EVALUATION OF THE 1972-73 CONSUMER EXPENDITURE SURVEY Cathryn Dippo, John Coleman and Curtis Jacobs, Bureau of Labor Statistics

The Consumer Expenditure Survey (CES) was a major component of the Bureau of Labor Statistics (BLS) program to update the Consumer Price Index (CPI). Its primary purpose was to collect relative annual mean expenditures for all components of consumption to be used as the basis for creating the cost weights of the revised Consumer Price Index (CPIR). Additionally, the survey provided data for publication of mean expenditures at various geographic and demographic levels.

The CES consisted of two separate types of questionnaires, a diary and an interview, administered to independent samples of housing units. The diary survey was used primarily to obtain data on frequently purchased items; the interview survey for less frequently purchased items.

I. Sample Design and Procedures

The specific PSU (Primary sampling unit) design for the CES was a modified CPS design of 216 PSU's, 30 self-representing (SR) SMSA's and 186 non-self-representing (NSR) PSU's. The original plan was to complete the survey in one year; however, due to a reduction in funds, the data collection was divided into two one-year phases. One half of the selected housing units in SR areas were interviewed each year; all the housing units in half of the NSR PSU's were interviewed each year.

The eligible population was composed of all civilian noninstitutional persons and certain persons residing in group quarters. A systematic unclustered sample of approximately 15,000 housing units was selected for each year of the diary survey. A similar sample of about 13,000 housing units was selected for the interview survey. Each housing unit in the diary sample was requested to complete two one-week diaries and was assigned an initial week of interview so as to distribute data collection over the period July 1972 to June 1974. For the interview survey, the sample housing units were interviewed during the first quarter of 1972 or 1973 and for four succeeding quarters for a total of five interviews per household.

Approximately eleven to thirteen percent of the housing units designated for the interview survey were vacant, non-existent or ineligible; another ten percent refused or were unable to be contacted. For the diary survey, about thirteen to fifteen percent of the units were ineligible. Seventeen percent refused to cooperate during the first year and nine percent the second year. Therefore, diaries were completed at about 10,000 units the first year and 12,000 the second. During the last quarter of the interview survey, about 10,000 units were interviewed each year.

A sampling weight was determined for each consumer unit (CU) $\frac{1}{2}$ responding in the fifth quarter of the interview survey and each consumer unit completing at least one week of the diary. The weight included factors for noninterview adjust-

ment, a ratio adjustment for NSR PSU's by colorresidence, a ratio adjustment to population controls by age-sex-race, and a CU adjustment based upon multiple-CU household composition. These procedures provided estimates consistent with the number of households estimated by the March Current Population Survey (CPS). Data collection and processing of the data to this stage was completed by the Bureau of the Census. After the data tapes were transmitted to BLS, additional processing included editing, allocation, imputation, annualization, and sales tax adjustments. Two separate data bases were created - one for CPIR and another for publication. The results presented in this paper are for the most part based upon the data base developed for the CPIR. Therefore, levels of mean expenditures presented here are given in terms of the CPIR classification scheme and may not agree exactly with those developed by BLS for other purposes. Moreover, data from the diary survey for infrequently purchased items will not be published by BLS and are used in this paper only for analytical purposes.

II. Sampling Errors

Estimates of sampling errors have been simulated by using the random group and collapsed strata methods. Basically, each designated housing unit has been systematically assigned to one of t random groups in the order of selection. The assignment is independent between SR and NSR PSU's, but is across PSU's within type. For the diary, there are 10 random groups; for the quarterly, fifteen. In addition, the SR PSU's are grouped into 15 clusters and the NSR PSU's for the first year into 43 clusters. For both years combined there are 93 NSR clusters. The NSR clusters have been formed by grouping together two or three PSU's of similar size and characteristics.

Using the notation: c = cluster, g = randomgroup, $t = number of random groups, <math>X_{cg} = expen$ ditures in cth cluster, gth random group, $<math>X = \sum \sum X_{cg} = total expenditures (either SR or$ NSR), the random group estimates of varianceare given by:

$$\hat{\sigma}_{X}^{2} = \frac{1}{(t-1)} \sum_{c} \{ t_{g} x_{cg}^{2} - [\sum_{q} x_{cg}^{2}]^{2} \}$$

This is an estimate of the within - PSU component of variance and has been computed for both the SR and NSR PSU's (σ_{SR}^2 and σ_{NSRW}^2). Although this method of variance estimation tends to slightly overstate the variance, it does include the effects of both the weighting and systematic sampling procedures.

