

## Fourth Dr Abraham Horwitz Lecture

### What makes the difference? Applying the positive deviance approach to improve pregnancy outcomes

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I am honored to have been selected to deliver the *Fourth Dr Abraham Horwitz Lecture*. Dr Horwitz is a legend in the field of nutrition and a role model for many of us in the younger generation. I had the privilege of meeting Dr Horwitz two weeks ago in his home here in Washington. With the kind efforts of Alan Berg, we were able to see the cherry blossoms together. In India, we use the term *darshan* to describe a meeting with an inspirational person. Meeting Dr Horwitz was for me an experience of *darshan*.

During this Lecture I would like to show how use of the positive deviance concept and methodology can improve pregnancy outcomes. It could be said that wherever this method has been tried, there have been promising and successful results.

First, the concept of positive deviance and its use in developing countries to improve child growth will be introduced. Then the critical importance of the pregnancy period in the nutritional life cycle will be discussed briefly. Finally, the outline of a proposal to utilize positive deviance to reduce intrauterine growth retardation and low birthweight will be presented.

#### **Positive Deviance Based Nutrition Activity to Date**

The pioneering work on the application of the positive deviance concept to nutrition was carried out by Professor Marian Zeitlin at Tufts University in the late 80s. The concept of positive deviance draws upon both the importance of behavioral change in nutrition as well as the importance of accentuating the positive. The role of behavioral change was well articulated by Alan Berg, former senior nutrition advisor to the World Bank who wrote in his book, *The Nutrition Factor*<sup>1</sup>, "An important part of the nutrition gap is the information gap. Although lack of purchasing power is a major constraint, many nutritional deficiencies would be moderated if people knew how better to use the resources already at hand." Positive deviance shows people how to accomplish this. Poverty is not necessarily an over-riding constraint when using the positive deviance approach. The positive deviance approach points out that people can succeed nutritionally in low-income communities. The positive deviance approach attempts to show that the resources needed to succeed nutritionally are often available in the community. The "positive deviants" are utilizing these resources effectively.

The importance of stressing the positive was underlined by former Harvard Professor Mark Hegsted in 1967 who advised that "we should pay a great deal more attention to the

reasons for nutritional successes rather than nutritional failure."

Application of the positive deviance approach to nutrition evolved out of the observation that most poor communities include impoverished families with well-nourished children.<sup>2</sup> This observation, in turn, raised the question of how do some poor families have well-nourished children when their neighbors do not? That is, what is their "deviant" behavior? Zeitlin suggests that these deviant characteristics may be behavioral, social, psychological or physiological. Most prior research focused on problems. Positive-deviant research centers on solutions. The positive deviance approach works with the surroundings of the citizens and deals with their limitations and also their potential.

Utilization of this concept focusing on child growth at the community level has been undertaken with considerable success by the US-based nongovernmental organization Save the Children, with support from various donors including USAID, UNICEF and several corporations and universities. In Save the Children's own words, "Positive deviance is a developmental approach that is based on the premise that solutions to community problems already exist within the community".<sup>3</sup>

The basic positive deviance model adapted by Save the Children involves growth monitoring promotion (GMP) every two months for every young child. Specific age coverage varies slightly from country to country. Children falling below  $-2SD$  in weight-for-age enter a two-week Nutrition Education and Rehabilitation Program, or NERP session, with their mothers. The NERP session itself is modeled on the "Hearth" model developed by Drs Warren and Gretchen Berggren in which, ideally, positive deviance mothers themselves participate in the counseling of mothers of malnourished (low weight for age) children, and in which mothers bring a portion of the raw food which will be prepared into nutritious meals.

Children who remain moderately or severely malnourished at the conclusion of the NERP session are automatically enrolled in the next session. An average positive deviance project employed by Save the Children might have four GMP sessions and four NERP sessions and continue for a period of one year.<sup>4</sup>

It is worth noting that this model differs conceptually from those followed in large scale, multi-year nutrition projects in Bangladesh, India, Indonesia, and Tanzania. It differs not only in the use of the positive deviance concept but also in



the premise that intensive daily meal-based sessions (usually a complete meal plus counseling lasting two hours) will produce dramatic improvements in a short period of time.

