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INCOME, TIME, THE WORKING MOTHER AND CHILD NUTRITURE

by

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It is widely recognized that the activities of the mother will have an important impact on the health and nutritional status of the child. The nutrition literature abounds with examples such as the squatter or barrio child whose marasmic condition is associated with the mother who had to go to work and was unable to adequately breast feed the child. (Jelliffe) Nutritional status can be viewed as the result of a series of household decisions related to food and health production, purchasing, preparation and feeding. Each has an important time and income component which can be greatly affected by changes in the mother's time allocation. The working mother may add income to the

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household but may also have less time available for child care. Key issues in this relationship include the allocation of maternal time, the substitutions between the time of the mother and other family members and the types of goods which can be purchased with her additional income to replace the time she might have given up. Understanding her use of time is also important in explaining the usage patterns of health and nutrition services.

This paper will center on the Filipino mother in examining these income-time issues as they relate to changes in the maternal labor market status. First, we will examine the potential conflicts between the additional income generated by the mother and the effects this has on child food intake. The effect of the mother's entrance into the work force will be very different for low and high income groups so detailed consideration will be given to this income-time issue. Second, the relationship of these income-time issues with infant feeding behavior will be studied. Since breast feeding can utilize so much of the mother's time and is so important for child nutriture we will explore three issues--the effects of breast feeding, some of the key determinants of breast feeding, and the type of behavior necessary to

overcome the deleterious effects maternal labor force participation may have on the infant. Third, we consider how income and especially time constraints have affected the use of nutrition and health-related social services. Often, the failure of the social services to reach the target population relates to income and time problems.[1/] In total, we hope to use this paper to elucidate more completely the importance of understanding the time issue as it relates to health and nutrition problems.

These household income and time constraints are increasingly being recognized by economists. Much recent work has gone into understanding how individual and household labor supply and family planning decisions are affected by these issues. Similar work has begun on the household consumption issue. To the new "home economics" economist, the two key components are best viewed as goods and time. (Nerlove) The economist would say the entrance of women into the labor market raises the value of her time and makes her more willing to eliminate time-intensive practices such as breast feeding. Concurrently, she would be

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[1/] These economic and time constraints, of course, may not be the real reason social service programs fail. Failure may be part of the larger problem of not understanding fully the sequences and processes in which the social change required for the success of these programs takes place. (Oshima and Rikken)

more likely to substitute goods such as milk or prepared food for the time she would normally use for home production. Overall consumption of a process or good may not decline, however, if the additional income were to lead her to increase her demand for certain types of time-intensive home practices such as breast feeding. There has been little research on these issues as they relate to nutrition; consequently, we feel the ideas presented here must be viewed cautiously. Hopefully, this paper will suggest both avenues for further research and planning and some ways to reconsider existing health and nutritional problems and programs. In this paper, we do not have exact data on the maternal time input nor the value of her time. The labor force participation of the mother is used as a proxy for these factors.[1/]

Female Employment Background

While woman's activities over time and space vary greatly due to economic, geographic and sociocultural factors, it is obvious that women in most low income nations are

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[1/]The use of a single measure--female labor force participation--hides many important income and time differences which relate to the location of the job, the wage level and total hours worked per week. Some of these issues are discussed in this paper.

extremely active in both income-producing and household-related work (e.g., Boserup; Fox; Ward; Firth). The effects on the household of slight or large changes in the mother's normal activities should not be underestimated when one considers,

> "within a given cultural setting--[the] woman's daily round of work at different seasons of the year. This may include cultivating, weeding, bird scaring, harvesting; washing down the cow and fetching grass for it; fetching, perhaps from a distance, all the water needed for domestic and personal use; fetching wood from surrounding bushlands for fuel or collecting cattle dung and putting it into fuel cakes; looking for edible plants, roots, berries, mushrooms, caterpillars, locusts, ants; pounding or grinding grain--all this in addition to cooking food, serving the husband and senior men first, and the women and children second." (Read)

In the Philippines, women are actively involved in trade, service, professional, industrial and other work which draws them outside the home for employment (Ward). Others are involved in market-related activities which take place in the home such as embroidery, basket-weaving and small grocery

store (sari-sari) management.[1] Place of work will be shown to be a major factor in considering the effects of maternal work on child nutriture.

