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## Seasonal Influenza Vaccine in Pregnant Women: Views and Experiences of Obstetrician–Gynecologists

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### Abstract

**Background:** Seasonal influenza vaccination rates among pregnant women remain well below the Healthy People 2020 target of 80%. Obstetrician–gynecologist (OB/GYN) recommendations are a critical means of encouraging pregnant women to get vaccinated, but there are limited data about their views.

**Materials and Methods:** A nationally representative survey of 506 practicing OB/GYNs was completed between October 26, 2015, and May 8, 2016. Analyses included univariate distributions and comparisons based on age, size of practice, and academic affiliation using all-pairs, dependent *t*-tests.

**Results:** A majority of OB/GYNs report they “strongly recommend” seasonal influenza vaccination for their pregnant patients in the first (79%) or second and third trimesters (81%). Among those who do not strongly recommend the flu vaccine in the first trimester, many say this is because of their own concerns (28%) or their patients’ concerns (44%) about safety. Older OB/GYNs, those in smaller practices, and those without academic affiliation were less likely to recommend the vaccine and more likely to have safety concerns. For example, 72% of those age 60+ strongly recommended the vaccine in the second and third trimester, compared with 86% of those ages 30–44 and 83% of those ages 45–59 ( $p < 0.05$  for all comparisons).

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#### Publisher's Disclaimer: Disclaimer

**Publisher's Disclaimer:** All authors acted in a personal capacity. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC), any other portion of the Government of the United States, National Public Health Information Coalition (NPHIC), Harvard T.H. Chan School of Public Health (HSPH), or SSRS.

**Conclusions:** OB/GYNs across the country largely support seasonal flu vaccination among pregnant women. Nonetheless, safety is a concern for them and their patients. Outreach to support clinician decisions and conversations with pregnant patients may be most needed among older physicians, those in smaller practices, and those without academic affiliation.

### Keywords

obstetrics and gynecology; pregnancy; influenza vaccination

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### Introduction

Pregnant women and young infants are at elevated risk for severe illness and complications from influenza, including pneumonia.<sup>1–8</sup> The flu vaccine provides effective and safe protection against these risks in pregnant women.<sup>9–16</sup> Moreover, vaccinating a pregnant woman provides protection to her infant after birth, which is particularly important because influenza vaccination is not recommended for children <6 months of age.<sup>9–13</sup> Therefore, the Advisory Committee on Immunization Practices and the American College of Obstetricians and Gynecologists recommend the influenza vaccine for all healthy pregnant women, regardless of trimester, during flu season.<sup>17–19</sup> These recommendations have been reiterated in the wake of COVID-19, given the role of influenza vaccination in protecting pregnant women and minimizing burden on the health care system during the pandemic.<sup>20</sup>

Despite these benefits, flu vaccination rates among pregnant women have been historically low. Rates hovered at 15% in the years after the national recommendation in 2004.<sup>21,22</sup> They did increase during the 2009–2010 H1N1 pandemic flu outbreak, during which there were several new stories covering the deaths of pregnant women and a concerted effort from public health agencies to vaccinate pregnant women.<sup>21,23–26</sup> However, the most recent estimates suggest rates are now only at about 61%, which is still substantially lower than the Healthy People 2020 target of 80%.<sup>27,28</sup> Furthermore, there are concerns that this level may drop in the wake of the COVID-19 pandemic.<sup>29</sup>

Although access and cost play a role in flu vaccination coverage, the largest contributor to undervaccination appears to be pregnant women's concerns that the vaccine could be unsafe for their developing fetus.<sup>30–33</sup> Furthermore, a recommendation from a physician appears to be the strongest predictor of getting the vaccine among pregnant women.<sup>31,32,34–36</sup>

Evidence to date suggests that a majority of obstetrician–gynecologists (OB/GYNs) are supportive of influenza vaccination among pregnant women, and there are studies to understand their views to support them in making recommendations to patients.<sup>37–44</sup>

However, there is no clear evidence at a national level about characteristics of physicians who are less supportive of influenza vaccination and their reasoning. There is some suggestion that logistics around maintaining vaccination supply and financial considerations play an important role in physicians not offering the vaccine, with less attention to physician concerns about safety or their reactions to patient concerns.<sup>30–33,45</sup> Furthermore, little is known about variation in support nationally by size of practice, academic affiliation or age of physician, although one study in Oregon suggests that younger prenatal

physician providers are more likely than their older counterparts to recommend vaccination during pregnancy.<sup>37</sup> Finally, there is limited examination of possible variation in support for vaccination of women in early compared with later stages of pregnancy. A more robust evaluation of physician views and concerns would assist in the development of effective communication strategies that encourage physicians, and OB/GYNs specifically, to recommend vaccination to their pregnant patients.

