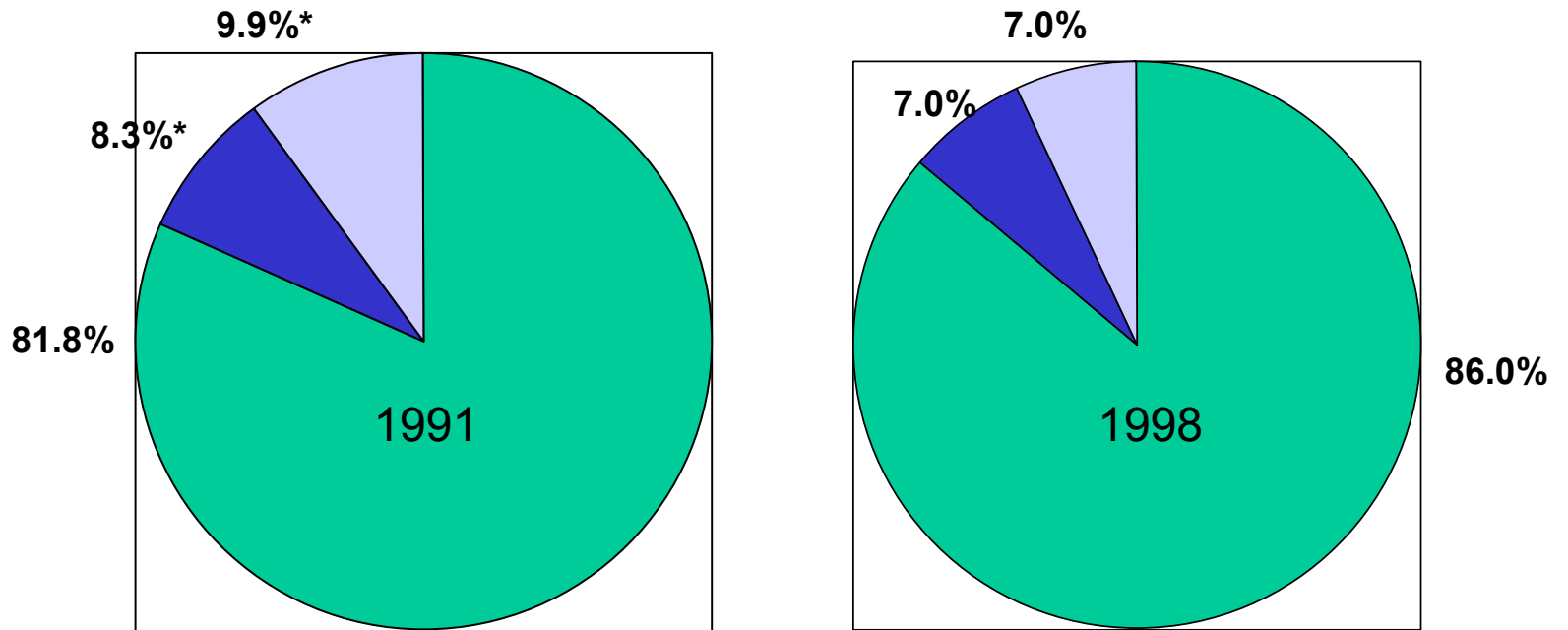


Figure 6

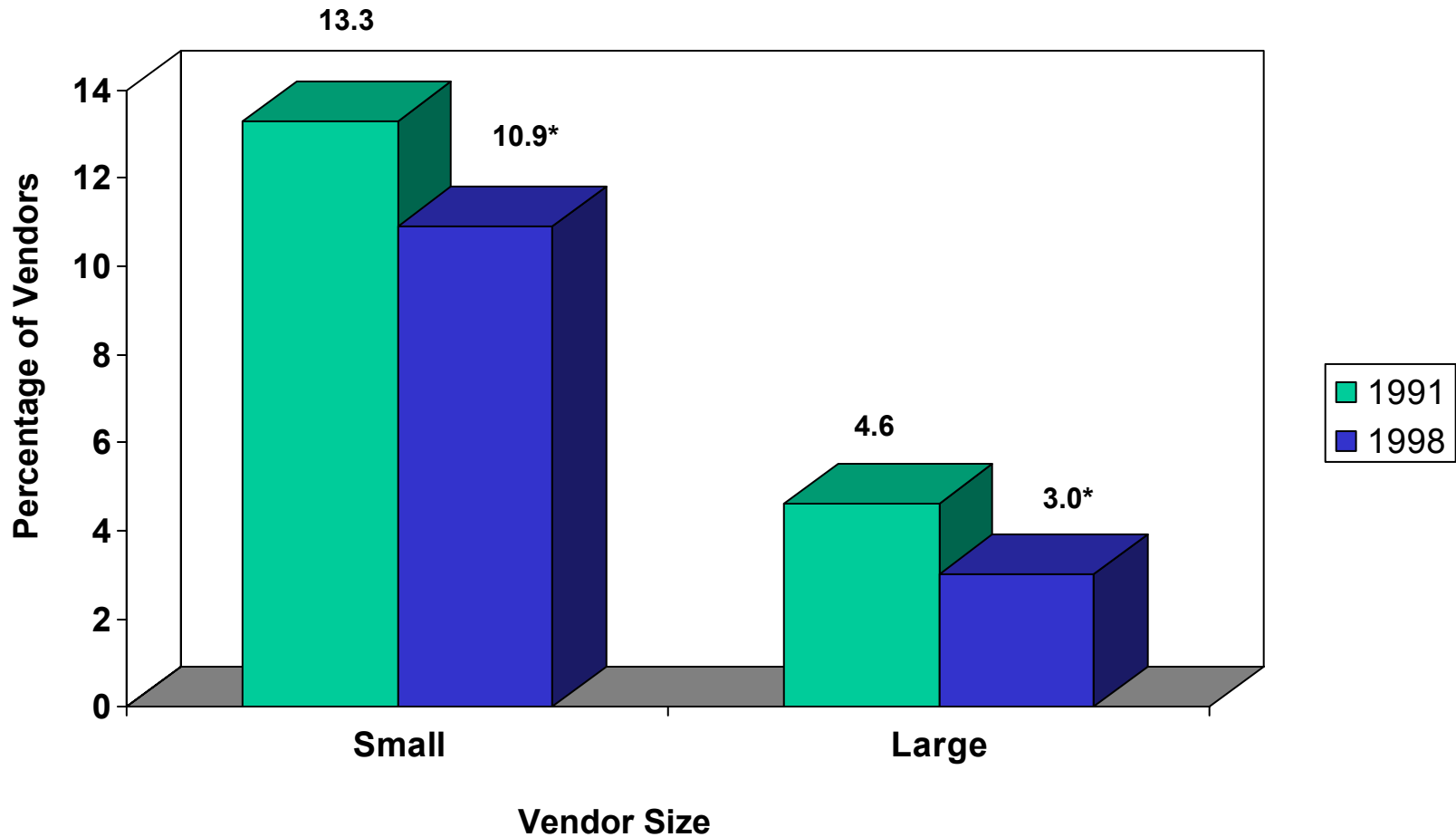
Comparison of the National Estimate of the Percentage of WIC Vendors who Overcharged, Undercharged and Correctly Charged the WIC Program



