Effectiveness of MADLAC at Improving Breastfeeding Promotion and Counseling Indicators in Maternity Wards in El Salvador

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Rafael Pérez-Escamilla, Ph.D.

BASICS II

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USAID
U.S. Agency for International Development
Office of Health and Nutrition
Bureau for Global Health
Website: www.usaid.gov/pop_health/

BASICS II

1600 Wilson Boulevard, Suite 300
Arlington, Virginia 22209 USA
Tel: 703-312-6800
Fax: 703-312-6900
E-mail address: infoctr@basics.org
Website: www.basics.org

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Acronyms

BASICS II	Basic Support for Institutionalizing Child Survival
BF	Breastfeeding
BFHI	Baby-friendly hospital initiative
EBF	Exclusive breastfeeding
FUP	Follow-up phase
LAC	Latin American Countries
MADLAC	Monitoreo de Apoyo Directo con la Lactancia Materna
USAID	United States Agency for International Development
WHO	World Health Organization

Introduction

MADLAC, which stands for Monitoreo de Apoyo Directo con la Lactancia Materna, is a low-cost management information system that empowers health workers delivering breastfeeding (BF) support to use an evidence-based approach to improve service performance. MADLAC involves several steps. First, approximately fifty women per month are interviewed using a 5-7 minute questionnaire containing nineteen BF promotion/counseling indicators (see Appendix) at hospital discharge. To avoid biases, the questionnaire is adminstered by hospital personnel who are not directly involved in providing BF counseling to women. Next, the data collected is entered into either Epi Info or Microsoft's Excel®. The hospital MADLAC committee meets regularly (i.e., approximately once every 3 months) to discuss the results after approximately 100 women have been interviewed and their data has been entered and analyzed. The hospital implements changes in breastfeeding support in response to MADLAC committee recommendations. Finally, the impact of the decisions are monitored regularly using the continuous MADLAC cycle.

The key MADLAC breastfeeding promotion indicators were identified through 3 prospective controlled studies in Mexico, Honduras, and Brazil (i.e. USAID LAC/HNS project). The data collection instrument is evidence-based, and the indicators are considered to be valid predictors of exclusive breastfeeding (EBF) duration (Perez-Escamilla, 1995). The key indicators emphasize counseling activities since this was an area where even the hospitals with "strong" Baby Friendly Hospital Initiative (BFHI) implementation were not doing well. Other key indicators are based on maternal BF and EBF duration intentions as these were identified as key predictors of EBF success in the LAC/HNS study. Several BFHI indicators are also included in the MADLAC instrument as maternity wards had a lot of interest in tracking them. These include breastfeeding in the delivery room, timing of first BF episode, baby bottle use, and rooming-in.

At a time when UNICEF's/WHO BFHI has lost steam and substantial funding in most parts of the world, it is imperative to identify cost-effective alternatives that can help BFHI continue improving breastfeeding outcomes worldwide (Perez-Escamilla, 2003; Perez-Escamilla et al., 1994; Horton et al., 1996; Kramer et al., 2001). With this goal in mind, MADLAC was first piloted in Honduras and Ecuador, and building upon the lessons learned in those countries, it was then tested in El Salvador at a national level under the leadership of BASICS II and in full partnership with the Ministry of Health (MOH).

Objective

The objective of this chapter is to present the results documenting the impact of MADLAC at improving breastfeeding promotion and counseling indicators in maternity wards in public hospitals in El Salvador.

Methods

MADLAC Evaluation Design

El Salvador has 28 national public hospitals that are under the MOH umbrella. All of these hospitals offer maternity services and thus were invited to participate in the national MADLAC effort that involved a) a baseline period in 2001, b) an intervention phase in 2002, and c) follow-up monitoring in 2003.

Baseline Phase

The baseline MADLAC phase took place in 2001. All national hospitals were asked to collect 100 questionnaires following the pre-established protocol with technical support from BASICS II/El Salvador. All hospitals were trained on MADLAC to ensure the feasibility of implementation and the collection of high quality data that could be used for a national assessment. Although all the hospitals agreed to participate, four were unable to produce their baseline electronic data bases. Thus, baseline data is based on data from 24 hospitals (n=2399 women). All baseline data were collected between April 1st and August 31st 2001.

