Designing Prenatal Care Messages for Low-Income Mexican Women

RINA ALCALAY, PhD
ANNETTE GHEE, MPH
SUSAN SCRIMSHAW, PhD

Dr. Alcalay is Professor of Communication, University of California at Davis. Ms. Ghee is a Research Assistant, and Dr. Scrimshaw is Professor, both at the University of California School of Public Health, Los Angeles.

Funding for this study was provided by the International Center for Research on Women through a Cooperative Agreement with the Office of Nutrition and Health of the U.S. Agency for International Development. Collaborating in the study were Dr. Hector Rivera and Dr. Rosa Luna of the Universidad Autonoma's Medical School in Tijuana; Rocio Abundis, Marian Abernathy, and Laura Durazo, students at the University of California at Los Angeles' School of Public Health; and Jan Donnenwirth and Mary Turowski, students at the University of California at Davis.

Tearsheet requests to Rina Alcalay, PhD, 1874 Yosemite Road, Berkeley, CA 94707; tel. 510-527-0551.

Synopsis

Communication theories and research data were used to design cross-cultural health education messages. A University of California Los Angeles–Universidad Autonoma in Tijuana, Mexico, research team used the methods of ethnographic and survey research to study behaviors, attitudes, and knowledge concerning prenatal care of a sample of pregnant low-income women living in Tijuana.

This audience provided information that served as a framework for a series of messages to increase awareness and change prenatal care behaviors. The message design process was guided by persuasion theories that included Petty and Caccioppo's elaboration likelihood model, McGuire's persuasion matrix, and Bandura's social learning theory.

The results from the research showed that poor women in Tijuana tend to delay or not seek prenatal care. They were not aware of symptoms that could warn of pregnancy complications. Their responses also revealed pregnant women's culturally specific beliefs and behaviors regarding pregnancy. After examination of these and other results from the study, prenatal care messages about four topics were identified as the most relevant to communicate to this audience: health services use, the mother's weight gain, nutrition and anemia, and symptoms of high-risk complications during pregnancy.

A poster, a calendar, a brochure, and two radio songs were produced and pretested in focus groups with low-income women in Tijuana. Each medium included one or more messages addressing informational, attitudinal, or behavioral needs, or all three, of the target population.

RESEARCH HAS DEMONSTRATED that prenatal care is strongly associated with improved pregnancy outcomes, and prenatal care is especially important for women at increased medical and social risk (*1*). In developing countries, prenatal care services are particularly scarce and minimal (*2,3*), and poor women's tendency and ability to avail themselves of these inadequate services are even less impressive.

For example in Tijuana, Mexico, a city with a population of close to 1 million inhabitants, about 25 percent of low-income women do not use prenatal care services during pregnancy (*4*). Poor women who do use prenatal care tend to do so late in their pregnancy that they use the services only twice: once to ascertain their pregnancy and once again when they go into labor. These patterns of use result in higher proportions of miscarriages and infant deaths (*4*).

Studies in Latin America have shown that communication campaigns via the mass media are effective in promoting the use of health care services and can contribute to healthier behaviors, thus preventing illness, improving the quality of life, and decreasing health costs (*5,6*).

The main goal of this project was to develop health education materials for pregnant women in Tijuana. These materials were designed to increase the awareness of appropriate prenatal care behaviors among the target population and to promote specific behavioral changes during pregnancy.

In this project, we chose pregnant low-income women in Tijuana as the target population. The study was designed first to identify the target

population's key information needs and their psychosocial and structural constraints regarding prenatal care. An intervention was then designed that would enable the women to recognize pregnancy-related problems and constraints and encourage them to adopt healthful prenatal behaviors. This two-step approach to communication interventions increases the chances of persuasion (*7*).

'The main goal of this project was to develop health education materials for pregnant women in Tijuana ... to increase the awareness of appropriate prenatal care behaviors among the target population and to promote specific behavioral changes during pregnancy.'

Methods

Baseline data were gathered to (*a*) identify the specific information needs of the target population, (*b*) identify communication patterns appropriate for delivering health messages to this group, and (*c*) provide data on how to design culturally appropriate messages to improve health behaviors in the population. Data for items *a* and *b* were gathered using both anthropological and survey research methods. Focus groups were used later in the project to design and pretest the media materials.