The basic model of GMP and NERP sessions is complemented by additional activities in particular countries. In Vietnam a Nutritional Revolving Loan Program provides credit for poultry activity to the households of children failing to graduate after two NERP cycles. Vietnam is also initiating a project that addresses healthy pregnancies for new mothers similar to that being proposed in this *Lecture*. In most countries, these efforts are integrated with complementary immunization, disease control, micronutrient, deworming and family planning activities provided by Save the Children and other organizations.

Finally, positive deviance programs in several countries are experimenting with what is called a "Living University" in which staff and volunteers from project areas train counterparts in new areas to facilitate project expansion. The positive deviance approach is employed currently in 15 countries. Vietnam and Egypt will be used as examples.

The results of these positive deviance-based nutrition projects have been dramatic. The Poverty Alleviation and Nutrition Program (PANP), the project in Vietnam, resulted in a 40% reduction in malnutrition of children under the age of three, and a 68% reduction in the prevalence of severe malnutrition. The pilot program moved 3092 children out of moderate or severe malnutrition to mild malnutrition.<sup>4</sup> Now the program has expanded to about 108,000 children.

In Egypt projects of 12 months duration reduced the prevalence of moderate and severe malnutrition from 47% to 13% in one area and to an astonishingly low 1.4% in another.<sup>5</sup> Of children "who graduated" from NERP sessions in Egypt, none relapsed during the year of project operations. The pilot program covers about 1000 children. Although data on behavioral change has been limited to date, studies indicate that messages have been disseminated effectively.

In such short duration projects, sustainability is of critical importance. Sustainability here means that once the NERP sessions have ended and the organization leaves the project area, the messages taught are still applied and improved nutritional status is maintained. The results to date have been noteworthy. In Vietnam, an assessment of sustainability found that three years after the termination of project services, the nutritional status of project participants remained higher than that of matched controls. Even more impressive was the finding that siblings of these children, who had never been exposed to the program were also much better nourished than age-and gender-matched controls. The caretakers also fed their children, the younger siblings more meals per day on average than their comparison counterparts. In Egypt, recent data suggests that sus-

tainability may require some minimal follow-up for message reinforcement. Where such follow-up was in place, malnutrition prevalence increased by only 1.6 percentage points in 14 months. Where follow-up was absent, prevalence increased by ten percentage points in less than one year.<sup>5</sup>

While the annual cost per child, using direct cost data from the Egypt project, is roughly three times higher than World Bank-assisted projects in South India and Bangladesh, the short duration and high impact of positive-deviance projects makes them comparable in terms of overall cost-effectiveness. Comparable projects assisted by World Bank provide supplements only. Positive-deviance projects on the other hand provide full meals and counselling to all enrolled children who are moderately and severely malnourished. The positive-deviance program is considered permanent rehabilitation. This means that because mothers are being educated and behaviors are targeted, improved nutritional status will be maintained and relapse will be infrequent. There are two additional outcomes of this program. In Vietnam, at least one more family member of each child is included as an indirect beneficiary. Also, there is anecdotal evidence that a significant number of deaths are avoided due to the program.<sup>6</sup>

In Vietnam, PANP provides education through role modeling and hands on experience, enabling women to learn from each other in the community. It reinforces good habits already in existence. PANP is based on the belief that in order for development gains to be sustainable, strategies and solutions to community problems need to be identified *by community members themselves*.<sup>3</sup> The positive deviance model respects the culture, thus making the program more easily accepted in the community. These programs involve the community heavily from the outset. They use existing infrastructure and community health workers, and organize women in focus groups for their mutual support.

In the positive-deviance model, society is paying attention to positive role models and using them to assist others in their own community to reach the next level.

The positive-deviance method has been utilized to rehabilitate malnourished children. It is proposed now to improve pregnancy outcomes; specifically to prevent intrauterine growth retardation and to reduce the number of low birth-weight babies.

