

RESEARCH AND PRACTICE ARTICLE

Changes in Immunization Practices, Knowledge and Beliefs of Michigan Obstetrician-Gynecologists Since 2000

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INTRODUCTION:

Obstetrician-gynecologists are health care providers for women over the life cycle and are often the only source of medical contact for non-pregnant women (Leader & Perales 1995). Primary care has increasingly, though not universally, become part of the standard practices provided by obstetrician-gynecologists; a recent study (Schrag, et al., 2003) found that over half of obstetrician-gynecologists view themselves as fulfilling a primary care role.

An important component of primary care is the administration of vaccines against diseases that have an impact on general health and well-being (e.g. influenza). Additionally, infections remain a leading cause of preventable morbidity in pregnant women and newborns (Anderson, 2001). A 2000 survey of obstetricians and gynecologists in Michigan found that a majority of providers considered screening for vaccine-preventable diseases an important responsibility. However, only 10% routinely assessed whether patients had indications for all of the vaccines recommended for use in pregnant or recently delivered women. Moreover, one quarter of providers in this survey did not administer any vaccines to obstetric patients (Gonik et al., 2000). A national study (Schrag et al., 2003) found that only about two thirds worked in practices that offered at least one vaccine type and only 10% worked in practices that offered all six of the primary vaccines recommended for adults and/or pregnant women.

Both of the aforementioned studies (Gonik et al., 2000; Schrag et al., 2003) found that obstetrician-gynecologists identified costs of vaccination and a belief that vaccine administration was not the responsibility of obstetrician-gynecologists as the primary reasons for not offering vaccines. Given that these two studies are several years old, it is important to assess if there has been any change in obstetrician-gynecologists' practices and attitudes regarding immunizations.



This study surveyed all ACOG fellows in the state of Michigan in order to compare the current status of immunization in obstetrician-gynecologist practice with that determined by Gonik and colleagues nearly a decade ago.

MATERIALS AND METHODS:

Sample: Questionnaire surveys were sent to 912 Fellow and Junior Fellows of the American College of Obstetricians and Gynecologists (ACOG) in Michigan. A Fellow is a member who has a current medical license, is in medical practice focused on women's health, and is board certified in obstetrics and gynecology. A Junior Fellow is a member who meets all the requirements to be a Fellow of the College except that they are not board certified. ACOG Fellows and Junior Fellows comprise at least 90% of the practicing obstetricians and gynecologists in the United States.

This study was part of a larger study on immunization involving all regions in ACOG's District V: Ohio, Kentucky, Indiana, Michigan and Ontario, Canada. Initial mailings were sent in June 2007. Those who did not respond were sent four reminder mailings. Questionnaires returned by December 19, 2007 were included in data analyses.

Survey: The questionnaire was approved by the Institutional Review Board at the University of Louisville, and submission of a completed questionnaire indicated consent. The questionnaire consisted of five sections: 1) a series of items regarding the respondents' demographic characteristics and those of their patient populations, 2) practices regarding vaccination, 3) practice, knowledge and beliefs specifically regarding the HPV vaccine (this data is reported elsewhere), 4) beliefs and knowledge regarding other vaccines, such as the influenza vaccine, etc., and 5) background information regarding their view of immunization education in medical school and residency, as well as their views on what would help improve their ability to administer vaccines and disseminate knowledge of immunization to patients and clinicians.

Several knowledge questions were asked, for which the CDC and ACOG's recommendations were used to determine the correct answers (ACOG, 2004). Three vaccines are considered safe during pregnancy: TDAP, Influenza, and Hepatitis B (HBV) and two are not indicated: MMR and Varicella.

The study protocol was reviewed and approved by the Institutional Review Board at the University of Louisville.

