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# LATIN AMERICA AND CARIBBEAN HEALTH AND NUTRITION SUSTAINABILITY:

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**THE EFFECT OF HOSPITAL-BASED BREASTFEEDING  
PROMOTION PROGRAMS ON EXCLUSIVE  
BREASTFEEDING IN THREE LATIN  
AMERICAN COUNTRIES**

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**THE EFFECT OF HOSPITAL-BASED BREASTFEEDING  
PROMOTION PROGRAMS ON EXCLUSIVE BREASTFEEDING  
IN THREE LATIN AMERICAN COUNTRIES**

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## ABSTRACT

The effect on exclusive breastfeeding of hospital-based breastfeeding promotion programs in seven hospitals in three Latin American countries is evaluated in this study. Exposure to the 17 specific activities that were measured varied dramatically. In general, exposure to activities that result in cost savings such as rooming-in, and the elimination of prelacteal feeds, formula, and glucose water, was high. In contrast, exposure to activities in the area of lactation management and education/counseling, which require an on-going commitment of resources (such as trained and motivated personnel), was low. The one exception was a hospital in Brazil, where a comprehensive breastfeeding promotion program has been in place for 20 years. The median duration of exclusive breastfeeding among women delivering at this hospital was 53 days longer as compared to women delivering at a nearby control hospital (75 versus 22 days). In contrast, the effect of specific program activities such as a demonstration on breast milk expression or information on sufficient milk, while statistically significant, were associated with far less dramatic increases in the median duration of exclusive breastfeeding. These results show that activities in the areas of early mother-infant contact, lactation management, and education/counseling can have a dramatic effect on the duration of exclusive breastfeeding. However, vast improvement in the exposure to such activities is needed in most hospitals before this effect is realized.

**KEY WORDS:** Exclusive breastfeeding, breastfeeding, breastfeeding promotion, maternity wards, program effectiveness, Latin America, urban

## INTRODUCTION

Although a high incidence of breastfeeding initiation and long breastfeeding durations are still the norm throughout much of the developing world, breastfeeding practices are far from optimal (WHO, 1993). Optimal breastfeeding, defined as exclusive breastfeeding (breast milk as the sole source of infant food) for the first 4 to 6 months of life, with continued breastfeeding and introduction of complementary foods at about 6 months, is rarely practiced (Diamond and Ashworth, 1987; Sommerfelt et al. 1992; Monteiro, 1987). This is of concern because exclusive breastfeeding, with its strong protective effect on infant morbidity and mortality (Victora et al., 1987; Brown et al., 1989; Popkin et al., 1990), is likely to be the breastfeeding practice most relevant to child survival. The WHO/UNICEF Baby-Friendly Hospital Initiative, currently being implemented throughout the world, promotes breastfeeding through improvements in maternity ward practices (WHO/UNICEF, 1989). Inasmuch as data on exclusive breastfeeding have not been available, formal tests of the recommendations in this initiative have focused on any or full breastfeeding (Salariya, 1978; Taylor et al., 1985; Renfrew, 1993; Perez-Escamilla et al., 1994). This study addresses this gap in the literature by examining the effect of specific hospital-based breastfeeding promotion activities on exclusive breastfeeding in three Latin American countries.

## METHODOLOGY

### Study design

Women were recruited in maternity hospitals and visited twice post-partum in their homes in Brazil, Honduras, and Mexico. All women were visited at month 1. The timing of a second visit depended on the country of study: at month 3 in Brazil, at month 2 in Honduras, and at month 4 in Mexico. Four survey forms were used: hospital record, hospital exit interview, first home interview, and second home interview. The hospital record form was used to abstract information from the clinical records such as infant birthweight and sex, gestational age, drugs and anesthetics used during labor and delivery, type of birth, infant feeding orders and medication, and length of hospitalization. The hospital exit interview form was used just prior to discharge and to collect detailed information from mothers on exposure to hospital practices and activities related to breastfeeding, knowledge and plans for infant feeding, previous breastfeeding history, prenatal care, demographic characteristics, and socioeconomic status. The recommendations outlined in the Baby-Friendly Hospital Initiative (WHO/UNICEF, 1989) was used in the development of this form. In addition to these recommendations, information on other activities often included in hospital-based breastfeeding promotion programs was collected. Exposure to program activities were grouped by type of activity: 1) early mother-infant contact, 2) policies and procedures, 3) lactation management, and 4) education/ counseling. To assess potential

confounding and effect-modifying variables, information was collected on maternal characteristics and other factors that previous studies have shown to influence infant feeding practices (Margen et al., 1991). Care was taken to get a home address complete with identifying landmarks and map to find the home. The home interview forms were used at each follow-up visit to collect information on infant feeding practices, infant and maternal health, and breastfeeding problems.

Trained interviewers, not associated with any of the hospitals, were recruited to administer the surveys. Supervision visits were made in all countries to ensure the accuracy and completeness of questionnaires. Women were classified as lost to follow-up if they could not be found after three attempts to locate them at the address they provided in the hospital.

Data were collected between 1992 and 1993: all women giving birth in the hospitals during the time the study was taking place were recruited unless the infant had a birthweight of less than 2000 g (Brazil only) or birth defects that prevented normal suckling. Women were also excluded if either the mother or infant was in the intensive care ward. In each country, data were entered into EPI INFO (CDC, 1991) following routine quality control procedures.

#### Brazil

Women were recruited in two Ministry of Health supported hospitals that target low-income women in Santos, a city of approximately 250,000 inhabitants and the port city for Sao

Paulo. In the program hospital (n=236), a comprehensive breastfeeding promotion program had been in place for 20 years. In the control hospital (n=206), there was no formal breastfeeding promotion program although several reforms mandated by Brazilian law such as rooming-in and the prohibition of free gifts of infant formula had been instituted. The overall attrition was 20%.

#### Honduras

Women were recruited from three hospitals, all of which had rooming-in and the prohibition of free infant formula and to varying degrees other components of a breastfeeding promotion program in place. Hospitals Escuela (n=488) and Catarino (n=593) were run by the Ministry of Health and served poor, uninsured women. Hospital IHSS (n=501) was run by the Social Security hospital and served lower and middle-income women covered by social security insurance. Hospital Escuela was located in the capital city of Tegucigalpa while the other two hospitals were located in San Pedro Sula. The overall attrition was 34%.