Specifically, the ethnographic study and the survey sought to gather information on the following areas:

Health care beliefs and behaviors:
- women's use of formal and nonformal sources of prenatal care,
- frequency of prenatal care visits,
- recognition of potentially high-risk conditions,
- stress associated with pregnancy, and
- self-care behavior during pregnancy.

Nutrition behavior:
- patterns of nutrition behavior during pregnancy, and
- use of iron and vitamin supplements during pregnancy.

Communication:
- media preferences of women, and
- preferred and actual sources of prenatal health information.

The ethnographic phase used anthropological field methodologies to identify knowledge, attitudes, and practices related to prenatal care. This phase provided a preliminary look at key beliefs and behaviors during pregnancy that can affect pregnancy outcomes in a sample of low socioeconomic level women in Tijuana. This information was sought in a series of 40 open-ended face-to-face interviews with a nonrandom sample of women.

Criteria for selection of the sample were as follows: low-income pregnant women (primiparous or multiparous) between ages 15 and 45 living in the target communities. Initial contacts were made at either the local health clinics or through school teachers. A snowball technique was adopted, such that respondents were asked to provide names of other women in the community who fit the study criteria. Women were interviewed in their homes. Selection criteria for low income were defined as lack of piped water, drainage, electricity, and paved roads in the community.

The "RAP" or Rapid Assessment Program, a field guide for collecting data on health practices at the community level, was used (*8*). RAP was developed as a methodology for the study of the effectiveness of primary health care programs and the relationship between users and providers. RAP provides social scientists and health workers with guidelines for conducting rapid assessments of health-seeking behavior, behavior in maintaining health and overcoming illness, including the use of both traditional and modern health services. RAP procedures are concerned specifically with beliefs and perceptions regarding health, the prevention and treatment of illness, and the use of traditional and biomedical health resources.

Its methods require a relatively short time in the field and focus data collection on three categories of information: community, household, and primary health care providers. The guides are intended to help focus the research, organize the data collection process, and standardize the information gathered (*8*).

In the Tijuana project, data collection and data analysis included history of prenatal care, ideal and real behavior during pregnancy, knowledge of fetal development, perception of pregnancy's stages, perceptions of risks and diet needs during pregnancy, and sources of health information. The ethnographic data were content-analyzed by entering all interview texts into a computer using the software, Ethnograph (*4*), to label and sort the data. The

qualitative data obtained in this phase were used to (*a*) construct the survey using the language, issues, and concept categorization relevant to the target population; (*b*) make decisions about the selection of messages, language, and media for the communication intervention; and (*c*) provide examples of specific situations that were then used in the communication phase to guide the message development process. After completing the ethnographic phase, a survey was designed to gather quantitative data in four major areas: sociodemographic characteristics, patterns of use of prenatal care service, behaviors and perceptions during pregnancy, and use of media and sources of health information.

All households in each of the four selected communities were approached, and all pregnant women were asked to participate in the study that was conducted in 1988 and 1989. A total of 451 women were personally interviewed, 51 more than anticipated as the goal by the research team. The data were collected during a period of 2 months.

Draft instruments were prepared and pretested for clarity, completeness, and cultural and linguistic appropriateness. Eight medical students from the Universidad Autonoma in Tijuana were trained to collect information by use of a precoded questionnaire. Data analysis was conducted using SPSS and consisted mostly of simple frequencies and cross-tabulations, given the descriptive nature of the data. Chi-square and Student's *t*-tests were used.

Following is a summary of the sociodemographic characteristics of the 444 respondents:

Characteristic	*Mean*	*Range*
Age in years	24.5	13–47
Years of education	6.6	0–17
Number of pregnancies	3.1	1–16
Month of pregnancy	5.0	1–9
Month care began	2.18	[1] 1–9
Live births	1.95	0–14
Household size	5.2	1–20

[1]145 respondents had had no care at the time of the interview.