Seasonality of female market production is a second aspect. Farming, one of the key occupations of rural women provides heavy seasonal labor requirements especially in monsoonal Asia. (Oshima) We also know that the malnutrition related to seasonal food availability is a key problem in many nations of the world. (e.g., Hunter; Oomen) While food shortages and climatic changes have been used to explain this seasonal hunger effect, we hypothesize that constraints on female labor during peak employment seasons may also be a key factor. Certainly nutrition programs which require much time from mothers would be expected to fail if they occurred during the peak seasons--a period during which

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[1] While the Philippines may be highly industrialized and have a large percentage of females employed in the modern industrial sector, females form a smaller percentage of all workers in that sector than they do in the more traditional sectors such as the bazaar, service and cottage industry sectors (e.g., Boserup pp. 176-177). Still, they account for about 30% of the employment in the modern sector which is one of the highest rates outside the Western hemisphere (Boserup, p. 182). Also, Filipino women predominate in the service and sales occupations and tend to play a smaller role in agriculture than one finds in some other Asian countries. (Ward, p. 52).

children may receive less care. Many other occupations provide seasonal employment. For example, women in Central Luzon provinces who engage in hat weaving normally must stop in the months of April and May because of the heat and the fact that the fiber dries up and becomes very difficult to handle. (Takahashi)

In the sample population studied on the island of Cebu, Philippines, 26% of the urban and 31% of the rural women were engaged in some form of market employment.[1/] In the rural coastal sector, dressmakers and peddler vendors were the chief categories while in rural mountainous areas, employment was evenly split among the household occupations of shoemaking and dressmaking, barrio work in farming, and factory labor. In the urban squatter areas, owners of small shops, vendor/peddlers and artisans were the 3 main groups and in the urban fringe barrios, dressmakers and vendor/peddlers were the 2 main groups.

[1/] The data comes from a random stratified sample of 6 rural and 3 urban barrios (on the fringe of large urban areas) and 3 squatter areas. Each household had at least one child aged 0-6. Data were collected from 626 households and 1715 children (aged 1-16) during July-September 1973 and February-March 1974. Dr. Florentino S. Solon, project director of this Cebu Institute of Medicine-Cornell University Vitamin A Deficiency Research Project and the other staff members are thanked for allowing us to use this data. The principal funding for that project has come from the Philippine National Science Development Board (NSDB-CIT 7305 FN).

The Effects of the Working Mother on Household Food Expenditures and Child Consumption and Nutritional Status

The entrance of mothers into the formal labor market will have a differential effect on families of various income backgrounds. The malnutrition which is often associated with working mothers may result from poverty rather than the effects of the mother's working status.[1] The net effect of the mother's labor force activity must include, inter alia, considerations of the original household income, the changed household income and expenditure patterns, the changed usage pattern of social services, and the intra-household reallocations of time for child care and feeding.

Normally, women from low income households would be expected to work and contribute more to household income. For the Cebu sample, women contributed an average of 10% of household income. For the poorest 25% of the households, almost 16% of their income came from the mother.[2] The

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[1] Mary P. Hollnsteiner is thanked for clarifying this point. Levinson provides some examples of this relationship. (Levinson, pp. 60-62; see also Sharman).

[2] This is an underestimation of the mother's income since the jointly produced items were attributed to the husband's income. Also information on many home-produced items were not determined. Also, home production, home economics type activities such as cooking and child care were not valuated.

independent effect of the mother's market labor force participation on household foods expenditures is positive. In multiple regression analyses run with all the standard economic determinants of food expenditure plus a female market labor variable, we find that the independent effect of the mother's working is to increase weekly food expenditures by 1-5%. Furthermore, this effect was not adversely affected in a significant manner by the reduced home production of food (especially from a garden) which would be expected to accompany an increase in female market production.[1/] While the total household food expenditures appear to have increased with the mother's market labor force participation, child nutritional status has been found to suffer. (Popkin, 1974a).

In the Cebu sample simple cross tabular analysis shows that the calorie, protein, iron and vitamin A intakes of children whose mothers worked were lower. (Table 1) The data comes from a survey of the individual dietary intake of 130 sample children. The greatest differences between children of working and nonworking mothers occurred in the consumption of vitamin A. Most of these children's vitamin

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[1/] These relationships are discussed in depth by Popkin and Hart.

Table 1. NUTRITIONAL INTAKE ASSOCIATED WITH EMPLOYMENT STATUS OF MOTHER

Ecological Zone	Nutritional Intake				Proportion of recommended daily allowance of Vitamin A[a/]
	Calories	Protein (grams)	Iron (grams)	Vitamin A (IU)	
Coastal					
Mother works market job	1083	50	7	703	62%
Mother does not work	1433	62	10	1126	95%
Hinterland					
Mother works market job	1096	46	8	941	60%
Mother does not work	1172	51	9	3251	209%

a/ Based on age and sex for each child.

A comes from nonanimal sources; in fact, 83% of the vitamin A of the coastal children and 93 percent for the hinterland barrio children comes from vegetables. This is important in that these children are not willing consumers of vegetables and the manner in which the vegetables are prepared (a soup) is relatively time-intensive. Thus, it was not surprising that the consumption of vitamin A was much less for children whose mothers worked. When the mother is unavailable, a simpler soup without vegetables is often provided, the child is fed the normal soup but does not eat the vegetables, or the child is more likely to be served corn porridge or another staple.