#### Mexico

Women were recruited in two Ministry of Health Hospitals in Mexico City and serving poor, uninsured women. In the Hospital General (n=333), a breastfeeding promotion program was in place that included rooming-in. In the Hospital de la Mujer (n=247), women were assigned to either a rooming-in ward (Mujer-RI) with breastfeeding promotion or a "high-risk" ward (Mujer-NU) in which the mother and infant had little contact. All primiparas and

women giving birth by cesarean section were assigned to the "high risk" ward. The overall attrition was 45%.

### **ANALYTIC STRATEGY**

#### **Dependent variables**

Infant feeding status at each follow-up visit was determined by 24-hour structured recall in which the mother was read a list of common infant liquids and foods. An infant was classified as exclusively breastfed, only if he received solely breastmilk in the previous 24-hours. If other foods/liquids had been introduced, the mother was asked the age at which they were given. The duration of exclusive breastfeeding was determined by calculating the minimum age at which water, teas, or juices were introduced.

For Mexico, the duration of any breastfeeding was also used as a dependent variable. The duration of any breastfeeding was determined by calculating the minimum age at which any breastfeeding ceased.

#### **Independent variables**

All independent variables were entered as dichotomous (yes or no) in the survival models. Early mother-infant contact was assessed by the following variables: holding one's infant in the delivery room, initiation of breastfeeding in the delivery room, and breastfeeding within the first half-hour of birth. Policies and procedures were assessed by variables for mother-infant separations of > than 15 minutes, prelacteal feeds, use of formula and glucose water, and gifts of infant feeding products.

Lactation management was assessed by two variables: help to breastfeed the first time and a demonstration on breast milk expression. Education and counseling activities were assessed by a breastfeeding talk, brochure, film (Mexico only), and information on any of the following topics: engorgement, sore nipples, sufficient milk, increasing milk supply, post-partum breastfeeding help, introduction of liquids, and introduction on solids.

Data analysis for Mexico revealed that most women were interviewed prior to receiving breastfeeding information (Perez-Escamilla et al., 1994). Information on selected activities (breastfeeding talk, brochure, and film) was collected in the first follow-up interview. Thus, for exposure to information/counseling activities, these retrospective recalls of hospital exposure are used.

All analyses were carried out using the SPSS for Windows Statistical Package (Noruhsis, 1992). Bi-variate associations between the independent variables and exclusive breastfeeding were examined within each country using chi-square analyses.

Multivariate survival analysis (Cox model) was used to examine the effect of program exposure and exclusive breastfeeding within each country. For Mexico, the effect on any breastfeeding was also assessed. The independent variables consisted of all the variables listed above, except for "help to breastfeed the first time", and the two way interaction terms between each variable and hospital. The variable for "help to

breastfeed the first time" was not entered because of the problem of reverse causality: women with the most difficulty initiating breastfeeding may be the most likely to received help, however, they may also be the most likely to experience other breastfeeding difficulties. Full models were reduced using backward step wise procedures and the survival curve patterns were generated for the interpretation of significant main effects and interactions. When country-specific models failed to converge, separate models were run by hospital.

The duration of exclusive or any breastfeeding among women that were still exclusively breastfeeding or breastfeeding when they were lost to follow-up or at the end of the study was based on the age at which the subjects were last seen and entered as censored values in the survival models. The minimum duration of exclusive or any breastfeeding was assumed to be one day.

## RESULTS

Characteristics of women in the study were similar across the three countries and reflect those of poor urban women in Latin America (Table 1). The average age was 24 years, and parity was about two children. Approximately 40% were primiparae and three-quarters were married. The average length of completed schooling was just short of 7 years. Women in Brazil have one more consumer item as evidenced by socii-economic score compared to women in Honduras and Mexico. Women in Mexico are more likely to have a flush toilet in the household and women in Honduras the least likely. Most women received prenatal care: with 95%, 80%,

and 85% reporting such care in Brazil, Honduras, and Mexico, respectively. The overall prevalence of maternal employment was 29% for Brazil, 34% for Honduras, and 18% for Mexico. The incidence of cesarean section varies dramatically between countries: with the highest incidence in Brazil (35%), followed by Mexico (26%); and Honduras (9%)<sup>1</sup>. Birthweight was slightly higher in Brazil as compared to Honduras and Mexico.

### Brazil

Significant differences between hospitals were found for 17 of the 18 indicators of program exposure ( $p < 0.001$ ) or all indicators except "gifts of formula" (Table 2). Exposure at the program hospital was universally high while exposure at the control hospital was universally low. For example, in the program hospital 65% of women nursed their infant in the delivery room compared to only 2% of women at the control hospital; 87% of women in the program hospital received a breastfeeding talk compared to 18% of women in the control hospital.

### Honduras

Except for indicators related to policy and procedures, exposure was less comprehensive in Honduras and between hospital comparisons less clear than in the case for Brazil (Table 3). For example, 12%, 21%, and 30% of women in Escuela, Catarino, and IHSS, respectively, received a demonstration on breast milk expression. A breastfeeding talk was reported by 20%, 33%, and

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<sup>1</sup>To some extent the low incidence of cesarean section in Honduras reflects under sampling of high-risk wards in Escuela. In IHSS where women in all wards were interviewed, the incidence of cesarean section was 13.2%.

21% of women in Escuela, Catarino, and IHSS, respectively. In general, exposure at IHSS was higher than for the other two hospitals.

### Mexico

At the time of the hospital interview, most women in Mujer-NU had not yet initiated breastfeeding and hence exposure for many indicators could not be assessed. Exposure to indicators, other than those related to policy and procedures, in the other two maternity wards was not comprehensive. Exposure to some indicators was higher in General while exposure to other indicators was higher in Mujer. For example, 4% and 16% in General and Mujer-RI, respectively, breastfed their infant in the delivery room. In contrast, 35% of women in General reported a breastfeeding talk compared to only 12% at Mujer-RI.

### **Bi-variate**

*one of high* Because of the universally high exposure to indicators in the area of policy and procedures (or complete lack thereof in the case of Mujer-NU), the specific effects of exposure to these indicators on exclusive breastfeeding could not be determined.

