INTRODUCTION

Implant-based breast reconstruction and breast augmentation using implants comprise some of the most common procedures performed by plastic surgeons.1 Approximately 100,000 implant-based breast reconstruction and 190,000 cosmetic breast augmentation procedures were performed in the United States in 2020 alone, and breast augmentation has remained one of the top five cosmetic surgical procedures since 2006.1

Breast implants have gained much attention in the media, especially given increasing awareness of complications, such as breast implant illness (BII) and breast implant-associated anaplastic large cell lymphoma (BIA-ALCL).2 In October 2021, the US Food and Drug Administration (FDA) released a boxed warning to be included in physician and patient labeling materials for breast implants, and required that certain risks be communicated to patients receiving implants.3,4 The FDA recommended communicating these risks, such as implants not being lifetime devices, complications increasing over time, leaking of implant contents, and associations with

BACKGROUND: The US Food and Drug Administration (FDA) issued a boxed warning on breast implants in October 2021, requiring communication of certain risks to patients. This study assessed how this boxed warning may impact public perceptions of breast implants.

METHODS: A cross-sectional survey was administered to adult women in the United States in December 2021 using Amazon Mechanical Turk to assess perceptions of breast implant risks communicated in the FDA-issued guidance. Sociodemographic predictors of responses were identified using multivariable models.

RESULTS: There were 494 complete responses. Respondents had a mean age of 36.9 years, and 80% had an associate’s degree or higher. At baseline, most would consider receiving implants for reconstructive or cosmetic purposes (65%). Some were unsure or indicated that it is not possible to undergo mammograms after receiving implants (42%). After provided information in the FDA guidance, the majority strongly agreed or agreed that they were less likely to receive implants knowing the risk of anaplastic large cell lymphoma (75%), because implants contain chemicals/heavy metals (74%), and because implants are not lifetime devices (68%), with greater odds among Hispanic respondents (OR, 2.35; P < 0.01) and lower odds among higher-income respondents (OR, 0.64; P = 0.03).

CONCLUSIONS: There are misconceptions with regard to breast implant-associated risks. Despite most laywomen indicating that they would consider receiving implants at baseline, the risks communicated in the 2021 FDA boxed warning may make patients less likely to receive implants, with variability among different sociodemographic populations. (Plast Reconstr Surg Glob Open 2022;10:e4439; doi: 10.1097/GOX.0000000000004439; Published online 8 November 2022.)

Disclosure: Dr. Broyles, MD, serves on the scientific advisory board for Healshape LLC and receives consulting support from The Agency for Healthcare Research and Quality (AHRQ). The other authors have no financial interest to declare.

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.
the development of BIA-ALCL and BII, in the form of a checklist.

Following the release of the FDA’s draft guidance in October 2019, a previous cross-sectional study concluded that the proposed warning label would significantly influence laywomen’s opinions of breast implants. While some research groups have further attempted to understand public perceptions of certain complications, such as BII and BIA-ALCL, less is known regarding how specific elements of the new, formally released FDA boxed warning may impact perceptions of implants. Moreover, less is known regarding perceptions of more common complications of implants, such as infection, which can affect up to 35% of breast reconstruction patients and require implant removal.

In this study, we aimed to assess public perceptions of the breast implant complications communicated within the 2021 FDA checklist, and whether this awareness may impact willingness to receive breast implants. In addition, we aimed to elucidate public awareness and perceptions of more common complications of breast implants, such as infection and seroma, as well as implications for breast cancer screening.

**METHODS**

**Survey Design**

Study authors (C.J.H. and J.M.B.) developed an anonymous survey to assess respondent demographics, baseline healthcare exposure (ie, work in healthcare; receipt of plastic surgery), baseline knowledge of risks associated with implants, and willingness to receive implants. A five-point Likert scale was used to assess agreement.

Information regarding the FDA boxed warning was abstracted from previously published FDA guidance for recommended labeling and a patient checklist to communicate breast implant risks. Information displayed to respondents is detailed in Supplemental Digital Content 1. (See table, Supplemental Digital Content 1, which displays abstracted information from labeling and patient checklist guidance for the FDA boxed warning on implants displayed to respondents, [http://links.lww.com/PRSGO/C103](http://links.lww.com/PRSGO/C103).) Respondents were unable to change responses to previously answered questions after provided with this information.