A multivariate analysis is used to isolate considerations of income and wealth from the maternal work factor. To separate the direct income and wealth effects, we included food expenditures and home gardening (the major source of home-produced vitamin A for this sample) variables in a multiple regression equation along with a mother working variable. The model relates the intake of calories, protein and vitamin A intake of young children to these main economic and time components and also controlled for some important demographic parameters. The results are presented in Table 2 for all nutrients for the hinterland

	RURAL HINTERLAND BARRIOS			Rural Coastal Barrios Vitamin A Intake
	Calorie Intake	Protein Intake	Vitamin A Intake	
Constant	.816	39	4853	2260
Male (0-1 dummy)	262 (241)	14 (10)	-2605* (1326)	408 (617)
Age 1-6 (0-1 dummy)	-62 (264)	-11 (11)	-79 (1452)	-438 (736)
Age 13+ (0-1 dummy)	149 (337)	-0.2 (15)	6639* (1856)	-1292 (1154)
Size of household (Number)	35 (70)	1.4 (3)	-257 (387)	-96 (182)
Value of home garden ($)	55 (55)	3.8** (2.4)	580*** (300)	144 (395)
Food Expenditures ($)	-23 (30)	-1.0 (1.3)	-7 (166)	23 (64)
Mother works (0-1 dummy)	48 (244)	3 (11)	-1387 (1345)	-947*** (650)
R^2	.17	.27	.67	.12
F-ratio	0.56	1.02	5.6	0.54
Mean Dependent Variable	1130	48.3	2224	981
Number of Cases	35	35	35	27

Standard errors in Parentheses:

*Statistically significant at 1% level (one-tailed test).

**Statistically significant at 5% level (one-tailed test).

***Statistically significant at 10% level (one-tailed test).

barrios and for only vitamin A for the coastal barrios.[1] The independent effects of the mother's labor force participation show more clearly the impact of working on what we feel is the more time-intensive nutrient consumed in the Cebuano diet. That is, a large decline on the child's vitamin A intake of 1387 IU and 947 IU was associated with mothers who worked. The positive but small effects of the mother's working on calorie and protein intake may be indicative of a positive income effect.[2] By this we mean that the independent effects of the increased income associated with the mother's working may lead to an increase in caloric and protein consumption.

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[1] This sample of children with individual dietary intake data was too small to attempt to analyze the effects of the nature of the mothers work according to factors such as location of work and amount of time per day and per week. Ecological zones are discussed separately because of the great differences in the time, income and other resources of households in each zone as well as the labor food markets.

[2] Income and time effects could not be separated as we did not have data on the total time the mother worked. When the mother's income was added as an independent variable, it helped to clarify some of the results but produced a slight negative sign as higher income often means greater time for market labor.

Table 3. The Relationship Between the Prevalence of Xerophthalmia and the Employment Status of the Mother

Household Income Quartile	Employment of mothers (percentage of xerophthalmia)[1/]		Percentage of mothers who work	Tot Numb of mot
	No	Yes		
1 (bottom)	42	49	38	16
2	36	54	34	15
3	33	41	37	15
4 (top)	41	35	46	15
TOTAL	38	44	39	62

Number of cases = 1715

1/ Xerophthalmia is defined very conservatively as occurrence of clinical e symptoms plus serum vitamin A less than or equal to 19 mcg/100ml.

We find lower income children are negatively affected when the mother worked while the opposite was true for upper income children whose mother worked. The most meaningful example relates to the differential prevalence of xerophthalmia, a serious and widespread nutritional disease caused by the interaction of vitamin A deficiency and other nutrition and health problems. For these 1715 Cebuano children, vitamin A deficiency has been shown to be the main factor associated with this xerophthalmia. (Popkin, 1974a) For children whose family income is in the bottom three quartiles, the mother who worked was associated with an increase in the incidence of xerophthalmia while the opposite occurred for children belonging to the top income quartile.

As would be expected, we also find this relationship when we examine the vitamin A intake of the 130 children from whom we have collected individual dietary intake data. Additional household income is not associated with additional vitamin A intake when the mother works except for the top income quartile. (Table 4) The difference is biggest in the lowest income quartile. The results for calorie and protein intake are different. The additional income of the mother outweighs the loss of maternal time among the lowest income

Table 4. Association Between the Dietary Intake of Children, Household Income and the Working Status of Mothers

	Calorie Intake (K cal)	Protein Intake (g)	Vitamin A Intake (IU)	Proportion of Recommended Daily Allw. of Vitamin (%)
Income Quartile:				
One (Lowest)				
Mother does not work	930	42	1,306	76
Mother works	1,126	50	804	54
Two + Three (Middle 50%)				
Mother does not work	1,234	54	1,078	85
Mother works	1,028	43	958	81
Four (Highest)				
Mother does not work	1,108	47	1,110	89
Mother works	1,166	49	1,454	132

Number of Cases: 130

quartile when we examine the calorie and protein intake of the children. Consequently, the children of working mothers from first quartile families consume more calories and protein. The relationship is reversed for the middle two quartiles while the children of the top income quartile whose mothers work consume slightly more calories and protein. Elsewhere, we have shown that the effect of increased income on food expenditures in this sample is great for cereal and meat consumption and very low for vegetable consumption, so these general relationships are expected. (Popkin, 1974a).