DATA ANALYSIS:

Data were analyzed using a personal computer-based version of SPSS 15.0 (SPSS Inc. Chicago, IL). For chi-squared tests with medical school graduation year as a factor, we created three approximately equally-sized groups: before 1983, between 1983 and 1992, and after 1992. Because the proportion of women obstetrician-gynecologists has steadily increased over time, for instances where graduation year was used as a factor in the analysis we statistically controlled for gender, and vice versa. Analyses were done using ANOVA and chi-squared tests. Significance was evaluated at $p < .05$, and confidence intervals of 95%.



RESULTS:

A total of 287 surveys were returned from physicians currently in practice, for a response rate of 32%. Selected demographic data pertaining to this latter group are shown in Table 1. Over half (52.3%) of the respondents were female. Physicians with more years in practice were more likely to be male ($\chi^2 (2) = 53.292, P < .001$) and to specialize in only gynecology ($\chi^2 (14) = 32.44, p = .003$).

Most physicians (67%) graduated from medical school between 10 and 30 years ago, with a median of 22 years ago. Fifty-six percent of the physicians said they provided obstetric, gynecologic and primary care services; 25.4% provided obstetric and gynecologic care only; the remainder provided gynecologic care with and without primary care, or only obstetric services. In total, 61.4% of responding physicians acknowledged they provided primary care to some of their patients, which is greater than the 47% reported by Gonik and colleagues (2000). With regard to which age groups they served, 97.1% served adolescents and women of childbearing age, 2.4% did not serve postmenopausal women. In the 2000 study (Gonik et al., 2000) 12% did not care for adolescents; this was down to 6.2% in this study. Nearly all provide gynecologic care to adolescents (94%), women of childbearing age (97.1%) and postmenopausal women (97.4%). A majority provide obstetric care for the same groups (82.2% in adolescents and 88.6% in women of childbearing age). Fewer physicians provide primary care for their patients. Less than half provide primary care for adolescents (40.6%) and postmenopausal women (47.8%) and 60.9% provide primary care for women of childbearing age.

Physicians were asked whether they currently assessed their patients for nine vaccine-preventable diseases and five associated vaccines (tetanus/diphtheria/acellular pertussis, measles/mumps/rubella, influenza, varicella, and pneumococcus). If an affirmative response was given, they were asked whether they actually administered the indicated vaccine (allowing for the possibility of delaying administration until the postpartum period) or referred the patient to another health care provider. Only 3% of respondents did not assess their obstetric patients for these nine diseases, down from 19% in 2000. The highest proportion of those who provide obstetric care assessed the need for two (20%) or three (22%) or four (20%) of these vaccines. In order of frequency, influenza (86%), measles/mumps/rubella (72%), and varicella (51%) each were assessed by over half of responding obstetricians. About one quarter (25.8%), down from 40% in 2000, of physicians did not assess for any vaccine-preventable disease for their gynecologic patients. Fourteen percent assessed for all nine diseases. The most frequently assessed were influenza (66.6%), measles/mumps/rubella (41.8%) and tetanus/diphtheria/acellular pertussis (36.9%).

When asked to rank reasons for not administering an indicated vaccine in the office, 42.1% agreed or strongly agreed that immunization is not part of their routine patient care. This reason was also the most commonly cited deterrent in the 2000 study (Gonik et al., 2000). The next most common answers in this study were related to financial concerns: high cost to order (62.7%), high cost to store (65.5%) and inadequate reimbursement (60.7%). Over one-quarter (26.3%) cited a lack of available vaccines. Our results show that 18.1% agreed or strongly agreed they were uncertain of recommendations, and 9.2% were uncomfortable with vaccine



administration. Over half (57.5%) of respondents agreed or strongly agreed that demand for immunizations in their practices is low.

