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Improving Birth Outcomes: Women's Oral Health Project

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Executive Summary

Serving approximately 15,000 children annually, The Child Health and Disability Prevention Program is positioned to reach out to the city's medical and dental community to train and provide oral health assessments, parent education, dental referrals, transportation and treatment services. Administered by the San Francisco Department of Public Health, CHDP is a preventive program that delivers periodic health assessments and services to low income children and youth in California. Children under age 21, with Medi-Cal, are eligible to receive CHDP periodic health screenings (includes dental screenings) and preventative health services. As SF CHDP's mission is dedicated to the health and well being of children, especially targeting low-income families.

Improving Birth Outcomes: Women's Oral Health Project is a new project housed within the Child Health and Disability Prevention, CHDP Program. The main goal of the project is to improve the birth outcomes of high-risk pregnant women and their children, by educating participants within the Maternal Child and Adolescent Health Section at the San Francisco Department of Public Health. The educational component will focus on the importance of oral health and the impact of oral disease on perinatal health. Following the educational component, referrals for appropriate dentists will be provided for participants to they may begin improving their oral health.

This proposal addresses the goals and implementation for the March of Dimes Priority #2: To provide services and education for pregnant women regarding strategies and interventions that could help reduce the risk of premature birth in population groups at higher risk.

Agency Background

The Mission of the San Francisco Department of Public Health is to protect and promote the health of all San Franciscans by assessing the health of the communities, developing policies, preventing diseases, educating the public and providing quality and culturally-competent health services. In regards to preventing diseases, SFDPH models an environmental approach to prevention that changes the societal context in which disease and injury occurs. To be effective, this approach depends upon the active involvement of the community. By mentoring the community, planning and developing projects, The Community Health Promotion and Prevention makes sure that the focus is always on community-based prevention.

Housed within the San Francisco Department of Public Health, Maternal, Child and Adolescent Health Section promotes the health and well-being of women of childbearing age, infants, children and adolescents who are at increased risk of "adverse health outcomes by virtue of financial, language or cultural barriers, or mental or physical disabilities by assuring access to health promotion and health care services" (San Francisco Department of Public Health, 2014). These services include education, outreach, nutrition, reproductive health, dental health, and primary care for children and youth.

Needs Assessment

Untreated oral disease during pregnancy endangers the health of both the woman and her baby. Studies have reported associations between oral diseases, particularly periodontal disease, and an increased risk for poor birth outcomes such as preterm birth and low birth-weight (Gaffield, 2001). Additionally, there is also an association between periodontal disease and gestational diabetes, which can cause low glucose in newborns and lead to seizures and brain injuries. During pregnancy, reversible mild inflammation of the gums, called "pregnancy gingivitis," is estimated to occur in 30 to 100% of pregnant women (Gaffield, 2001). Untreated gingivitis can lead to Periodontitis (infection of the bones that support teeth), which is believed to affect 5 to 20% of pregnant women. Periodontitis can damage the bone and other supporting structures of teeth and ultimately result in tooth loss. This situation endangers the health of the pregnant woman and her baby; moreover, predisposes the baby up for a lifetime of decay. Children whose mothers have poor oral health and high levels of oral bacteria are at a five times greater risk for having oral infections at young ages and for developing dental caries, compared with children whose mothers have better oral health and lower levels of bacteria (Beck, 2003).

What starts as a minor redness and inflammation along the gum line could quickly grow into an oral disease, affecting both mother and her unborn. This process occurs when starches and sugars individuals consume interact with the healthy bacteria found in the mouth. If the individual does not maintain a proper oral hygiene, bacteria -nourished by the food residues left between teeth gaps- produce acid. Overtime, this acid build up results in plaque and inflammation (redness and swelling) along the gum lines in the mouth. This situation is especially important during pregnancy because changes in hormone levels can affect the gingival response to plaque, resulting in increased gingivitis. As an example, as the mother- to- be enters the second trimester, her body shifts from having less destructive periodontal pathogens to more destructive pathogens. Coupled with decreased systemic immunity during typical pregnancy, the shift may speed up the gingival inflammation- causing

tenderness, bleeding gums. Pregnancy-related gingivitis is seen in 25–75% of pregnant women (Buekens, 2009). Minor gingival issues (inflammation that has not affected the bone and tooth structure) are preventable. By maintaining an excellent oral hygiene-by brushing and flossing and having regular dental visits- prenatal women can severely reduce inflammation. The fact that non-advanced dental disease can be prevented and be easily treated provides the justification for the need of an early intervention. Early intervention has the ability to eliminate future oral health problems and costs associated with it.