### Brazil

Of the indicators for early contact and lactation management, only a demonstration on breast milk expression had a consistent effect at both follow-up visits (Table 5). In contrast, six of the eight education/counseling indicators (breastfeeding talk, information on engorgement, sore nipples, increasing milk supply, post-partum breastfeeding help, and

introduction of liquids) had an effect at both follow-up visits (Table 6).

#### Honduras

As in the case of Brazil, only a demonstration on breast milk expression had a consistent effect across both follow-up visits (Table 7). Five of the eight education/counseling variables (breastfeeding talk, information on engorgement, sufficient milk, post-partum breastfeeding help, and introduction of liquids) had an effect at both follow-up visits (Table 8).

#### Mexico

A breastfeeding talk at month 1 was the only indicator associated with exclusive breastfeeding (Table 9). None of these indicators were associated with any breastfeeding.

#### **Multivariate**

##### Brazil

Because the hospital correlated so highly with indicators of program exposure, models with both the main effect of hospital and interactions of hospital and indicator failed to converge. Thus, two models were run. The first tested for the comprehensive effect of all activities at the program hospital, and the second tested for effects of specific activities in the program hospital.

The overall effect of hospital was strong and significant (Figure 1). The median duration of exclusive breastfeeding was 75 days in the program hospital compared to 22 days in the control hospital. Thus, the median duration of exclusive

breastfeeding was 53 days longer among women giving birth in the program hospital. At month 1, the probability of exclusive breastfeeding was .64 in the program hospital compared to .39 in the control hospital. Assuming that this relationship is causal, at one month 250 additional women per 1000 would be exclusively breastfeeding if they had delivered in the program hospital. At three months this figure was 260 women per 1000 (Table 10).

In the model testing for the effect of specific indicators, only information about timing of introduction of solids was associated with exclusive breastfeeding (Figure 2). The median duration of exclusive breastfeeding could not be calculated for this model because more than half of women who received this information were still exclusively breastfeeding at the end of the study. At month 1, the probability of exclusive breastfeeding was 0.76 among women who received this information compared to 0.61 among women who did not. Assuming this relationship is causal, at one month 150 additional women per 1000 would be exclusively breastfeeding if they had received this information. At three months, this figure was 210 per 1000 women.

### Honduras

A demonstration on breast milk expression and information on sufficient milk were the only main effects in the model significantly associated with the duration of exclusive breastfeeding (Table 11; Figures 3 and 4). Significant interactions with hospital were detected for breastfeeding in the

delivery room, brochure, and information on engorgement. The median duration of exclusive breastfeeding was 9 days longer for those women who received a demonstration on breast milk expression compared to those women that did not (median duration 25 and 16 for those responding yes and no, respectively). The median duration of exclusive breastfeeding was 7 days longer for women who received information on sufficient milk compared to those women that did not (median duration 25 and 18 for those responding yes and no, respectively). At month 1, the probability of exclusive breastfeeding was .42 for those women receiving a demonstration on breast milk expression compared to .31 for those women that did not. Assuming this relationship is causal, at one month 110 additional women per 1000 would be exclusively breastfeeding if they had received this component of lactation management. At two months this figure was also 110 women per 1000 (Table 11).

The results of the significant interactions were difficult to interpret. For example, the effect of information on engorgement had a positive effect in IHSS, a negative effect in Escuela, and no effect in Catarino (Figure 5).

#### Mexico

The model for Mexico failed to converge, and thus models were run separately for General and Mujer-RI. Because so few women in Mujer-NU had been exposed to any program activities, it was not possible to assess program activities in this hospital. The only activity to have a significant effect on exclusive

breastfeeding was a breastfeeding talk (Figure 6; Table 12). Women who reported receiving such a talk exclusively breastfed for 7 days longer than women who did not (median duration 10 and 3 days for women who responded "yes" and "no" respectively). There were no significant program effects for any breastfeeding in either of the two hospitals.

#### DISCUSSION

Exposure to hospital-based breastfeeding promotion activities varied dramatically between the seven hospitals. In general, exposure to activities in the area of policy and procedures were excellent. Except for the "high-risk" ward in Mujer (Mujer-NU), all women roomed-in with their infants and were rarely separated from them. Few infants received prelacteals, or formula or glucose water once breastfeeding was initiated. Virtually all women were discharged without "gifts" of infant feeding products. With respect to activities in the area of early contact, the most common practice was holding one's infant in the delivery room. In contrast, with respect to other activities in the areas of early mother-infant contact, lactation management, and education/counseling, only exposure in the program hospital in Brazil was comprehensive.

Activities such as placing the infant with the mother in the delivery room, rooming-in, no prelacteals, no formula/glucose water, and no "gifts" generally result in significant cost savings (Fiedler, 1993). For example, when infants are placed with their mothers in the delivery room and room with their

mothers, fewer personnel are needed to monitor the infants and nurseries are not needed. Breastfeeding in the hospital eliminates the need for expensive formulas, glucose water, and bottles, as well as the personnel to administer and sterilize them. In contrast, other activities in the area of early contact (breastfeeding in the delivery room and initiation of breastfeeding within the first half-hour of life) and all activities in the area of lactation management and education/counseling require an on-going commitment of trained and motivated personnel as well as an environment conducive to learning. Thus, it appears that activities that result in cost savings have been implemented thoroughly, while those that results in additional costs have been implemented at a slower pace. Unfortunately, it appears to be precisely the latter activities that have the greatest impact on exclusive breastfeeding, as illustrated by the program hospital in Brazil.

In the program hospital in Brazil, only information on timing of introduction of solids was significantly associated with exclusive breastfeeding. Lack of a significant association between other program activities and exclusive breastfeeding is likely a reflection of the high degree of exposure to these activities and consequent loss of statistical power to detect significant associations. For example, nearly 90% of mothers received a breastfeeding talk and nearly 75% received help to breastfeed the first time. Thus, given the universally high level of exposure in the program hospital compared to the

universally low level of exposure in the control hospital, the appropriate comparison for these hospitals is the hospital rather than exposure to specific activities within hospitals. In this comparison, all women in the program hospital are considered "exposed" whereas all women in the control hospital are considered "unexposed". Such a comparison is also not potentially biased by selective maternal recall of exposure. This comparison revealed a difference of 53 days in the duration of exclusive breastfeeding between women in the program as compared to the control hospital. Inasmuch as all women in the control hospital were exposed to appropriate policies and procedures (no prelacteals, "gifts of infant feeding products", etc.), this increase in the duration of exclusive breastfeeding reflects the additional effect of comprehensive exposure to lactation management and information/counseling activities over and above that already in place in all but one of the study hospitals.

