Making a Difference in Infant Survival:
Evidence-based Actions to Reduce Tobacco Exposure During Pregnancy and Infancy in North Carolina

Cathy L. Melvin, PhD, MPH, and Sally Herndon Malek, MPH

Health and Economic Consequences in North Carolina

Three of the top four causes of infant death in North Carolina are directly associated with either maternal smoking during pregnancy and/or infant exposure to tobacco smoke after birth.[1] Rates of preterm birth/low-birth weight, respiratory distress syndrome and Sudden Infant Death Syndrome (SIDS) could all improve dramatically if pregnant women and their partners did not smoke during and after pregnancy, and if infants were always in smoke-free environments, especially in their homes, child care locations, public places and automobiles.

In 2002, 15,440 women, or 13.2% of all women giving birth in North Carolina smoked while pregnant. A 2002 report on the association of maternal smoking during pregnancy with infant mortality in North Carolina showed that mothers who smoked had nearly twice the risk of an infant death or low-weight birth as mothers who did not smoke.[1] For SIDS, the risk associated with maternal smoking was more than five times as high.[1] Low-birth weight rates (per 1,000 live births) for smokers were 12.6 compared to 6.4 for non-smokers and 'small for gestation age' rates for smokers were 10.0 compared to 4.0 for non-smokers. When data by cause of death were examined, 50% of the infants who died of SIDS had mothers who smoked during pregnancy.[1]

If no pregnant women smoked during pregnancy, the overall infant mortality rate for the state would drop an estimated 10 to 20%.[1] Furthermore, the mortality rates would improve most in underserved and disadvantaged communities where women are more likely to smoke while pregnant.

Secondhand smoke is a known human lung carcinogen, and there is increasing evidence of its threat to both the short- and long-term health of pregnant women and infants.[2] Regardless of whether mothers smoked while pregnant, infants living in households or being cared for outside the home where they are exposed to secondhand smoke (SHS) may be at greater risk for SIDS.[3,4] These infants are also at greater risk than infants without this exposure for respiratory and growth-related problems.[3,4] In 2001, 11.7% of new mothers in North Carolina reported that their infants were often in the same room with someone who was smoking.[5]

"If no pregnant women smoked during pregnancy, the overall infant mortality rate for the state would drop an estimated 10 to 20%."

Not only does prenatal exposure and/or exposure to SHS endanger the lives of infants, they also result in higher public expenditures for the care of mothers and infants participating in the Medicaid program in North Carolina. Costs during the first year of life for infants of women who smoked while pregnant were $4,353 compared to $3,769 for infants of non-smoking women.[1] Overall this difference amounts to nearly $6.5 million in excess Medicaid costs during one year for the infants of mothers who smoked.[1]

What Works to Reduce the Impact of Smoking on Infant Death?

A number of strategies have been proven to help pregnant and parenting smokers quit smoking and to increase the number of smoke-free environments for families. *The Guide to*

Cathy L. Melvin, PhD, MPH, is the Director of the Child Health Services Program at the Cecil G. Sheps Center for Health Services Research and a Research Associate Professor in the Department of Maternal and Child Health, University of North Carolina at Chapel Hill School of Public Health. She can be reached at melvin@mail.schsr.unc.edu or CB# 7590, Chapel Hill, NC 27599-7590. Telephone: 919-966-8072.

Sally Herndon Malek, MPH, is Head of the Tobacco Prevention and Control Branch, Division of Public Health, NC Department of Health and Human Services. She can be reached at sally.malek@ncmail.net or 1915 Mail Service Center, Raleigh, NC 27699-1915. Telephone: 919-733-1340.

Community Preventive Health Services presents recommendations for use by communities and healthcare systems on population-based interventions to promote health and to prevent disease, injury, disability, and premature death. Three strategic areas for intervention in tobacco use and prevention were identified through systematic reviews of the literature: reducing exposure to environmental tobacco smoke; reducing tobacco use initiation by children, adolescents, and young adults; and increasing tobacco cessation.[6] (See www.thecommunityguide.org for a complete listing of proven strategies to prevent and reduce tobacco use.)

Brief clinician counseling with pregnancy-specific self-help materials for pregnant smokers has been found to increase cessation rates by 30 to 70%.[7] Depending on the underlying prevalence of smoking in a particular group, this improvement could double or even triple cessation rates and save $3 for every $1 invested in treatment.[8] Similar counseling interventions along with appropriate pharmacotherapies for non-pregnant smokers have also been shown to significantly increase their chances of quitting smoking.[9]

Telephone support, when combined with other efforts such as educational approaches or medical therapies, is effective in helping smokers to quit when implemented in both clinical and community settings.[6] These help, or quit, lines are a valuable resource for clinicians who may need to refer their patients to external sources of counseling and support during their quit attempts.