This study utilizes data from a nationally representative survey of OB/GYNs to address four key questions that can help shape effective communications and outreach: (1) What fraction of OB/GYNs do not recommend influenza vaccination for patients, and what are the reasons they do not? (2) What are OB/GYN views of flu vaccine safety? (3) How prevalent do OB/GYNs think patient concerns about vaccine safety are and what do they think of these concerns? (4) How do recommendations and views vary by age, size of practice, and academic affiliation?

## Materials and Methods

Data for this study come from a nationally representative survey of practicing OB/GYNs, conducted by researchers at Harvard T.H. Chan School of Public Health (HSPH, Boston, MA). Data collection was coordinated by an independent company, SSRS (Glen Mills, PA). A random sample of physicians was obtained from Redi-Data, an official licensee of the American Medical Association (AMA)'s masterfile of all physicians in the United States. The sample was drawn from those listed as specializing in Obstetrics and Gynecology, as well as physicians in the following subspecialties who care for pregnant women or women actively considering getting pregnant: Obstetrics, Gynecology, Maternal and Fetal Medicine, and Reproductive Endocrinology and Infertility.

Respondents were mailed an invitation and were asked to participate by either returning the print survey by mail or completing the survey online through a secure website. Offering multiple modes is recommended for surveys of physicians because it can help boost responses overall and help ensure responses are not skewed toward physicians who generally prefer communication through print or digital channels.<sup>37,46</sup> Survey participation was also encouraged through a \$20 incentive and extensive recruitment procedures based upon approaches developed in previous studies with high response rates among physicians.<sup>47,48</sup> Physicians were randomly assigned to receive a check or cash as part of a methodological experiment within this study (results reported separately).<sup>49</sup>

The survey was conducted from October 26, 2015 to May 8, 2016, measured as the date that invitations were sent to the date that the last survey was completed and returned. It yielded a 52% response rate. Evidence suggests that the risk of nonresponse bias can be mitigated with weighting to population demographics, and thus data were weighted to match distributions of key demographics among the OB/GYN population.<sup>48,50</sup> Relevant variables included age, gender, race/ethnicity, and geographic region. OB/GYN population parameters were obtained from the 2015 edition of the AMA's Physician Characteristics and Distribution in the United States based on the specialties used to draw the sample.<sup>51</sup> In addition, data were weighted to ensure no systematic overrepresentation of physicians who

were provided an incentive in check or cash. Furthermore, data were weighted to account for survey design characteristics and to account for modes of invitation to ensure that physicians who were able to be sent reminders by email were not overrepresented. The final, weighted data has a very similar distribution to the AMA Masterfile, with measures of all identified characteristics being <1% point different (Supplementary Appendix Table A1).

The survey included 46 substantive and demographic questions. Questions were designed based on an extensive review of surveys among physicians on related topics, including vaccination of pregnant women against other diseases, such as pertussis, diphtheria, and tetanus, as well as vaccination of nonpregnant women. (It also included questions about pregnancy-related medication safety, with results reported elsewhere).<sup>52</sup> Development was also based on a review of psychometric properties of proposed questions. The draft instrument was pretested among OB/GYNs and feedback was incorporated in the final questionnaire. Wording of analyzed questions is in the Tables.

Researchers first calculated univariate point estimates for survey question responses. Second, they compared responses between OB/GYNs of different ages, different sized practices, and those with varied affiliations using all-pairs dependent *t*-tests that account for the design effect of weighted data. Results of these tests with a *p*-value of <0.05 were considered statistically significant. All statistical analyses were calculated using survey software Mentor 3.0 (Survox, Inc., San Francisco, CA). All statistically significant differences are shown in the Tables; however, only differences that were statistically significant and at least 5% points are discussed in the text, as only differences of this size were considered both to be robust and to have practical implications for communication strategies.