*p<0.001 1991 versus 1998

Figure 7

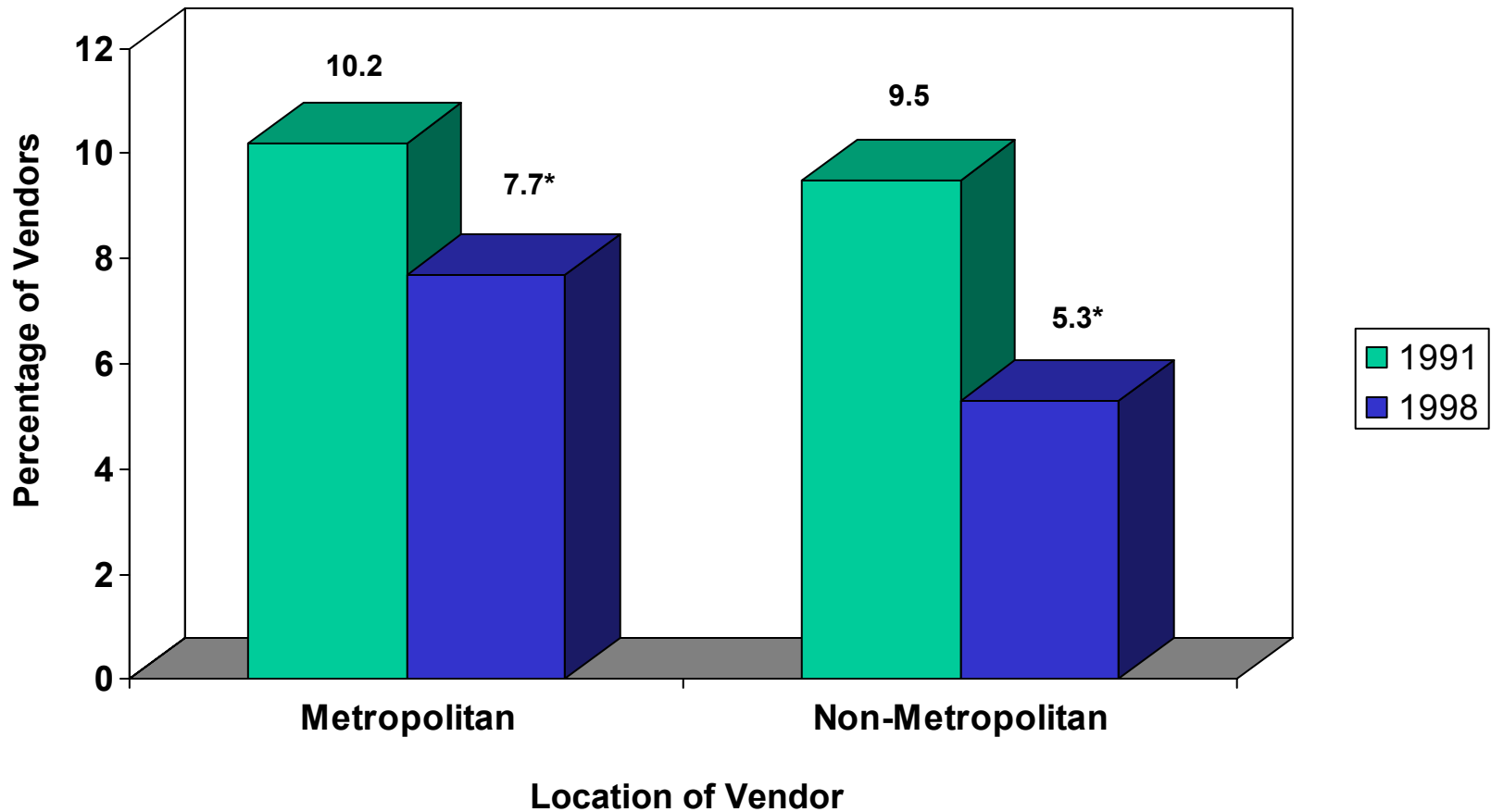
Comparison of the National Estimate of the Percentage of Vendors Who Overcharged the WIC Program by Size of Vendor