The survey contained three sets of knowledge questions regarding the CDC's vaccination recommendations (see Tables 2 and 3). The first concerned current recommendations regarding hepatitis B (HBV) vaccination. Ninety-six percent of respondents recognized CDC recommendations to give this vaccine to patients in high-risk occupations, and 70.7% identified the need for HBV vaccination in adolescents. This latter statistic is in sharp contrast with the 69% who were *unfamiliar* with the adolescent HBV recommendation in 2000 (Gonik et al., 2000). A small amount (15%) of physicians indicated that all women over age 65 years required vaccination against hepatitis B, although the current CDC recommendation indicates this should be given only if other risk factors are present. For influenza, 87.1% agreed with the CDC that maternal morbidity and mortality increased in the second and third trimesters. When physicians were asked about vaccine safety in pregnancy 50.9% and 62.4%, agreed with the CDC that tetanus/diphtheria and hepatitis B vaccines were safe to administer. Most (89.2%) believed the influenza vaccine is safe during pregnancy, and 31.4% thought the pneumococcal vaccine was safe to administer in pregnancy. A small minority of physicians indicated that it was acceptable to give measles/mumps/rubella (2.1%) and varicella (8.4%) vaccines during pregnancy, contrary to current recommendations. Overall, only 4% of physicians answered all components of the knowledge-based questions correctly. No respondent answered all incorrectly and only 1.7% answered fewer than seven questions correctly.

Two opinion questions that required a scaled response were asked in the survey. The first queried whether routine screening for vaccine-preventable diseases is outside the scope of practice for an obstetrician-gynecologist. Fourteen percent agreed or strongly agreed with this statement, compared with 15% who were neutral, and 70.7% who disagreed or strongly disagreed (see Figure 1).

A series of correlations were run examining physician characteristics, practice patterns, opinions, and knowledge. Female physicians were more likely to have fewer years in practice compared with male physicians ($\chi^2(2) = 53.3, P < .001$).

Physicians who acknowledged that they performed primary care were more likely to assess their gynecologic patients for vaccine-preventable diseases (seven of 8 χ^2 s significant at $P < .05$) and more likely to assess their obstetric patients for MMR ($\chi^2(1) = 6.043, P < .05$). There were no significant differences between physicians who practiced primary care and those who did not in their responses to the knowledge-based questions.

DISCUSSION:

Immunization is an important primary care preventive practice and, as primary care providers, obstetrician-gynecologists have unique opportunities to immunize women across the life cycle (Schrag, 2003). Immunization will also minimize the impact of diseases on the fetus, and will reduce transmission to others. This study aimed to determine if there have been changes in Michigan obstetrician-gynecologists' knowledge, attitudes and practices regarding immunization over the past several years.



We can see that in just less than one decade, there has been an increase in the proportion of Michigan obstetrician-gynecologists who report that they provide primary care to their patients (61.4% in the current study vs. 47% in 2000), and are caring for adolescents (in 2000, 12% did not care for this age group vs. 6.2% in the current study). More physicians view the administration of vaccines as within their professional role (see Figure 1) and part of their usual patient care activities, a phenomenon which is occurring across physician age groups. For example, in 2000, 60% responded that vaccination was not part of their usual patient care activities. In the current study, 42.1% agreed or strongly agreed that immunization is not part of their routine patient care. Additionally, in 2000, 60% responded "it is not part of my usual patient care activities" as the most frequent response, compared with 42.1% agreeing or strongly agreeing with this statement in the current study.

Unlike in 2000, there was no difference between genders in their support of the view that screening for vaccine-preventable disease is a part of routine obstetric and gynecologic care. However, it is of note that while in 2000 those with more years in practice were less likely to consider vaccine screening as a part of routine care and also score lower on knowledge related questions, there were no such differences found in the current study.

More Michigan obstetrician-gynecologists are assessing patients' needs for more vaccines. For example, in 2000, 40% did not assess for *any* vaccine-preventable disease in gynecologic patients, compared to 25.8% in the current study. Despite these improvements, further gains are necessary; less than one in five respondents are assessing for all five vaccines in their gynecologic patients. Additionally, while gynecologic patients' needs for the influenza vaccine were the most commonly assessed, and are improved from 2000, only two-thirds are currently assessing this need.