Researchers at HSPH led the study design, questionnaire design, and analysis of deidentified data. Staff at National Public Health Information Coalition and Centers for Disease Control and Prevention contributed to questionnaire design and provided subject matter expertise. None of these organizations had a direct role in data collection. Given the role of HSPH researchers in working with deidentified data, this study was deemed not human subjects research by the Office of Human Research Administration at HSPH. Complementary data on OB/GYN views of medications from the same survey are published in a separate article.<sup>52</sup>

## Results

### Demographics

Five hundred six OB/GYNs responded to the survey. The vast majority (95%) identified as OB/GYNs, whereas the remainder identified as one of other subspecialties that care for pregnant women (Table 1). OB/GYNs were nearly equally men (47%) and women (53%). The majority (70%) were white (non-Hispanic), whereas 13% were Asian, 10% were black non-Hispanic, 4% were Hispanic, and 1% were American Indian/Alaska Native. Just over a quarter were ages 30–44 (27%) or 60+ (28%), whereas 44% were 45–59. Approximately a quarter were in practices of 1–2 physicians (23%), 3–5 physicians (28%), or 6–10 physicians (27%). A fifth (20%) were in practices of 11 or more physicians. About a third (30%) said their practice had an academic affiliation, whereas approximately two-thirds (68%) did not.

Respondents were distributed across the country by Census region, with a third (36%) in the South, about a quarter in the Northeast or West (22% each), and a fifth in North-Central (20%).

### Recommendations for seasonal flu vaccine

More than three-quarters (79%) of OB/GYNs said they “very strongly” recommended the seasonal flu vaccine for patients in the first trimester, and an additional 10% recommend it “somewhat strongly,” leaving few who said they recommend it “not strongly” (6%) or do not recommend it at all (4%) (Table 2). OB/GYNs who were older (age 60+) were less likely to recommend the vaccine “very strongly” in the first trimester as compared with younger OB/GYNs (69% age 60+ vs. 84% ages 30–44 and 80% ages 45–59;  $p < 0.05$  for all comparisons). Those in smaller practices were less likely to recommend the vaccine “very strongly” for patients in the first trimester (67% in practices with 1–2 physicians vs. 81% in practices with 3–5 physicians, 82% in practices with 6–10 physicians, and 85% in practices with 11+ physicians;  $p < 0.05$  for all comparisons). Those without academic affiliations were also less likely (76% vs. 85%;  $p < 0.05$ ) to do so.

OB/GYNs who recommend the seasonal flu vaccine “very strongly” for patients in the first trimester reported being motivated primarily by the health risks of influenza to the mother, with 94% saying this is a major reason for the recommendation. Less than half were motivated by the health risks of influenza to the fetus (43% mentioned this as “a major reason”) and approximately the same fraction said they encourage patients to get vaccinated as early as possible because patients sometimes delay (44% “a major reason”).

Among OB/GYNs who do not “very strongly” recommend the vaccine in the first trimester, the most common major reasons were that patients are often concerned about getting vaccinated in the first trimester so they “don’t push the issue” and that they recommend patients get the vaccine in later trimesters instead (44% cited each reason). A smaller fraction had concerns about safety risks for the fetus or mother (28%) or believed there is insufficient research about possible safety risks for fetus or mother (24%). Few OB/GYNs who said they do not recommend the vaccine “very strongly” in the first trimester felt that the health risks of influenza for the mother were not sufficient to warrant vaccination (10% mentioned this as “a major reason”) and very few said it was because there was not enough time during an appointment (5% “a major reason”) or patients should get the vaccine from another provider (4% “a major reason”). Very few (4%) cited any other major reasons.

More than three-quarters (81%) of OB/GYNs said they “very strongly” recommended the seasonal flu vaccine for patients in the second or third trimester. Those who were older (60+) were less likely to recommend the vaccine “very strongly” in the second and third trimesters as compared with younger OB/GYNs (72% age 60+ vs. 86% ages 30–44 and 83% ages 45–59;  $p < 0.05$  for all comparisons). Those in smaller practices were less likely to recommend the vaccine “very strongly” to patients in the second and third trimesters compared with those in larger practices (71% and 79% in practices with 1–2 and 3–5 physicians, respectively, vs. 89% and 87% in practices with 6–10 and 11+ physicians, respectively;  $p < 0.05$  for all comparisons). Those without academic affiliation were also less likely to say this (79% vs. 88%;  $p < 0.05$ ).