*p<0.001 1991 versus 1998

Figure 8

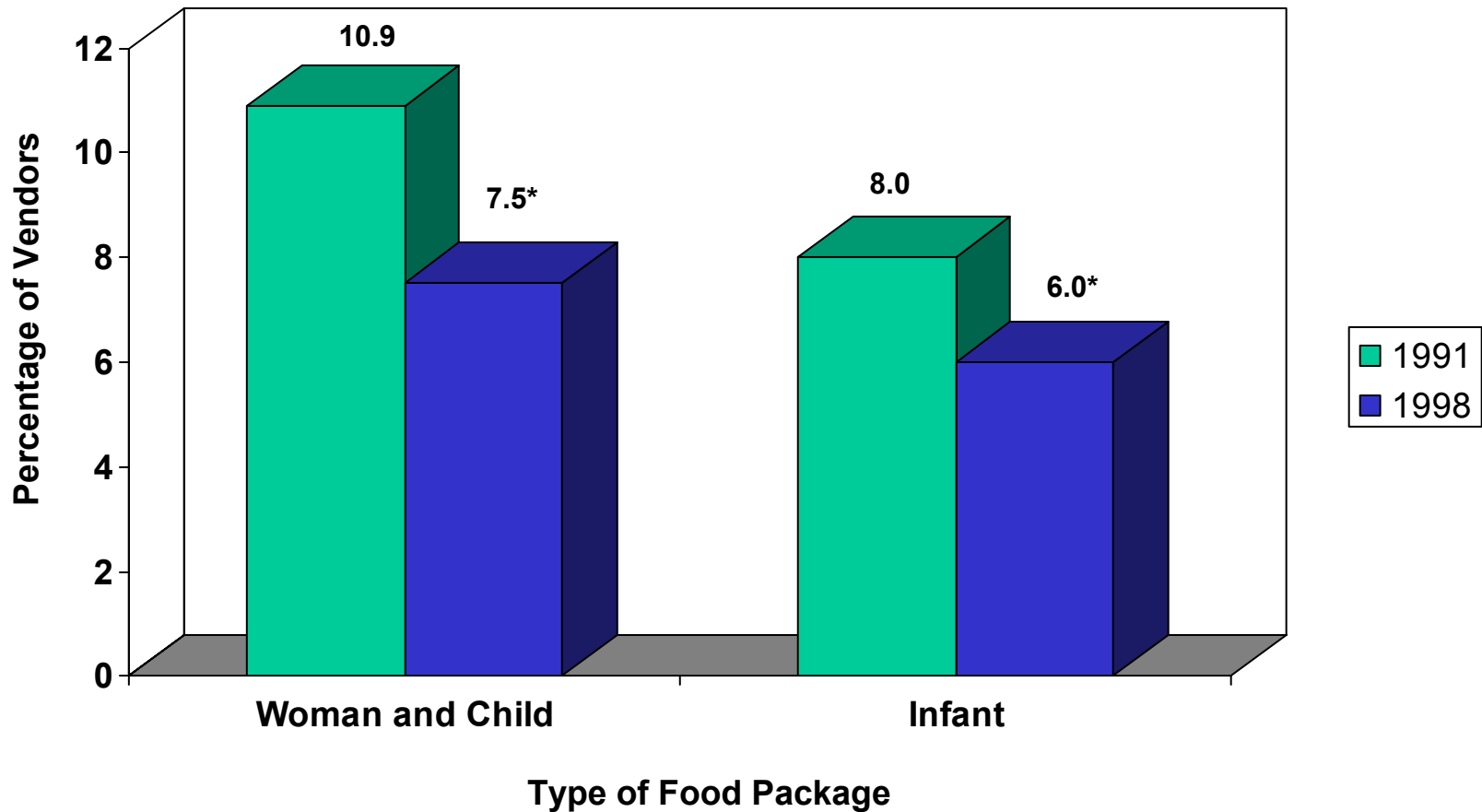
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*p<0.001 1991 versus 1998