Mass media education campaigns when combined with other interventions have also proven to be effective in preventing and reducing tobacco use.[6] Advertisements aimed at promoting cessation coupled with other interventions such as provider cessation services using the "5A's"[10] and full service, proactive quitlines are strongly recommended strategies.[6]

Increasing the numbers and types of smoke-free environments for pregnant women and children can reduce their exposure to SHS and its consequences. Policies and legislation aimed at creating smoke-free environments in worksites and public places have been found to increase cessation rates among smokers and to reduce SHS exposure for smokers and non-smokers alike. [6]

Strategies that increase the price of cigarettes and other tobacco products also have an impact on initiation of smoking and smoking cessation. Pregnant women seem to be especially sensitive to changes in price; for every 10% increase in the price of cigarettes, maternal smoking falls by 5%.[11] Increasing excise taxes on tobacco products in many states has prompted a significant number of smokers to quit smoking altogether.[11] Since many pregnant women are already motivated to quit smoking for their baby's health, the increase in price provides one more incentive to help them quit smoking.

Is North Carolina Using These Strategies?

North Carolina is making substantial progress in some, but not all, of these areas. To help clinicians who care for pregnant women gain the skills, confidence, and materials they need to help pregnant women quit smoking, the state has pursued a number of strategies. The Maternal and Child Health (MCH) Program within the NC Department of Health and Human Services (DHHS) has established a performance standard for treating tobacco use among pregnant clients. MCH programs must identify pregnant smokers and treat them using the Public Health Service "5A's" approach to cessation counseling. Award winning training materials for providers have been developed and training sessions have been held across the state. The Health and Wellness Trust Fund Commission has provided funding to increase tobacco cessation services for pregnant teens. Backup support and consultation is also available for clinicians working with pregnant smokers. Each year, programs compile data to assess their progress and identify areas for improvement in their approach to treating pregnant smokers.

The Women and Tobacco Coalition for Health (WATCH) has been working through a grant from the American College of Obstetricians and Gynecologists to conduct a number of activities designed to increase smoking cessation rates in North Carolina. This group is currently conducting a survey of clinicians providing prenatal care in North Carolina to understand how clinicians currently treat tobacco use among pregnant women they serve and to identify training and other needs that clinicians may have. Information gathered in this survey will help organizations involved in the coalition to develop new programs, materials, and approaches to help clinicians.

As part of an effort to reduce SIDS risk, the NC Child Care Commission recently approved changes to North Carolina's childcare licensing rules to address tobacco use and SHS exposure in child care facilities, including family child care homes. Recognizing that the risk for SIDS is more than doubled when babies breathe SHS and that tobacco products are a leading cause of childhood poisoning, the Commission expanded the prohibition on smoking in family child care homes so that the operator(s) cannot use tobacco products at any time children are in care; and that smoking or use of tobacco products is not allowed indoors when children are in care or in a vehicle when children are transported. Changes in policy and regulations such as these dramatically reduce the exposure of infants and young children to SHS and the risks associated with it.

North Carolina's local school boards are increasingly promoting 100% tobacco free school policies to eliminate secondhand smoke exposure and provide positive role modeling at school and school events. Thirty-six of North Carolina's 117 school districts have 100% tobacco-free schools policies; this is up from six school districts in 1999.

Significant progress has been made in North Carolina's private sector to protect workers from exposure to SHS, however this progress is considerably greater in the white collar sector. Disparities exist in blue collar and service industry sectors where many low-income women work. State law is a barrier to local government protections for secondhand exposure. The 1993 law entitled "Smoking in Public Places" (GS 143-597), states legislative intent "...to address the needs and concerns of both smokers and nonsmokers in public places by providing for designated smoking and non-smoking areas." This law requires state-controlled buildings to set aside 20% of space for smoking and preempts local governments from passing stricter rules.[12]

Are There Other Things North Carolina Can Do?

The state can expand efforts to train all clinicians in evidence-based interventions for pregnant and parenting smokers and take steps to assure adequate reimbursement for these interventions, especially through the Medicaid program and the state employee's health insurance plan(s). One of the barriers clinicians frequently cite as a reason for not providing cessation services is the lack of reimbursement for such services. An investment in the reimbursement of cessation services for pregnant smokers brings short-term cost savings for healthcare systems and the state, and has been shown to increase the likelihood that clinicians will offer these services.