### OB/GYN views of seasonal flu vaccine safety

The vast majority of OB/GYNs believe the seasonal flu vaccine is “very safe” for pregnant patients. Nine in ten (90%) say this for patients in the second or third trimester (90%), whereas 82% say the same for patients in the first trimester (Table 3). Older OB/GYNs were less likely than younger OB/GYNs to say the vaccine is “very safe” for pregnant patients: for example, only 69% of those age 60+ said the vaccine is “very safe” for patients in their first trimester compared with 88% and 86% of those ages 30–44 and 45–59, respectively ( $p < 0.05$  for all comparisons). There were no differences between physicians with or without academic affiliation and no consistent pattern in views across practice size with regard to perceived safety of the influenza vaccine.

### OB/GYN views of patient concerns

Many OB/GYNs said a majority of their pregnant patients have concerns about taking the seasonal flu vaccine. About 4 in 10 (40%) said that “all” or “most” of their patients in their first trimester have concerns, and about a quarter (25%) said the same of their patients in the second or third trimester (Table 4). Older OB/GYNs (age 60+) were more likely than those in the youngest category (ages 30–44) to indicate that a majority (“all” or “most”) of their patients in the first trimester have concerns about taking the seasonal flu vaccine (47% age 60+ vs. 35% ages 30–44;  $p < 0.05$ ). OB/GYNs in the smallest practice size (1–2 physicians) reported more concern about taking the vaccine among pregnant patients. For example, just over half of OB/GYNs in small practices said “all” or “most” patients in the first trimester have concerns (52% in practices with 1–2 physicians) compared with less than a third of those in the largest practices (31% in practices with 11+ physicians). There was no significant difference between physicians with and without academic affiliation with respect to their views of patient concerns.

A majority of OB/GYNs (61%) felt their patients are generally more concerned than they need to be about seasonal flu vaccine. There were no clear patterns across age and no differences across physicians based on size of practice or academic affiliation with respect to the perceived level of concern among pregnant patients.

## Discussion and Conclusions

This multimode, nationally representative study of OB/GYNs shows that a majority of OB/GYNs strongly recommend seasonal flu vaccination for their pregnant patients at all stages of pregnancy. Furthermore, the majority of OB/GYNs believe seasonal flu vaccine is very safe in these populations. At the same time, the data provide key insights about the small, but nonetheless substantial, share of OB/GYNs who feel and behave differently and the challenges many face with patient concerns.

First, the data suggest that concerns about safety play a key role for OB/GYNs who do not recommend the vaccine very strongly to pregnant patients. Many say this is a reason they do not recommend the vaccine in the first trimester, alongside the belief that research about safety risks is insufficient. In contrast to other studies, the idea that vaccination is not “in their purview” or operational challenges with stocking vaccine or reimbursement

did not come up in response to questions about their reasoning.<sup>39,45</sup> Education and outreach to physicians about flu vaccine safety may be needed to boost vaccination rates among pregnant women.

Second, patient concerns appear to be playing a major role for OB/GYNs. Many say a majority of their patients have concerns about vaccine safety. Furthermore, OB/GYNs appear to be responding to these patient concerns about vaccine safety by not recommending the vaccine, as many of those who do not recommend the vaccine in the first trimester say it is because patients are concerned. Support for conversations with patients may need to be part of the outreach to physicians.

Finally, the data help target communications and engagement strategies for OB/GYNs in the United States. Data suggest that OB/GYNs who are less likely to recommend the vaccine and more likely to have safety concerns are more likely to be older. This may be logical given that the universal influenza vaccination recommendation for healthy pregnant women came into being in 2004, a substantial way into their years of clinical practice for physicians age 60+. Furthermore, the data point to some clustering of recommendation reluctance and concerns among physicians in small practices. There is some lesser support for strong vaccine recommendations among physicians without an academic affiliation, although views of safety and other concerns are not markedly different. Communication and engagement strategies may need to consider focusing on these groups of physicians, with special consideration for overcoming challenges related to reaching smaller practices, as they may have more limited connections to institutional outreach channels.