To estimate the total variance for the NSR PSU's, collapsed stratum estimates have been made as follows. Let: i = PSU, c = cluster, k = number of PSU's in cluster, $X_{NSR} = \sum_{c}^{NSR} \sum_{i} X_{ci}$ = total c

NSR expenditure, P_{ci} = proportion population of stratum represented by PSU i is to the total population of the cth cluster, then

 $\hat{\sigma}_{X_{(NSR)}}^{2} = \Sigma \left[k\Sigma \left(X_{ci} - X_{c} P_{ci} \right)^{2} \right].$

The total variance of expenditures at the U.S. level is then estimated by

$$\hat{\sigma}^2 = \hat{\sigma}^2_{X(SR)} + \hat{\sigma}^2_{X(NSR)}$$

and the between PSU component of variances $\hat{\sigma}_R^2$ by

$$\hat{\sigma}_{\rm B}^2 = \hat{\sigma}_{\rm X(NSR)}^2 - \hat{\sigma}_{\rm X(NSRW)}^2$$
.

Since the variances of primary concern are those for mean expenditures, a ratio of two random varibles, the variances of consumer units and the covariances between expenditures and consumer units have been computed using similar procedures. The relvariance of the ratio X = X/Y is then estimated by $V_{\overline{X}}^2 = V_{\overline{X}}^2 + V_{\overline{Y}}^2 - 2V_{XY}$.

At the U.S. level, the relative proportions of total variance of consumer unit wks (142,341,000) due to SR, NSRW, and between PSU variance are 14, 29, and 57 percent respectively. The largest component of variance is the between, which is a function of the number of PSU's (93).

The average relative between PSU contribution to the variance of mean expenditures for the twenty food EC's is 30 percent, which is about half of the same proportion for the variance of consumer unit weeks. In other words, the effect of having a relatively small number of PSU's is subordinate to the sample size in determining the variance of mean expenditures.

III. Comparisons of Expenditures Between the Diary and the Interview

Although the purpose of the diary was to obtain expenditure data for food and other frequently purchased items, respondents were requested to enter <u>all</u> purchases including clothing, household textiles, furniture, appliances, etc.

Therefore, one of the research topics has been the comparison of mean expenditure levels for infrequently purchased items between the diary and the interview surveys. The completion of this task has not been straight forward. Numerous definitional differences $\frac{2}{}$ exist between the two sources, and the coding schemes for the two surveys are not comparable. Some of these problems have been overcome by using the CPIR data base, but others have required massive recoding.Table 1 presents corresponding mean expenditures from the two surveys with their variances as computed from the CPIR data base along with the absolute differences (Δ) and a measure of significance testing (Δ/σ_{Δ}) . The variance of the difference σ_{Δ}^2 (σ^2 Diary + σ^2 Interview) was computed assuming total independence between the two estimates and therefore may be a slight overestimate. Again, it should be noted that the data presented in these tables was prepared for research purposes only and may not correspond exactly to the final BLS published data. $\frac{3}{2}$

Comparisons between the two sources (i.e., diary and interview) should not be based upon statistical significance alone; for between estimates not significantly different, the one with the lower coefficient of variation (CV) can be considered more reliable. Also, comparisons for EC's 33, 55, and 64 are relatively meaningless since the interview did not cover many of the items in these EC's.

Of the 47 EC's for which comparisons have been made on 1972-73 data, only nine EC's have nonsignificant differences between the diary and interview means. These are: 23-maintenance and repair services, 25-other fuels, 26-gas and electricity, 29-furniture, 39-girl's apparel, 50-insurance, 56-professional services, 57-hospital and other medical care services and 60-sporting goods and equipment. In all cases the coefficient of variation for the diary estimate is larger than that of the interview.