Figure 1.Evaluation Design & Sample Sizes

Time points	Dates	Sample Size
Baseline (t0)	Apr-Dec, 2001	2399
FUP I (t1)	Jan-Mar, 2003	1555
FUP 2 (t2)	Apr-Jun, 2003	2739
FUP 3 (t3)	Jul-Sep, 2003	3004
FUP 4 (t4)	Oct-Dec, 2003	1457

Intervention Phase

As a result of the local and regional meetings where MADLAC results were presented and discussed, an intensive national effort was carried out to train key hospital personnel on BF counseling. These key personnel were in turn responsible for training the rest of the personnel in their hospitals, following a 'train the trainer' cascade approach. This effort, which was led by BASICS-II in- country office, was mostly implemented in 2002. It was very successful as it reached all hospitals on time to expect a detectable impact on key BF indicators during the follow-up phase. Participants' evaluations showed that they were extremely satisfied with the style and quality of trainings received.

Follow-up Phase

The MADLAC follow-up phase began on January 3, 2003 and continued until December 31st of the same year. Of the 28 hospitals, 27 hospitals provided an electronic follow-up data base. Thus, the follow-up results are based on all but one of the national hospitals with the sample size ranging from 1457 in the fourth trimester of 2003 to 3004 in the third trimester of the same year (Figure 1). The last trimester results are based on all questionnaires available through December 2, 2003.

Statistical Analyses

The hospitals entered MADLAC's data with either Epi Info or Microsoft's Excel®. All data sets were compiled, merged, and cleaned by BASICS-II in-country personnel. The data sets were transferred to BASICS USA headquarters in Excel format and then converted by Dr. Pérez-Escamilla into SPSS files. The SPSS files were further cleaned by BASICS-II headquarters personnel and provided to Dr. Pérez-Escamilla on March 2004 for final analyses. All analyses presented in this chapter were generated using SPSS for Windows® (version 12.0) which was used to conduct the analyses.

Data was grouped into time periods before analysis: baseline (t0), first follow-up trimester (t1), second follow-up trimester (t2), third follow-up trimester (t3), and fourth follow-up trimester (t4). Socio-economic, demographic, and biomedical indicators were compared across time using chi-square cross tabulation analyses for categorical variables and ANOVA for continuous variables. A similar analytical approach was used to examine the effectiveness of MADLAC at improving BF promotion/support indicators. Analyses were conducted first using all 27 hospitals with follow-up data and then with only the 24 hospitals with baseline data. Because findings were remarkably similar, results are only presented for the analyses based on the 27 hospitals with follow-up information.

Results

Sample Characteristics

Baseline and follow-up samples were very similar to each other with regards to their socio-economic, demographic, and biomedical characteristics. Furthermore, they were quite representative of the population from which they were drawn (Figures 2-5).

Women's ages ranged from 23.6 years on the first trimester follow-up sample to 24.1 years in the second trimester follow-up sample. The percent of women without formal schooling ranged from 18% to 20% across time. The corresponding range for women with more than secondary education was 3% to 5%. An interesting finding was that about two thirds of the women (range: 61%-66%) who delivered in the national hospitals came from rural areas. This illustrates the profound relationship between urban health care services and rural health in countries like El Salvador (Figure 2).

Figure 2. SES & Demographic Characteristics

	T0	T1	T2	T3	T4
Maternal age	24.0±6.6 (n=2392)	23.6±6.2 (n=1555)	24.1±6.4 (n=2739)	24.0±6.4 (n=3004)	23.7±6.5 (n=1457)
Schooling	(n=2378)	(n=1547)	(n=2716)	(n=2979)	(n=1446)
none	20%	18%	19%	19%	19%
elementary	49%	52%	53%	53%	53%
secondary	26%	27%	23%	24%	24%
> secondary	5%	3%	5%	4%	3%
Residence	(n=2383)	(n=1547)	(n=2685)	(n=2964)	(n=1445)
rural	61%	64%	61%	66%	64%

Figure 3. Maternal Employment

	T0	T1	T2	T3	T4
Employed outside	14% (n=2378)	14% (n=1548)	17% (n=2714)	15% (n=2987)	13% (n=1451)
Employment	(n=286)	(n=197)	(n=430)	(n=387)	(n=152)
factory	47%	34%	40%	33%	34%
agriculture	19%	33%	31%	36%	32%
own	34%	34%	29%	31%	34%

Figure 4. SES, Demographic Characteristics & Prenatal Care

	T0	T1	T2	T3	T4
Marital Status	(n=2352)	(n=1541)	(n=2687)	(n=2960)	(n=1441)
married	26%	23%	22%	21%	23%
single	17%	17%	18%	20%	18%
common law	56%	59%	59%	59%	59%
other	1%	1%	1%	1%	1%
Parity	(n=2365)	(n=1542)	(n=2702)	(n=2965)	(n=1427)
primiparae	39%	39%	37%	39%	42%
Prenatal care	(n=2387)	(n=1553)	(n=2729)	(n=2998)	(n=1455)
% yes	88%	89%	91%	91%	92%