If the mother-to-be is not able to keep the inflammation under control, than the minor inflammation along the gum line could progress into Periodontitis, a chronic inflammation. The constant inflammation can cause little holes to form along the gum line where the bacteria could accumulate in numbers. Progression of bacteria could cause the holes to get larger and reach the teeth structure and ligaments; eventually leading to destruction of the supporting bone and causing tooth loss. Periodontitis is known as a common oral disease, endangering 15% of pregnant women's health (Lydon -Rochelle, 2000). Unlike a minor gingivitis, periodontitis is harder to treat. Antibiotics would be need to treat bacterial infection; in addition, surgical treatments may be performed (for advanced periodontitis) to regenerate tissue needed to form a healthier gum line and reduce the holes that were formed by the bacterial invasion.

The greatest danger to the oral health of pregnant women is that the bacteria involved in Periodontitis could enter the bloodstream through the gum line and circulate to the rest of body. This is a serious case, especially in pregnant women, because the bacteria can also travel to the unborn baby and cause health defects. Many studies have been done to research the link between maternal oral disease, low birth weight and preterm birth. In their studies, Lydon-Rochelle and Krakoiak suggest that periodontal disease may have direct and indirect effects on the uterus. In direct mechanism, the

bacteria from the mouth travel the body and directly cause infection on the fetal membrane in the womb. In the indirect mechanism, body's normal response to fight the oral infection- by increasing body's defense hormones- causes the early labor initiation. Moreover, the body's response to fight the infection also restricts the blood flow to the baby and the mother's organs. The decreased blood flow to the baby causes low birth weight since nutrients and oxygen cannot adequately reach the baby for its growth. Further more, the decreased blood flow to the mother's organs, such as the heart and the brain, could cause heart attack and stroke (Lydon-Rochelle, 2000). This highlights the effects of poor oral health on overall systemic health of an individual.

This situation is a public health matter and it needs an intervention in order to reduce future health conditions. As said, oral disease can severely disturb systemic health. According to the Surgeon General's Report on oral health in 2000, dental care is the most common unmet health need where African American women have a higher relationship between periodontitis, pre-term birth, and low birth weight. San Francisco Department of Public Health is working to execute early intervention methods for pregnant patients and infants on oral health basics to develop good habits. It is expected that early treatments of oral disease in pregnant women will lead to improved birth outcomes and thus be a benefit for public health. This is why March of Dimes has prioritized educating pregnant women on strategies and interventions as a priority in order to help decrease birth defects, infant mortality and health risks concerning the mother.

The aim of *Improving Birth Outcomes: Women's Oral Health Project* is to provide services and education twice a month, fifty minutes each session, for pregnant women on strategies and interventions that could help reduce the risk of premature birth in population groups at higher risk. Although the services are available, a large proportion of women (35 to 44%) do not receive oral health care while pregnant. This is the biggest issue in the fieldwork site at DPH. Additionally, among pregnant women who report having oral problems, only about half seek oral health treatment

(Buekens, 2001). This creates a bigger problem because maintaining oral health improves birth outcomes and reduces transmission of dental caries from mother to children. Furthermore, pregnancy may be the only time in their lives that these women are eligible for dental benefits. So encouraging these pregnant women to take the opportunity is very crucial. Oral health is an essential, but often overlooked, component of prenatal care. Therefore, *Improving Birth Outcomes: Women's Oral Health Project* (housed with in the Maternal Child and Adolescent Health Section at the San Francisco Department of Public Health) will highlight the importance of oral health to improve birth outcomes and protect the health of both mother and new baby.

As its mission is to prevent diseases, educate the public and provide quality care, by utilizing the resources granted by the March of Dimes, SFDPH works to protect and promote equal healthcare to all San Franciscans. In addition, many individuals, who belong to underserved minority groups in San Francisco, face language barriers and often times lack the knowledge of where governmental resources are. In order to deliver quality services, SFDPH reaches out into the community and offer trainings in several languages including Chinese, Tagalog, and Spanish.

Target Population

The target population of the *Improving Birth Outcomes: Women's Oral Health Project* is low income, pregnant women who are enrolled in WIC, Black Infant Health, and Nurse Family Partnership, all of whom face perinatal health inequities. 100% of the women enrolled in Black Infant Health are African-American, 70% in Nurse Family Partnership are Hispanic and 11% are African American, and 9% in WIC are African American and 45% are Hispanic (Beck, 2003). Women who have low incomes, belong to racial or ethnic minority groups, or participate in Medicaid are half as likely to receive oral health care while pregnant, compared with women who have higher incomes, are white, or are privately insured (Beck, 2003). Further more, Black/African American babies in San Francisco are found to have higher perinatal and infant mortality rates compared to other racial/ethnic groups (Community Health Status Assessment, 2012). *Improving Birth Outcomes: Women's Oral Health Project's* target population is specifically from the Zip codes: 94102 (Tenderloin), 94104 (South of Market), 94112 (Excelsior), 94124 (Bayview-Hunters Point), and 94134 (Visitacion Valley (Community Health Status Assessment, 2012). Data shows that these zip codes have the highest rate for low birth weight babies, preterm births and lowest rate for prenatal care. It is crucial that educational trainings and tools target pregnant women of above communities.