Members of the sample varied considerably in level of education, when prenatal care was initiated, and number of months pregnant at the time of the interview. They were evenly distributed according to the number of months pregnant; between 10 and 15 percent were in each month of pregnancy from 3 to 9 months. Twenty-six percent of those interviewed were experiencing their first pregnancy. Twenty-four percent were ages 19 or younger, including nine who were ages 15 or younger. Only nine women (2 percent) were ages 40 or older. A total of 76.5 percent were unemployed, 64.1 percent were married, and only 7.2 percent were not living with the baby's father.

Focus groups were used for pretesting the intervention's media materials. A total of 13 focus groups, 12 with members of the target population and 1 with health professionals, were conducted in Tijuana. The groups varied in size from 4 to 12 participants (*9*). Each communication strategy (poster, brochure, and so on) was pretested in two focus groups. The materials were assessed for their cultural acceptability, relevance and message appeal, level of comprehension, and degree of credibility among the target audience.

Findings from the Ethnographic Data

In this section, we describe the major findings from the ethnographic study which yielded information about (*a*) barriers to prenatal care, (*b*) ways of conceptualizing pregnancy, (*c*) conceptions of risk during pregnancy, and (*d*) sources of information about health care.

Barriers to prenatal care. The analysis revealed a variety of explanations for delaying or completely avoiding prenatal care. A reason frequently given by respondents is that prenatal care is unnecessary if the mother feels well. One woman noted, "It's a good idea to go to see a doctor during pregnancy so that one does not put the child's life in danger, but I have not gone during this pregnancy because I have felt well." Another said, "When I feel odd in my belly such as the child does not move or it becomes hard or I feel boxed in, then I go to the *sobadora* or one who massages."

Some women avoid prenatal care because they experience embarrassment when at medical offices or hospitals. One respondent put the problem this way, "If I go to the doctor, I get very nervous. I feel more confident here in my house than in the hospital. There (at the hospital) many people look at me. I don't like that." Similar findings have been obtained in other studies of comparable populations (*10*).

Akin to embarrassment is respondents' belief that it is unseemly for young wives to go out alone and that husbands don't approve of such behavior. Having to be accompanied by husbands or female relatives creates a barrier to seeking medical attention.

Also, women expressed concerns about walking up and down unpaved hillsides to reach main roads

and transportation. Falling during pregnancy was greatly feared. In the interviewers' experience, falling was a real risk in some of the partly urbanized neighborhoods. Often this fear prevented women from seeking prenatal care.

Dissatisfaction with public health services was also a barrier to prenatal care. This feeling seemed to be universal and made women either (*a*) give up going to the clinic because "usually doctors do not even show up when the women are supposed to have checkups (without giving them any reasons why)" or (*b*) tend to use multiple services that are often located further away from their homes, such as other clinics or the hospital, and thus were costly in terms of time, transportation, and lost wages. In general, women expressed a preference for prenatal care from private practitioners.

Stages of pregnancy. Women did not refer to stages of pregnancy as trimesters but as *al principio*, referring to the first few months of pregnancy, and *al ultimo*, the last month or 2. A less clearly delineated middle period was described as *los mediados*. The concept of trimesters was meaningless to this population. These findings revealed a way of conceptualizing stages of pregnancy that was key to the language and concepts designed for the campaign.

Pregnancy risks. Data show that the term risk (*riesgo* in Spanish) was not used in relation to pregnancy. When asked what *riesgo* meant to them in relation to pregnancy, most said "the fear of childbirth, the birth itself." Upon discussion, the word *peligro*, or danger, emerged as the one word to express risk during pregnancy. Danger implied the hazards of pregnancy, the things that could go wrong and hurt the baby. Thus the word *peligro* was used in the subsequent survey instrument and again in the messages designed for the communication phase.

In discussing specific *peligros*, women believed that there was more danger for the fetus during the early months of pregnancy and more danger for themselves in the latter part of pregnancy. The theme of danger to the fetus from eclipses also rose frequently. Concerns centered around the idea that eclipses can cause deformities or other birth defects.