Figure 5. Infant's Gender & Biomedical Characteristics

	T0	T1	T2	T3	T4
Gestational age	(n=2378)	(n=1533)	(n=2692)	(n=2916)	(n=1413)
premature	4%	4%	3%	4%	3%
term	91%	91%	93%	93%	95%
late	5%	5%	3%	3%	2%
Delivery	(n=2352)	(n=1552)	(n=2732)	(n=2993)	(n=1455)
vaginal	80%	74%	77%	80%	79%
C-section	20%	26%	23%	20%	21%
Child gender	(n=2252)	(n=1543)	(n=2725)	(n=2981)	(n=1447)
% girls	50%	47%	48%	50%	49%

The percentage of women employed outside of their households ranged from 13% to 17% with employed women working in factories, the agriculture sector, or their own enterprises (Figure 3).

With regards to marital status, the "common law" arrangement was predominant ranging from 56% to 59%. The proportion of primiparous women ranged from 37% to 42%, and 88% to 92% of women had at least one prenatal care visit (Figure 4).

The rate of premature deliveries ranged from 3 to 4% across time and the incidence of Ceasarean-section deliveries was also quite constant across time ranging from 20% to 26%. As expected half of the newborns were girls with this indicator ranging from 47% to 50% (Figure 5).

MADLAC & BF Promotion/Counseling Indicators

Results in this section document how remarkably consistent was the effectiveness of MADLAC at improving BF promotion/support indicators in a dose response manner across time. The percent of women reporting that they received BF information prenatally increased in a stepwise fashion from 66% at baseline to 78% in the fourth follow-up trimester ($p<0.001$) (Figure 6). This is an important finding because it is well documented that many women make up their minds about their BF and EBF plans during pregnancy.

As expected in El Salvador, practically all women planned to breastfeed their babies since baseline (Figure 7). However, the proportion of women planning to follow the WHO recommendation of BF for more than 12 months increased in a stepwise manner from 55% to 73% ($p<0.001$) (Figure 8). Planned BF duration has been identified as a key predictor of both BF and EBF success.

Figure 6. BF information in prenatal care visit

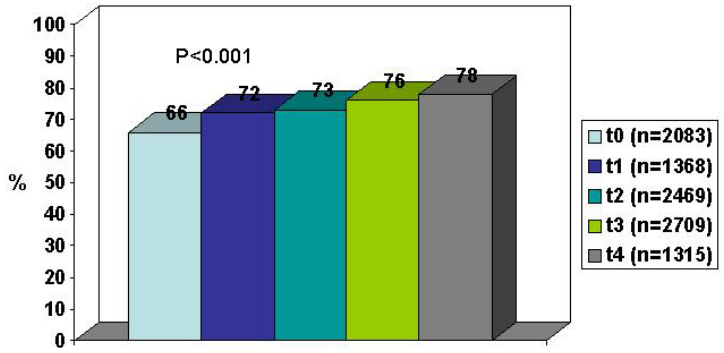


Figure 7. Planning to BF

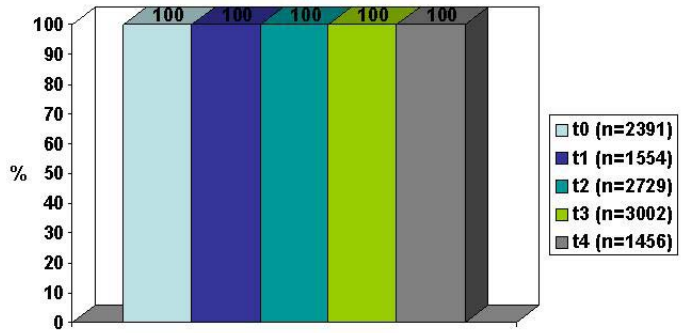
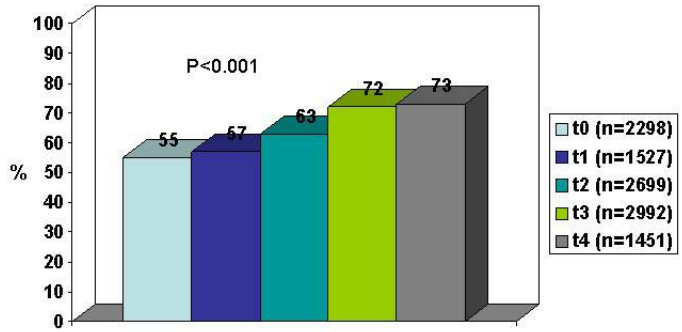


Figure 8. Planning to BF > 12 months



WHO recommends for infants to be breastfed exclusively until they are 6 months old. The percentage of mothers who reported to be advised on how long to EBF increased in a stepwise manner from 73% at baseline to 95% ($p<0.001$) (Figure 9). This improvement was accompanied by improved EBF duration plans of the mothers as the percent who were planning to EBF for 6 months increased from 75% at baseline to 91% in the last follow-up trimester ($p<0.001$) (Figure 10).