Goals and Objectives

The following goals and objectives of the *Improving Birth Outcomes: Women's Oral Health Project* are identified in order to meet March of Dime's proposal requirements and achieve healthy outcomes in the lives of at risk pregnant women in San Francisco:

1. Improve the birth outcomes of high-risk pregnant women in underserved communities of San Francisco

Objective 1: Reduction in the risk of premature birth (caused from poor oral health) in population groups at higher risk by 10% by 2017

Objective 2: 50% increase in the use of prenatal care services -by the target population- at SFDPH affiliated clinics within one month of having attended the lecture

2. Encourage the use of Denti-Cal Insurance, by the high-risk pregnant women, to improve oral health outcomes, following the lecture

Objective 1: 50% increase in the use of free dental care services -by at high-risk pregnant women- at SFDPH affiliated dental clinics within one month of having attended the lecture

Objective 2: Increase knowledge and awareness of poor oral health outcomes in all lecture attendees at every session via the use of real life pictures showing pregnant women and their children with poor oral health

3. Increase knowledge in healthy dietary and hygiene options that women- from the target population- could adapt in order to protect their oral and systemic health during pregnancy, following the lecture

Objective 1: SFDPH anticipates a 50% reduction in the consumption of sugar rich sodas and juices by the low-income pregnant women immediately following the lecture

Objective 2: 100 % increase in the use of hygiene supplies (toothbrush, floss and toothpaste) after each meal – by at risk pregnant women- throughout pregnancy

Design/ Methodology

Objective 1: Reduction in the risk of premature birth (caused from poor oral health) in population groups at higher risk by 10% by 2017

Objective 2: 50% increase in the use of prenatal care services -by the target population- at SFDPH affiliated clinics within one month of having attended the lecture

Participants are recruited from:

1. San Francisco General Hospital, via physician referrals
2. SFDPH affiliated community clinics, via public health nurses
3. Other SFDPH programs where the target population is currently receiving services

Trainings are staffed with two community educators, provided by the San Francisco Department of Public Health. Community educators train the participants in small groups, not exceeding twenty participants. Fewer numbers of participants allow educators to answer individual questions and spend more time with participants if they need further assistance with the resources provided.

Sessions begin with attendees providing contact information on the sign-in sheet and administration of a pre-test-to assess participants' initial knowledge on oral health. This is followed by a PowerPoint presentation that encompasses bulleted information (along with visuals) for ease of following the lesson and fast reading purposes. Educators explain the physical and hormonal changes that happen during pregnancy, providing information on the consequences of not receiving prenatal and dental care. The information presented allows the participants to understand the relationship between the healthy teeth of the mother impacting a lifetime of healthy teeth for the child! Participants are provided with a folder containing paper and pen for note taking, along with a lesson plan with in the language of their choice (English, Chinese, Spanish and Tagalog). During the session,

educators take turns reviewing the PowerPoint slides that are prepared in advance by the educators and the program supervisor. In order to accommodate the minimum education level of the individuals, medical terminology included in the slides is minimal; this allows ease of comprehension.

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Objective 2: Increase knowledge and awareness of poor oral health outcomes in all lecture attendees at every session via the use of real life pictures showing pregnant women and their children with poor oral health

The presentation slides include real life pictures exposing the teeth of pregnant women and children with poor oral health. This method is used to draw attention to the significance of proper oral hygiene. Educators in this section take turns explaining –for twenty minutes- how accumulated bacteria could enter the bloodstream through the tissues surrounding teeth, circulate to the rest of body and travel to the unborn baby, causing health defects. This section also covers early intervention methods that will be able to eliminate future oral health problems (in both the mother and the child) and costs associated with it.

The educators provide Denti-Cal Insurance information and SFDPH affiliated dental clinics in a folder to be used by the participants. At the end of a fifty-minute lecture, participants are given dental supply kit upon completion of the training. The supply kit is provided from the March of Dimes Grant and includes adult and child toothbrush, adult and child toothpaste and dental floss. Following the lecture, participants are able to make appointments with dentists that serve the zip codes of participants' residence. A month after each lecture, participants are contacted by phone and data is taken to record whether dental care was received or whether a dental appointment was made. Dental

care is very important during pregnancy so lessons are designed to show the seriousness of the issue and encourage at risk pregnant women to take an action towards a healthier outcome.