For the non-food at home EC's (19-68), the CV for the diary is less than that for the interview in the following EC's: 19-food away from home, 20alcoholic beverages, 33-housekeeping supplies and 64-toilet goods and personal care appliances. The diary has been used as publication source for these expenditures along with those for the following EC's:

EC	Rel Mean Exp	cv _D /cv _Q
25-other fuels	D=Q	1.3
27-other utilities	D>Q	1.7
47-gasoline	D <q< td=""><td>1.2</td></q<>	1.2
63-tobacco	D <q< td=""><td>1.0</td></q<>	1.0
65-personal care serv	D<0	1.7

However, for integration, the interview survey has been used as the source of mean expenditure for these EC's.

On the other hand, the CPIR cost-weights for the following non-food EC's are based upon the mean expenditures from the diary:

EC	Rel Mean Exp	cv _D /cv _Q
33 4/	D>Q	.4
47	D <q< td=""><td>1.2</td></q<>	1.2
55 4/	D>Q	1.2
$59 \overline{4}$ (part)	D>Q	1.2
$61 \overline{4}$ (part)	D>Q	2.3
64 4/	D>0	.6

The quarterly has been used for the remaining EC's including 27, which has a higher diary mean expenditure than quarterly. Therefore, for only EC 47 might the diary have been a better source.

IV. Diary reporting by day of week

In the past, diary surveys have exhibited differentials in levels of expenditure reporting between weeks and days within a week. The 1972 diary survey is no different. Table 2 shows mean expenditures by week for the diary published EC's and indicates the relative differences (Δ/σ_{Δ}) . When only completed diaries are considered for the 27 EC's shown, 21 have greater means the first week than the second week based on 95 percent confidence intervals. Over all diaries, 16 EC's have greater means for week one than week two. Of 1809 CPI items examined, mean expenditures for only 97 differ significantly between week one and week two. Of these 97 items, differences for 58 are associated with the published diary EC's and 55 the EC's used for CPIR. Not all of these differences result from higher first week mean expenditures. Twenty-one of the 97 items have higher second week means. However, among the items in the diary published EC's, there are only three with higher second week means. As to the reliability of first versus second week mean expenditures, the lower CV's are evenly divided between weeks over all items.

An examination of EC mean expenditures by day of reporting over the 14-day period (See Table 3) shows that the mean expenditure for day one is greater than every other day for all EC's except EC 3-Beef, EC 7-Fish and Seafood, and EC 20-Alcoholic beverages. (It should be noted that a one cent difference may be "significant"; however, the variance on the variance of very small mean expenditures could more than account for this and make such tests meaningless.) The differences between the second day of each week are very small - only three are greater than ten cents. Between days seven and fourteen, the last day of each week, only eleven EC's show differences but none of the food EC's differ by more than one cent making the differences not really meaningful. This implies that the last day of week two is not different from the last day of week one.

If the first day is ignored, most differences are small or within sampling error. The difference between day one and the other days could be due to: telescoping, failure to understand or follow instructions, or completion of all or part of the diary by the respondent using recall methods. Diaries completed either totally or partially by the interviewer using recall methods have lower mean expenditures than those completed by the respondent. This is not an unusual phenomenon. Most interviewers entered recall expenditures in day one and, therefore, to the extent the interviewers did not answer the completion code correctly, the day one mean expenditures for "completed" diaries are biased.

If the first day of each week is dropped and the mean expenditures of the remaining six days compared between weeks, there are only a few EC's with significant differences, even these have small differences. Therefore, it seems reasonable to attribute most of the difference between weeks to the same cause(s) as the first day bias.

V. Implications for CCES

The Bureau of Labor Statistics plans to initiate, some time in 1979, a Continuing Consumer Expenditure Survey (CCES). As presently formulated, this will be an ongoing effort consisting of both a diary and an interview survey in independent samples of approximately 4,800 interviewed households per year within the 86 urban CPI PSU's and an additional 16 PSU's selected to represent the rural U.S. population. The interview questionnaire will be modified to correspond closely with the CPIR item structure, and both the diary and the interview will be modified to include some point-of-purchase (POPS) information. Currently, BLS conducts a separate survey to obtain POPS data for use in selecting the outlets for CPI pricing.

Our ultimate goal is to initiate a set of surveys that will provide the data necessary to update both CPI outlets and cost weights as needed, with as much reliability as cost effectively possible. Evaluation of the 1972-73 CES at BLS has been directed towards this end.