Close to one-third of the ethnographic sample reported experiencing bleeding during pregnancy, although only one actually miscarried. Reasons given for the bleeding included *susto* (fright), *coraje* (anger), a fall, and lifting heavy things.

Table 1. Sources of health information used by Tijuana women

Source	Number	Percent
Mass media		
Television	230	52
Radio	144	32
Newspaper	53	12
Weekly paper	23	5
Pamphlets	212	48
Picture books	95	21
Magazines	186	42
Interpersonal communication		
Relatives	174	39
Neighbors	174	39
Friends	218	49
Midwife	39	9
Physician	374	84
Social worker	76	17
Nurse	133	30
Pharmacist	51	1

Most women thought that iron can only be absorbed in the early part of pregnancy. They indicated that there was no point in taking it after "the beginnings" since "it wouldn't do any good." This belief was strongly supported in the survey results. Messages in the communication campaign provided accurate information regarding these issues. Both the ethnographic study and the survey reflected high awareness of "good foods" for pregnancy as well as of actual dietary hazards during pregnancy.

Sources of prenatal care information. Regarding sources of health information, ethnographic interviews showed that most women get health information from the radio. Several respondents mentioned having heard a physician on the radio talking about how women should "not take any medicines" if they "miss their period" because if they are pregnant the medicine can "hurt the baby." Programs on nutrition during pregnancy, the use of natural herbs, and health in general were also recalled by respondents. Respondents believed radio information was very reliable.

Findings indicate strong emphasis on the woman's mother as a source of advice. For more educated women, the physician was seen as coming first in authority, but the mother would be consulted first. Accordingly, mother figures were used in the intervention to portray situations.

Interviewers observed that many women had wall calendars hanging in their homes. They were clearly used as decorations for the house. This observation

'Finally, an audio cassette with two songs using attractive ranchera rhythms was also developed. These songs were aimed at encouraging behavioral change by dramatizing nutritional aspects of the intervention. The songs were recorded on audio cassettes and made available to radio stations in Tijuana.'

led to the selection of a calendar as a valuable tool to communicate the campaign messages to the women.

Survey Findings

Access to care. Results indicated that about a third of the women in the sample did not use formal health services for prenatal health care. The majority of those women thought prenatal care was not necessary if they were feeling well. They also felt "it was too much trouble to bother with." Scrimshaw and coworkers have discussed the survey results in detail (*11*).

Weight gain. Women lacked knowledge regarding the amount of weight they should gain during pregnancy. Their responses were more accurate regarding the amount the newborn was expected to weigh. Most women responded that if the newborn were to weigh 3 kilos, for example, they should gain about 3 kilos of weight during their pregnancy. Many women were not aware of what, besides the baby, accounted for pregnancy weight gain. Also, many felt pressure from the baby's father not to get "too fat." Among women who attended prenatal clinics and were weighed, many were not told what they weighed and what their rate of weight gain should be.

Anemia. Findings showed that 82 percent of the women associated anemia with poor nutrition. Women were aware of the need for iron during pregnancy and of iron deficiency in the form of anemia as a risk factor. In addition, women indicated that they knew anemia during pregnancy was bad for the baby, yet they were not clear about how to prevent it. Because vitamins were regarded as important in this culture, especially during pregnancy, they can be viewed as a culturally acceptable vehicle for preventing anemia.

Risks during pregnancy. Data showed that women needed more information on symptoms that they can detect which could be early warning signs of pregnancy complications. They had little or no information about the implications for possible pregnancy complications of the following symptoms: strong headaches, excessive swelling of feet and hands, cramping when it was still too early to deliver, vaginal bleeding, fever or chills, nausea, rapid weight loss, movements of the baby discontinued, problems urinating, and excessive thirst.

Communication patterns. Results showed that the most frequent source of health information can be classified into three general categories: mass media, interpersonal communication with lay persons, and interpersonal communication with health professionals.

As shown in table 1, the physician was the single most important source of health information (84 percent) with television (52 percent), and friends (49 percent) ranking second and third. Table 1 also shows that mass media are important sources of health information and that the women frequently acquire health information from health pamphlets and magazines. These findings support other studies which have also shown that Latina women read health information pamphlets, particularly those obtained from health care sites, and that newspapers are not an appropriate medium to reach this population (*12,13*). Communication with lay people can be an important source of health information for this population, particularly communication with friends. The health experts that were significant sources of health information were physicians and, to a more limited degree, nurses.