The study has limitations. First, data are self-reported and are therefore subject to recall bias and social desirability bias. Given the national recommendations for pregnant women to get vaccinated, one would expect social desirability bias to encourage over-reporting of recommendation practices. Thus, this study may present the higher threshold of recommendation intention, and more OB/GYNs than reported may not be recommending the vaccine as strongly in practice. Second, findings may not apply to the fraction of physicians who did not reply to the study. If physicians who are less interested in the subject and less likely to strongly recommend vaccination are also less likely to reply to the survey, this would also serve to increase reported rates of vaccination recommendations. Furthermore, we were unable to weight the data with respect to all characteristics of physician practices, such as academic affiliation. In other studies, physicians without academic affiliations were less likely to respond to a survey, and thus we may have a lower fraction of them, which would further inflate the reported rates of vaccination recommendation in these data.<sup>53</sup> These three limitations—social desirability, overall response rate, and differential response rates—emphasize the risk that the true fraction of physicians who do not strongly recommend the vaccine is higher; thus, they serve to reinforce conclusions about the need for more education and support of such physicians. We also note that in the time since the data were collected, physicians may have changed views. It may be important to explore evolving perceptions going forward, particularly in the wake of the COVID-19 pandemic. Finally, we note that other providers of obstetric care, including family practitioners and certified nurse midwives, are not included in the study. Additional

research with these populations would help provide a more detailed view of the vaccine recommendation landscape that women receiving care in their pregnancies face.

Despite these limitations, results provide key evidence that OB/GYNs across the country largely support seasonal flu vaccination among pregnant women. Furthermore, they provide important evidence that safety issues are a concern for physicians and their patients. Finally, the data provide direction for education about vaccine safety and support for OB/GYNs. Future research may be needed to evaluate appropriate communication activities with OB/GYNs, including opportunities to encourage effective dialog with patients who may have concerns about safety.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**TABLE 1.**

DEMOGRAPHICS OF SURVEY RESPONDENTS ( $N = 506$ ), SEASONAL INFLUENZA VACCINE IN PREGNANT WOMEN: VIEWS AND EXPERIENCES OF OBSTETRICIAN–GYNECOLOGISTS, 2015–2016

	<i>Total % (n)</i>
Age, years	
30–44	27 (175)
45–59	44 (201)
60	28 (125)
Gender	
Male	47 (236)
Female	53 (269)
Race/ethnicity	
White non-Hispanic	70 (354)
Asian	13 (65)
Black non-Hispanic	10 (52)
Hispanic	4 (23)
American Indian/Alaska Native	1 (5)
Other	3 (16)
Number of physicians in practice	
1–2	23 (112)
3–5	28 (151)
6–10	27 (132)
11+	20 (103)
Specialty	
Obstetrics and gynecology	95 (480)
Gynecology	2 (11)
Maternal and fetal medicine	2 (8)
Reproductive endocrinology and infertility	1 (7)
Obstetrics	<1 (1)
Academic affiliation	
Yes	30 (154)
No	68 (345)
Region	
Northeast	22 (111)
North-Central	20 (100)
South	36 (183)
West	22 (112)

TABLE 2.

OBSTETRICIAN–GYNECOLOGIST RECOMMENDATIONS FOR SEASONAL FLU VACCINE, SEASONAL INFLUENZA VACCINE IN PREGNANT WOMEN: VIEWS AND EXPERIENCES OF OBSTETRICIAN–GYNECOLOGISTS, 2015–2016