Using the sample sizes planned for the CCES and the CES variances, estimates of variance have been projected for the CCES. These indicate BLS should be able to publish from the diary survey quarterly mean expenditures at the EC level for those EC's presently published from the diary. Other EC's not currently published from the diary but which are projected to have CV's within the range of the food EC's are: 54-Prescription drugs and 59-Reading materials. After four years, under relatively stable economic conditions, estimates of mean expenditures for the food EC's could be made at the market basket level. Therefore, at any time after four years, BLS would have the data necessary to update the cost weights of the CPI.

An indicated below, detailed analysis of the relative effects of the decreased sample sizes (5848 SR in 1972 to 2560 in CCES; 4831 NSR in 1972 to 2245 in CCES) and different number of NSR PSU's (93 in 1972 and 74 in CCES) shows the NSR sample size is far more important than the number of NSR PSU's.

For the CCES diary the estimate of mean expenditures (X) will be of the form $\overline{X} = {}_{h}^{L} P_{h} \overline{X}_{h}$ where h indicates market basket and P_{h} is the proportion the market basket population is of the total U.S. Remembering the relationships from Section II,

$$v_{\overline{X}}^{2} = P^{2}v_{\overline{X}_{SR}}^{2} + (1 - P)^{2} v_{\overline{X}_{NSR}}^{2}$$
$$v_{\overline{X}_{SR}}^{2} = v_{\overline{X}_{SR}}^{2} + v_{\overline{Y}_{SR}}^{2} - 2v_{\overline{X}_{YSR}}^{2}$$

and $V_{XNSR}^2 = V_{XNSR}^2 + V_{YNSR}^2 - 2V_{XYNSR}^2$ where P is the proportion of total U.S. population in SR PSU's, the relvariance of X can be expressed as

$$v_{\overline{x}}^{2} = \sum_{h} P_{h}^{2} \left[\frac{\overline{v} \widehat{s}_{R}}{n_{h}} + \frac{\overline{v}_{NSR}}{n_{h}} + \frac{\overline{v}_{B}}{L_{h}} \right]$$

where $\overline{V^2}$ indicates unit relvariance, n_h is the sample size in the hth market basket and L_h is the number of PSU's in the hth market basket.

$$v_{\overline{X}}^2 = v_{SR}^2 \sum_{h} \frac{P_h^2}{n_h} + v_{NSRW}^2 \sum_{h} \frac{P_h^2}{n_h} + v_{B}^2 \sum_{h} \frac{P_h^2}{n_h}$$

For the 1972 diary,

NSR

$$\sum_{h} \frac{p_{h}^{2}}{L_{h}} = .00532058; \text{ therefore,}$$

 $u^{2} = u^{2} (.4776) + u^{2} (.7061) + u^{2} (.4776)$

The diary data has also been examined by week to determine what kind of reliability would be achieved if consumer units were requested to complete a one week or a three week diary. For the 29 currently published EC's, the average increase in unit relvariances for SR and NSRW from using only one week would be 65 and 72 percent, respectively. If there were no correlation between weeks, a two week diary would have the same effect as doubling the sample size and the increase in unit relvariances from using only one week rather than two would be 100 percent instead of 65 or 72 percent. However, the between PSU variance remains about the same so that the projected CV's are only 22 percent higher. Only EC 25 has a projected CV greater than ten percent based upon one week's data.

The question of primary concern is to determine the optimum number of weeks of diary keeping in terms of both cost and reliability. The variance of a mean expenditure from a "w" week diary can be expressed as:

$$\operatorname{Var} \overline{X}_{w} = \operatorname{var} \left[\underbrace{\overset{\nabla}{\underline{i}} = 1}_{Wn_{w}} \underbrace{\overset{\nabla}{\underline{j}} = 1}_{Wn_{w}} \underbrace{\overset{X_{ij}}{\underline{j}}}_{Wn_{w}} \right]$$
$$= \underbrace{\frac{\sigma^{2}}{(wn_{w})^{2}} (wn_{w}) + \frac{2\sigma^{2} n_{w}}{(wn_{w})^{2}} \left[(w-1)\rho_{1} + (w-2)\rho_{2} \right]}_{(wn_{w})}$$
$$= \underbrace{\frac{\sigma^{2}}{(wn_{w})} \left\{ 1 + \frac{2}{w} \left[(w-1)\rho_{1} + (w-2)\rho_{2} \right] \right\}}$$