Breast feeding

The declining rates of breast feeding in low income nations are a source of great concern (Berg). This concern relates partially to the effect of reduced breast feeding on nutritional status of the child. Also, breast milk represents a major aspect of home produced food in any low income nation and is a key factor in lengthening the period of postpartum amenorrhea (e.g., Berg). Increased female labor force participation as well as changes in the location of female work would be expected to be key factors in this decline. The working pattern of the mother and the type of infant feeding combine to affect the child's nutritional

status with differential effects expected for infants from different socioeconomic backgrounds. Breast feeding can be substituted with other foodstuffs and cow's milk.[1] Moreover, as long as infants can not be breast fed at the mother's work place, the children of working mothers must be fed foods other than breast milk part of the time. If not, the children will suffer. In the Cebu sample we find a small decline (2%) in infants weight for height when they are solely breast fed and the mother works. Solely bottlefed infants whose mothers work have a 10% higher weight for age over those whose mothers do not work.

Before examining the effects of income and the labor force participation of the mother on baby feeding patterns, we will examine the effects of the different milk feeding practices on the child. The income issue is very important in that we find the negative effects of switching from breast to bottle feeding on the child's welfare are much greater if the household is very poor. For example, among the children from the bottom income quartile, the percent

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[1] The price and availability of alternative foods such as baby milk and weaning foods may be important factors which affect all facets of breast feeding but are not discussed here.

weight for age of those breast fed is about 10% greater than those bottle fed (72% vs. 66%).[1] Overall, bottle fed children have a higher prevalence of anemia, heavy loads of parasites and severe diseases. Based on the WHO definition of anemia, we find 51% of the bottle fed children are anemic versus only 33% of the breast fed infants. There was a 50% greater incidence of a combination variable representing heavy loads of hookworm, ascaris and trichuria and about a 33% higher prevalence of a severe disease combination variable.[2]

It is important to see how these time and income factors relate to breast feeding behavior. As with feeding vegetables to children, breast feeding requires a great deal of time. Few studies have been done of the time used by the

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[1] This increase in nutritional status would normally be good in a low income population but it is possible that obesity may result from this bottle feeding.

[2] This disease variable equalled 1 if the child had TB (tuberculin and X-ray), measles, cholera, pneumonia, whooping cough or was hospitalized for severe diarrhea. Otherwise, it equalled 0. The relationship is expected since we know breast milk provides more immunity toward malaria, bacteria and viruses than cow's milk. Also, bottle fed infants may be exposed to more unhygienic water and feeding utensils.

mother for breast feeding her child. In 2 Filipino studies, it was found that infants were fed 7-8 times a day with each feeding period lasting for 15 to 30 minutes (Bongga; Guthrie). With so much time required for breast feeding, one would expect women whose value of time had increased as they went to work to reduce the time they allocated to breast feeding.[1] Furthermore, women who work would not be expected to have the necessary time available to breast feed all of the time.

Breast feeding is widely practised in the Philippines.[2] Most studies have shown that 64 to 92% of the children are

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[1] In fact, some economists would predict that such a time-intensive activity as breast feeding must decline when the woman begins to work. This might mean that if breast feeding were a normal to superior good (a prestigious item preferred as income rises), breast feeding would not stop but only its frequency per day would decline.

It is possible that bottle feeding preparation and feeding time is greater than the time required for breast feeding; however, canned milk is mainly used in the Philippines so the preparation time is not likely to be very great. Furthermore, other persons, especially siblings or hired help with a lower value for their time can replace the mother when the child is bottle fed. Anne Burgess points out that breast feeding time can be combined with other activities. Also, she pointed out the tremendous difficulty of obtaining meaningful breast feeding time data when demand feeding is practised.

[2] The practice of breast feeding can be analyzed according to whether or not a child is breast fed, the frequency per day of breast feeding and the length of duration of breast feeding. We discuss only the former here.

breast fed for at least several months. In the Cebu sample, of 321 children under the age of 2, 66% were found to have been breast fed (Table 5).[1] Income is a very strong factor explaining the feeding pattern differences within each ecological area. The general trend indicates that as income rises, households breast feed their children much less.[2] For example, all fourth quartile families breast feed their children less than do the lower income groups. Households in the rural coastal areas, it should be noted, have both a much higher income and female market labor force participation rate than do the rural hinterland households. Consequently, the lower prevalence of breast feeding among households in the second income quartile would be expected.