Objective 1: SFDPH anticipates a 50% reduction in the consumption of sugar rich sodas and juices by the low-income pregnant women immediately following the lecture

Objective 2: 100 % increase in the use of hygiene supplies (toothbrush, floss and toothpaste) after each meal – by at risk pregnant women- throughout pregnancy

Various activities are held during the lectures to keep the participants engaged and alert. In order to show the negative effects of drinking soda on teeth, participants are given two cups (one filled with vinegar and the other with water), two chalks (representing teeth) and asked to submerge one chalk in each cup. Since vinegar is acidic, it would react and wear down the chalk after some time, just as soda would do on teeth. On the other hand, since water is neutral, the chalk would remain in water without being affected. This activity is hands- on and helpful because it vividly highlights the consequences of consuming carbonated drinks.

At the end of a fifty-minute lecture, participants are given dental supply kit upon completion of the training. The supply kits are provided from the budget set aside from the March of Dimes Grant, and include adult and child toothbrush, adult and child toothpaste and dental floss. All of the trainings for prenatal women will take place at the Maternal Child and Adolescent Health Section of the DPH. Over the course of the year, scheduled trainings will be given in order to educate future mothers and stop preventable diseases. All of the trainings will be evaluated by the quality of information presented, the quality of materials distributed, the presenters' knowledge of the subject, and the presentation style.

Further more, the public health nurses are also trained (trainings are non-mandatory for the nurses but highly recommended) so they could provide further information when they provide services in the target communities. Oral health lessons do not get included in many nursing schools' agendas; therefore, many nurses lack the knowledge on the connection between the mouth and body. Therefore forty-five minute trainings are offered once a month for nurses. As an incentive, this training could be counted towards nurses' yearly-required course hours towards their licensure. Trainings for nurses are comprehensive, in depth, and include medical terminology. The public health nurses are also provided with dental supply kits so they can distribute to their patients.

Supply/ Budget

The following materials make up the dental tool kit. These home care tools are essential to effectiveness of the nurse/parent training, in order to communicate the importance of home oral health care. With these tools, pregnant women can immediately practice and make the changes needed to improve their health and birth outcomes, and set their children up for a lifetime of good oral health.

LINE ITEM	PURPOSE	IN-KIND	FORMULA	AMOUNT
DENTAL SUPPLIES:	Home care			
TOOTHBRUSHES (Child)			0.25 X 700	$175.00
TOOTHPASTE (Child)			0.45 X 700	$315.00
FINGER COTS (Child)			0.50 X 700	$350.00
TOOTHBRUSHES (ADULTS)			0.41 X 700	$287.00
TOOTHPASTE (ADULTS)			0.85 X 700	$595.00
FLOSS			0.45 X 700	$315.00
CELLOPHANE BAGS	For parents to carry dental supplies		0.15 X 700	$105.00
PRINTING OF FLIERS/PAPER/MAILINGS/ BROCHURES/Flip Charts	To advertise the training, & to provide educational materials for PERINATAL WOMEN to take home			$108.00
Oral Health Consultant	Develop Training/Coordination & Present Training	40 hours x $43 = $1720 IN- KIND		
Management Fee for San Francisco Public Health Foundation			10% of total grant award	$250.00
Total with IN KIND		$4220		
TOTAL				$2500

Evaluation

Improving Birth Outcomes: Women's Oral Health Project encompasses a comprehensive evaluation that is planned to determine the success in achieving the goal of improving the birth outcomes of high-risk pregnant women and their children via community education. San Francisco Department of Public Health and March of Dimes Committee will conduct the final evaluation of *Improving Birth Outcomes: Women's Oral Health Project* at the end of the 12th lecture on August 26, 2014. The Project supervisor, from the Maternal Child and Adolescent Health Section at the San Francisco Department of Public Health, will collect pre and post-test scores, attendee data, end-of-session notes and provide the progress reports throughout the project period to the funders, March of Dimes Committee.

The funders of *Improving Birth Outcomes: Women's Oral Health Project* will use the information collected during the planning, execution, and evaluation steps to understand and recommend modifications for improving the project for latter months. Sign-in sheets for the participants along with their contact information, end -of -session notes completed by the lecturers, and the notes taken by the supervisor during unannounced visits during lectures serve as important data and will be used as proofs for the overall project. March of Dimes Committee will closely work with SFDPH to determine how successfully the strategies of *Improving Birth Outcomes: Women's Oral Health Project* were executed as planned, and measure their impact on the target population. This will help determine the future funding for prenatal education sessions.