	Total % (n)	Age				# of physicians in practice				Academic affiliation	
		30–44 % (n) [a]	45–59 % (n) [b]	60+ % (n) [c]	1–2 % (n) [d]	3–5 % (n) [e]	6–10 % (n) [f]	11+ % (n) [g]	Yes % (n) [h]	No % (n) [i]	
How strongly, if at all, do you recommend the seasonal flu vaccine for patients who are...?											
In the first trimester <sup>/</sup>											
Very strongly	79 (399)	84 <sup>c</sup> (146)	80 <sup>c</sup> (162)	69 (87)	67 (75)	81 <sup>d</sup> (122)	82 <sup>d</sup> (108)	85 <sup>d</sup> (87)	85 <sup>i</sup> (132)	76 (263)	
Somewhat strongly	10 (52)	9 (16)	11 (22)	11 (14)	15 <sup>f</sup> (17)	11 (17)	7 (9)	8 (8)	7 (11)	12 (41)	
Not strongly	6 (29)	7 (12)	4 (9)	7 (8)	8 <sup>g</sup> (9)	6 (8)	7 <sup>g</sup> (9)	2 (2)	5 (8)	6 (20)	
Do not recommend	4 (22)	0 (0)	4 <sup>a</sup> (11)	11 <sup>a,b</sup> (14)	9 <sup>e</sup> (11)	2 (3)	4 (5)	3 (3)	1 (2)	6 <sup>h</sup> (19)	
In the second or third trimester <sup>/</sup>											
Very strongly	81 (412)	86 <sup>c</sup> (151)	83 <sup>c</sup> (166)	72 (90)	71 (79)	79 (119)	89 <sup>d,e</sup> (117)	87 <sup>d</sup> (89)	88 <sup>i</sup> (136)	79 (272)	
Somewhat strongly	10 (50)	11 (20)	8 (17)	11 (14)	15 <sup>f,g</sup> (17)	13 <sup>f</sup> (20)	5 (7)	6 (6)	6 (9)	12 (40)	
Not strongly	2 (10)	0 (0)	4 <sup>a</sup> (7)	3 <sup>a</sup> (3)	2 (2)	1 (2)	2 (3)	3 (3)	2 (3)	2 (7)	
Do not recommend	1 (7)	0 (0)	<1 (1)	5 <sup>a,b</sup> (6)	2 (3)	3 (4)	1 (1)	0 (0)	0 (0)	2 (7)	
Why do you recommend the seasonal flu vaccine “very strongly” for pregnant women in the first trimester?											
For each item below, please indicate whether it is a major reason, a minor reason, or not a reason.											
Among respondents who “very strongly” recommend the seasonal flu vaccine for patients who are in the first trimester, n = 396											
I am concerned about the health risks of influenza for the mother											
Major reason										Total % (n)	
Minor reason										94 (377)	
Not a reason										4 (14)	
Refused/no answer										1 (5)	
I try to encourage patients to get the vaccine as early as possible because they sometimes delay										1 (3)	

	# of physicians in practice					Academic affiliation				
	Total % (n)	30-44 % (n) [a]	45-59 % (n) [b]	60+ % (n) [c]	1-2 % (n) [d]	3-5 % (n) [e]	6-10 % (n) [f]	11+ % (n) [g]	Yes % (n) [h]	No % (n) [i]
Major reason										44 (174)
Minor reason										31 (124)
Not a reason										22 (86)
Refused/no answer										4 (15)
I am concerned about the health risks of influenza for the fetus										
Major reason										43 (171)
Minor reason										36 (142)
Not a reason										17 (67)
Refused/no answer										5 (18)
Why don't you recommend the seasonal flu vaccine "very strongly" for pregnant women in the first trimester? For each item below, please indicate whether it is a major reason, a minor reason, or not a reason.										
Among respondents who do not "very strongly" recommend the seasonal flu vaccine for patients who are in the first trimester, n = 106										Total % (n)
Patients are often concerned about the safety risks of vaccinations in the first trimester so I do not push the issue										44 (46)
Major reason										23 (24)
Minor reason										10 (10)
Not a reason										23 (24)
Refused/no answer										
I recommend they get the vaccine in later trimesters instead										
Major reason										44 (45)
Minor reason										14 (14)
Not a reason										23 (24)
Refused/no answer										19 (19)
I am concerned about safety risks of the vaccine for the fetus or mother										
Major reason										28 (29)
Minor reason										21 (22)
Not a reason										29 (30)
Refused/no answer										22 (23)

	Age				# of physicians in practice				Academic affiliation	
	Total % (n)	30-44 % (n) [a]	45-59 % (n) [b]	60+ % (n) [c]	1-2 % (n) [d]	3-5 % (n) [e]	6-10 % (n) [f]	11+ % (n) [g]	Yes % (n) [h]	No % (n) [i]
There is not sufficient research about the possible safety risks for the fetus or mother										
Major reason										24 (25)
Minor reason										19 (20)
Not a reason										31 (32)
Refused/no answer										25 (26)
The health risks of influenza for the mother in the first trimester are not high enough to warrant vaccination										
Major reason										10 (10)
Minor reason										12 (13)
Not a reason										50 (52)
Refused/no answer										28 (29)
There is not enough time during appointments										
Major reason										5 (5)
Minor reason										11 (12)
Not a reason										55 (57)
Refused/no answer										29 (30)
Patients in their first trimester should get the vaccine from another provider										
Major reason										4 (4)
Minor reason										10 (10)
Not a reason										57 (58)
Refused/no answer										30 (31)
Other										
Major reason										4 (4)
Minor reason										0 (0)
Not a reason										4 (4)
Refused/no answer										92 (95)