When these Cebuano women work close to their home their market labor force participation does not deter them from breast feeding their children. However, there is a highly significant decline in breast feeding when the mother

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[1] This is not a meaningful statistic. It relates only to the point prevalence of breast feeding. A more useful statistic is the probability of a child being breast fed at each age in months.

[2] Economists would characterize the behavior found in Cebu as indicating that bottle milk is a normal good.

Table 5. BREASTFEEDING PATTERN IN CEBU FOR CHILDREN UNDER 2 YEARS OLD BY ECOLOGICAL ZONE AND HOUSEHOLD INCOME QUARTILE

(percent)

Zone and Income Quartile	Did not breast or bottle feed	Breast Feed	Bottle Feed	Mixed Feeding	Total a/	Per Capi Incom
Urban Squatter						
1	10	76	5	9	100	23
2	20	48	28	4	100	55
3	26	55	15	4	100	66
4	9	39	30	22	100	181
Subtotal	17	54	20	9	100	82
Urban Barrio						
1	6	82	12	0	100	23
2	7	82	4	7	100	47
3	0	83	4	13	100	66
4	6	44	44	6	100	198
Subtotal	5	74	14	7	100	84
Rural Coastal						
1	11	83	0	6	100	20
2	14	55	4	27	100	50
3	5	68	5	22	100	85
4	0	62	19	19	100	251
Subtotal	8	66	7	19	100	102
Rural Hinterland						
1	13	81	6	0	100	21
2	6	88	0	6	100	38
3	8	76	8	8	100	68
4	7	53	27	13	100	137
Subtotal	8	75	10	7	100	66
Total						
1	10	81	5	4	100	22
2	12	67	10	11	100	48
3	11	70	8	11	100	71
4	5	49	30	16	100	191
	10	66	13	11	100	84

a/ Date of Interview was July to September 1973.
Number of household with children in this category = 321

works in a different barrio (Table 6). The most interesting effect is that the decline in breast feeding as a sole means of feeding is associated with a large increase in mixed feeding, especially in the coastal barrios. A similar trend is found in the urban barrios. This increase in mixed feeding may indicate that breast feeding is preferred over bottle feeding by these women.

Urbanization is a key factor often used to explain the decline in breast feeding. Urban/rural differences in breast feeding are significant in most studies but seldom has the effects of other intervening variables such as income been analyzed along with these urbanization effects. Table 5 indicated a much lower prevalence of breast feeding in the urban squatter areas. Based on average income per income quartile, these squatter families have an income distribution similar to those in the urban barrio and lower than the rural coastal households (Table 5). Also, only 22% of the urban squatter women work in market production while 30% of the urban barrio and 36% of the rural coastal mothers work. Most of the squatter mothers report that they work in their same areas. In fact, the market employment status of urban squatter women has a minimal impact on their breast feeding behavior while its impact is quite significant in

Table 7.1 ASSOCIATION BETWEEN BREAST FEEDING OF CHILDREN UNDER 2 AND LOCATION OF MOTHER'S OCCUPATION FOR RURAL AREAS

(percent)

Location of occupation	FEEDING BEHAVIOR									
	Rural Coastal					Rural Hinterland				
	None	Only Breast	Only Bottle	Mixed	Total	None	Only Breast	Only Bottle	Mixed	T
one	10	70	6	14	100	7	78	10	5	
n home	0	75	13	12	100	0	88	0	12	
n same arrio	16	77	0	17	100	20	60	20	0	
ifferent arrio	0	43	14	43	100	17	50	17	16	

Number of cases = 139

the other ecological areas. This is shown in Table 7. For these reasons it is impossible to explain with economic reasons, the lower breast feeding prevalence in these squatter areas.

One key question which must be asked in relation to this decline in breast feeding is: What type of behavior would be necessary on the part of the working mother to prevent this decline in the child's nutritional status?[1] The unskilled and semi-skilled sample mothers had annual incomes of $76 and $130. Normally, a very small percentage of this income would go for milk or other baby foods. In our sample, the poorest 50% of the families spent $.43 or 7.5% of their total weekly food expenditures on all beverages including milk, soft drinks, coffee and beer. Of this amount, only $.24 or 56% of their beverage expenditures goes for milk. The marginal increase in these expenditures as income increases (income elasticity) is small. The required amount to be spent for milk to adequately feed the infant is the key issue.

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[1] In a study in process, this author shows there are numerous circumstances in which it is highly rational on a benefit-cost basis for the mother to cease breast feeding. While the cessation of breast feeding may be rational, there must be concomitant adjustments in the household behavior to ensure the health of the child. This is the thrust of the discussion which follows in the text.