The study received IRB approval at Mass General Brigham. Research Electronic Data Capture (REDCap; Vanderbilt University) was used to collect and manage survey data. Completing a CAPTCHA (completely automated public Turing test to tell computers and humans apart) question was required before starting the survey.

**Survey Administration**

The survey was administered using Amazon Mechanical Turk, a crowdsourcing data platform that allows “requesters” to distribute surveys to “workers,” or the general public, for research purposes. Amazon Mechanical Turk has been used previously in public perceptions research. Adult women age 18 and older in the United States were surveyed in December 2021. Respondents received up to $0.50 for survey completion.

The survey was first administered to 100 respondents to assess functionality. Results from this pilot were excluded from analysis. Anticipating some number of incomplete responses, the survey was administered to 550 respondents, for a goal of approximately 500 complete responses.

**Data Analysis**

Categorical variables were described using frequencies (percentage). Continuous variables were described using means and SD. Multivariable logistic regression models were used to identify hypothesis-driven predictors of responses, with significance set at a P value less than 0.05. For statements that elicited respondent agreement, the two possible outcomes were “strongly agree or agree” versus “neither, disagree, or strongly disagree.” “Experienced” respondents were defined as those who knew someone or personally worked in healthcare and respondents who knew someone or personally had any type of surgery. “Naive” respondents were those who did not fit the criteria of experienced respondents. Analyses were conducted by author using R software version 4.1.0.

In describing the results of the sociodemographic predictors of responses, respondents who had greater odds of strongly agreeing or agreeing that they were less likely to receive implants are simplified as “less likely to receive implants.” Respondents who had lower odds of strongly agreeing or agreeing that they were less likely to receive implants are simplified as “not less likely to receive implants.”

**RESULTS**

**Characteristics of the Study Population**

Complete survey responses were obtained from 494 female respondents for a response rate of 89.8%. Characteristics of the study population are shown in Table 1. Respondents had a mean age of 37 years (range 18–69), and were 86% White, 11% Black or African American, and 17% Hispanic. Most were insured (90%), had private insurance (41%), and reported an annual income...
of $25,000–49,999 (29%), and reported bachelor’s degree as their highest educational attainment (43%).

The majority reported seeing a doctor two to five times per year (45%), personally knew someone who worked in healthcare (68%), and had any type of surgery (63%).

Overall, the majority of respondents were experienced (92%). Some respondents reported having had any type of cosmetic (33%) or reconstructive (22%) plastic surgery. Many reported personally knowing someone who had received cosmetic (56%) or reconstructive (46%) breast surgery.

### Baseline Knowledge and Perceptions

At baseline, 26% of respondents would not consider receiving implants for cosmetic or reconstructive reasons, as compared to 26% of respondents who would consider implants for cosmetic and 22% for reconstructive reasons only (Table 1).

With regard to which complications respondents had heard of previously, 49% indicated infection, followed by breast pain (48%). BIA-ALCL (8.1%) was least commonly selected. With regard to which complications were perceived as most and least common, most respondents indicated breast pain (42%) and BIA-ALCL (25%), respectively. With regard to which complications were perceived as most and least concerning, most respondents indicated damage to surrounding structures (39%) and breast pain (22%), respectively. (See table, Supplemental Digital Content 2, which displays perceptions of breast implant-associated risks, http://links.lww.com/PRSGO/C104.)

With regard to factors that respondents believed increased the risk of developing complications from breast implants, the majority indicated active smoking (62%) and more than half indicated alcohol use (55%) (Fig. 1).

The plurality of respondents indicated that implants affect the quality of breast milk (47%). Nearly half indicated that they were unsure or that it was not possible to undergo mammograms after receiving implants (42%). Nearly half also indicated that breast implants were lifetime devices with a low risk of complications over time (41%) and most were either unsure or indicated that it is not necessary to undergo routine surveillance with imaging (56%) (Fig. 2).