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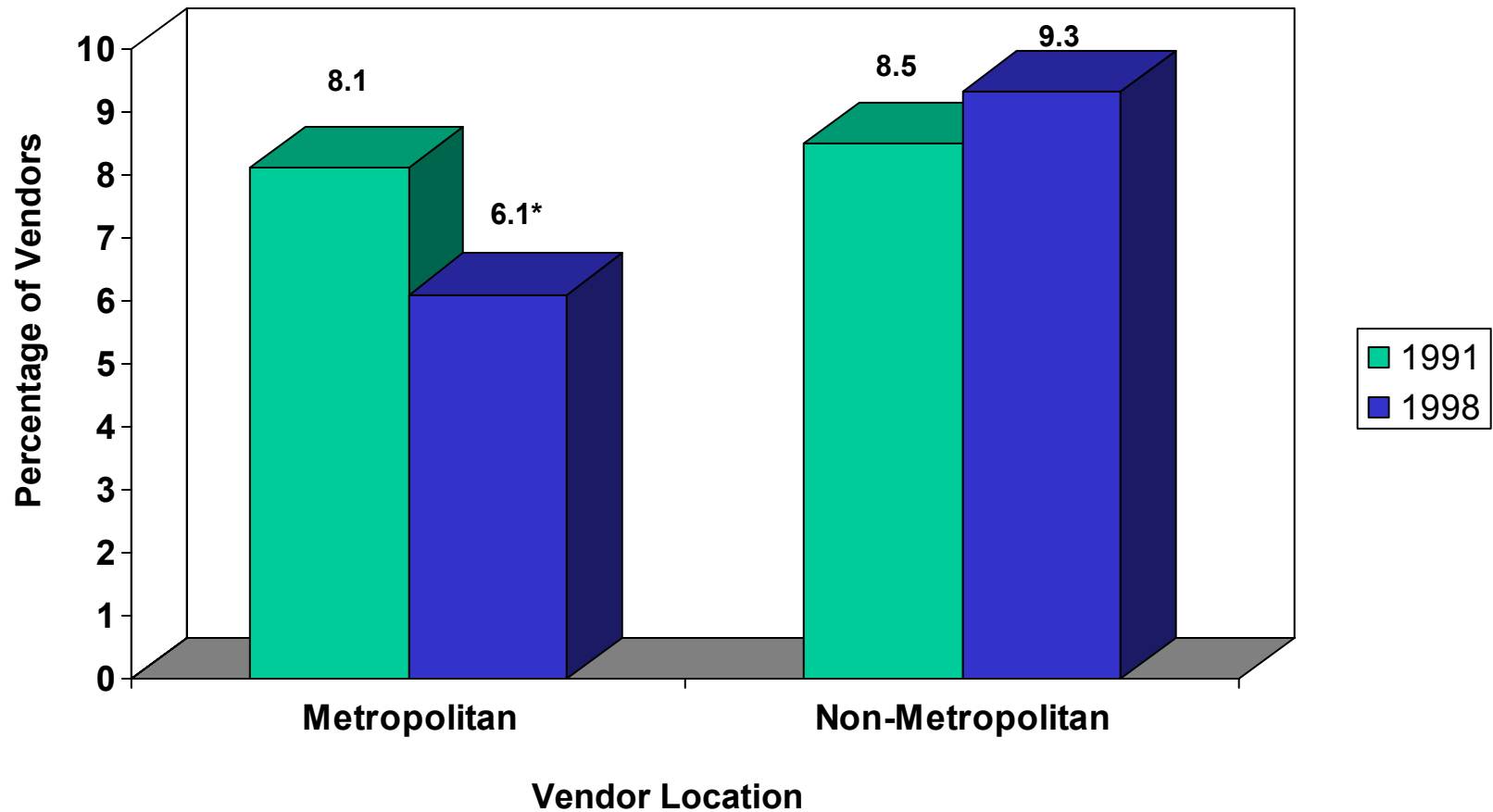
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*p<0.001 1991 versus 1998