Table 7. ASSOCIATION BETWEEN BREASTFEEDING OF CHILDREN UNDER 2 AND MOTHER'S LABOR FORCE PARTICIPATION FOR URBAN AND RURAL BARRIOS

(percent)

Mother's LFPR	Urban Squatter						Urban Barrios						Rural Coastal						Rural Hinterland					
	No. Cases	Baby Feeding Behavior (%)					No. Cases	Feeding Behavior (%)					No. Cases	Feeding Behavior (%)					No. Cases	Feeding Behavior (%)				
		None	Breast	Bottle	Mixed	Total		None	Breast	Bottle	Mixed	Total		None	Breast	Bottle	Mixed	Total		None	Breast	Bottle	Mixed	Total
Mother Works	21	24	52	19	5	100	72	14	55	27	4	100	28	4	57	11	28	100	19	11	68	11	10	10
Mother Not Work	75	15	55	20	10	100	64	2	81	9	8	100	52	10	70	6	14	100	40	7	78	10	5	10

Number of cases - 321

The average Filipino infant receives about 500 milliliters of breast milk on a daily basis over the first year of his life (Bongga; Villa-Real). We will assume this is adequate for child nutriture.[1/] The cow's milk equivalent of this about ₱.37/500 ml/day or about $20/year.[2/] Thus between 15 and 36% of the additional income received by the mother should go for canned milk to feed the young child.

On the other hand, if the family cannot afford to increase the purchases of milk substantially, how many times should the child be breast fed? Normally the child is fed about 63 ml. of breast milk per feeding but this amount could be increased to 100 ml per feeding. Furthermore, assume the family would be willing to spend only 5% of the

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[1/] Engel has shown for approximately 100 nursing infants that normal Filipino breast feeding with no additional food is adequate for the first 6 months but leads to a deterioration in child nutriture in the second 6 months of life (Engel). Thus, the behavioral change needed to meet this milk requirement must be viewed as a minimal one.

[2/] Based on the sari-sari store price according to the April 29, 1974 Philippine Price Control Council Case No. 11-74 which is applicable throughout the country. Price used is for evaporated reconstituted milk. Ideally, one should base these cow's milk costs on the equivalent amount of cow's milk to replace the nutrients in the breast milk. We used a one to one substitution ratio of cow's milk for breast milk since accurate conversion ratios between Filipino breast milk and cow's milk are not known.

increased income of the mother on milk for the baby. Then, only 15-33% of the baby's milk needs would come from cow's milk. The number of times the child of the unskilled or semi-skilled working mother must be breast fed would be 3-4 times based on 100 ml feeding and 5-7 times based on 63 ml feeding.[1/] It is likely that the mother could feed the baby 3 times but not more without living close to her home or provisions being made for her to breast feed her child at her place of work. If the mother slept with the baby, however, she might be able to feed the child many more times.

In summary, we see that the working status of the mother adversely affects the child, especially in the low income groups by leading to declines in breast feeding. The location of the woman's work is an important factor. Furthermore, women could replace their breast milk with milk or other food substitutes by contributing 15-36% of the mother's income to baby food or breast feeding 3-7 times per day.

1/ From studies conducted in other countries, children can be fed more than 100 ml/feeding. We have no knowledge of the relationship between the amount of breast milk per feeding and frequency of feeding in the Philippines.

The Use of Social Services

The working status of the mother and other household time and income constraints affect the use of health, nutrition and other welfare-related social services.

A study of a food supplementation program in Madya Pradesh, India (Project Poshak), clarifies some of these income and time issues (Gopaldas). The program required food to be collected weekly at a primary health center. In one study group of 123 mothers who worked all year round, 59% collected the food supplements less than 20% of the time and were called poor collectors. Among the 37 women who worked either occasionally or did not work, only 27% were poor collectors. The authors felt that the poor collectors were predominantly landless laborers for whom time and income were very precious. They felt that the income constraints--seen through the relatively higher importance attributed to the wage of women--was a key factor preventing higher food collection rates. All of the more severely malnourished children were found in the group of children of working mothers.[1/] This indicates that the food supplementation

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[1/] The author noted the greater maternal neglect suffered by preschool children of working mothers and felt that an instant pre-cooked food supplement which required less preparation time was the best food supplement for these children.

program may be reaching those least in need of the program.

The income constraint is felt most when the programs offered to the population require some expenditures for the services provided or for transportation to reach these services. For example, the municipal day care centers in Bangkok which are publicly funded have failed to reach the very poor.

> "When asked about the 'slum children' in the center, the nurse replied, "I am afraid it is too expensive for the poor... We just don't get them... (cost is $.15)... And then they have to pay transportation costs if they don't live in the immediate neighborhood and there are few things they must provide for the children (although we can help with that aspect). Also, we are open government hours, 8:00 to 4:00 and the very poor, they work rather long hours." (Morrell, p. 71)

The income constraint affects also the utilization pattern of Filipino nutrition services. For example this author has found the average income of households whose children were patients at rural malnutrition wards was $221 while the average household income of rural mothercraft center users from a similar locale was $295.[1/] These

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[1/] This data is from a survey of over 500 users of health and nutrition institutions in the Greater Manila region being conducted by the author and others at the U.P. School of Economics. Malnutrition wards are sections in the hospitals used to treat the severely malnourished. Mothercraft centers are community-based programs which educate mothers and feed children in local feeding centers.

differences reflect a general trend which prevents the very poor from utilizing the preventive services of the mother-craft and day care centers and other similar facilities. Consequently, it is the children of the very poor who become most malnourished and must be sent to the hospitals, etc.