Figure 9. Advised how long to EBF

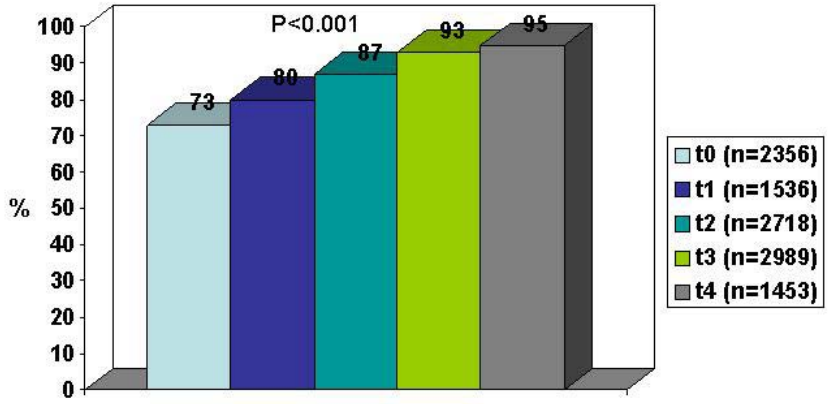
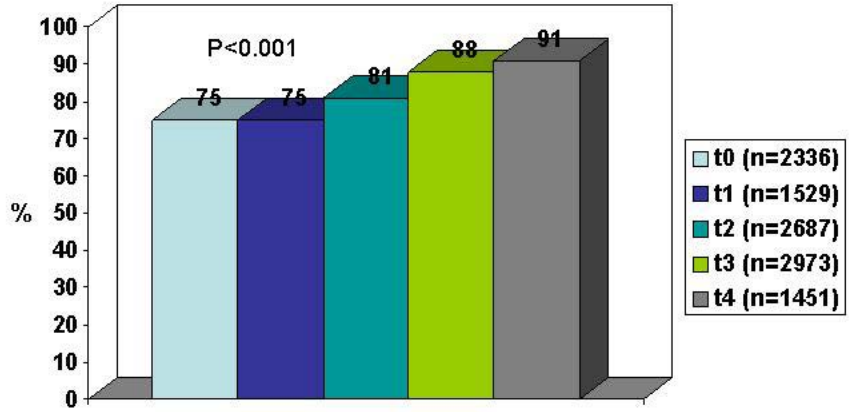


Figure 10. Planning EBF for 6 months



Step 4 of the BFHI calls for the newborn to be BF for the first time as soon as possible after delivery. Thus, it is encouraging that the percent of babies that were BF in the delivery room increased from 66% at baseline to 72% in the follow-up ($p<0.001$) (Figure 11). Consistent with this finding, the percent of babies who initiated BF during the first 30 minutes post-partum increased from 57% to 70% ($p<0.001$) (Figure 12).

Figure 11. BF in delivery room

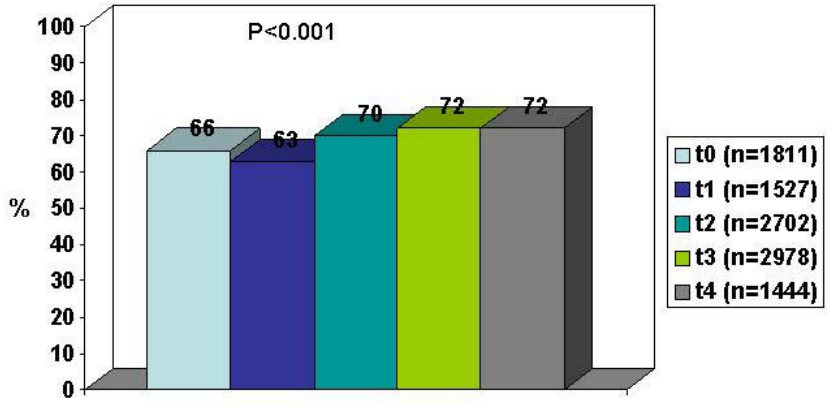
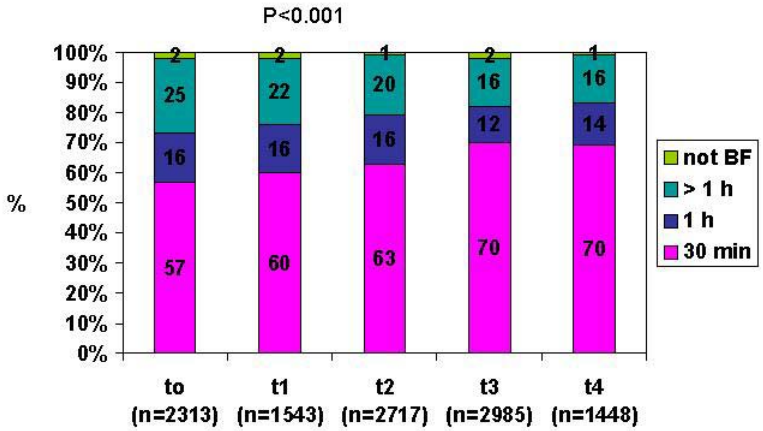


