COMMENTARY

ON MATERNAL SMOKING QUESTIONS

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Using the Birth Certificate to Monitor Smoking During Pregnancy

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Tobacco use during pregnancy has long been associated with an elevated risk of low birth weight, retardation of intrauterine growth, and preterm birth.[1,2] Low birth weight in turn is one of the major predictors of infant and childhood morbidity and mortality.[3-5] Given the documented relationship between maternal smoking and poor birth outcomes, it is critical that reliable data be collected and reported on a regular basis on the incidence of smoking during pregnancy—to ascertain the smoking patterns of women in the childbearing ages, to determine those women most likely to smoke, and to identify those women who smoke through their pregnancy—with a goal of developing intervention strategies to reduce smoking during pregnancy. Birth certificate data have shown that babies born to women who smoke as few as one to five cigarettes daily are at 61% greater risk of low birth weight than babies born to nonsmokers.[6]

Recognizing the importance of routine and timely assessment of smoking levels during pregnancy, the 1989 revision of the US Standard Certificate of Live Birth, sponsored by the National Center for Health Statistics (NCHS), included two questions to measure tobacco use during pregnancy[7]:

Tobacco use during pregnancy? ..... Yes ☐ No ☐
Average number of cigarettes per day _____

Currently, California, Indiana, New York State, and South Dakota do not include these questions on their birth certificates. These states do collect smoking data but in nonstandard formats, so their data are not included in NCHS reports.[6,8-9] Data for New York City, a separate registration area, are included in NCHS reports.[6,9]

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Identifying the extent to which women change their smoking behavior during pregnancy will help improve the effectiveness of smoking cessation programs.

For the eight years for which birth certificate data on maternal smoking have been available, NCHS analysts and other researchers have regularly compared smoking data compiled from birth certificates with data from other sources, including the Pregnancy Risk Assessment Monitoring System, the National Survey of Family Growth, and the National Pregnancy and Health Survey.[6,8-14] In general, trends in smoking rates based on birth certificate data have been confirmed with data from other sources. However, smoking rates tend to be somewhat lower using birth certificate–based data. A major reason for the discrepancy is the lack of specificity in the birth certificate questions. In addition, the information may come from a variety of sources, including the mother's worksheet, the prenatal care provider, or other sources. The mother, the attending physician, or other health professionals may answer the birth certificate questions based on the mother's smoking status at any time during pregnancy, for example, the last trimester. No guidance is given as to how to respond for a woman who had smoked prior to pregnancy, for a woman who smoked at the beginning until learning she was pregnant, or for a women who reduced her tobacco use.

Several studies have suggested that the lack of specificity in the birth certificate questions is the principal factor accounting for reported differences in smoking levels during pregnancy.[13,14] NCHS has convened a committee of state vital statistics registrars, physicians, health care officials, and researchers that is evaluating the 1989 revision of the US Standard Certificate of Live Birth with the goal of recommending changes that would take effect in 2002.

A critical advantage that we have in the National Vital Statistics System is that the overwhelming majority of US births are now registered electronically.[15] Previous versions of the birth certificate had to conform to a standard paper size to facilitate recording, copying, and filing, but this is not the case with the electronic birth certificate. The states and NCHS are now able to focus on the data items that should be included, the level of detail that is needed for public health and research purposes, and the best way to obtain the information, including the best source. In the case of maternal smoking, there is the potential to collect more detailed information on smoking status by trimester of pregnancy and even to ascertain the mother's smoking status prior to pregnancy. More specific information about smoking behavior would make it possible to develop intervention strategies for curtailing smoking by women during pregnancy and for encouraging women to refrain from smoking after giving birth.

Kharrazi et al. have made an important contribution to our knowledge of effective approaches to obtaining information on smoking during pregnancy.[16] Taking into account practical considerations of space, time, and respondent burden, they focused on developing the most effective and reliable approach to collecting information on maternal smoking on the birth certificate. As they note in their article in this issue of *Public Health Reports*, the ideal questions must be concise and likely to achieve high response rates.[16]

Although recommendations concerning the content of the next revision of the birth certificate will not be made until later in 1999, the study by Kharrazi et al. will be valuable to the committee and to NCHS in developing the most effective and reliable questions on smoking during pregnancy. While Kharazzi and colleagues tested their questions on paper worksheets, they clearly anticipate the electronic registration process, which is now virtually universal. The question they ultimately recommend is quite provocative because it assumes smoking

during pregnancy and then determines smoking status for each trimester of pregnancy and the average number of cigarettes smoked in each trimester. The question they recommend seeks to determine if the mother stopped smoking at any point during pregnancy or if she changed the number of cigarettes smoked daily over time. Some may reject their approach of "assuming the behavior" because it seems to imply that a woman will not be truthful in reporting her smoking behavior during pregnancy. However, there is some evidence to support this approach. For one thing, there is a growing stigma attached to smoking, and especially on smoking during pregnancy. Most states have inaugurated intensive anti-smoking and smoking cessation programs targeting the most vulnerable populations, including children and pregnant women. Moreover, a woman who smokes prior to pregnancy and quits is at great risk of resuming tobacco use after the pregnancy.[17] Identifying the extent to which women change their smoking behavior during pregnancy will help improve the effectiveness of smoking cessation programs.

The Kharrazi et al. study was illuminating for several reasons. First, the question they recommend can be seen as encouraging women to report smoking behavior truthfully since it gives them a chance to say that they stopped smoking at some point during pregnancy, if that is the case, or that they modified their smoking behavior in response to the pregnancy. Furthermore, Kharrazi and his colleagues confirmed the responses to two of their four smoking questions with cotinine levels from blood tests conducted in mid-pregnancy, thus providing evidence of the truthfulness of the responses provided for the various questions. Finally, Kharrazi and colleagues tested their questions in hospitals in California, the state that currently collects the least information on maternal smoking on the birth certificate. Their success in eliciting responses to a series of questions augurs well for their somewhat unorthodox approach to collecting this information. Additional studies of this nature are to be encouraged, as they will help ensure that the standard questions ultimately recommended provide the most complete, accurate, and reliable data possible.

Whatever questions on tobacco use are ultimately recommended on the US Standard Certificate of Live Birth, the development of these questions will be guided by the research of Kharrazi et al. and other studies that have focused on devising questions that will be most successful in identifying whether, when, and how much a woman smoked during pregnancy.

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