The benefit gained by the various income groups enrolled in the specific services are also important. In a small survey of several of these programs, we found that attendance at the weekly meetings is 60-75% of those enrolled except in the peak farming or rainy seasons when it is much lower. Working mothers have a greater percentage of the absences although exact figures were unavailable. Furthermore they appear to constitute a much smaller proportion of those attending these programs than they do of the potential population. Mothers gave the need to perform housekeeping and childcaring chores as other key reasons given for missing meetings. Work plus the need to spend time in the house constituted 35-50% of the reasons for missing attendance in several centers.[1]

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[1] Based on research efforts of Miss Susan de Jesus. Some background information comes from the Asian Social Institute Research Department. A Comparative Evaluation of Two Approaches Used by the Catholic Relief Services in Nutrition Education, Manila, September 1973.

The distance to these social services is another key factor for which there is a great deal of evidence (Sharpston; Gish). Time and cost are the two interacting components of this distance issue. For example, while most of the Bangkok day care centers had few children from poor families attending them, one which was located adjacent to a slum had a greater number of low-income children attending it. (Morell, p. 72) There are also the low income households whose work schedules are so tight that younger children cannot be brought to the day care centers (Morell, p. 75). For them, pickup and delivery service would be necessary. The distance factor is even more important when one considers that persons in Asia travel to health centers with one or more relatives and these persons stay with the patient continually. The cost and time issue relates as much to these additional relatives as it does to the sick person. For example, in the Greater Manila survey, on the average, 1.5 persons accompanied the 500 sick patients we studied to health and nutrition facilities.

Discussion

The income-time-female working problem reflects critical dimensions of the broader question of poverty or low household productivity. As such, it is difficult to

change the socioeconomic, political and ecological forces which combine to produce these conditions. We can center on specific issues but must place our discussion within the framework which understands that the broader income issue is critical.

One finding was that the working mother's impact on child nutriture was great for the low income households. The key effect was on the items which require much of the mother's time such as feeding children vegetables and breast feeding. This income-time interaction may suggest an imperfect substitution between the goods provided by the mother's additional income and her time contribution both to child care and home production.

The decrease in time the mother has available for her household does not necessarily have to affect the nutritional status of the children. As has been shown in the U.S. working mothers might spend less time at nonchild home tasks or the reduction in the mother's childcare time can be matched by an increase in the time spent by husbands and others caring for the children.[1/] The substitution between

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[1/] For U.S. examples, see Lindert.

the childcare provided by the mother and other household members is not necessarily perfect.[1/] In some cases, it is likely that these children are left untended when the mother gets involved in market employment. Also, the displacement of only nonchild home tasks is less likely for low income Filipinos where an income constraint makes it difficult to increase nonchild home task productivity with time-saving devices or servants. If this negative effect takes place only for time-intensive items and not for calories and proteins, it would suggest a simpler set of policies would be needed to help out low income households with working mothers.

In the case of breast versus bottle feeding, it is obvious that lower income households would have more difficulty substituting adequate foodstuffs for the mother's breast milk. In addition, they must replace her feeding time with that of another household member. Income and time factors could not explain the lower prevalence of

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[1/] At an early age, girls in the rural sector learn household responsibilities such as cooking and baby-sitting for younger siblings. Along with unmarried female relatives, low salaried servants, these young female siblings usually act as parental surrogates for the working mother. (Fox)

breast feeding in the urban squatter areas. Nutritionists often report that the breast feeding decline relates to the impact of infant milk manufacturers via advertisements, inducements they give to doctors, and high-pressure salesmanship campaigns focused on the mother before and after she gives birth. This issue may be important for urban squatter women who are faced with more advertisements and tend to deliver their babies more in institutionalized settings. This may also be the case for higher income households. What we attribute to income could, in effect, be a proxy for greater access to hospitals and the pressures of the milk companies. Or higher income mothers may be less able to breast feed due to psychological factors. We were unable to study these factors.

An important caveat is called for. The indirect psychological effects of a mother's presence may be just as crucial as her physical effect on feeding and childcare. Psychological and other environmental stimuli can play an important role in explaining growth and development. In fact, Levitsky and Barnes have shown that the behavioral effects of early malnutrition were completely eliminated

by supplying additional (environmental) stimulation early in life.[1/] At this time, we realize that there is little evidence which would allow us to separate the effects of nutrition deprivation from that of environmental deprivation in understanding how the cognitive development of children may be affected by the mother's working status (e.g. Latham).

