

CHANGING TRADITIONS: PREVENTING ILLNESS ASSOCIATED WITH CHITTERLINGS

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Social marketing of theory-based interventions should have greater impact on targeted populations than non-theory-based, non-targeted interventions (Andreasen). This paper presents a theory-based evaluation of a public health problem and the design and implementation of an intervention using social marketing strategies.

In 1989, a severe form of diarrhea in African-American infants caused by the bacterium *Yersinia enterocolitica* (*YE*) was first associated with preparation of chitterlings (pork intestines or chitlins) in the home (Lee 1990). An informational intervention, including flyers and short lectures, was designed for dissemination through Women Infant and Children (WIC) clinics each November and December in metro Atlanta (MMWR). The intervention emphasized hand washing and protection of children from exposure to chitterlings. The trend in numbers of cases was followed at one hospital, our sentinel hospital, that regularly cultures stools for *YE* bacteria in all cases of diarrhea. Data collected during 1996 by the Georgia Department of Human Resources (GA-DHR) showed that yearly winter peaks of cases were continuing despite the WIC-based intervention.

In August 1996 it was decided to try a social marketing approach to prevent the next holiday outbreak of chitterlings-associated *YE* diarrhea cases. Formative research included literature reviews, community focus groups, and interviews. The literature reviews included medical, epidemiological, microbiological, and agricultural (pig/pork) studies. Phone and personal interviews were conducted with pork producers and with food safety experts at the United States Department of Agriculture (USDA), the Food and Drug Administration (FDA), and the Centers for Disease Control and Prevention (CDC).

Community focus groups and interviews were conducted at a retirement center, a clinic waiting room, a grocery store, and churches. Preparation and hygiene practices, cultural views of chitterlings preparation, and age-related handling practices were elicited. Participants were informed about the annual outbreaks and the literature review findings and then were asked to discuss two questions: "How do you think the bacteria are being transmitted to the small babies?" and "What could we do to prevent this transmission?".

The women themselves identified hygiene breaks, either during refrigeration or during the long hours of cleaning the chitterlings, as the likely method of transmission to children. These hygiene breaks varied but were evident in each preparation story. Two specific preparation methods with potential for preventing disease transmission were identified during the focus groups and interviews: 1) wash chitterlings in low concentration of bleach-water during the hours of cleaning and 2) briefly pre-boil chitterlings before cleaning. These potential interventions were evaluated in home cleaning and cooking trials and by laboratory culture studies. Barriers to acceptance of the interventions were assessed via follow-up phone interviews.

The home cleaning and cooking trials confirmed observations from the formative research. Perfect hygiene was very difficult (impossible) to maintain, even when awareness of disease-causing bacteria in chitterlings was high. Pre-boiled chitterlings were found to be easier and faster to clean than raw chitterlings.

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A microbiological study was done of levels of *YE* bacteria present in different commercially available preparations of chitterlings and in chitterlings samples taken after implementing the two preparation interventions. The commercially available chitterlings varied in the amount of bacteria found, but all kinds carried some risk of exposure. (Pre-cooked chitterlings, which are available commercially, were not tested because they are 3-5 times as expensive as other types and were unacceptable in taste and texture to focus group participants.) The first potential intervention, bleached chitterlings, were not consistently lower in bacterial counts than the chitterlings from which they were taken. The second potential intervention, home pre-boiled chitterlings, grew no bacteria of any kind in any of the samples and met the necessary health criteria of killing bacteria in the chitterlings. Pre-boiling removed the potential of transmission in the refrigerator and around the kitchen during and after the cleaning process. Because of this confirmed efficacy and community origin and acceptability, the intervention chosen for dissemination was "Pre-boil your chitterlings for 5 minutes before cleaning and cooking as usual".

From the formative research and follow-up interviews a behavioral theory evaluation was done (Glanz), primarily based on the Health Belief Model (HBM). Perceived threat was almost non-existent. While chitterlings were acknowledged as "dirty" and with potential for disease transmission (one "doesn't eat just anybody's chitterlings" because they might not be safe), most interviewees did not have any experience or knowledge of *YE* diarrhea. This is probably due to the fact that the incubation period is long (Lee 1991) and the exposure is environmental rather than direct (the cases are small children who did not eat chitterlings). There are strong cultural traditions surrounding chitterlings preparation. This is a holiday food with preparation practices and recipes passed down through the generations. Interventions changing traditional practices suggested from outside the community are unlikely to be accepted. Perceived self-efficacy, in maintaining meticulous hygiene, is high among older women despite reported hygiene breaks and a distinct generation gap in hygiene practices and self-efficacy in chitterling preparation is described by both older and younger focus group participants. In contrast, perceived self-efficacy is low, with external locus of control, for prevention of diarrhea in small children.