For analytical purposes, primiparous women in the sample were compared with multiparous women in their communication patterns. Considering that primiparous women might use different sources of health information than multiparous women, further analysis was done according to parity. There were relatively few statistical differences between primiparous and multiparous women in their communication patterns. Multiparous women were more likely to use the radio ($P < .01$) and the physician ($P < .001$) than were primiparous women, and they generally were more likely to report health programs as sources of information (degrees of freedom [*df*] = 441, $F = 11.78$, $P < .001$).

Women who started using prenatal care services early in their pregnancy were more likely to watch television ($P < .05$) and obtain information from their physician than were late or noninitiators ($P < .001$). In general, early initiators of prenatal care were greater users of mass media than late or noninitiators ($df = 439$, $F = 5.00$, $P < .01$), but the main difference was with the noninitiators ($P < .05$ level).

Table 2 presents detailed data on the specific types of broadcast media, print media, and participatory groups used as communication sources in general by the population. TV news and soap operas and radio music programs were particularly popular.

Data show that about 94 percent of households in the Tijuana region own at least one radio, a higher percentage than the 70 percent radio ownership in Mexico as a whole (*14*). Tijuana listeners can receive a total of 44 commercial radio stations, 21 from Mexico and 23 from the United States. In addition to the 44 commercial radio stations Tijuana receives 3 cultural stations, 2 Mexican and 1 from the United States (*14*).

Research has shown that less educated women in Tijuana listen more to radio, whereas more educated women watch more television. Also, low socioeconomic groups prefer local productions to programs imported from the United States (*15*). Radio programming is mostly music (about 80 percent of the time), and advertisements fill 6 to 12 percent. Research also shows that 13–17-year-olds prefer English rock music, whereas the majority of people ages 18–24 prefer Spanish *baladas* (ballads), and people ages 24 and older prefer *rancheras nortenas*, *tropicales*, and *baladas* (*14*).

According to Mexican law, 3 to 4 percent of radio programming must be allocated to government messages and between 2 to 4 percent to news (*16*). Although regulations require a certain minimum amount of state-supplied educational, cultural, and public service programming to be carried free on each radio station (rules which also apply to television), rarely, if ever, has the government provided its full quota (*17*).

Mass media in Mexico are privately owned and commercially operated. Both television and radio are characterized by ownership concentration. State-run efforts have never posed a competitive threat to the private industry (*17*). For example, the private conglomerate, Televisa, has a 90 percent share of the television audience. On the other hand, Imevision, the government owned stations, captures only 2 percent of the viewers (*18*).

Table 2. General communication patterns of Tijuana women

Source	Percent
TV programs	
News	72
Soap operas	76
Films	70
Female program	33
Musical	42
Children	45
Talk shows	43
Health	45
Community service	33
Radio programs	
News	59
Music	80
Talk shows	36
Community service	26
Soap operas	13
Religious	9
Health	34
Print media	
Story books	23
Magazines	33
Newspapers	35
Weekly or monthly group	
Church	43
Neighborhood group	16
PTA	12
Union	2

Studies show there is very little information, if any, about health on commercial media and when available it is mostly about mental health. The health information that is presented relates to poverty, illiteracy, promiscuity and bad living, and hygienic conditions. Yet no solutions are offered, and there is a sense of fatality in the reporting of health issues. Advertising on radio stations, in particular, promotes consumption of unhealthy products such as alcohol and junk food (*19*).

Communication Intervention

An education intervention in prenatal care was designed to address four basic needs identified in the study: (*a*) encourage use of early prenatal care, (*b*) provide information regarding appropriate weight gain during pregnancy, (*c*) promote good nutrition plus the use of vitamins to prevent anemia during pregnancy, and (*d*) improve women's skills in the identification and management of risk factors during pregnancy to prevent complications. The message design process was guided by persuasion theories including Petty and Cacioppo's elaboration likelihood model, McGuire's persuasion matrix, and Bandura's social learning theory.