### ***The Case for a Positive Deviance Based Pregnancy Intervention***

The importance of reducing intrauterine growth retardation (IUGR) and improving pregnancy outcomes hardly needs recounting for those in the international public health arena. Suffice it to say, that low birth weight, a prime result of IUGR, has been closely associated with growth retardation, poor mental performance, morbidity and mortality during childhood<sup>7</sup> it may also increase susceptibility to chronic dis-

eases including cardiovascular disease, diabetes mellitus and hypertension, which in turn affects adult productivity and mortality.<sup>8</sup>

Some 30 million infants born each year in developing countries have experienced intrauterine growth retardation.<sup>9</sup> In the developing world as a whole, one in five newborns will be low birthweight. In Sub-Saharan Africa, the figure is one in six. For South Asia, the area of the world contributing the largest number of low birthweight infants, the figure is as high as one in two – in Bangladesh for example.

It is also clear that maternal malnutrition is in large part responsible for IUGR and low birth weight, and poses an enormous risk for reproductive age women themselves in developing countries. Indeed the health-related indicator with the greatest differential between developing and industrialized countries is maternal mortality with rates often 100 times higher in poorer countries. Effective project activity addressing malnutrition before and during pregnancy not only would reduce rates of maternal mortality but would also reduce nutritional depletion that often occurs over the course of successive pregnancies. Dr Roger Shrimpton<sup>10</sup> (formerly of UNICEF), in a review of global low birthweight prevention, concludes by saying, "I now see low birthweight prevention as the critical missing link of programs designed to improve both maternal and child survival and development. In many developing countries, there seems to be an obvious relationship between rates of low birthweight and rates of both child malnutrition and maternal mortality."

It is important to note that affecting birthweights through pregnancy interventions is more complex than we once believed and certainly far less linear than the relationship between child nutrition interventions and child growth. Nonetheless there is broad acknowledgement that addressing maternal malnutrition during pregnancy will have positive effects whether they manifest themselves in pregnancy weight gain, birthweight, survival of offspring or growth of offspring.

Because so many of the determinants of IUGR and low birthweight are behavioral, activities oriented towards behavior change, such as the positive deviance-based program of Save the Children, would appear to have a comparative advantage in addressing the problem, at least in countries where maternal malnutrition is not strongly income determined. Among the behavioral factors associated with IUGR are age of first pregnancy, inadequate birth spacing, absence of prenatal care, inadequate energy micronutrient intake prior to and during pregnancy, inadequate daytime rest during pregnancy and smoking or alcohol consumption during this period. These behaviors can all be targeted during the prenatal period.

Data collected in March 2000 in Egypt in communities which have participated in Save the Children's positive deviance-based projects geared to children, indicate clearly

the opportunities that exist to influence some of the behavioral determinants of low birthweight. While only two to six percent of women reported consuming more food than usual during their last pregnancy, 25-40% reported intentionally consuming less than usual.<sup>5</sup> Only one third of these mothers had regular day time rest during their pregnancies, a finding associated with the fact that almost none received assistance from their husbands in relieving their work load. Finally only 46% received any prenatal care and only 39% received any micronutrient supplements.<sup>5</sup> Neither, to date, is routinely provided in that part of Egypt and both are usually procured from private practitioners rather than government clinics.

### ***A Positive Deviance Based Pregnancy Education Program***

In Vietnam, the Healthy Pregnancy and New Mother Program (HPNMP), implemented by Save the Children, has been able to reach 88% of pregnant women in the villages covered. The program met its objective of bringing about adequate pregnancy weight gain in over 60% of the women reached.

The adaptation of the positive-deviance program to pregnancy proposed in this *Lecture* would build on this work with pregnant women in Vietnam.