The primary intervention, the innovation to be diffused (Table 1), was the pre-boil message to be targeted to the chitterling preparers: older African-American women who prepare chitterlings and who, as grandmothers, are often care givers for infants. The design of materials for this target audience again was based heavily on the HBM, cognizant also that the materials would need to move the target audience through the Stages of Change model from precontemplative to action in order for the initiative to be effective. Perceived threat was addressed in describing the outbreaks and demographics of cases. Perceived severity was included by case description of symptom severity and hospitalization rates; one infant death had occurred during a previous outbreak. Barriers identified during the formative research were addressed with specific pieces of information to overcome each of the major barriers. A major barrier to trying the pre-boil innovation was the expectation that boiling chitterlings before cleaning would "boil in the dirt" and change the taste. Perhaps for the first time in a nutritional intervention, a taste test was done which showed home pre-boiled chitterlings to be indistinguishable from usual preparation methods. As a holiday food, it was important that home cooking of chitterlings could still be part of the holiday preparation and that the preparation method came from traditions already being practiced by the community. Implicit modeling by community grandmothers as the acknowledged source of the intervention and collaboration with the Office of Minority Affairs gave more "ownership" of the intervention to the community. Previous intervention messages had suggested removing children from the home during the entire time that chitterlings were

being prepared - a matter of many hours. The pre-boil message required their removal only for the five minutes of pre-boiling and kitchen clean-up. The safety of the children (health benefit) now did not have to be weighed against the barrier of finding alternative child care for extended periods of time (Multiattribute Utility {MAU} Theory). A secondary (non-health) benefit of pre-boiling was that it made cleaning both easier and twice as fast. Once tried, this secondary gain was expected to maintain the acceptability of the innovation. Self-efficacy in the new procedure was encouraged by very simple step-by-step instructions on flyers and brochures.

The promotional materials designed for diffusing the innovation included flyers, cartoon flyers, cartoon stickers, brochures, a case story, public service announcements, news releases and television news features. In planning the diffusion of these materials, it became clear we had two other target audiences as well: Health Care Providers and a heterogeneous group of "Gatekeeper /Community Leaders" (Table 1). The desired actions (product), barriers, and benefits (price), promotion and place (Lefebvre) were different for these groups than for chitterlings preparers and so additional materials were designed to address these two target audiences: sub-group specific cover letters, a medical fact sheet, and personal and/or phone presentations to decision makers. For example, the action desired for church leaders was willingness to hand out materials to the congregation. Working from the Health Belief Model, the cover letter explained the susceptibility and potential severity of the problem and the ease (lack of barriers) and benefit of the proposed intervention.

Table 1: Summary of Target Segments and Focused Interventions

TARGET POPULATION	PRODUCT	PRICE	PROMOTION	PLACE
Chitterlings preparers	Message	Perceived Barriers	Cartoon Flyers	Grocery stores
Primarily older African-American women in metro Atlanta	Pre-boil chitterlings before cleaning	Change from traditional technique	Walk-by eye-catching	Point of sale reaches chitterlings purchasers
		Perceived change in taste	Flyer/bulletin insert	Churches Targets church goers.
		Extra 5 minutes of up-front work	Short read: problem & community solution	
		Perceived Benefit	Brochure	Churches trusted source
		Community ownership as source of technique	Full info for interested readers	Health Care providers
		Taste test showed no change in taste	News release	Doctors, hospitals, county clinics, WIC Waiting rooms
		Faster / easier overall	PSA: Public service announcements Newspaper articles Radio talk show TV news spots	Media
Safer for children				
Child care issues avoided		Focus on new problem with a simple community solution	<u>Targeted:</u> Gospel station talk show	