Petty and Caccioppo's elaboration-likelihood model (*20*) suggests that persuasion is likely to occur when the communication issue has personal relevance for an audience and when recipients have great need for cognition. These authors argue that attitudes formed under conditions of high personal relevance are more predictive of behavior change than attitudes formed under conditions of little personal relevance or low need for cognition (*21*). Thus a primary goal of the intervention was to highlight the relevance of healthful prenatal care behaviors to the target population.

McGuire's persuasion matrix describes the process of persuasion as that of persons moving from a state of unawareness of the message being promoted through awareness and attitude change to behavior change (*22*). The intervention identified the key messages that needed to be communicated and organized them to provide information to increase awareness, change attitudes, and modify prenatal care behavior among the target population.

Bandura's social learning model argues that people often change behaviors by imitating the behavior of role models (*23*). These models are highly effective when they are similar, yet slightly more attractive than the target audience by creating identification (*24,25*). Thus for the intervention we chose attractive characters similar to the target audience performing the desired prenatal care behaviors.

Based on the first need, that is, to encourage use of prenatal care, messages were designed to communicate that women should have a prenatal care examination at least three times during pregnancy: at the beginning of the pregnancy, in the middle, and towards the end. The rationale for this decision was a compromise between the medical ideal of monthly visits during pregnancy and the sample's socioculturally determined conditions of late or no visits at all. If women were making relatively few visits anyway, the detection of high-risk conditions may be the most important function of prenatal care. For this purpose, women should be seen as soon as possible in pregnancy and then again in the middle and last stages of pregnancy. The importance of starting prenatal care early in the pregnancy and the need for some basic continuity of care were emphasized.

With respect to the nutritional needs identified by the survey, a message was designed to communicate the importance of gradually gaining between 10 and 12 kilos during pregnancy (significantly more than the weight of the fetus). Messages to prevent anemia through good nutrition and taking vitamins were designed to address nutrient requirements.

Finally, the intervention included messages encouraging women to consult a physician if, during pregnancy, they noted any of the aforementioned high-risk symptoms such as headaches, vaginal bleeding, weight loss, and so forth. Specific messages were designed to address the lack of information, as well as the misinformation about risks (that is, their belief that eclipses can hurt the fetus) found in both the ethnographic study and the survey.

The choices of media were made based on the availability and structure of mass media in the Tijuana area, the research findings, and material and time constraints. For example, television was identified by the survey and other sources of information on local use of media (*16*) as widely used and an important source of health information. Nevertheless, the cost of television productions made them unfeasible, given the project's budget and time constraints.

Also, radio, a much cheaper medium, is more widely used among poor Tijuana women than television (*15*). In addition, radio had been identified by the ethnographic study as an important source of health education. Therefore, radio was selected by the project team as one communication channel appropriate for disseminating prenatal care messages to the target population. Because the usual radio format is interspersed with much advertising and occasional news announcements, songs were selected as the format to carry the prenatal care messages on the radio, and *ranchera* music was selected as the rhythm for the project's songs because of its popularity among the target population.

A poster, a calendar, a health pamphlet, and two popular songs for radio were selected as the channels most likely to grab the attention and influence the target audience. These channels were also found to be well suited for communicating the kinds of messages designed for the intervention. In addition, they provided the possibility of combining attractive visual components with relevant text. Each channel complemented the other in the persuasion process, from simple relevance enhancement to encouraging behavior change.

The poster and the calendar responded to the preference for visual materials expressed by the target audience. The pamphlet was selected because the audience identified this medium as an important source of health information. These three

channels of communication also offered the advantage of least cost (or lesser cost than other channels) and potential for reinforcement of information.

The poster's communication objective was to increase the personal relevance of prenatal care to the population by emphasizing both the seriousness of pregnancy and how to get more information. The need to increase a sense of personal relevance was based on Petty and Cacciopo's argument that if a person perceives an issue as highly relevant, chances of persuasion occurring will increase. The poster was a visually attractive and culturally appropriate way to capture the attention of members of the audience, communicate these key messages, and highlight the idea of prenatal care importance.