Since the beginning Improving *Birth Outcomes: Women's Oral Health Project*, February 2014, the activities have been implemented as planned. The lecturers were present at every session and supplies were prepared to meet the maximum number of participants, 20. Moreover, the given budget (by the March of Dimes Committee) has been enough to cover the program and supply costs. One obstacle was that the SFDPH has underestimated the number of Arabic speaking participants. At two

out of eleven sessions, because of not having prepared Arabic translations, lecturers were unable meet all the needs of the participants. This situation was reported on the end- of -session notes by the lecturers and was brought to the supervisory committee. In order to overcome future lingual barriers, the committee decided to make translations of the lectures in more than 15 languages. The lecturers were also urged to be as specific as possible on every end- of- session note. On the notes, lecturers could provide written feedback about the sessions; recognizing strengths, weaknesses, and possible modifications. These evaluations will be used to improve this project and its development plan.

Improving Birth Outcomes: Women's Oral Health Project made a difference in the lives of its participants. Over the course of 6 months, SFDPH was able to reach over 134 participants from the target population through bi-monthly lecture sessions. Average of 12 participants in the month of March, 17 participants in the month of April, 15 in the month of May, 13 in the month of June, 12 in the month of July and 14 participants in the month of August. The project goal had set a minimum of 10 participants and a maximum of 20 participants. The data gained from the sign-in sheets, completed at every session, proved that project has met above the minimum attendee standards. In order to reach out for more participants, community educators also work with San Francisco General Hospital's primary care physicians reminding them about the resources and information that they could provide to their patients. This is a helpful way for reaching out into the community because 10% of the participants attended on physicians' referrals. The rest of the participants already belong to other SFDPH programs; therefore, they get reminded when new sessions/ projects take place. Other ways of reaching out and giving the public all the information they need on where to find resources are being worked on.

During the lecture sessions, the visuals along with presentation slides were very helpful in grabbing the attention of the participants. The pictures showing pregnant women and newborn babies with poor oral health opened a window in to reality and highlighted the seriousness of the issue. After seeing real life pictures, the participants reported that they all became more aware of the consequences

of poor oral health and felt more knowledgeable about the subject. The scores attained from the pre and post-test also proved the improvements participants have made and the knowledge they have gained following the lecture. The post-tests have showed an average of 75% improvement in the answers when compared with pre-test. Participants noted that they have become more enthusiastic towards making healthy changes in their lives and also promised to use their Denti-Cal insurance (free dental insurance provided for pregnant women who are part of the Medi-Care program) and make an appointment with affiliated dentists. Contact information gained from the participants were used, one month after each lecture, in order to track whether the participants have used the given resources such as, dental check ups, prenatal care services, and etc. The current data shows that more than 30% of participants have had both dental care and prenatal care, with more than 20% are waiting for their care appointments. The remaining participants have not responded to SFDPH's follow up calls/ e-mails. Not being able to track participants creates another obstacle in the project. Therefore, the supervisory committee is working towards different ways of reaching out to participants post lectures. One possible option is that dental appointments could be made at the end of every lecture for the pregnant attendees. Making appointments at the scene would guarantee an increase in the dental appointments. In order to execute this possible option, SFDPH would need further funding and additional employee/volunteer to track appointment cancellations and arrivals.

As conclusion, the information/ reports gained during the unannounced visits, made by the supervisor, have shown promising results on how educators have adapted the program for instructional use. The lecture satisfactory rate given by the participants, gained from the post-test, also showed promising results, exceeding 90% satisfactory rate. Scores help the higher committee determine the overall effectiveness of the program and make modifications for subsequent months if needed. The continuation of *Improving Birth Outcomes: Women's Oral Health Project* would be secure in the commitment of SFDPH working towards attaining all the project goals and continually making improvements in the lives of the target population.

Conclusion

SFDPH believes in making a difference by educating and providing services for at risk population groups in San Francisco. Oral health is an essential, but often overlooked component of prenatal care (Gaffield, 2001). This is why March of Dimes has set educating pregnant women on strategies and early interventions as a priority in order to help decrease birth defects, infant mortality and health risks concerning the mother. Early treatment of oral disease in pregnant women leads to improved birth outcome, benefiting the public health. The Child Health and Disability Program stands firmly behind this project and is committed to sustaining it. The program is actively seeking for future funding to sustain and expand its trainings with an effort to educate patients and public health nurses while providing them with the tools needed to improve the health of pregnant women and their children.

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Appendices

See attachment for Gantt Chart