Another important finding is that physicians are generally knowledgeable regarding vaccine recommendations. More physicians (89.2%) believe the influenza vaccine is safe for obstetric patients, and fewer believed that the tetanus/diphtheria/acellular pertussis (50.9%) and HBV (62.4%) when compared with the range provided by Gonik and colleagues in 2000 (73-83%). A smaller proportion also believed that the pneumococcal vaccine is safe for obstetric patients (31.4% vs. 48% in 2000). While a small minority of physicians indicated that it was acceptable to give measles/mumps/rubella (2.1%) and varicella (8.4%) vaccines during pregnancy, contrary to current recommendations, these rates have decreased since 2000 when 6% and 14% of respondents indicated these two vaccines were safe in obstetric patients, respectively. There has been some improvement in immunization-related knowledge over the past eight years; only 1.7% answered fewer than seven knowledge-based questions correctly, down from 5.5% in 2000.

While there have been improvements in the assessment and administration of vaccinations it is important that more gains be made in viewing immunization as within their role, and part of their routine responsibilities. In addition to a view that immunization is not within the professional role of the obstetrician-gynecologist, there are barriers that prevent immunization by this medical specialty. This study showed that a lack of available vaccines has become less of a problem, with only 26.3% currently citing this as a concern, compared with 43% in 2000. Uncertainty regarding current vaccine recommendations and lack of comfort with administration have also



become less common deterrents; in 2000, each of the aforementioned concerns were ranked at 30%, compared with 18.1% agreeing or strongly agreeing they are currently uncertain of recommendations, and 9.2% being uncomfortable with administration.

While vaccines may be more accessible to obstetrician-gynecologists, this study showed that financial concerns act as a deterrent from adopting immunization into routine practice. Over 60% agreed or strongly agreed that inadequate reimbursement, and high costs to order and store vaccines deter them from offering immunizations in their practice. This was higher than the 50% who were concerned about reimbursement in 2000. This may be due to increasing costs of offering immunizations, or an increase in the amount of obstetrician-gynecologists who are considering implementing immunization programs in their practices.

Given that both this study and that of Gonik and colleagues in 2000 found that those who acknowledged they provide primary care are more likely to assess patients for vaccine-preventable diseases, a first step to improve vaccination rates among obstetrician-gynecologists may be to modify the professional role that obstetrician-gynecologists view for themselves. If more obstetrician-gynecologists view themselves as primary care providers, the missed opportunities for the assessment and provision of vaccines may be reduced, improving women's health. Improving obstetrician-gynecologists' willingness to provide assessment and administration of immunizations can have an improvement on patient health, as vaccine-preventable infections have continually been a leading cause of preventable morbidity in pregnant women and neonates (Anderson, 2001). For example, only 13% of pregnant women received the influenza vaccine in 2003 (CDC, 2003), despite the fact that women infected with influenza during pregnancy are at increased risk for serious complications and hospitalizations (Neuzil, et al., 1998). This change can have a particular benefit to a woman's health overall, especially when considering that obstetrician-gynecologists are often the sole medical contact for nonpregnant women (Leader & Perales, 1995).

There are several limitations to this research. Firstly, we relied on retrospective reports, which are subject to errors of recall and subjectivity. Second, it has been demonstrated in the past that there is a discrepancy between physician-perceived responsibility for vaccination administration and actual practices (Gonik et al, 2000); therefore, a prospective and objective study of actual immunization practices is warranted. A third limitation of this study is that not all questions were identical to those of Gonik and colleagues (2000). For example, we did not ask about the hepatitis B vaccine practices as that study did, and we also did not ask respondents to rank reasons for not administering vaccines; this question asked them to indicate on a Likert scale how strongly they felt about each provided reason. This study also had a somewhat low response rate; however, the 32% response rate is no different from the rates obtained in other states in the larger study of all District V. Additionally, this study is not meant to apply to obstetrician-gynecologists nationwide. Given that this research only examined respondents practicing in Michigan, it is possible that the findings are not true for all obstetrician-gynecologists. However, this study corroborates many of the findings in our recent study involving a national sample (*in preparation*), thus mitigating this concern.