It pictured an attractive young pregnant woman from Tijuana. The text in Spanish included the message, "El Embarazo es cosa seria, informate y cuidate," (Pregnancy is a serious matter, obtain information and take care of yourself) and a call to action: "Busca la atencion medica al principio, a mediados y al final del embarazo" (Look for medical care at the beginning, at the middle, and at the end of your pregnancy). The Spanish text has a crisper and more to-the-point feeling than the English translation. As per findings from the ethnographic study, the call to action included the exact words used by women in Tijuana to identify pregnancy stages.

The calendar was designed to provide cues to action and to model the four main areas of need identified by the survey and ethnographic study: use of prenatal health services, weight gain in the mother, anemia, and risk prevention. For the calendar, aesthetically attractive visual elements were balanced with written information about prenatal health behaviors and self-care in each of the four areas. Given the ethnographic finding that calendars frequently served to decorate women's homes, the aesthetic value of the calendar was pretested repeatedly in focus groups. The calendar format was developed as a means to communicate more directly with women since they could hang the calendar in the home and therefore be exposed to the messages more frequently.

The calendar's visual images depicted sources of health information favored by target audiences in the ethnographic study and the survey, such as physicians, spouses, and mothers performing the behaviors advocated by the intervention. The calendar was produced based on Bandura's modeling concept from social learning theory. The visualization of appealing characters performing the desired behaviors would increase chances of obtaining change in prenatal care behavior.

'. . . radio, a much cheaper medium, is more widely used among poor Tijuana women than television. In addition, radio had been identified by the ethnographic study as an important source of health education.'

McGuire's persuasion matrix, which states that a change in the level of information can result in attitude and in behavior change, was the basis for a health pamphlet developed to strengthen the cognitive dimensions of the persuasion process. The pamphlet gave more detailed information about the four main areas included in the calendar. For example, in relation to risk prevention, the brochure provided more in-depth information about pregnancy risks identified by the research, their symptoms, and what to do about them. The text featured a series of simple questions and answers. Each answer provided positive arguments about the reasons why actions suggested in the poster and the calendar were important for a healthful pregnancy outcome. The same photograph was used for the brochure's cover and the poster to tie them together. This brochure was designed for distribution through public health services, community organizations, private physicians, clinics, and local TV and radio stations.

Finally, an audio cassette with two songs using attractive *ranchera* rhythms were also developed. These songs were aimed at encouraging behavioral change by dramatizing nutritional aspects of the intervention. The songs were recorded on audio cassettes and made available to radio stations in Tijuana.

After selecting the media and the messages that needed to be communicated to the target population, drafts of several formats and contents for the calendar, the poster, the brochure, and the songs were designed, pretested in focus groups, and then produced in their final format.

In conclusion, the Tijuana prenatal care intervention was designed by an interdisciplinary and cross-cultural team that combined technical proficiency in qualitative and quantitative research and expertise in the production of communications materials with familiarity and contact with the target popula-

tion (bilingual, bicultural, and binational). The extensive research was a special effort to identify and produce a culturally appropriate intervention in prenatal care.

Several private organizations in Tijuana and in the United States have agreed to fund the reproduction of these materials and to disseminate them in Tijuana and similar communities. This project represents only a first step in a communication intervention process. Dissemination of these materials and evaluation of their effectiveness are necessary steps to complete this process.