Figure 12. Timing of BF initiation



Another important finding from this project is that the percent of women who reported actually receiving BF counseling (not simply information) increased from 60% to 90% ($p<0.001$) (Figure 13). In total consistency with this, the percent of women who reported having being taught how to extract breast milk increased from 50% at baseline to 82% during the follow-up (Figure 14). This indicator is very relevant first because in countries like El Salvador maternal employment outside the household is on the rise. Second, because it has been identified as a key predictor of EBF success in Latin American countries.

Figure 13. BF counseling in maternity ward

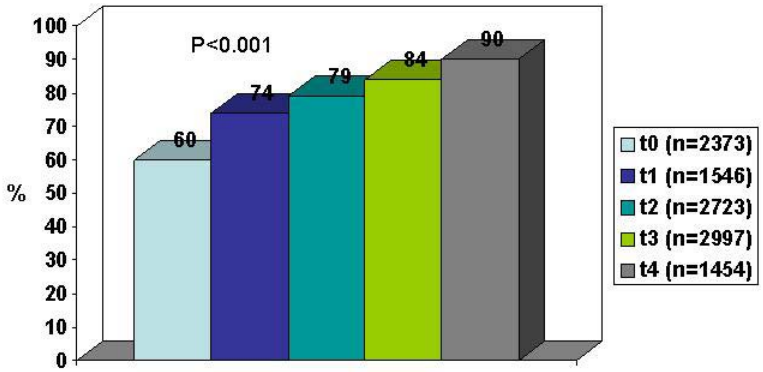
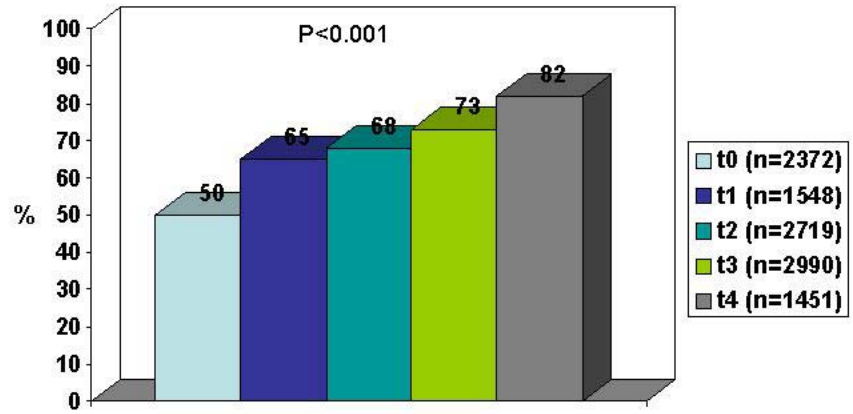


Figure 14. Taught how to express milk



As far as the mothers knew, the vast majority of babies had not been fed with a bottle in the maternity ward (Figure 15). This indicates that the policy of avoidance of baby bottles that is strongly encouraged by BFHI was clearly in place since baseline and continued to be so throughout the follow-up. Likewise, the percent of mothers-babies who were in continuous rooming-in since birth was high at baseline but it still significantly improved during the follow-up (88% vs. 92%, $p<0.001$) (Figure 16).