For equal reliability from a "w" and "w'" week diary (w>w') assuming equal means and equal response levels for each week,

$$\frac{v_{X_{W}}^{2}}{v_{X_{W}}^{2}} = \frac{w'n_{w'} \left\{1 + \frac{2}{w} \left[(w-1)\rho_{1} + (w-2)\rho_{2}\right]\right\}}{wn_{w} \left\{1 + \frac{2}{w'} \left[(w'-1)\rho_{1} + (w'-2)\rho_{2}\right]\right\}}$$

or

$$\frac{n_{W}}{n_{W'}} = \frac{w' \{1 + \frac{2}{W} [(w-1)\rho_{1} + (w-2)\rho_{2}]\}}{w \{1 + \frac{2}{W'} [(w'-1)\rho_{1} + (w'-2)\rho_{2}]\}}$$

The variable cost for the diary operation C_{t_W} consists of an initial cost C_{fn_W} and a variable cost associated with each completed diary and return visit $C_{v_Wn_W}$

$$C_{f_{v}} = C_f n_w + C_v w n_w$$

For equivalent cost to obtain equal reliability,

$$\frac{C_{tw}}{C_{tw}} = \frac{C_{f} n_{w} + C_{v} w n_{w}}{C_{f} n_{w} + C_{v} w' n_{w}}$$
$$= \frac{(C_{f} + C_{v}w)}{(C_{f} + C_{v}w')} = \frac{w' \{1 + \frac{2}{w} [(w-1)\rho_{1} + (w-2)\rho_{2}]\}}{\psi \{1 + \frac{2}{w'} [(w'-1)\rho_{1} + (w'-2)\rho_{2}]\}}$$

For the comparison of a three week to a two week diary,

$$\frac{C_{t_3}}{C_{t_2}} = \frac{(C_f + 3C_v) 2\{1 + \frac{2}{3} (2\rho_1 + \rho_2)\}}{(C_f + 2C_v) 3\{1 + \rho_1\}}$$

For a two week to a one week diary,

$$\frac{Ct_2}{Ct_1} = \frac{(C_f + 2C_v) \{1 + \rho_1\}}{(C_f + C_v) 2}$$

Assuming a thirty percent cost differential between first and succeeding visits, fourteen of the 29 diary published EC's have week-to-week correlations (Table 4) large enough to warrant a one week diary. Twelve of these fourteen EC's are food EC's. The smallest correlation among the food EC's is .23 and among the published EC's, -.12 for EC 25-Other home heating fuels. Only five of the 29 EC's have low enough correlations to warrant a three week diary.

For the CPIR, only EC's 55, 61 and 64 have correlations low enough to warrant a three-week diary. As for the published EC's, the number of EC's with week-to-week correlations greater than or less than .39 is about evenly split. The weighted average correlation of CPIR diary EC's is .40, which only indicates a one-week diary if the relative costs of the first visit versus succeeding visits are about equal. Also, as the level of aggregation decreases to item strata and item, the correlations decrease, indicating a two-week diary is probably optimum for CPI needs.

Although the analysis is not complete and indeed, it has barely started with respect to the interview survey, the diary appears to have succeeded in improving the reliability of frequently purchased items. The small number of NSR PSU's does not appear to be the major factor in determining the reliability; however, despite the small sample size it is expected that CCES will provide four year cumulative data for CPI comparable to the 1972-73 survey. A completely definitive statement on the adequacy of the sample for CPI cost weights cannot be made until the effect of the variance of the cost weights on the index can be examined.

 $[\]underline{l}$ A consumer unit is a single financially independent consumer or a family of two or more persons living together, pooling incomes and drawing from a common fund for major expenditures.

^{2/} The diary does not include expenditures for items purchased while away from home on vacation.

^{3/} The interview clothing expenditures do not include expenses for items purchased as gifts.

^{4/} The quarterly does not cover many of the items in these EC's.