Obstetrician-gynecologists have the opportunity to identify women who would most benefit from immunizations by attending to life-style and co-morbid health issues (Leaphart et al., 2003). An



adoption of a primary care role on the part of many obstetrician-gynecologists has likely led to the improvement in the assessment and administration of vaccinations. While more respondents are incorporating vaccination into routine practice, there are still improvements that can be made; there are still obstetrician-gynecologists who are not assessing all vaccines, and fewer are assessing the needs of gynecologic, as opposed to obstetric, patients. An increased focus on the provision of primary care and the reduction of financial barriers may increase the willingness of obstetrician-gynecologists to provide assessment and administration of immunizations, benefiting the general health of women.



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Table 1:
Demographic Information for All Respondents

	<u>% of Respondents</u>
<u>GENDER</u>	n = 287
MALE	47.7%
FEMALE	52.3%
<u>PRIMARY PRACTICE</u>	
GENERAL OB-GYN	74.5%
GYNECOLOGY ONLY	12.9%
OTHER	6.4%
MATERNAL/FETAL MEDICINE	5.9%
OBSTETRICS ONLY	0.3%
<u>CURRENT PRACTICE</u>	
LARGE GROUP (FOUR+ PARTNERS)	30.5%
SOLO PRIVATE PRACTICE	19.0%
SMALL GROUP (2-3 PARTNERS)	17.2%
COMMUNITY HOSPITAL FACULTY (FULL TIME)	8.2%
UNIVERSITY FACULTY AND PRACTICE (FULL TIME)	6.8%
UNIVERSITY FULLTIME FACULTY & PRACTICE	6.8%
ONE PARTNER	6.1%
OTHER	5.4%
<u>LOCATION</u>	
SUBURBAN	47.0%
URBAN- NON-INNER CITY	30.7%
RURAL	12.7%
URBAN- INNER CITY	9.5%
<u>ADMINISTER VACCINES</u>	
YES	80.6%
NO	19.4%



Table 2:

Immunization Recommendations for Pregnant Women. (Adapted from: Centers for Disease Control and Prevention. Recommended adult immunization schedule—United States, 2009. MMWR 2008;57(53)).

Pregnant Women				
	Vaccine	Should be considered if otherwise indicated	Contraindicated during pregnancy	Recommended if other risk factors exist (e.g. lifestyle)
Routine	Hepatitis A (HAV)			X
	Hepatitis B (HBV)			X
	Human Papillomavirus (HPV)			
	Influenza (Inact.)	X		
	Influenza (LAIV) *		X	
	Meningococcal (MCV4)			X
	Pneumococcal			X
	Measles, Mumps, Rubella (MMR)		X	
	Tetanus - Diphtheria	X		
	Tetanus - Diphtheria - Pertussis (Tdap)			X
	Varicella			X



Table 3:

Immunization Recommendations for Non-Pregnant Women. (Adapted from: Centers for Disease Control and Prevention. Recommended adult immunization schedule—United States, 2009. MMWR 2008;57(53)).

Non-Pregnant Women**					
Vaccine	AGE RANGE				
	19-26	27-49	50-59	60-64	65+
Tetanus, diphtheria, pertussis (Td/Tdap)	X	X	X	X	X
Human Papillomavirus (HPV)	X				
Varicella	X	X	X	X	X
Zoster				X	X
Measles, Mumps, Rubella (MMR)	X	X	*	*	*
Influenza	*	*	X	X	X
Pneumococcal	*	*	*	*	X
Hepatitis A (HAV)	*	*	*	*	*
Hepatitis B (HBV)	*	*	*	*	*
Meningococcal	*	*	*	*	*

*Recommended if other risk factors are present (e.g. lifestyle or occupation).