Figure 15. Newborn given bottle

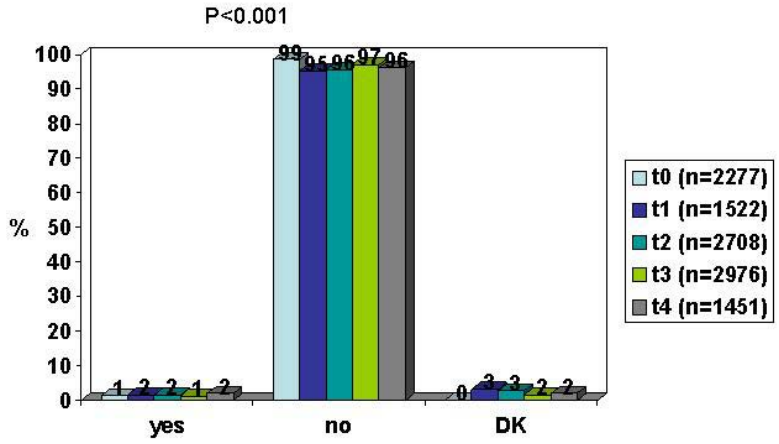
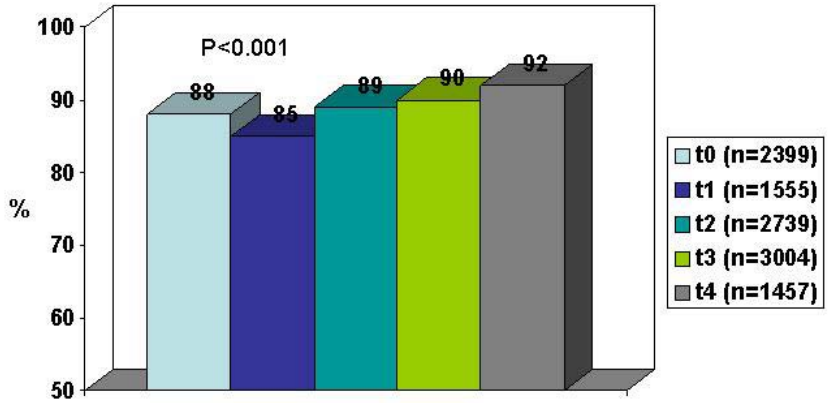
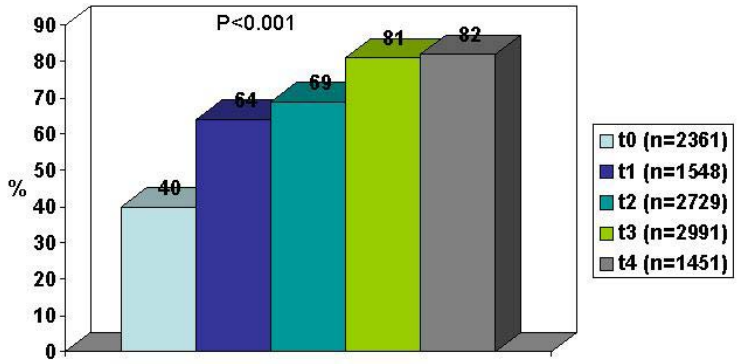


Figure 16. Rooming-In since birth



Step 10 from BFHI strongly encourages the formation of community support groups. This step is perhaps the one where hospitals have had the most difficulty complying with. Thus, it is of enormous relevance the fact that MADLAC led to a significant ($p<0.001$) improvement in the percent of mothers who were referred from the hospital to a location in or nearby their communities where they could receive help/support if they experiences bf difficulties once they were discharged from the hospital (Figure 17).

Figure 17. Information on community BF counseling and support



Conclusions

The results of this evaluation indicate that MADLAC is not only a useful monitoring tool but also that it is a simple and effective managerial system capable of inducing major improvements in BF promotion/support. Because indicators can be easily collected through interviews with women upon discharge from the maternity ward, it is feasible as well. MADLAC helped bring about improvements in indicators crucial for improving EBF rates in El Salvador:

- informational indicators (percentage of women who received prenatal BF information, percentage of women who received maternity ward BF information);
- counseling indicators (percentage of women who were helped with BF in maternity ward, percentage of women who were taught how to express breast milk);
- motivational indicators (planned BF and EBF durations); and
- infrastructure indicators (BF in delivery room, rooming–in, restricted access to baby bottles).

The evaluation design compared prevalences of BF promotion/support indicators from baseline to follow-up. Because the study did not include a control group, any causal inferences drawn have to rely on the plausibility approach to program evaluation (Habicht et al., 1999). According to this approach, to be able to claim program success it is essential to rule out competing hypotheses or explanatory factors. Thus, in this instance it becomes of paramount importance to demonstrate that: a) MADLAC led to the BF counseling training intervention, and b) the implementation of this intervention preceded the major documented improvements in BF indicators. As the chapter on activities conducted in response to MADLAC baseline results indicates, a very intensive period of BF counseling training activities took place soon after the MADLAC baseline results were available, and this effort preceded the start of the follow-up phase. Because at the

time of this evaluation there were no parallel BF monitoring efforts or BF interventions of this magnitude in El Salvador there is little doubt that MADLAC triggered the response that eventually led to major BF indicator improvements. A second potential confounder of results could be the presence of substantive differences in the socio-economic, demographic, and biomedical characteristics of the monitoring samples across time (i.e., baseline, and first, second, third and fourth trimester follow-ups). Although statistically significant differences were detected as a result of the very large sample sizes involved, the samples' characteristics were very similar across time and quite representative of the target population (i.e., Salvadorian women delivering in public hospitals) indicating an excellent monitoring performance by MADLAC.