Rather than focussing on specific "positive-deviance food" as is often the case in Save the Children's child-based projects, this proposal would focus primarily on behaviors. The study question here would be: How do some mothers give birth to healthy babies when other mothers do not? What are they doing in the prenatal stage that makes the difference? Additionally, rather than focussing exclusively on pregnant women themselves as agents of change, my proposal would target mothers-in-law and husbands. The positive deviance program is envisioned to operate in this way. The aim of this study is to determine which behaviors and practices result in a healthy newborn. The objective would be to promote healthy pregnancies and safe deliveries in order to decrease the incidence of low birthweight babies.

Following appropriate village level discussions and volunteer training, the first step would be the positive deviance inquiry. This inquiry would be conducted by a team of interviewers. This would be accomplished by carrying out baseline surveys, in project and control areas, to collect data on body mass index (BMI) of women early in pregnancy, pregnancy weight gain and birthweights and/or the weights of infants under one month of age. Data would also be collected on each of the behaviors discussed earlier, plus information on age, educational level, parity, and socio-economic status of the women. All pregnant women in the community would be weighed and women with low body mass index would be enrolled in the program. Questions on feeding and caring practices, health



care seeking behaviors and knowledge of safer motherhood practices would also be asked. Analysis of this data would permit a determination of those positive deviant behaviors associated with adequate pregnancy weight gain and adequate birthweight among low-income women but practiced less often among lower income pregnant women as a whole. This quantitative data collection would be coupled with focus group discussion and key informant interviews and direct observation in homes in an effort to identify inappropriate practices which are unlikely to emerge from the baseline survey itself.

and pregnancy weight gain are the outcomes of interest in this positive-deviance based intervention program.

Given the vital importance of prenatal care and micronutrient provision, steps would also be taken in advance to assure that local health care facilities are capable of providing good care and are fully stocked with micronutrient supplies.

Primiparous or first time mothers are an ideal focus of such activity because first time mothers are new to child rearing and are likely to be open towards new information. It is an

### DYNAMIC MODEL OF THE PROGRAM

INPUTS	ASSUMPTIONS OF THE INPUTS	OUTPUTS	ASSUMPTIONS OF THE OUTPUTS	OUTCOMES (BEHAVIORIAL)	IMPACTS	BENEFITS
<ul style="list-style-type: none"> <li>□ PD mothers</li> <li>□ Training of Staff and volunteers</li> <li>□ PD foods</li> <li>□ PD behaviors</li> <li>□ assistance of local health clinics to assure capacity for ante-natal care and supply of micronutrients</li> <li>□ Physical center for activities</li> <li>□ project monitoring system</li> </ul>	<ul style="list-style-type: none"> <li>□ There are PD mothers and children</li> <li>□ Staff and volunteers understand concepts and are motivated to apply them</li> <li>□ Local departments of health and clinic staff are receptive to the approach and cooperative</li> <li>□ Pregnant mothers will complete the PEP</li> </ul>	<ul style="list-style-type: none"> <li>□ Monthly BMI screening for pregnant and newly married women</li> <li>□ Monthly recording of pregnancy weight gain for women already registered with counseling</li> <li>□ Utilization of ante-natal care and complementary services; supply of micronutrients</li> </ul>	<ul style="list-style-type: none"> <li>□ Periodic attendance of mothers-in-laws and fathers at project sessions</li> <li>□ Mothers, mothers-in-law and husbands understand messages and are motivated to change behavior</li> <li>□ Women do not substitute the project meal for food normally consumed at home</li> </ul>	<ul style="list-style-type: none"> <li>□ Changes in practices relating to positive deviant behaviors</li> <li>□ Increase in total daily intake of calories and micronutrients</li> <li>□ Women form continuing mutual support network</li> </ul>	<ul style="list-style-type: none"> <li>□ Improved birth weights</li> <li>□ Improved pregnancy weight gain</li> <li>□ Improved growth of offspring</li> </ul>	<ul style="list-style-type: none"> <li>□ Decreased maternal and child morbidity</li> <li>□ Decreased maternal and child mortality</li> <li>□ Sustainability of behaviors-mothers will apply to their second pregnancy</li> <li>□ Increased productivity in next generation</li> </ul>