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TABLE	I ANNUA	LMEA	NEX	PEND	ITURE	5 -	19/	2 - 1	3		
			Diary		0	uarterl	.у		Δ		
EC		<u> </u>	X	CV	<u> </u>	σΧ	CV	CPI	D-Q	σΔ	<u>σΔ</u>
19	Food away from home	452.50	6.50	.0144	427.73	6.76	.0158	D	24.77	9.38	2.64
20	Alcoholic beverages	111.26	2.34	.0210	82.49	1.89	.0229	D	28.77	3.01	9.55
21	Pure Rent (Renters)	536.52	12.15	.0226	622.85	9.80	.0157	Q	-86.33	15.61	-5.53
23	Maint. & Repair Servic	e 90.39	9.59	.1061	88.69	2.72	.0307	Q	1.70	9.96	.17
24	Maint. & Repair Comm.	85.63	4.50	.0526	33.06	1.00	.0302	Q	52.57	4.61	11.41
25	Fuels	66.64	2.82	.0423	73.41	2.44	.0332	Q	-6.76	3.73	-1.81
26	Gas & Electricity	272.37	4.39	.0161	274.27	3.42	.0125	Q	-1.90	5.57	34
27	Other Utilities &										
	public services	268.12	4.82	.0180	239.23	2.49	.0104	Q	28.89	5.43	5.32
28	- Textile house fur-							~			
	nishings	66.90	2.35	.0351	54.41	1.05	.0193	0	12.49	2.58	4.85
29	Furniture	135.22	12.99	.0961	135.41	3.18	.0235	õ	20	13.37	01
30	Household appliance	84.01	5.89	.0701	100.41	1.63	.0162	õ	-16.40	6.12	-2.68
31	TV. radio & sound equi	n 71.57	4.85	.0678	103.36	1.64	.0159	õ	-31.79	5.12	-6.21
32 .	Other household equin	182 38	6 11	0335	60.03	1 35	0225	õ	122 35	6 26	19 54
32	Housekeeping supplies	13/ 96	1 60	0125	43 33	1 30	0220	× N	01 63	2 13	13 00
24	Housekeeping supplies	142 01	1.09	.0125	100 07	2.04	.0300	5	15 54	5 10	200
34	Nonia apparel	143.01	4.34	.0302	146 22	2.04	.0221	Ŷ	13.34	4 10	2.33
30	Men's apparei	103.91	3.70	.0364	140.32	1.01	.0124	Q	-42.40	4.19	-10.11
3/	Boy's apparel	24.64	1.20	.0487	36.67	.00	.0180	Q	-12.03	1.3/	-8./8
38	Women's apparel	193.54	6.17	.0319	213.02	2.77	.0013	Q	-19.49	6.//	-2.88
39	Girl's apparel	41.88	1.76	.0420	44.23	.88	.0199	Q	-2.35	1.97	-1.19
40	Foot wear	93.70	2.32	.0248	81.86	.73	.0089	Q	11.84	2.44	4.86
41	Infants & Toddlers										
	apparel	16.41	.59	.0360	12.92	.35	.0271	· Q	3.50	.69	5.07
42	Sewing material & noti	on17.11	• 55	.0321	20.95	.43	.0205	Q	-3.84	.70	-5.50
43	Jewelry & luggage	38.04	1.91	.0502	44.15	1.55	.0351	Q .	-6.11	2.47	-2.48
44	Apparel Services	40.04	1.01	.0252	61.83	.85	.0137	Q	-21.78	1.32	-16.51
45	Purchase of new cars,										
	trucks, etc.	286.03	23.09	.0807	446.81	10.27	.0230	Q	-160.78	25.27	3.97
46	Purchase of old cars,										
	trucks, etc.	93.59	21.07	.2251	269.63	6.07	.0225	Q	-176.04	21.93	-8.03
47	Gasoline, motor oil										
	coolant, etc.	357.98	4.61	.0129	399.99	4.26	.0107	D	-42.00	6.27	-6.70
48	Parts & equipment	65.48	3.12	.0476	71.98	.93	.0129	0	-6.50	3.25	-1.99
49	Maintenance & repairs	127.59	4.03	.0316	138.74	1.98	.0143	õ	-11.14	4.49	-2.48
50	Insurance	203.48	7.77	.0382	196.63	1.94	.0099	õ	6.84	8.01	.85
52	Vehicle rental, regis.							~			
	£ fees	43.55	1.91	. 0439	64.24	1.19	.0185	0	-20.69	2.25	-9.19
53	Public transportation	72 00	4 44	0617	98 61	3 15	0319	õ	-26.60	5.44	-4.89
55	Non prescription drug	/2.00	3.33		20.01	3.13	.0315	×	20.00	5.11	1.07
22	s modical supplies	61.58	1.86	.0302	16.50	.43	.0261	D	45.07	1.91	23.64
	& medical supplies	198 36	7.22	.0364	188.99	3.40	.0180	Q	9.37	7.98	1.17
56	Professional services	190.90									
57	Hospital & Other medi-		5 45	1426	32.77	2.41	.0735	0	5.44	5.96	.91
	cal care services	30.21	2.42	.1420	155 07	2 71	0175	õ	-99,68	4.04	-24.66
58	Health Insurance	55.40	3.00	.0342	13 70	62	0142	D .0	15.60	1.21	12.94
59	Reading Materials	59.39	1.03	.0173	70 07	1 04	0513	0	-8.14	11.92	68
60	Sporting Goods & Equip	. 70.68	11.21	.1280	/0.02	4.04	.0313	×			
61	Toys, hobbies & other			0557	F2 22	1 26	0241	ЪO	67.93	6.82	9.97
	entertainment	12.24	6.70	.0557	52.32	1.20	.0241	512	07.55	0.01	
62	Admission fees & other					2.00	0010	0	29 70	6 89	4.31
	entertainment services	\$ 197.28	5.83	.0296	167.58	3.00	.0210	õ	-14 08	2 20	-6.39
63	Tobacco products	111.84	1.50	.0134	125.92	1.01	.0128	Ŷ	-14.00	2.20	5.55
64	Toilet goods & persona	al					0010	~	60 30	1 00	62 89
	care appli.	76.56	1.07	.0140	8.26	1 20	.0218	0	_22 27	1 76	-12 21
65	Personal care services	68.49	1.38	.0201	91.86	T.08	.0118	Ŷ	-23.37	1 20	-5 24
66	School books & supplie	es 12.10	1.05	.0868	18.41	.66	.0359	Ŷ	-0.31	£ 22	-2.24
67	Tuition & school fees	67.84	5.51	.0812	93.18	2.90	.0311	Q	-23.34	0.23	
68	Legal, bank, acc'g							~	74.00	10 00	2 04
	funeral and other	95.29	19.00	.1994	20.43	.86	.0421	Q	/4.86	19.02	3.74