Exposure to specific activities in Honduras, such as a demonstration on breast milk expression and information on sufficient milk, while statistically significant resulted in far lower increases in the duration of exclusive breastfeeding. For example, the median duration of exclusive breastfeeding was extended by 9 and 7 days for women reporting exposure to a demonstration on breast milk expression and information on sufficient milk, respectively.

In Mexico, there is a low prevalence of exclusive

breastfeeding (Perez-Escamilla et al., 1992) coupled with a low level of exposure to program activities. Only reported receipt of a breastfeeding talk was associated with exclusive breastfeeding, increasing the duration from 3 to 10 days. These results show that exposure to lactation management and education/counseling activities needs to be improved before their effects can be evaluated for exclusive or any breastfeeding.

It is important to note that although few infants received prelacteals, many mothers in Brazil and Mexico were not so informed. In Brazil, 8% and 40% of mothers at the program and control hospitals, respectively, responded "don't know" to the question about prelacteals. These proportions corresponded approximately to the proportions of women reporting separations of greater than 15 minutes, and show that hospital staff are failing to communicate to mothers hospital policies and procedures in this regard. In Mexico, 43%, 37% and 97% in General, Mujer-RI, and Mujer-NU, respectively, responded "don't know" to the question about prelacteal feeds.

In conclusion, the results of this study show that activities in the areas of early mother-infant contact, lactation management, and education/counseling can have a dramatic effect on the duration of exclusive breastfeeding. However, vast improvement in the exposure to such activities is needed in most hospitals before this effect is realized.

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Table 1			
Maternal and biomedical characteristics, by country			
	Brazil (n=446)	Honduras (n=1582)	Mexico (n=765)
<u>Characteristic</u>			
Maternal age (yrs, mean+SD)	24.9+6.0	24.3+5.8	23.6+5.4
Parity (mean+SD)	3.7+1.9	3.5+1.9	3.0+1.4
Primiparae (%)	44	38	39
Married (%) <sup>1</sup>	83	75	76
Education (yrs, mean+SD)	6.9+3.4	6.8+3.2	6.8+2.9
Socioeconomic score <sup>2</sup> (mean+SD)	3.0+1.0	2.0+1.3	2.2+1.2
Employed (%)	27.5	30.7	17.1
Flush toilet (%)	83	69	94
Received prenatal care (%)	94.5	79.3	85.0
Cesarean section (%)	35	9	26
Male infants (%)	50	48	50
Birthweight (kg, mean+SD)	3.3+0.49	3.0+0.49	3.1+0.46

<sup>1</sup>Includes both legal and common law marriages.

<sup>2</sup>Composite indicator based on presence/absence of a radio, television, refrigerator, telephone, and car.

Table 2			
Program exposure <sup>1</sup> , by hospital: Brazil			
	Program (n=236)	Control (n=206)	Significance
<u>Early mother-infant contact</u>			
Held infant in delivery room (%)	87.3	58.7	p<0.001
Breastfed infant in delivery room (%)	65.3	2.2	p<0.001
Breastfed within first half-hour of birth (%) <sup>2</sup>	45.6	3.1	p<0.001
<u>Policies and procedures</u>			
No separations of > 15 min (%)	93.2	68.7	p<0.001
No prelacteals (%) <sup>3</sup>	91.5	56.8	p<0.001
No formula/glucose water (%)	99.6	90.3	p<0.001
No gifts of formula/glucose water/bottles (%)	100	100	
<u>Lactation management</u>			
Help to breastfeed the first time (%)	72.0	33.7	p<0.001
Demonstration on breast milk expression (%)	68.2	5.4	p<0.001
<u>Education/counseling</u>			
Breastfeeding talk (%)	87.3	18.0	p<0.001
Breastfeeding brochure (%)	63.6	40.3	p<0.001
Information on engorgement (%)	76.3	2.4	p<0.001
Information on sore nipples (%)	68.2	2.9	p<0.001
Information on sufficient milk (%)	49.2	3.9	p<0.001
Information on increasing milk supply (%)	61.0	5.3	p<0.001
Information on post-partum breastfeeding help (%)	72.5	21.1	p<0.001
Information on introduction of liquids (%)	32.6	2.9	p<0.001
Information on introduction of solids (%)	31.8	1.5	p<0.001

<sup>1</sup>As determined by maternal recall.

<sup>2</sup>Nearly half of the values for this variable were missing.

<sup>3</sup>Although less than 3% of infants at either hospital received prelacteal feeds, 7.5% and 40.3% of mothers at the program and control hospitals, respectively, responded "don't know" to this question.

Table 3  
 Program exposure<sup>1</sup>, by hospital: Honduras

	Escuela (n=457)	Catarino (n=596)	IHSS (n=505)
<u>Early mother-infant contact</u>			
Held infant in delivery room (%)	78.9	52.0	49.4
Breastfed infant in delivery room (%)	63.1	39.3	39.3
Breastfed within first half hour of birth (%)	39.8	36.3	42.0
<u>Policies and procedures</u>			
No separations of > 15 min (%)	98.0	99.0	79.0
No prelacteals (%)	95.3	96.0	95.7
No formula/glucose water (%)	97.0	98.0	98.0
No gifts of formula/glucose water/bottles (%)	100	99.8	99.8
<u>Lactation management</u>			
Help to breastfeed the first time (%)	12.1	20.6	30.3
Demonstration on breast milk expression (%)	11.9	5.7	23.4
<u>Education/counseling</u>			
Breastfeeding talk (%)	19.5	33.4	20.6
Breastfeeding brochure (%)	34.7	1.7	8.4
Information on engorgement (%)	5.7	20.6	41.2
Information on sore nipples (%)	3.1	5.7	19.0
Information on sufficient milk (%)	4.4	9.7	17.8
Information on increasing milk supply (%)	8.3	23.3	45.9
Information on post-partum breastfeeding help (%)	10.4	4.2	20.1
Information on introduction of liquids (%)	12.5	24.9	20.9
Information on introduction of solids (%)	12.7	22.8	21.5

<sup>1</sup>As assessed by maternal recall.