Responses were weighted to account for survey design characteristics and poststratified to match population distributions of age, gender, race/ethnicity, and geographic region.

\*\*a-i\*\* corresponds to columns a, b, c, d, e, f, g, h, and i.

<sup>a-i</sup>Percentage is statistically greater than the group(s) noted in superscript; this is also indicated with bolded text.

<sup>j</sup>Responses not shown: Not applicable <8%; Refused/no answer <5%.

TABLE 3.

OBSTETRICIAN–GYNECOLOGIST VIEWS OF SEASONAL FLU VACCINE SAFETY, SEASONAL INFLUENZA VACCINE IN PREGNANT WOMEN: VIEWS AND EXPERIENCES OF OBSTETRICIAN–GYNECOLOGISTS, 2015–2016

	Age					# of physicians in practice				Academic affiliation	
	Total % (n)	30–44 % (n) [a]	45–59 % (n) [b]	60+ % (n) [c]	1–2 % (n) [d]	3–5 % (n) [e]	6–10 % (n) [f]	11+ % (n) [g]	Yes % (n) [h]	No % (n) [i]	
Regardless of your answers to previous questions, how safe do you think the seasonal flu vaccine is when patients are...?											
In the first trimester <sup>f</sup>											
Very safe	82% (416)	<b>88<sup>c</sup> (153)</b>	<b>86<sup>c</sup> (173)</b>	69 (87)	74 (83)	<b>87<sup>d</sup> (131)</b>	79 (104)	<b>90<sup>d,f</sup> (92)</b>	87 (134)	81 (278)	
Somewhat safe	12 (61)	10 (18)	10 (21)	16 (20)	<b>16<sup>g</sup> (18)</b>	8 (13)	<b>16<sup>g</sup> (21)</b>	6 (6)	10 (16)	12 (42)	
Not very safe	2 (12)	2 (4)	1 (3)	4 (5)	4 (4)	2 (4)	2 (2)	2 (2)	1 (1)	3 (11)	
Not at all safe	1 (4)	0 (0)	0 (0)	<b>3<sup>a,b</sup> (4)</b>	1 (1)	1 (2)	1 (1)	0 (0)	0 (0)	1 (4)	
In the second or third trimester <sup>f</sup>											
Very safe	90 (454)	<b>93<sup>c</sup> (163)</b>	<b>93<sup>c</sup> (186)</b>	80 (101)	85 (95)	91 (138)	90 (119)	<b>94<sup>d</sup> (96)</b>	92 (143)	89 (308)	
Somewhat safe	7 (36)	7 (12)	3 (7)	<b>13<sup>b</sup> (16)</b>	<b>11<sup>g</sup> (12)</b>	5 (7)	8 (10)	3 (4)	5 (8)	7 (25)	
Not very safe	<1 (1)	0 (0)	0 (0)	1 (1)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	<1 (1)	
Not at all safe	1 (4)	0 (0)	<1 (1)	<b>3<sup>a</sup> (3)</b>	1 (1)	2 (3)	0 (0)	0 (0)	0 (0)	1 (4)	

Responses were weighted to account for survey design characteristics and poststratified to match population distributions of age, gender, race/ethnicity, and geographic region.

<sup>a–i</sup> corresponds to columns a, b, c, d, e, f, g, h, and i.

<sup>a,b,c,d,f,g</sup> Percentage is statistically greater than the group(s) noted in superscript; this is also indicated with bolded text.

<sup>f</sup> Responses not shown: Not applicable <8%; Refused/no answer <5%.



TABLE 4.