TABLE 2			(Comparis	on of Weekly	Mean Expenditures	for Co	mpleted ¹	Diaries - 1	1972	
EC	x ₁	x ₂	$\Delta = \overline{x}_1 - \overline{x}_2$	σΔ	Δ/σΔ	EC	\overline{x}_1	x ₂	$\overline{\Delta = \overline{x}_1 - \overline{x}_2}$	σΔ	Δ/σΔ
01	.75	.70	.05	.025	2.02*	15	.83	.76	.07	.027	2.56*
02	2.34	2.15	.19	.052	3.67*	16	.69	.62	.07	.022	3.17*
03	3.97	3.64	.33	.178	1.85	17	1.98	1.78	.20	.054	3.67*
04	2.23	2.07	.16	.069	2.32*	18	2.21	2.08	.13	.050	2.61*
05	1.16	1.09	.07	.039	1.81	19	9.26	8.93	.33	.277	1.19
06	1.08	.96	.12	.038	3.16*	20	2.35	2.17	.18	.110	1.63
07	.72	.67	.05	.039	1.30	27	6.14	5.25	.89	.275	3.24*
80	.60	.53	.07	.017	4.07*	33	3.14	2.84	.30	.096	3.12*
09	2.03	1.90	.13	.052	2.50*	47	7.64	6.94	.70	.218	3.21*
10	1.50	1.37	.13	.039	3.37*	55	1.34	1.32	.02	.099	.20
11	1.02	.88	.14	.046	3.04*	63	2.36	2.21	.15	.070	2.15*
12	1.12	1.02	.10	.031	3.21*	64	1.85	1.67	.18	.061	2.94*
13	.83	.75	.08	.029	2.79*	65	1.60	1.43	.17	.068	2.49*
14	.89	.81	.08	.026	3.07*						