Table 4  
Program exposure<sup>1</sup>, by hospital: Mexico

	General (n=448)	Mujer-RI (n=200)	Mujer-NU (n=284)
<u>Early mother-infant contact</u>			
Held infant in delivery room (%)	55.6	85.0	57.4
Breastfed infant in delivery room (%)	3.9	15.5	-- <sup>2</sup>
Breastfed within first half hour of birth (%)	3.5	15.7	-- <sup>2</sup>
<u>Policies and procedures</u>			
No separations of > 15 min (%)	95.0	93.3	-- <sup>3</sup>
No prelacteals (%)	41.8	61.0	2.5 <sup>4</sup>
No formula/glucose water (%)	88.2	92.0	-- <sup>4</sup>
No gifts of formula/glucose water/bottles (%)	99.8	99.0	99.7
<u>Lactation management</u>			
Help to breastfeed the first time (%)	31.7	15.7	-- <sup>2</sup>
Demonstration on breast milk expression (%)	25.3	22.0	17.1
<u>Education/counseling<sup>5</sup></u>			
Breastfeeding talk (%)	35.1	12.4	10.6
Breastfeeding brochure (%)	11.5	22.3	22.4
Breastfeeding film (%) <sup>6</sup>	--	26.4	2.4

<sup>1</sup>As assessed by maternal recall.

<sup>2</sup>Virtually all women in this hospital were interviewed prior to initiation of breastfeeding.

<sup>3</sup>Virtually all women (99%) responded "don't know" to this question.

<sup>4</sup>Although few infants actually received prelacteal feeds, 43.3%, 37.0%, 97.2%, at General, Mujer-RI, and Mujer-NU, respectively, responded "don't know" to this question.

<sup>5</sup>Inasmuch as many women were exposed these activities after being interviewed, information on exposure was collected at the first home visit.

<sup>6</sup>Only 1, 32, and 4 women at General, Mujer-RI, and Mujer-NU, respectively reported watching a film.

Table 5

Early contact and lactation management and exclusive  
breastfeeding at month 1 and 3: Brazil

	Month 1 (n=356)	Month 3 (n=332)
<u>Early contact</u> <sup>1</sup>		
Held infant in delivery room (%)		
yes (n=265/242) <sup>2</sup>	50.2	33.5
no (n=91/90)	36.3	28.9
	(p<0.01)	
Breastfed infant in delivery room (%)		
yes (n=130/116)	50.8	39.7
no (n=207/199)	44.4	28.6
		(p<0.05)
Breastfed within first half hour of birth (%)		
yes (n=55/46)	36.4	45.7
no (n=166/159)	47.6	28.9
<u>Lactation management</u>		
Help to breastfeed the first time (%)		
yes (n=198/184)	47.0	32.6
no (n=140/132)	47.1	33.3
Demonstration on breast milk expression (%)		
yes (n=136/124)	52.9	42.7
no (n=218/206)	43.1	25.7
	(p=0.07)	(p<0.001)

<sup>1</sup>As assessed by maternal recall.

<sup>2</sup>n=month 1/month 2.

Table 6		
Education and counseling and exclusive breastfeeding at month 1 and 3: Brazil		
	Month 1 (n=356)	Month 3 (n=332)
<u>Education/counseling</u> <sup>1</sup>		
Breastfeeding talk (%)		
yes (n=193/175) <sup>2</sup>	50.8	42.3
no (n=163/157)	41.7	21.0
	(p=0.09)	(p<0.000)
Breastfeeding brochure (%)		
yes (n=194/162)	52.6	35.8
no (n=179/153)	39.5	28.1
	(p<0.01)	
Information on engorgement (%)		
yes (n=150/133)	56.0	42.1
no (n=148/142)	40.5	26.1
	(p<0.01)	(p<0.01)
Information on sore nipples (%)		
yes (n=138/124)	56.5	43.5
no (n=97/93)	44.3	21.5
	(p=0.07)	(p<0.000)
Information on sufficient milk (%)		
yes (n=104/94)	48.1	40.4
no (n=200/190)	48.0	30.0
		(p=0.08)
Information on increasing milk supply (%)		
yes (n=127/114)	52.8	45.6
no (n=142/135)	47.2	25.2
	(p=0.07)	(p<0.001)
Information on post-partum breastfeeding help (%)		
yes (n=167/153)	56.3	36.6
no (n=187/177)	38.0	28.2
	(p<0.001)	(p=0.09)
Information on introduction of liquids <sup>3</sup> (%)		
yes (n=72/64)	66.7	46.9
no (n=284/268)	41.5	28.7
	(p<0.000)	(p<0.001)

<sup>1</sup>As assessed by maternal recall.

<sup>2</sup>n=month 1/month 2.

<sup>3</sup>Results for information on introduction of solids were similar.

Table 7

Early contact and lactation management and exclusive  
breastfeeding at month 1 and 2: Honduras

	Month 1 (n=1086)	Month 2 (n=1034)
<u>Early contact</u> <sup>1</sup>		
Held infant in delivery room (%)		
yes (n=649/619) <sup>2</sup>	37.0	28.1
no (n=437/415)	41.0	28.2
Breastfed infant in delivery room (%)		
yes (n=449/477)	39.7	31.0
no (n=560/534)	37.1	24.5
		(p<0.05)
Breastfed within first half hour of birth (%)		
yes (n=386/372)	38.8	28.2
no (n=559/529)	38.3	26.7
<u>Lactation management</u>		
Help to breastfeed the first time (%)		
yes (n=188/178)	39.9	23.6
no (n=872/834)	38.1	28.8
Demonstration on breast milk expression (%)		
yes (n=220/205)	53.2	36.1
no (n=871/833)	35.0	26.3
	(p<0.000)	(p<0.01)

<sup>1</sup>As assessed by maternal recall.

<sup>2</sup>n=month 1/month 2.