### Post-boxed Warning Perceptions

Respondents were then provided information contained in the FDA boxed warning and recommended guidance. Most respondents strongly agreed or agreed that they were less likely to receive implants knowing that implants are not lifetime devices (68%) and that there are risks of developing BIA-ALCL (75%) and BII (68%). Fewer respondents strongly agreed or agreed that they were less likely to receive implants, given surveillance requirements initially (59%) and over time (52%). More respondents strongly agreed or agreed that they were less likely to receive implants given possible interference with mammograms and breast examinations (72%), possible leakage of implant chemicals and metals (74%), and the risk of additional operations (76%), and implant rupture (72%) (Fig. 3).

Most respondents strongly agreed or agreed that the percentage of patients who develop rupture or leaking (68.2%), capsular contracture (69.7%), and needing an additional operation (74.9%) were higher than imagined (Fig. 4).
Sociodemographic Predictors

Hispanic respondents were less likely to receive implants given that implants are not lifetime devices (OR, 2.35; CI, 1.33–4.39; *P* < 0.01), the risk of BIA-ALCL (OR, 2.04; CI, 1.12–3.94; *P* = 0.03), initial (OR, 1.78; CI, 1.05–3.09; *P* = 0.04) and long-term surveillance requirements (OR, 1.74; CI, 1.06–2.92; *P* = 0.03), and the risk of additional operations (OR, 2.39; CI, 1.27–4.85; *P* = 0.01). Conversely, respondents with a higher annual income were not less likely to receive implants given that implants are not lifetime devices (OR, 0.64; CI, 0.42–0.96; *P* = 0.03) and the risk of BII (OR, 0.52; CI, 0.34–0.79; *P* < 0.01). Privately insured respondents were not less likely to receive implants given initial surveillance requirements (OR, 0.56; CI, 0.37–0.84; *P* < 0.01), but were less likely to receive implants given possible interference with mammograms and breast exams (OR, 1.70; CI, 1.10–2.66; *P* = 0.02) (Tables 2–4). Notably, being experienced was not predictive of any response. Complete regression model results are displayed in Supplemental Digital Content 3. (See table, Supplemental Digital Content 3, which displays complete regression
model results, [http://links.lww.com/PRSGO/C105](http://links.lww.com/PRSGO/C105). (See table, Supplemental Digital Content 4, which displays regression model results for respondents who strongly agree or agree for each question, based on independent characteristics listed. Responses reflect respondent perceptions after receiving information provided in the FDA boxed warning for breast implants, [http://links.lww.com/PRSGO/C106](http://links.lww.com/PRSGO/C106).) Percentage of respondents who strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree shown on the horizontal axis.

Fig. 3. Respondent attitudes of being less likely to receive breast implants in response to the FDA boxed warning. Statements provided to respondents are displayed on the left. Statements are elaborated within Supplemental Table 1. (See table, Supplemental Digital Content 1, which displays abstracted information from labeling and patient checklist guidance for the FDA boxed warning on implants displayed to respondents, [http://links.lww.com/PRSGO/C103](http://links.lww.com/PRSGO/C103).) Percentage of respondents who strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree shown on the horizontal axis.

**DISCUSSION**

Although previous studies have aimed to characterize the public’s familiarity with certain breast implant risks, such as BIA-ALCL, less work has been done to elucidate the public’s awareness of more prevalent complications, such as breast pain or infection, in comparison to BIA-ALCL in a given study population. Furthermore, little work has established the comparative differences in the public’s perceptions on risk factors that predispose patients to experiencing complications. Building upon prior research that assessed the possible impacts of an FDA guidance on implants, this study identified specific warnings that may be most likely to deter respondents from receiving implants in the future, as well as sociodemographic factors that were predictive of such attitudes. Assessment of additional factors, such as respondents’ insurance status and frequency of doctor’s visits, further provides surgeons with knowledge that may aid in addressing specific patient concerns with breast implants on a case-by-case basis. Additionally, this study identified the information in the FDA’s warning that was most surprising to respondents, highlighting areas that may require greater educational efforts on behalf of plastic surgeons to better establish familiarity of the requirements and risks of breast implant surgery among the general public.