Figure 10

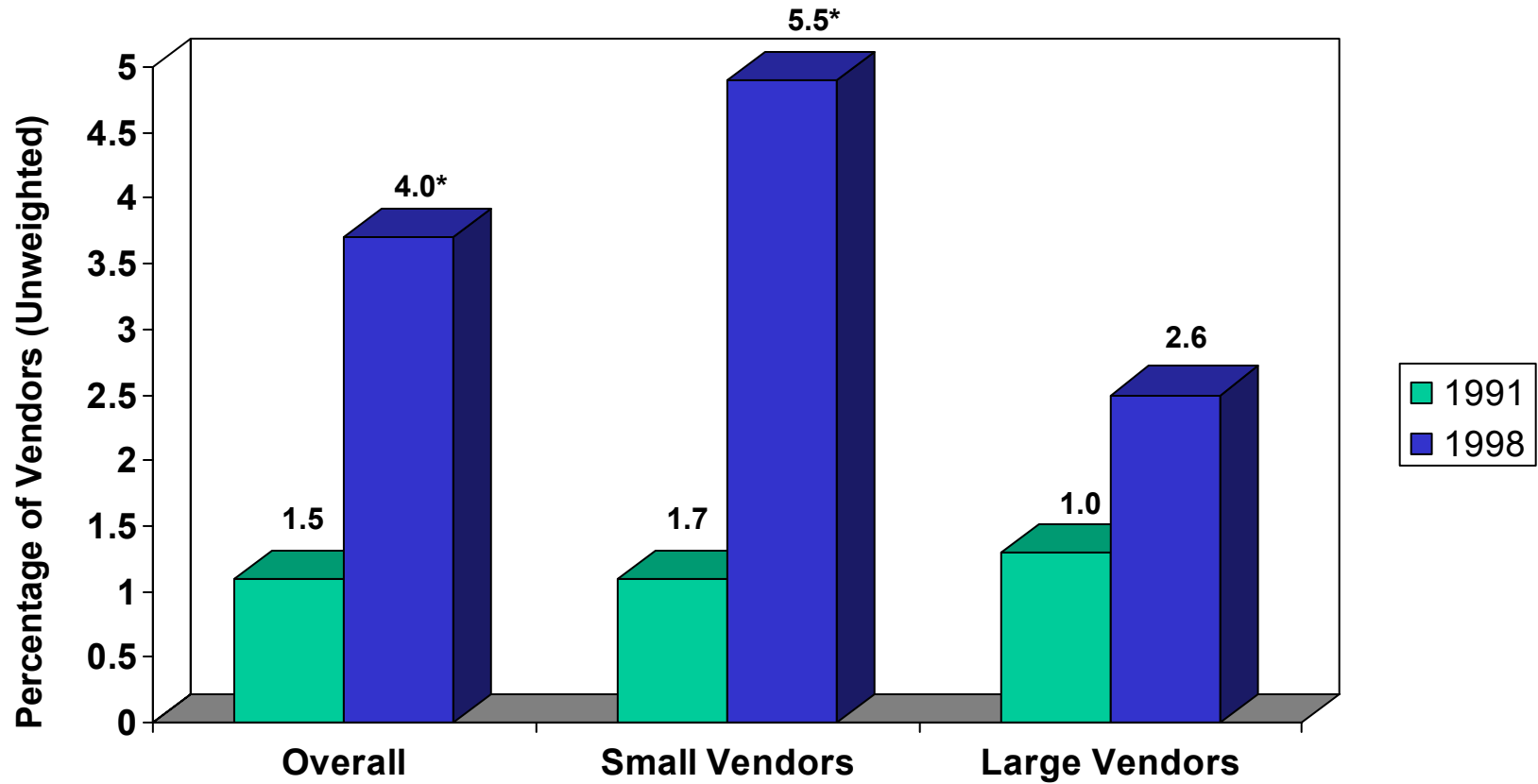
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Figure 11