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TARGET POPULATION	PRODUCT	PRICE	PROMOTION	PLACE
Community leaders / gatekeepers Heterogeneous group having authority to allow dissemination of information	Allow and encourage message dissemination to target group within their sphere of influence	Perceived barriers Extra work Potential political or economic repercussion Perceived benefits Image of promoting safety of children DHR did most of follow-up work	Cover letters for each sub group News release Medical fact sheets Samples of brochures & flyers Can evaluate what they are being asked to distribute Presentation In person/phone to address questions	Grocers' associations & large chains Point of sale distribution Church Associations Posting, bulletin insert, pulpit announcements Media Timely awareness of preventable health
Health Care providers Private doctors County clinic nurses & environmentalists WIC nutritionists Hospital infection control nurses & epidemiologists	To take exposure history and culture for YE in appropriate cases Disseminate prevention message	Perceived barriers: Requires awareness & asking about chitterling exposure Extra cultures & cost Perceived benefits: Correctly diagnosis YE Earlier treatment YE Simple prevention message	Cover letter Medical fact sheets News release Samples of brochures & flyers Distribution to their patient population Presentations In person/phone to address questions	Work place /office From supervisors State Epidemiologist Research investigator Emphasis on new, well documented medical information and timeliness of prevention issues

- PLACE**
- grocery stores
 - Point of sale reaches chitterlings purchasers
 - churches
 - targets church goers,
 - churches trusted source
 - Health Care providers
 - doctors, hospitals, county clinics, WIC waiting rooms
 - Media
 - targeted: Gospel station talk show

Pastors and church leaders had to make their own judgement as to whether they perceived their own congregation as matching the described population at risk.

Over a one and a half month period, from mid-November to the end of December, the promotion was implemented through the locations listed in the table. Penetration of the market increased week by week as gatekeepers gave permission and facilitated dissemination of the promotion. The efficacy of the project was limited by several factors: less than adequate time to fully design and pilot each of the materials, late and incomplete penetration of the market (at least one high risk market refused to post flyers), and the immensity of moving a target population from pre-contemplation to action in a short time frame.

It was expected that health care providers would increase their efforts to find and diagnose cases of diarrhea in response to the message targeted for them and we would see an apparent increase of cases (increased reporting). If the community implemented the intervention, they would reduce their exposure to the bacteria and reduce the true number of cases of severe diarrhea in small children. The number of cases reported in our sentinel hospital was followed to evaluate the impact of the intervention (surveillance) and would be the balance of the two competing factors. The outbreak season begins in November but our intervention didn't begin until mid-November. Cases exposed before mid-November would begin to get sick through the end of

November and be diagnosed at the beginning of December. The period of intervention effect would then be expected to begin in mid- December 1996. Compared to 1995/96 the number of cases prior to intervention effect was slightly higher this year, especially noticeable was the Thanksgiving peak (at the beginning of December). However, post intervention there is no Christmas peak, as there was the last year, and the number of cases was lower during this period (11 cases) than for the same weeks last year (16 cases), despite increased surveillance by doctors. While the decrease is not statistically significant, these are suggestive of some intervention effect.

Feedback from the target audiences was anecdotal. Gatekeepers and health care providers for the most part approved and helped promote dissemination of the intervention. They included: two grocery retail associations, several large chain grocery stores, a number of African-American clergy associations, and the major pediatric hospitals. Two of three stores surveyed had flyers posted next to the chitterlings. All the hospitals pre-approved distribution of brochures and distribution was verified at four of six medical centers. Several clinics and two churches requested extra copies of the materials. Some negative feedback came from mid-level health care workers who believed that the stated case demographics were racist. Over 90 percent of ascertained Atlanta cases are in the African-American population and the intervention materials identified African Americans as the target group. The primary target was receptive to the intervention message - returning to a clinic in one instance to get more brochures for family members in other states. The only negative response received from the community was a woman unmoved by the results of the taste test, who was convinced that the taste would change and refused to try pre-boiling.

This social marketing approach to a food related health problem was well received and results suggest effectiveness greater than previous non-targeted interventions. Project objectives were met in that new information, both microbiological and behavioral, was obtained, on transmission and potential interventions. The message was designed for (addressed specific barriers and benefits) and was liked by the primary target audience. Implementation of the intervention was widespread and done at low cost, despite the short time frame for assessment and innovation design (three months from formative research to beginning of the outbreak season) and late market penetration. While modest, this apparent success in the pilot intervention is encouraging. Expansion of this program to include rural (including white) target audiences statewide is planned.

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