** “Neither inactivated nor live vaccines administered to a lactating woman affect the safety of breast-feeding for mothers or infants. Breast-feeding does not adversely affect immunization and is not a contraindication for any vaccine, with the exception of smallpox vaccine.” (CDC, 2006)



Figure 1:

Level of agreement with the statement “routine screening for any vaccine preventable diseases falls outside of the routine practice of an ob/gyn physician” for Gonik, et al., 2000 and the current study.

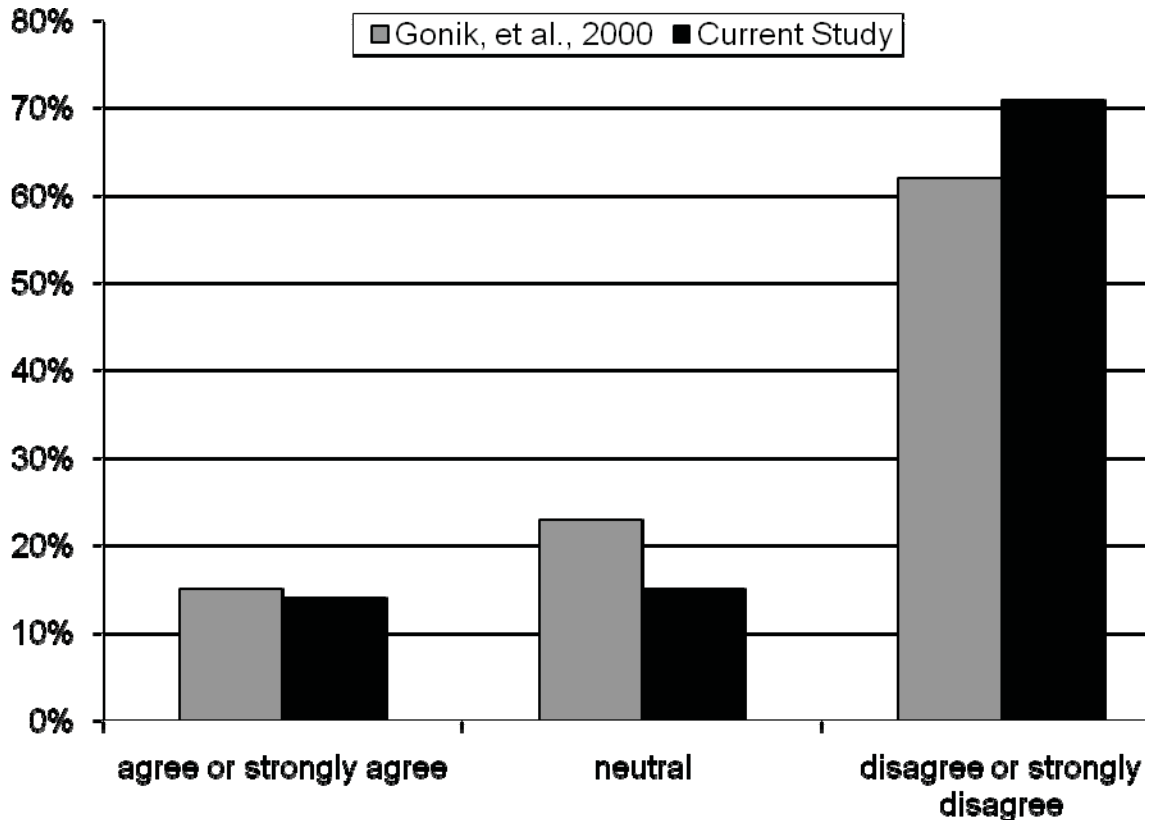


Figure 2:
Comparisons between the current study and Gonik, et al., 2000.