Table 8		
Education and counseling and exclusive breastfeeding at month 1 and 2: Honduras		
	Month 1 (n=1086)	Month 2 (n=1034)
<u>Education/counseling</u> <sup>1</sup>		
Breastfeeding talk (%)		
yes (n=317/295) <sup>2</sup>	44.4	33.2
no (n=773/743)	36.6	26.2
	(p<0.05)	(p<0.05)
Breastfeeding brochure (%)		
yes (n=159/152)	41.5	34.2
no (n=932/886)	38.3	27.2
		(p=0.08)
Information on engorgement (%)		
yes (n=248/237)	54.0	33.3
no (n=851/809)	34.2	26.5
	(p<0.000)	(p<0.05)
Information on sore nipples (%)		
yes (n=99/94)	53.5	31.9
no (n=1000/952)	37.2	27.6
	(p<0.001)	
Information on sufficient milk (%)		
yes (n=123/117)	56.9	35.9
no (n=976/929)	36.4	27.0
	(p<0.000)	(p<0.05)
Information on increasing milk supply (%)		
yes (n=302/296)	47.7	31.1
no (n=797/750)	35.3	26.8
	(p<0.000)	
Information on post-partum breastfeeding help (%)		
yes (n=136/131)	51.5	38.9
no (n=956/908)	36.9	26.7
	(p<0.001)	(p<0.01)
Information on introduction of liquids <sup>3</sup> (%)		
yes (n=215/204)	48.8	36.8
no (n=875/833)	36.2	26.2
	(p<0.01)	(p<0.01)

<sup>1</sup>As assessed by maternal recall.

<sup>2</sup>n=month 1/month 2.

<sup>3</sup>Results for information on introduction of solids were similar.

Table 9

Early contact and lactation management and exclusive  
breastfeeding at month 1 and 4: Mexico

	Month 1 (n=479)	Month 4 (n=418)
<u>Early contact</u> <sup>1</sup>		
Held infant in delivery room (%)		
yes (n=312/265) <sup>2</sup>	11.5	3.4
no (n=167/153)	9.6	3.3
Breastfed infant in delivery room (%)		
yes (n=24/22)	12.5	-- <sup>3</sup>
no (n=432/377)	10.9	3.7
Breastfed within first half hour of birth (%)		
yes (n=20/20)	20.0	--
no (n=263/229)	14.8	4.8
<u>Lactation management</u>		
Help to breastfeed the first time (%)		
yes (n=71/62)	9.9	6.5
no (n=208/182)	15.4	4.4
Demonstration on breastmilk expression (%)		
yes (107/95)	11.2	5.3
no (373/324)	11.0	2.8
<u>Education/counseling</u> <sup>4</sup>		
Breastfeeding talk (%)		
yes (n=94/77)	17.0	5.2
no (n=370/327)	9.5	3.1
	(p<0.05)	
Breastfeeding brochure (%)		
yes (n=85/70)	9.4	--
no (n=379/334)	11.3	3.6
Breastfeeding film (%)		
yes (n=37/30)	13.5	--
no (n=427/374)	10.8	3.7

<sup>1</sup>As assessed by maternal recall.

<sup>2</sup>n=month 1/month 4.

<sup>3</sup>Cell has fewer than 4 cases and hence estimates are unreliable.

<sup>4</sup>As assessed at first home visit.

Table 10								
Estimates of the effectiveness of the breastfeeding promotion program on exclusive breastfeeding								
	B estimate (se)	p	median (days)	benefit (days) <sup>1</sup>	probability of exclusive breastfeeding		benefit (per 1000 women) <sup>2</sup>	
					1 mo	3 mo	1 mo	3 mo
Hospital <sup>3</sup> program control	-0.368 (0.068)	0.000	75 22	+53	.64 .39	.46 .20	250	260

<sup>1</sup>Increase in the median duration of breastfeeding (program versus control).

<sup>2</sup>Number of additional women that would exclusively breastfeed per 1000 women if exposed the program. Calculated at 1 month as follows:  $(.64 - .39)(1000) = 250$ .

<sup>3</sup>Survival analysis (Cox model), n=341.

Table 11  
 Estimates of the specific breastfeeding activities on  
 on exclusive breastfeeding: Honduras

	B estimate (se)	p	median (days)	benefit (days) <sup>1</sup>	probability of exclusive breastfeeding		benefit (per 1000 women) <sup>2</sup>	
					1 mo	3 mo	1 mo	2 mo
<b>Information<sup>3</sup></b>								
Engorgement	0.1504 (0.0543)	0.01						
yes								
no			25	+9	.42	.32	110	110
			16		.31	.22		
Sufficient milk	0.1313 (0.0729)	.07						
yes			25	+7	.42	.32	90	90
no			18		.33	.23		

<sup>1</sup>Increase in the median duration of breastfeeding (yes versys no).

<sup>2</sup>Number of additional women that would exclusively breastfeed per 1000 women if exposed the program. Calculated at 1 month as follows: (.42 - .31)(1000) = 110.

<sup>3</sup>Survival analysis (Cox model).

Table 12

Estimates of the specific breastfeeding activities on  
on exclusive breastfeeding: Mexico, Hospital Mujer-RI