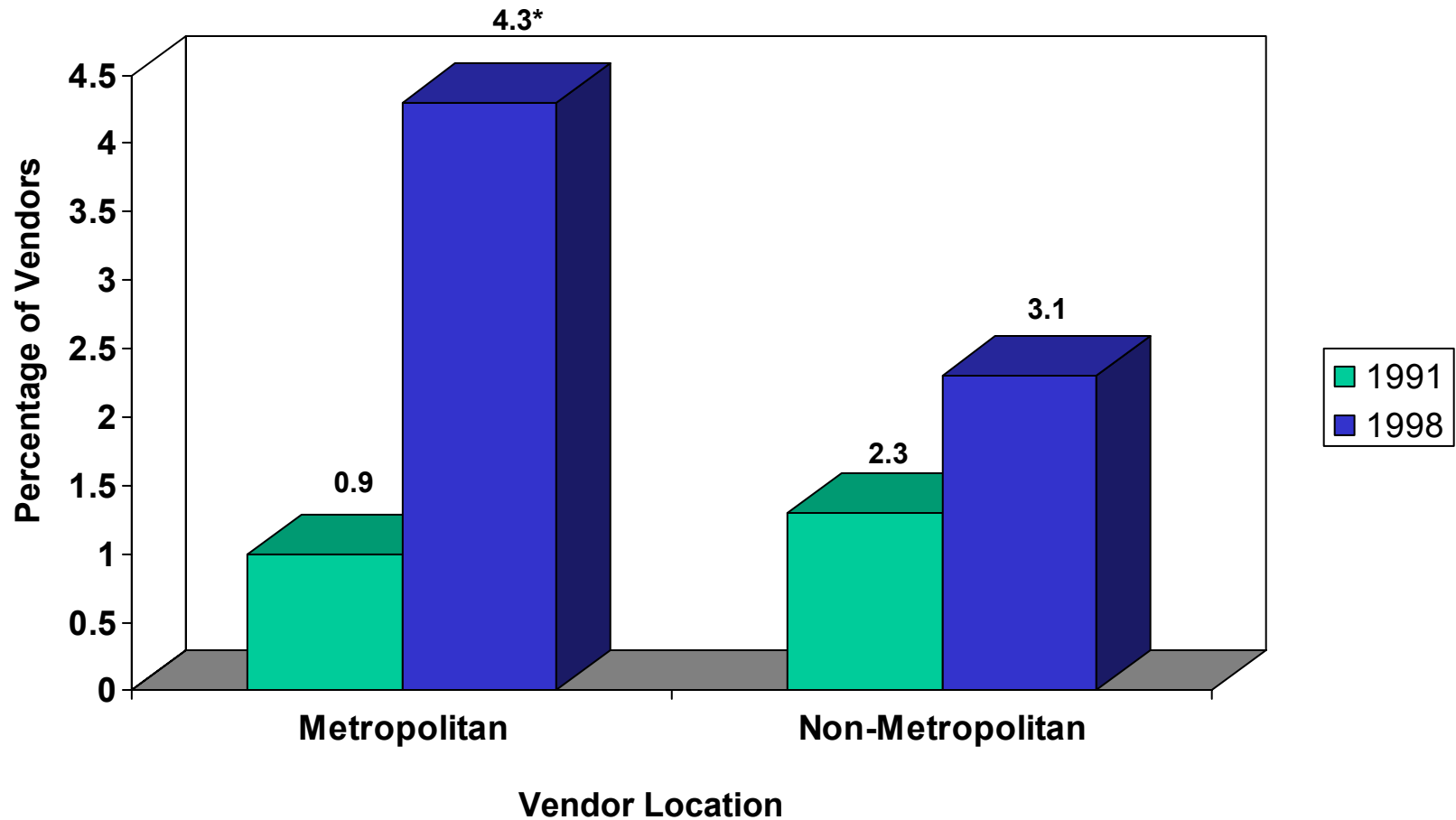
Vendors Who Accepted A Buyer-Initiated Major Substitution Buy: Comparison of the Overall Percentage of Vendors and by Vendor Size



*p<0.001 1991 versus 1998

Figure 12

Comparison of the Percentage of Vendors Who Accepted A Buyer-Initiated Major Substitution by Location



*p<0.05 1991 versus 1998