Although MADLAC had previously shown promising results in Honduras and Ecuador, it is the experience in El Salvador that helped us fully understand and appreciate the impressive effectiveness of this managerial system for BF promotion at a national level within a context of very strong political support from MOH and exemplary technical assistance from BASICS II-El Salvador. First, the system proved to be easily adopted by the vast majority of MOH national hospitals. This applied to all its components: a) hospital personnel MADLAC training, b) questionnaire application, c) data entry, d) data processing, e) MADLAC committee meetings, f) evidence-based decision making, g) measuring effectiveness of actions implemented. Second, MADLAC baseline results rapidly lead to an understanding of the major BF promotion/counseling gaps and ways to address them. In this instance, the data were so convincing that MOH agreed to the hospitals' request for a national-scale training effort of hospital personnel on BF counseling. Third, MADLAC rapidly documented the major impact of the training investments at improving the performance of indicators that are key for successful EBF outcomes.

MADLAC has enormous potential to strengthen and revitalize the BFHI in developing countries and to lead to improved EBF practices. Because not all countries have the level of political support that El Salvador had for this effort nor the in-house technical assistance from highly qualified personnel, it still remains to be seen how MADLAC would perform under less ideal circumstances. This is a big challenge that must be undertaken as at the moment there are few if any other effective BFHI low-cost alternatives other than MADLAC. Indeed, one of MADLAC's positive side effects was how much it strengthened the interest in BFHI in Honduras, Ecuador, and El Salvador where it was introduced in scale. One issue that came out across the board and that needs urgent remedial action is that the vast majority of hospitals participating in MADLAC received the BFHI certification a decade or more ago. MADLAC has clearly demonstrated in these countries that few if any of these hospitals would receive the BFHI certification today. Thus, it is essential that MADLAC's national experience in El Salvador get transferred as soon as possible to other countries in Latin America and the rest of the world.

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Appendix A
MADLAC instrument used during follow-up phase in El Salvador

MINISTERIO DE SALUD PÚBLICA Y ASISTENCIA SOCIAL

MONITOREO DEL APOYO DIRECTO A LA LACTANCIA MATERNA (MADLAC)

Cuestionario para la entrevista a madres al momento del alta en el hospital

No. de entrevista: _____

Fecha de la entrevista: __/__/ __/__/ __/__ **SIBASI:** _____

Nombre del hospital: _____

*Nombre de la madre:*_____

Número de Expediente Clínico: __/__/__/__/__/__/__/__/__ **N1. Edad**: ___/___ años

N2. Escolaridad: 1. Ninguna ❑ 2. Primaria ❑ 3. Secundaria ❑ 4. Superior ❑

N3. Estado civil: 1. Casada ❑ 2. Soltera ❑ 3. Acompañada ❑ 4.Otra ❑

Dirección de la casa: _____

N4. Procedencia: 1. zona rural ❑ 2. zona urbana ❑ 3. zona urbano marginal ❑

N5. Contando con este(a) niño(a), **¿Cuántos hijos tiene?:** __/__

N6. Duración del último embarazo: 1. Prematuro ❑ 2. De tiempo ❑ 3. Se pasó de la fecha ❑

N7.Fecha del parto: _____

N8. Tipo de parto: 1. Vaginal ❑ 2. Cesárea ❑

N9. Sexo del recién nacido: 1. M ❑ 2. F ❑

N10. Peso del recién nacido (en gramos): __/__/__/__ g.

N11. ¿Trabaja usted fuera de la casa?: 1. SI ❑ 2. NO ❑ → **Pase a N13**

*Si contesta que **SI**, pregunte:*

N12. ¿En dónde?: 1. En empresa ❑ 2. En el campo ❑ 3. En negocio propio ❑

N13. ¿Recibió control del embarazo?: 1. SI ❑ 2. NO ❑ → **Pase a N 17**

*Si respondió que **SI**, pregunte:*

N14. ¿Dónde recibió los controles? 1. Hospital ❑ 2. Unidad de Salud ❑ 3. Otro lugar ❑

N15. ¿Cuántos controles de embarazo recibió? __/__

N16. ¿Le hablaron de Lactancia materna en los controles de embarazo? 1. Si ❑ 2. No ❑

N17. ¿Le dará pecho a su hij@?: 1. SI ❑ 2. NO ❑ → **Pase a N20**

N18. ¿Cuánto tiempo? __/__ meses.