The complication that respondents were least familiar with was BIA-ALCL (8.1%), with fewer respondents reporting having heard of the condition than has been reported in previous survey data. This was observed despite this study’s participant population having a greater percentage of respondents with higher educational attainment, a factor that has previously been identified as predictive for greater health literacy and patient education. Notably,
Fig. 4. Respondent perceptions of complications after being shown the FDA boxed warning on implants. Statements provided to respondents are displayed on the left. Percentage of respondents who strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree shown on the horizontal axis.

Table 2. Significant Regression Model Results on Factors Influencing Respondent Perceptions*  

| Perceived Risk Factor | Respondent Characteristic | OR (95% CI)       | P     |
|-----------------------|--------------------------|-------------------|-------|
| Obesity               | Hispanic ethnicity       | 0.49 (0.29–0.80)  | 0.004 |
|                       | Private health insurance | 1.87 (1.26–2.78) | 0.002 |
| Active smoking        | Private health insurance | 2.95 (1.56–5.58) | <0.001|
|                       | Annual household income ≥$50,000 | 0.65 (0.43–0.97) | 0.037 |
| Former history of smoking | Hispanic ethnicity       | 1.98 (1.24–3.14) | 0.004 |
|                       | Unsure of health insurance status | 41.0 (4.44–965) | 0.003 |
| Chemotherapy          | ADH                      | 0.46 (0.28–0.76) | 0.002 |
|                       | Private health insurance | 1.53 (1.02–2.29) | 0.059 |
| Radiation therapy     | ADH                      | 0.50 (0.30–0.82) | 0.006 |
|                       | Private health insurance | 1.72 (1.15–2.60) | 0.009 |
|                       | Naive                    | 0.43 (0.18–0.95) | 0.042 |
| Older age (>65 years) | Hispanic ethnicity       | 0.43 (0.24–0.76) | 0.004 |
|                       | ADH                      | 0.33 (0.19–0.56) | <0.001|
|                       | Private health insurance | 3.83 (2.49–5.98) | <0.001|
|                       | Annual household income ≥$50,000 | 0.45 (0.29–0.68) | <0.001|

*Respondent characteristics listed were used as the independent variables in the regression model; the dependent variable was the proportion of respondents who strongly agree or agree for each question. All regression model results, including nonsignificant results, displayed in Supplementary Tables 2–4. (See table, Supplemental Digital Content 2, which displays perceptions of breast implant-associated risks. http://links.lww.com/PRSGO/C104.) (See table, Supplemental Digital Content 3, which displays complete regression model results. http://links.lww.com/PRSGO/C105.) (See table, Supplemental Digital Content 4, which displays regression model results for respondents who strongly agree or agree for each question, based on independent characteristics listed. Responses reflect respondent perceptions after receiving information provided in the FDA boxed warning for breast implants. http://links.lww.com/PRSGO/C106.)
Table 3. Responses Reflect Participant Responses of Strongly Agreeing or Agreeing That They Would Be Less Likely to Receive Breast Implants after They Were Provided with a Given Piece of Information from the FDA Boxed Warning on Breast Implants during the Survey

| FDA Boxed Warning | Respondent Characteristic | OR (95% CI) | \( P \) |
|-------------------|--------------------------|------------|-----|
| Not considered lifetime devices | Hispanic ethnicity | 2.35 (1.53–4.39) | 0.005 |
| Risk of BIA-ALCL | Hispanic ethnicity | 2.04 (1.12–3.94) | 0.026 |
| Risk of systemic symptoms | Other insurance type* | 4.48 (1.39–16.3) | 0.016 |
| Recommendation of initial screening for rupture | Hispanic ethnicity | 4.48 (1.39–16.3) | 0.002 |
| Recommendation of continued screening for rupture | Hispanic ethnicity | 1.78 (1.05–3.09) | 0.037 |
| Interference with mammogram/breast examination | Private health insurance | 2.44 (1.47–4.08) | <0.001 |
| Risk of needing additional operation(s) | Hispanic ethnicity | 2.39 (1.27–4.85) | 0.010 |
| Risk of capsular contracture | Hispanic ethnicity | 2.11 (1.19–3.96) | 0.015 |