References

1. Bragonier, J. R., Cushner, I. M., and Hobel, C. J.: Social and personal factors in the etiology of preterm birth. *In* Preterm birth: causes, prevention and management, edited by F. Fuchs and P. G. Stubblefield. Macmillan Co., New York, 1985, pp. 64–85.
2. Romito, P., and Hoverlaque, F.: Changing approaches in women's health: new insights and new pitfalls in prenatal preventive care. Int J Health Serv 17: 241–258 (1986).
3. Bobadilla, J., and Langer, A.: La investigacion de la salud perinatal en Mexico. Salud Publica Mex 30: 3–5 (1988).
4. Jasis, M.: Perfil de opinion y servicios de salud materno-infantil en Tijuana. Salud Publica Mex 29: 73–83 (1987).
5. Pabon, L. H., and de Restreppo y Munoz, R.: Influencia de los medios de comunicacion masiva en la cobertura de una campana de vacunacion. Bol Of Sanit Panam 101: 39–47 (1986).
6. Alcalay, R.: Health education perspectives in Latin America. Health Promo 2: 283–288 (1988).
7. Gruning, J. E.: Publics, audiences and market segments: segmentation principles for campaigns. *In* Information campaigns: balancing values and social change, edited by C. T. Salmon. Sage Publications, Newbury Park, CA, 1989, pp. 199–228.
8. Scrimshaw, S., and Hurtado, E.: Rapid assessment procedures for nutrition and primary health care: anthropological approaches to improving programmes. UCLA Latin American Center Publications, University of California, Los Angeles, 1987.
9. Abundis, R., et al.: The use of focus groups in developing prenatal health education materials in Tijuana, Mexico. Food Nutr Bull 12: 120–127 (1990).
10. Jasis, M.: Creencias y tradiciones sobre salud prenatal. Centro de estudios fronterizos del norte de Mexico. Tijuana, Mexico, 1985.
11. Scrimshaw, S., et al.: Prenatal health behaviors in Mexico and mass communication/education strategies for improvement. Final report for the International Center for Research on Women, Washington, DC, 1989.
12. Alcalay, R., et al.: Patterns of mass media use among Hispanic smokers: implications for community interventions. Int Q Community Health Educ 8: 341–350 (1988).
13. Greenberg, B. S., et al.: Mass media use preferences and attitudes among young people. *In* Mexican Americans and the mass media, edited by B. S. Greenberg, et al. Ablex Publishing Corp., Norwood, NJ, 1983, pp. 147–201.
14. Lozano, J. C.: Prensa, radiodifusion e identidad cultural en la frontera norte. Cuadernos COLEF, Colegio de la Frontera Norte, Tijuana, Mexico, 1991.
15. Malagamba, A.: Procesos de recepcion en la frontera norte. Un enfoque descriptivo. Cuadernos COLEF, Colegio de la Frontera Norte, Tijuana, Mexico, 1986.
16. Iglesias, N.: Medios de communicacion en la frontera norte. Fundacion Buen Dia, Mexico, D.F., 1990.
17. In the shadow of Buendia. The mass media and censorship in Mexico. Article 19 report, International Center on Censorship, London, 1989.
18. Mexican tv titan bids for Spanish network in U.S. Sacramento Bee, Aug. 9, 1992, p. F1.
19. Menendez, E. L.: Medios de comunicacion masiva, reproduccion familiar y formas de medicina popular. Centro de Investigaciones y Estudios Superiores en Antropologia Social. Cuadernos de la Casa Chata, No. 57, Mexico, D.F., 1982.
20. Petty, R. E., and Cacioppo, J. T.: Attitudes and persuasion: classic and contemporary approaches. William C. Brown, Co., Dubuque, IA, 1981.
21. Petty, R. E., and Cacioppo, J. T.: The elaboration likelihood model of persuasion. *In* Advances in experimental social psychology, edited by L. Berkowitz. Academic Press, New York, 1986, pp. 123–205.
22. McGuire, W.: Theoretical foundations of campaigns. *In* Public communication campaigns, edited by R. E. Rice and C. K. Atkin. Ed. 2, Sage Publications, Newbury Park, CA, 1989, pp. 43–65.
23. Bandura, A.: Social learning theory. Prentice Hall, Inc., Englewood Cliffs, NJ, 1977.
24. Cialdini, R. B.: Influence: science and practice. Scott Foresman, and Co., Glenview, IL, 1988.
25. Devine, P. G., and Hirt, E. R.: Message strategies for information campaigns: a social psychological analysis. *In* Information campaigns: balancing values and social change, edited by C. T. Salmon. Sage Publications, Newbury Park, CA, 1989, pp. 229–258.

Equipment

A. The Ethnograph, Qualis Research, 611 E. Nicholas Dr., Littleton, CO 80122.