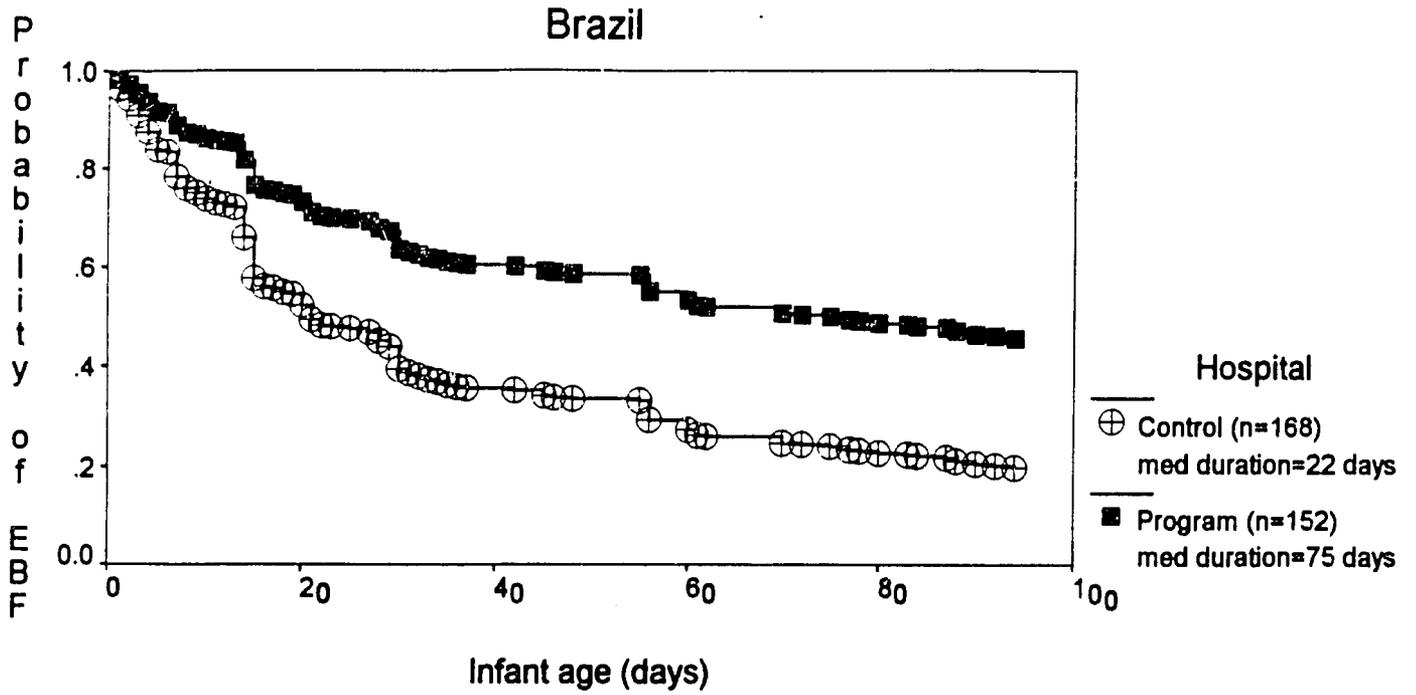
	B estimate (se)	P	median (days)	benefit (days) <sup>1</sup>	probability of exclusive breastfeeding		benefit (per 1000 women) <sup>2</sup>	
					1 mo	3 mo	1 mo	4 mo
Talk	-.2798 (0.1517)	0.08						
yes			10	+7	.30	.07	180	60
no			3		.12	.01		

<sup>1</sup>Increase in the median duration of breastfeeding (yes versus no).

<sup>2</sup>Number of additional women that would exclusively breastfeed per 1000 women if exposed the program. Calculated at 1 month as follows:  $(.30 - .12)(1000) = 180$ .

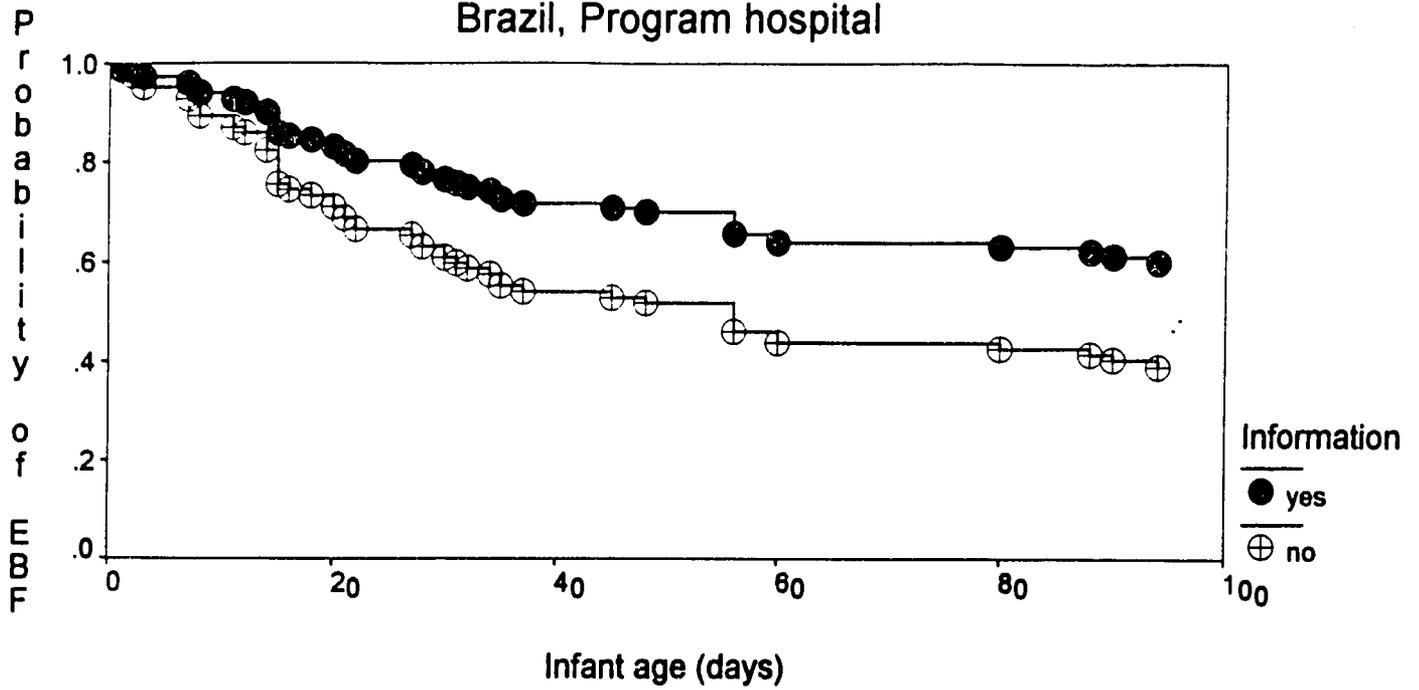
<sup>3</sup>Survival analysis (Cox model).