*Respondents had the option to list their insurance type as private coverage, Medicare/Medicaid, or other/not applicable. “Other insurance type” reflects a response of “other/not applicable.”

this study also had higher percentages of individuals who either had or knew someone who had cosmetic breast surgery (23%, 56%) or reconstructive breast surgery (21%, 46%) than previous survey data (10%, 54.4% and 2%, 18.4%), thereby suggesting that disparities in awareness of some breast implant complications are driven in part by factors outside of familiarity with other patients who have undergone breast surgery. This further suggests that previous experiences as patients and increased personal proximity to issues surrounding plastic surgery are insufficient in solely addressing knowledge gaps in breast surgery complications among the public. Addressing these disparities is particularly important in regard to communicating BIA-ALCL risk, given that most respondents (75%) expressed that they were less likely to receive breast implant surgery in the future after being provided with the FDA’s relevant warning statements.

Overall, while most respondents in our study indicated that they were less likely to receive implants after being provided information about implant risks, some respondents were not. Reasons for this are likely multifactorial and warrant future qualitative research to better understand the rationale of respondents. It is possible that many respondents could be considering their own future desire or need for breast implants, which could be influencing risk perception. Our study also reveals that perceptions differ significantly among certain sociodemographic groups. These findings highlight further how risk perception can be highly relative and variable.

Private health insurance coverage was the most consistent predictor for a given respondent to identify a proposed characteristic as a risk factor that would increase the likelihood of complications following breast implant surgery. This may be due to the higher use of preventative care services among patients with health insurance coverage, as well as greater access to primary care visits, during which patients and providers tend to regularly discuss the negative effects of risk factors, such as obesity and smoking, on general health.

Hispanic ethnicity was the most consistent predictor of respondents indicating that they were less likely to receive breast implants after learning about the information provided in the FDA boxed warning. For example, Hispanic respondents expressed lower likelihood of receiving implants with regard to BIA-ALCL risk, surveillance recommendations, long-term risks of needing additional operations and developing capsular contracture, and the guidance that breast implants are not lifetime devices. While further investigation is warranted to explore other factors that may explain these perceptions, Hispanic patients accounted for 7% of all breast reconstructions and 12% of all cosmetic breast augmentations in 2020. As such, the boxed warning may result in shifting patient demographics with regard to implant-based or autologous reconstruction.

Furthermore, addressing these findings is particularly important in light of evidence that continues to demonstrate that Hispanic patients experience disproportionately elevated health disparities, increased risk factors to general health, and decreased access to health care services in the United States. Disparate perceptions of breast implant complications should also be considered in the context of previous findings in the literature that demonstrate already disproportionately lower healthcare service access and utilization among Latina patients. It is also important to note that Hispanic ethnicity was the only predictive factor outside of familiarity with other patients who have undergone breast surgery.

Table 4. Responses Reflect Participant Attitudes of Strongly Agreeing or Agreeing with the Listed Statement after Being Provided with Information from the FDA Boxed Warning on Breast Implants

| Respondent Attitude                                                                 | Respondent Characteristic | OR (95% CI) | \( P \) |
|-------------------------------------------------------------------------------------|--------------------------|------------|-----|
| The recommendation for imaging (ultrasound or MRI) to monitor for implant rupture is more frequent than I imagined. | Hispanic ethnicity | 1.71 (1.03–2.90) | 0.043 |
| The percentage of patients with implants who develop rupture or leaking is higher than I imagined. | Hispanic ethnicity | 1.76 (1.02–3.15) | 0.050 |
| The percentage of patients with implants needing an additional operation is higher than I imagined. | Insured | 3.38 (1.22–9.72) | 0.020 |
characteristic found in this study for respondents finding the surveillance recommendations for implant rupture to be more frequent than expected, as well as finding the incidence of implant rupture or leaking to be higher than expected. Studying the factors that specifically affect Hispanic and Latino patients’ experiences with plastic surgery is warranted to better understand how the factor of Hispanic ethnicity affects perceptions of breast implants. Conducting focus groups with these patients may allow for a more holistic, informed understanding of key insights that shape these patients’ experiences.