OBSTETRICIAN–GYNECOLOGIST VIEWS OF PATIENT CONCERNS, SEASONAL INFLUENZA VACCINE IN PREGNANT WOMEN: VIEWS AND EXPERIENCES OF OBSTETRICIAN–GYNECOLOGISTS, 2015–2016

	Total % (n)	Age				# of physicians in practice				Academic affiliation	
		30–44 % (n)[a]	45–59 % (n)[b]	60+ % (n)[c]	1–2 % (n)[d]	3–5 % (n)[e]	6–10 % (n)[f]	11+ % (n)[g]	Yes % (n)[h]	No % (n)[i]	
How many of your patients in the following categories have concerns about taking the seasonal flu vaccine?											
In the first trimester <sup>f</sup>											
All/most (NET)	40% (204)	35 (61)	41 (82)	<b>47<sup>a</sup> (59)</b>	<b>52<sup>f,g</sup> (58)</b>	43 (65)	36 (47)	31 (32)	39 (61)	41 (141)	
All	5 (24)	4 (6)	4 (8)	7 (9)	8 (9)	5 (8)	4 (5)	3 (3)	3 (5)	5 (19)	
Most	35 (179)	31 (55)	37 (73)	40 (50)	<b>44<sup>f,g</sup> (50)</b>	38 (57)	32 (42)	29 (30)	36 (56)	36 (123)	
Some	44 (225)	<b>53<sup>c</sup> (92)</b>	<b>44<sup>c</sup> (89)</b>	34 (42)	36 (41)	43 (64)	48 (63)	<b>54<sup>d</sup> (56)</b>	45 (69)	45 (156)	
Not very many	12 (62)	12 (20)	12 (25)	13 (16)	7 (8)	14 (21)	14 (18)	12 (13)	14 (22)	11 (40)	
None	<1 (1)	0 (0)	0 (0)	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)	<1 (1)	0 (0)	
In the second or third trimester <sup>f</sup>											
All/most (NET)	25 (125)	22 (39)	25 (50)	29 (36)	<b>29<sup>g</sup> (33)</b>	25 (37)	28 (37)	17 (17)	26 (40)	24 (83)	
All	3 (15)	3 (6)	2 (4)	4 (5)	2 (2)	4 (6)	3 (4)	2 (2)	3 (4)	3 (11)	
Most	22 (111)	19 (33)	23 (46)	25 (31)	<b>27<sup>g</sup> (30)</b>	20 (31)	25 (33)	15 (15)	24 (36)	21 (73)	
Some	52 (262)	<b>60<sup>c</sup> (104)</b>	<b>51<sup>c</sup> (103)</b>	40 (51)	53 (59)	53 (80)	49 (65)	55 (57)	44 (68)	<b>56<sup>h</sup> (193)</b>	
Not very many	18 (91)	16 (28)	18 (36)	21 (26)	9 (10)	<b>20<sup>d</sup> (30)</b>	<b>19<sup>d</sup> (24)</b>	<b>23<sup>d</sup> (24)</b>	<b>24<sup>i</sup> (36)</b>	16 (54)	
None	1 (3)	1 (2)	<1 (1)	1 (1)	1 (2)	1 (2)	0 (0)	1 (1)	<b>2<sup>i</sup> (3)</b>	0 (0)	
Would you say your pregnant patients are generally more concerned about seasonal flu vaccine than they need to be, less concerned about it than they need to be, or about as concerned as they need to be? <sup>f</sup>											
More concerned than they need to be	61 (307)	59 (104)	<b>67<sup>c</sup> (135)</b>	51 (64)	57 (64)	59 (90)	62 (82)	69 (71)	64 (98)	60 (208)	
Less concerned than they need to be	15 (77)	19 (33)	12 (25)	15 (18)	16 (18)	18 (27)	15 (20)	10 (11)	13 (20)	16 (56)	
About as concerned as they need to be	23 (119)	21 (36)	19 (38)	<b>34<sup>a,b</sup> (43)</b>	27 (30)	23 (34)	22 (30)	21 (22)	23 (36)	24 (81)	

Responses were weighted to account for survey design characteristics and poststratified to match population distributions of age, gender, race/ethnicity, and geographic region.

<sup>a–i</sup> corresponds to columns a, b, c, d, e, f, g, h, and i.

*a,b,c,d,f,g,h,i* Percentage is statistically greater than the group(s) noted in superscript; this is also indicated with bolded text.

*j* Responses not shown: Not applicable <8%; Refused/no answer <5%.

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