A second major issue was the effect of time and income on the use of health, nutrition and other social services. We know the low income population needs such targetted services more.[2/] Day care programs have become one popular program in the Philippines and Thailand. Location flexibility in hours and ways to get children to the centers are some of the relevant policy questions. In the Philippines,

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1/ Levitsky and Barnes. See also Barnes et al.

2/ Programs aimed at targetted age, income, regional or other special groups do not represent the only alternative available for dealing with the problems of malnutrition among the poor. General programs for the entire population such as income or price subsidies, employment programs or food fortification may be important for reaching the low-income malnourished population under certain circumstances. Other forms of the time issue such as seasonality are important issues to be considered with some of these programs These circumstances are not discussed here. For example, Pinstrup-Andersen has shown that price subsidies of plantains or maize in Cali, Colombia would benefit mainly this target population. Francois, Navarro and Machicado discuss the income issue.

these day care centers are often located in poblacions and are unavailable to the poorer barrio inhabitants. Also, they only run for 2-4 hours per day.[1] On a nutritional basis, these programs represent an expensive alternative; however, other goals such as child intellectual stimulation and socialization are considered important. Much greater attention must be given to the design of these programs.[2]

This discussion points out several policy issues. First, satisfactory physical and institutional changes which can allow women to continue breast feeding or can allay the

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[1] In collaboration with UNICEF, the Philippine Department of Social Welfare is planning some childminding experimental projects to take children for the entire day.

[2] Day care programs are often patterned after approaches utilized in the US and other highly industrialized nations. The design of these programs must be more sensitive to traditional Asian forms of childcare, which would include consideration of the time needs of each household. The child-minding centers being planned on an experimental basis in the Philippines are hoping to utilize some of these concepts by allowing the local centers to purchase and design their own facilities, programs, etc. Still, it is extremely difficult to develop techniques which give local staff the capability incentives and freedom to do things on their own. Another example would be the use of local inexpensive or free materials to make toys for the children at these centers. In only few cases do local Filipino day care workers use their imagination to do this.

effects of bottlefeeding must be considered. In increasing the prevalence of breast feeding, the ability to breast feed on-the-job as is done in Chinese factories may be important. It may be possible that the provision of breast feeding centers in factories may both benefit the child and the factory in that it may shorten the necessary pregnancy leaves. If not, as with any law which increases the costs of hiring women, this would act as a disincentive toward hiring women. Also, flexibility of working hours with possible short breast feeding leaves and the location of work near the home are important. In Bangkok, lower income women who went to work in rural or urban areas were able to continue breast feeding while middle income mothers were employed in work that did not allow them to bring babies with them. (National Economic and Social Development Board)[1]

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[1] Other issues such as the availability and pricing of breast milk substitutes, especially powdered, evaporated and condensed milk are important. Milk price subsidies, however, should not be considered until we can determine whether a decline on the price of milk would not decrease the amount of breast feeding. It may be possible that a decline in milk prices could be associated with a decline in total caloric intake from milk as the breast milk decline would offset the consumption increase of cow's milk. This would occur when cow's milk was viewed as a superior product which was highly substitutable for breast milk. Of course the converse argument that a price increase in cow's milk might increase breast feeding must be considered.

A second issue is the availability of foodstuffs which can substitute for the mother's time and be prepared and served by household or other persons who replace the mother. Preparation time as well as household income constraints must be considered in designing such foods. In general, this discussion may be somewhat academic on this point as it is first necessary to develop low-cost infant and child foods before considering the extra needs of the working mothers (e.g., Popkin and Latham). While great experimentation on the provision of low cost multimixes has gone on, no successful large scale programs exist yet.

Third is the use of social services related to other time issues. One of these is the seasonality questions which have not been discussed here. It will be interesting to consider health, nutrition and other social services which are fully operational in slack employment seasons or periods when the need is greatest. Essentially, the barefoot doctor of the People's Republic of China who mainly farms during the peak seasons and spends more of his/her time in the non-peak seasons as a health person fits this role. As in the China example, health and nutrition workers do not have to be full time workers especially workers with minimal training

In summary, one weakness of this study must be pointed out. The effects of the woman on child nutriture which were discussed in this paper are net effects. Net effects would measure at the same time the effects of the working mother on food expenditures, home gardening, other forms of home production, feeding, social service use and show the results on the child's nutritional status. Only partial effects were discussed here. This paper has discussed the income and time constraints facing low income families, especially those with working mothers. It has tried to show when and how the concept of time may be important. Similar time and income constraints face the government officials and others planning and administering these social service programs. More often than not, they are aware of the weaknesses in their programs and do not have the time or money to change them. In some cases, however, lack of flexibility or creativity has stymied their work. The ability to decentralize program development to meet the unique time needs and constraints of households in the various regions and villages is a key problem. It appears that increased awareness of the time constraints of households must be accompanied by some type of decentralized programming.

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