Private health insurance coverage was also predictive for respondents being less likely to receive implants after learning that breast implants can interfere with mammograms and breast examinations. Interestingly, the opposite was true regarding the recommendation of initial screening for rupture 5–6 years after breast implant surgery. This may be explained by the previously described increased usage of and familiarity with primary care and preventative services that privately insured individuals tend to demonstrate, and may further demonstrate that risks directly associated with preventative practices, such as breast cancer screenings, may be particularly important to insured individuals in their decisions to receive breast implants. Likewise, given that these patients may be more accustomed to regular screenings with a primary care provider, it follows that they are less likely to find requirements for an initial imaging study for rupture monitoring to be abnormal. They may also be less likely to perceive a greater absolute risk of getting implants solely on the basis of receiving recommendations to undergo regular screenings.

Notably, higher income respondents were less likely to avoid breast implants after reading warnings that breast implants are not lifetime devices and that they have been associated with systemic symptoms in BII. Numerous studies have aimed to understand how affluence affects health behaviors. As compared with other populations, for example, wealthier patients may engage more in some unhealthy behaviors, such as moderate drinking, but may be simultaneously more likely to exercise and utilize preventative care services. Furthermore, more recent research has demonstrated that approximately one in three adults with a household income of $75,000 or greater per year have a close friend or family member that has had elective cosmetic surgery. As such, respondents with higher income may have greater familiarity with plastic surgery, lowering concern for procedural risks. Studies that account for changes in rising healthcare expenditures and current economic conditions are still necessary, however, to further understand the relationship between perceived risks and attitudes on reconstructive operations as they relate to patient income.

This study has some limitations. All data collected in the study were self-reported. This format of allowing for anonymous information and self-reporting was essential to obtaining data pertaining to knowledge and perceptions regarding the risks associated with breast implants, as well as obtaining data on relevant concerns of survey respondents. In addition, some respondents were unwilling to receive implants at baseline, which may have inflated the overall proportion of respondents who were less likely to receive implants in our study. The majority of the participants also had high educational attainment, with most having earned an associate’s degree or higher. Most participants also had experience with healthcare, which may have further influenced the findings of the study and the resulting generalizability of its findings. Characteristics, such as age and ethnicity, were mostly similar to those of the US population as demonstrated in US Census data. Selection bias may have been present in survey completion among those who had greater familiarity with breast implants. Another limitation resulted from question framing, as questions that assessed the impacts of the FDA boxed warning statements asked participants to consider their likelihood of getting breast implants in the future. These types of questions necessarily invoke hypothetical situations, requiring respondents to provide answers that may differ from the decisions they would make in real-life situations. Despite this shortcoming, it is necessary to understand the general public’s perceptions on breast implant surgery, as patients’ attitudes and beliefs toward procedures may be significantly affected before encounters with plastic surgeons or clinical settings. Qualitative research investigating perceptions in a more open-ended and less simplified format is warranted given these potential survey biases and limitations.

CONCLUSIONS

Implant-based breast reconstruction and cosmetic breast augmentation comprise some of the most common procedures performed by plastic surgeons. Risks communicated in the FDA checklist may make patients more concerned about implant risks and less likely to receive implants, with variability among different sociodemographic groups. As autologous reconstruction becomes more common and rates of breast implant removal continue to increase nationwide, these data suggest that communication of certain breast implant risks may continue to impact shifting patient demographics and trends in breast implant procedures.