N19. ¿Cuánto tiempo le va a dar sólo pecho, sin agua, otros líquidos o alimentos? __/__ meses.

N20. ¿Alguien en este hospital le habló de la lactancia materna? 1. SI ❑ 2. NO ❑ → **Pase a N27**

*Si respondió que **SI**, pregunte para cada una de las siguientes disciplinas y lugares del hospital:* **¿Quién?:**

N21. Médico: 1. SI ❑ 2. NO ❑ **N22. Enfermera**: 1. SI ❑ 2. NO ❑ **N23. Otra persona:** 1. SI ❑ 2. NO ❑

¿Dónde?

N24. Sala de trabajo de parto: 1. SI ❑ 2. NO ❑ **N25. Sala de parto**: 1. SI 2. ❑ NO **N26. Puerperio**: 1. SI ❑ 2. NO ❑

N27. ¿Le dijeron cuánto tiempo debe dar sólo pecho a su bebe? 1. SI ❑ 2. NO ❑ → **Pase a N32**

N28. ¿Cuántos meses le dijeron? __/__ meses.

*Si respondió que **SI** en N27, haga la siguiente pregunta para cada una de las siguientes disciplinas:* **¿Quién le dijo cuánto tiempo dar sólo pecho?**

N29. Médico: 1. SI ❑ 2. NO❑ **N30. Enfermera:** 1. SI ❑ 2. NO ❑ **N31. Otro:** 1. SI ❑ 2. NO❑

N32. ¿Le dio de mamar a su bebé en la sala donde el o ella nació? 1. SI ❑ 2. NO ❑

N33. ¿Cuánto tiempo después de nacid@ su hij@ le dió de mamar por primera vez?
1. Media hora ❑ 2. Una hora ❑ 3. Más de una hora ❑ 4. Aún no le ha dado ❑

N34. ¿Alguien en este hospital le explicó cómo dar de mamar? 1. SI ❑ 2. NO ❑ → **Pase a N38**

*Si respondió que **SI**, pregunte para cada una de las siguientes disciplinas:* **¿Quién?:**

N35. Médico: 1. SI ❑ 2. NO ❑ **N36. Enfermera:** 1. SI ❑ 2. NO ❑ **N37. Otra persona:** 1. SI ❑ 2. NO❑

N38. ¿Alguien en este hospital le explicó cómo extraerse o sacarse la leche? 1. SI ❑ 2. NO ❑ → **Pase a N42**

*Si respondió que **SI**, pregunte para cada una de las siguientes disciplinas:* **¿Quién?:**

N39. Médico: 1. SI ❑ 2. NO ❑ **N40. Enfermera:** 1. SI ❑ 2. NO ❑ **N41. Otra persona:** 1. SI ❑ 2. NO❑

N42. ¿Le han dado de beber a su niñ@ algún líquido o agua en este hospital? 1. SI ❑ 2. NO ❑ 3. No sabe ❑

N43. ¿Usted vio que le dieron pacha a su hij@ en este hospital? 1. SI ❑ 2. NO ❑ 3. No sabe ❑

N44. ¿Le dijeron a usted cada cuánto tiempo debe de dar de mamar a su hij@? 1. SI ❑ 2. NO ❑ → **Pase a N48**

*Si respondió que **SI**, pregunte para cada una de las siguientes disciplinas:* **¿Quién?:**

N45. Médico: 1. SI ❑ 2. NO ❑ **N46. Enfermera:** 1. SI ❑ 2. NO ❑ **N47. Otra persona:** 1. SI ❑ 2. NO❑

N48. ¿Desde que nació su niñ@, el o ella ha estado junto a usted? 1. SI ❑ 2. NO ❑

N49. ¿Alguien en este hospital le dijo dónde solicitar ayuda en caso de tener algún problema en su lactancia?
1. SI ❑ 2. NO ❑ → **Termine la entrevista.**

*Si respondió que **SI**, pregunte para cada una de las siguientes disciplinas:* **¿Quién?:**

N50. Médico: 1. SI ❑ 2. NO ❑ **N51. Enfermera:** 1. SI ❑ 2. NO❑ **N52. Otra persona:** 1. SI ❑ 2. NO❑

¿En qué lugar le dijeron que solicitara ayuda para su problema?
N53. Hospital: 1. SI ❑ 2. NO ❑ **N54. Unidad de Salud:** 1. SI ❑ 2. NO ❑ **N55. Clínica Privada:** 1. SI ❑ 2. NO ❑

N56. Promotor de Salud: 1. SI ❑ 2. NO ❑ **N57. Otro:** 1. SI ❑ 2. NO ❑

Nombre del entrevistador _____ Cargo _____