The next step would be organizing daily counseling and food provision sessions for women with low BMI plus women who fail to gain 1 kg of weight from one monthly weighing to the next. The name IMPRESS is given to these daily sessions which stands for Improving Pregnancy through Education and Supplementation. These sessions will be lead by a Community Health Facilitator/Volunteer (CHF/V) selected from the local village and trained by the organization. The CHF/V would be a woman from the community -- a good role model. The meal itself made in part from ingredients contributed by participants and always in a form easily prepared in the home, would provide an incentive for mothers to attend the sessions and provide needed energy and micronutrients, hopefully increasing daily intakes. Mothers-in-law and husbands would be invited to a specified number of these sessions. Counseling focussing on positive-deviant behaviors, other key nutrition and health information and messages dealing with child care (including the importance of exclusive breastfeeding and the timely introduction of complementary foods) would be done both by local trained volunteers and by positive deviant mothers themselves. Incentives would be provided for the latter. Enrolled women would continue to attend these sessions until delivery. Also, follow up and monitoring of these women would continue after delivery. Birthweight

anticipated that they will be more likely to apply what they have learned during their first pregnancy in their subsequent pregnancies. In fact, given the importance of first pregnancies and pre-pregnancy nutritional status, the daily food provision and counseling sessions would be targeted to any newly married women with low BMI.

Finally this program would try to instill a strong sense of community among reproductive age women in the project area, and an ongoing sense of responsibility on the part of experienced and successful mothers to share their wisdom with younger mothers and those less successful. Even after conclusion of the project *per se*, a support network of reproductive age women might continue to share wisdom and offer encouragement thereby sustaining gains achieved in the project.

Monitoring and evaluation of the project can be carried out with reference to the project conceptual framework. The monitoring system would focus primarily on inputs and on outputs or service delivery. Project evaluation would compare the pre-post changes in behavior between the project and control areas, and ultimately the changes in impact indicators, specifically in pregnancy weight gain and birthweights between project and control areas. What would be

gained? There would be improvements in birthweight and growth in the offspring. There would also be a higher intake of food energy and increased weight gain during pregnancy. Mothers would be educated about healthy pregnancy behaviors and knowledge of safer motherhood practices would be enhanced. It is not just one baby that would be affected. Succeeding babies would also benefit. An entire generation could be affected. Because of this impact, benefits such as a decrease in maternal and child morbidity and mortality would result. In terms of impact, the analysis would be extended to examine the child growth during their first year of life. Here the positive deviance approach would be used as a preventive measure to prevent unfavorable developmental outcomes which so often accompany fetal malnutrition.

### Conclusion

The nutrition strategy first articulated by UNICEF in 1990 states that "the shortcoming of most nutrition-oriented programs to date is not the lack of well-documented interventions... It is rather the failure of most programs to explore fully how existing local skills and resources should be mobilized and supported in concert with technical interventions, in order to create an environment and a support structure that is more conducive to improved nutrition."

The positive-deviance concept as it has been applied to children and as it hopefully will now be applied on a larger scale to pregnancy outcomes, represents a prime means of doing just that- of utilizing skills, wisdom and life management techniques and approaches which have proven successful in a local context.

There is reason to believe that, as with the interventions geared to children, a positive deviance-based pregnancy intervention would be effective and if effective and sustainable with low levels of follow-up message reinforcement. The results could provide major benefit both to these mothers and to their offspring, improving their health and, in some instances protecting their lives. The next step for us is to encourage programs that focus on women, especially females of reproductive age.

In closing, the main message is, "positive deviance is an approach that would be able to improve pregnancy outcomes and thus reduce low birthweight babies." It is an activity worthy of Dr Horwitz and one worthy of this institution. It is our turn to make the difference.

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Lucy Thairu, Graduate Student in International Nutrition, Cornell University, will present the Dr Abraham Horwitz Memorial Lecture during the SCN 28th Session in Nairobi, Kenya, on

**Infant Feeding Options for Mothers with HIV: Using Women's Insights to Guide Policies**