Currently two quitlines are available to North Carolina residents. The American Legacy Foundation Great Start Quitline for pregnant smokers can be reached at 1-866-66-START. The National Cancer Institute Quitline for all smokers/tobacco users at 1-888-44-UQUIT is currently available during weekday hours. Plans are in place to have this line become a full-service, proactive quitline in January 2005. These quitlines bring evidence-based cessation help directly to smokers. They are also an important referral resource to clinicians as they work with pregnant and parenting smokers. Marketing these quitlines in North Carolina will enhance their utilization and result in more successful quit attempts. Mass media campaigns designed to promote quitting and the use of local and national resources such as these quitlines among pregnant women and the members of their households are strongly recommended by the Community Preventive Services Task Force, but currently not funded in North Carolina.

An increase in the state excise tax on cigarettes would also increase the likelihood that pregnant and parenting smokers would quit smoking. North Carolina's tobacco tax is currently five cents per pack, the third lowest in the nation. With an increase to 75 cents, North Carolina's tax would be close to the national average (currently 72.9 cents). And, a 75-cent increase in the cost of a pack of cigarettes would result in a 17.5% decrease in the number of pregnant women in North Carolina who smoke.

Adoption of a 100% tobacco-free school policy by North Carolina school boards would eliminate smoking at school and school events by students, staff, and visitors so that students, faculty and staff are protected from secondhand smoke and nonsmoking is promoted as a social norm. Blue collar and service industry sector worksites should be smokefree in order to provide worker protection from secondhand smoke, a known, preventable health hazard. If private sector worker protections are not adequate, the law prohibiting local rulemaking to protect people from secondhand smoke in public places and workplaces should be reconsidered in light of new evidence of the serious risks of secondhand smoke exposure for pregnant women and other vulnerable populations, and the effectiveness of nonsmoking policies in protecting pregnant women and infants from harm.

Summary

North Carolina faces major challenges in dealing with smoking and its consequences during pregnancy and infancy. Evidence-based strategies exist to help pregnant and parenting smokers to quit, to discourage young people from becoming smokers and to reduce exposure of infants to SHS. North Carolina is making progress in implementing these strategies, but more infant lives could be saved each year if the state adopted a more comprehensive approach to addressing tobacco use by improving cessation services for pregnant and parenting smokers, reimbursing clinicians for providing cessation services, increasing state excise taxes on tobacco products, establishing statewide help or quitline services and adopting tobacco-free school policies. These proven strategies can make a difference. **NCMJ**

REFERENCES

1 Rosenberg DC and Buescher PA. The association of maternal smoking with infant mortality and low birth weight in North Carolina, 1999. State Center for Health Statistics 2002; Special Report No. 135.

2 US Department of Health and Human Services. Women and Smoking: A Report of the Surgeon General. Public Health Service, Office of the Surgeon General 2001, Rockville, MD.

3 Spiers PS. Invited commentary: disentangling the separate effects of prenatal and postnatal smoking on the risk of SIDS. *American Journal of Epidemiology* 1999;149:603-607.

4 Manuel, J. Double exposure. *Environmental Health Perspectives* 1999; 107:A196-A201.

5 North Carolina State Center for Health Statistics. The PRAMS Survey, 2001 PRAMS data tables. Available at http://www.schs.state.nc.us/schs/PRAMS.

6 Task Force on Community Preventive Services. Recommendations regarding interventions to reduce tobacco use and exposure to environmental tobacco. *American Journal of Preventive Medicine* 2001;20(2S),10-15.

7 Melvin, CL, Dolan-Mullen, P, Windsor, RA, Whiteside, HP, and Goldenberg, RL. Recommended cessation counseling for pregnant women who smoke: a review of the evidence. Tobacco Control 2000;9 Suppl III, iii80-iii84.

8 Marks, JS, Koplan, JP, Hogue, CJ, and Dalmat, ME. A cost-benefit/cost effectiveness analysis of smoking cessation for pregnant women. *American Journal of Public Health* 1990:5, 282-289.

9 Fiore, MC, Bailey, WC, Cohen, SJ, Dorfman, SF, Goldstein, MG, Gritz, ER, et al. Treating Tobacco Use and Dependence. Clinical Practice Guideline 2000; Rockville, MD: US DHHS, Public Health Service.

10 The "5A's" are a model/algorithm for treating tobacco. The 5A's are Ask, Advise, Assess, Assist and Arrange. Fiore, MC, Bailey, WC, Cohen, SJ, Dorfman, SF, Goldstein, MG, Gritz, ER, et al. (2000). Treating Tobacco Use and Dependence. Clinical Practice Guideline: Rockville, MD: US DHHS, Public Health Service.

11 Ringel, JS, and Evans, WN. Cigarette taxes and smoking during pregnancy. *American Journal of Public Health* 2001; 91(11), 1851-1856.

12 Malek, SH, Hopkins, DP, Molloy, M, and McGloin, T. The public health challenge of youth smoking in North Carolina: Putting what we know into practice. *North Carolina Medical Journal* 2002; 63(3):154-61.