# Probability of exclusive breastfeeding and hospital of birth



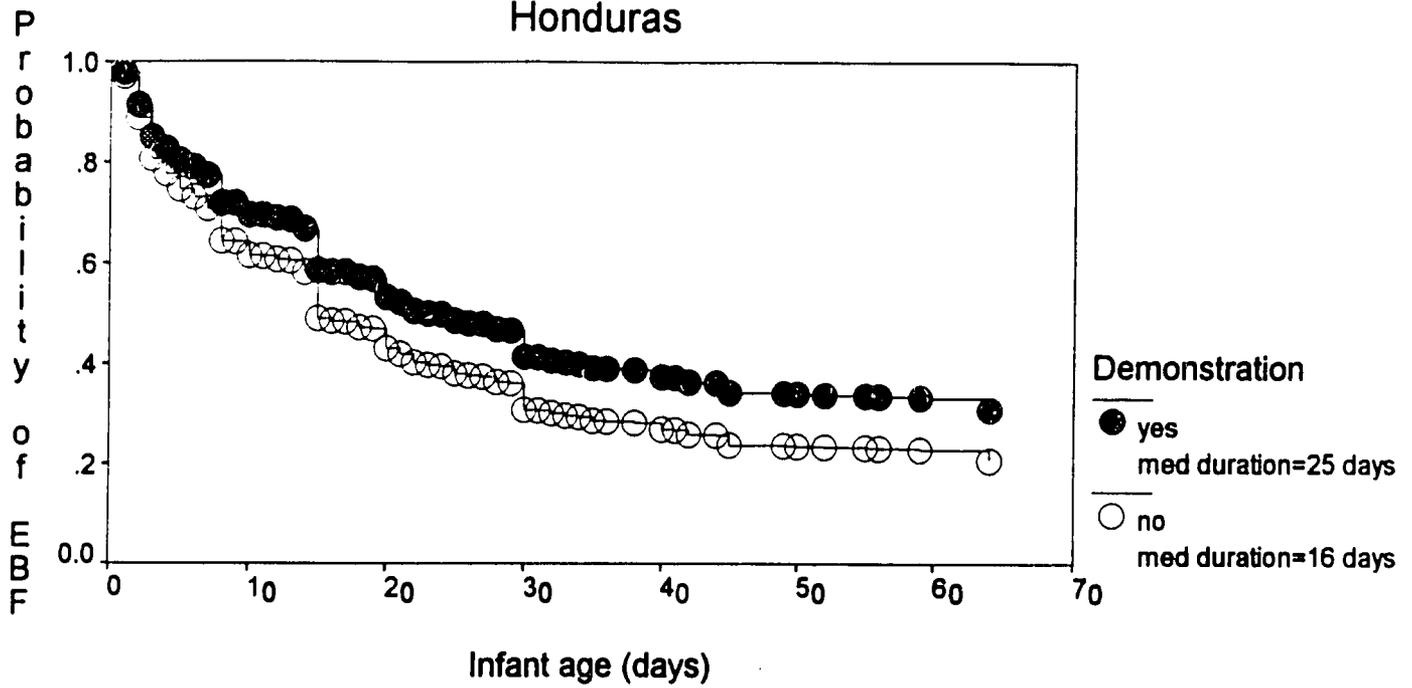
# Information on introduction of solids and exclusive breastfeeding

Brazil, Program hospital



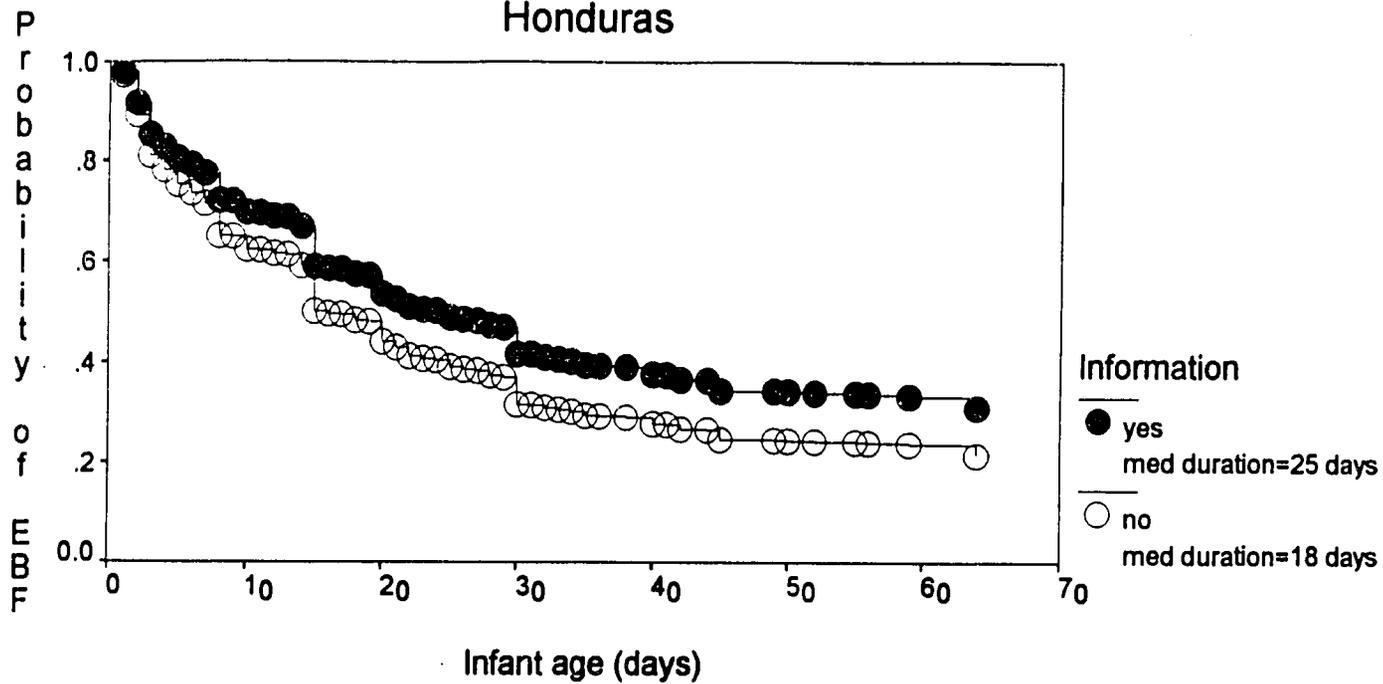
# Demonstration on breast milk expression and exclusive breastfeeding

Honduras



# Information on sufficient milk and exclusive breastfeeding

Honduras



# Breastfeeding talk and exclusive breastfeeding

## Mexico, Hospital Mujer, Rooming-in