*Significant difference(95%) 1/ Diaries with total or partial recall completion codes or without a completion code are excluded

TAB	LE 3		Me	an Expe	nditure	s by Da	y of Re	porting	Period	- 1972	Diary			
						Day of	Report	ing Per	iod					
EC	1	2	. 3	4	5	6	7	8	9	10	11	12	13	14
01	.15	.11	.11	.11	.10	.08	.08	.12	.10	.10	.12	.10	.08	.08
02	.43	.33	.35	.36	.33	.27	.28	.36	.32	.30	.34	.31	.24	.27
03	.72	.65	.67	.51	58 ،	.43	.42	.68	.55	.53	.57	.50	.38	.44
04	.47	.30	.33	.29	.32	.27	.25	.34	.34	.30	.32	.29	.22	.25
05	.23	.16	.17	.16	.17	.14	.13	.17	.16	.16	.17	.19	.12	.13
06	.24	.15	.15	.14	.16	.12	.11	.19	.15	.13	.16	.13	.09	.12
07	.13	.12	.11	.09	.10	.09	.08	.12	.08	.09	.12	.11	.07	.08
08	.13	.09	.09	.08	.08	.06	.06	.10	.07	.08	.08	.08	.06	.06
09	.42	.28	.29	.29	.27	.24	.25	.33	.27	.27	.29	.26	.23	.25
10	.30	.22	.22	.23	.21	.16	.16	.23	.20	.20	.23	.19	.16	.17
11	.22	.17	.14	.13	.15	.10	.10	.15	.14	.12	.14	.12	.09	.10
12	.24	.16	.17	.16	.15	.13	.12	.17	.16	.14	.16	.15	.11	.12
13	.16	.12	.13	.11	.13	.09	.10	.13	.11	.11	.12	.11	.08	.09
14	.17	.14	.13	.12	.13	.10	.10	.14	.13	.11	.14	.12	.08	.10
15	.16	.12	.12	.12	.12	• 09	.09	.12	.11	.11	.12	.11	.09	.10
16	.13	.10	.11	.10	.09	.08	.08	.10	.09	.09	.11	.09	.07	.08
17	.43	.29	.27	.29	.26	.22	.21	.29	.27	.24	.30	.26	.19	.22
18	.41	.36	.31	.32	.31	.26	.25	.34	.34	.28	.34	.29	.23	.25
19	1.49	1.40	1.34	1.39	1.33	1.18	1.12	1.39	1.25	1.31	1.32	1.25	1.19	1.23
20	.42	.33	.36	.39	.36	.26	.24	.33	.34	.30	.35	.31	.27	.27
27	1.86	.80	.73	.80	.61	.56	.76	.93	.64	.72	.71	.61	.63	1.02
33	.64	.45	.46	.45	.38	.38	.37	.49	.45	.40	.40	.41	.32	.37
47	1.63	1.19	1.02	. 1.06	1.02	.86	.86	1.23	.98	.98	.95	.96	.87	.97
55	.29	.16	.21	.20	.21	.14	.13	.23	.22	.18	.18	.22	.15	.13
63	.49	.35	.36	.35	.30	.26	.25	.39	.33	.30	.32	.31	.28	. 28
64	.37	.29	.24	.28	.25	.21	.20	.27	.24	.23	.24	.24	.20	.24
65	.37	.27	.23	.22	.18	.16	.17	.22	.23	.22	.24	.18	.14	.19
Tal	ble 4			Wee	ek-to-We	eek Cori	relation	n, 1972	Diary,	EC Leve	<u>el</u>			
		EC			ρ				EC			ſ)	
		01			5348				16			243	21	
		02			.6428				17			.41	55	
		03			.2365				18			.48	56	
		04			.2450				19			.543	31	
		05			.4867				20			. 661	1	
		06			.4268				25			123	33	
		07			.3130				26			.039	98	
		08			.4039				27			.139	90	
		09			.5602				33			. 328	33	
		10			.5888				47			298	38	
		11			,2660				55			.125	59	
		12			.5056				63			.571	.5	
		13			.3012				64			.144	16	
		14			.3337				65			.430	00	
		15			. 2294									