Justin M. Broyles, MD
Department of Plastic and Reconstructive Surgery
Harvard Medical School
Brigham and Women’s Hospital
73 Francis St
Boston, MA 02120
E-mail: jbroyles@bwh.harvard.edu

REFERENCES
1. American Society of Plastic Surgeons. Plastic Surgery Statistics Report. 2020. Available at https://www.plasticsurgery.org/documents/News/Statistics/2020/plastic-surgery-statistics-full-report-2020.pdf. Accessed February 2, 2022.
2. Adidharma W, Latack KR, Colohan SM, et al. Breast implant illness: are social media and the Internet worrying patients sick? Plast Reconstr Surg. 2020;145:225e–227e.
3. United States Department of Health and Human Services. Breast implants—certain labeling recommendations to improve patient communication. US Food & Drug Administration. September 28, 2020. Available at https://www.fda.gov/regulatory-information/
search-fda-guidance-documents/breast-implants-certain-labeling-recommendations-improve-patient-communication. Accessed November 6, 2021.

4. Plasticsurgery.org. FDA issues new labeling and informed-consent requirements for breast implants. 2021. Plasticsurgery.org. Available at https://www.plasticsurgery.org/for-medical-professionals/publications/psn-extra/news/fda-issues-new-labeling-and-informed-consent-requirements-for-breast-implants. Accessed November 6, 2021.

5. Yesantha Rao PS, Lee E, Khavanin N, et al. Thinking outside the black box: current perceptions on breast implant safety and utility. Plast Reconstr Surg. 2021;147:593–603.

6. Lee E, Khavanin N, He W, et al. Public perceptions on breast implant-associated anaplastic large cell lymphoma. Plast Reconstr Surg. 2020;146:30–37.

7. Azzi AJ, Almadani Y, Davison P. A national survey to assess the population’s perception of breast implant-associated anaplastic large cell lymphoma and breast implant illness. Plast Reconstr Surg. 2021;147:795–803.

8. Ozturk C, Ozturk CN, Platek M, et al. Management of expander- and implant-associated infections in breast reconstruction. Aesthetic Plast Surg. 2020;44:2075–2082.

9. Nguyen MD, Chen C, Colakoglu S, et al. Infectious complications leading to explantation in implant-based breast reconstruction with AlloDerm. Eplasty. 2016;10:e48.

10. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42:377–381.

11. Harris PA, Taylor R, Minor BL, et al; REDCap Consortium. The REDCap consortium: building an international community of software platform partners. J Biomed Inform. 2019;95:103208.

12. Amazon Web Services. Introduction to Amazon Mechanical Turk. 2022. Available at www.amazon.com. https://docs.aws.amazon.com/AWSMechTurk/latest/AWSMechanicalTurkGettingStartedGuide/SvIntro.html. Accessed March 2, 2022.

13. Mortensen K, Hughes TL. Comparing Amazon’s Mechanical Turk platform to conventional data collection methods in the health and medical research literature. J Gen Intern Med. 2018;33:535–538.

14. Wahl EP, Huber J, Richard MJ, et al. Patient perspectives on the cost of hand surgery. J Bone Joint Surg Am. 2021;103:2133–2140.

15. Jansen T, Rademakers J, Waverijn G, et al. The role of health literacy in explaining the association between educational attainment and the use of out-of-hours primary care services in chronically ill people: a survey study. BMC Health Serv Res. 2018;18:394.

16. Jerant A, Fiscella K, Tancerdi DJ, et al. Health insurance is associated with preventive care but not personal health behaviors. J Am Board Fam Med. 2013;26:759–767.

17. Hughes MC, Baker TA, Kim H, et al. Health behaviors and related disparities of insured adults with a health care provider in the United States, 2013-2016. Prev Med. 2019;120:42–49.

18. Velasco-Mondragon E, Jimenez A, Palladino-Davis AG, et al. Hispanic health in the USA: a scoping review of the literature. Public Health Rev. 2016;37:31.

19. Paz K, Massey KP. Health disparity among Latina women: comparison with non-Latina women. Clin Med Insights Womens Health. 2016;9(suppl 1):71–74.

20. van Kippersluis H, Galama TJ. Wealth and health behavior: testing the concept of a health cost. Eur Econ Rev. 2014;72:197–220.

21. Cutler DM, Lleras-Muney A. Understanding differences in health behaviors by education. J Health Econ. 2010;29:1–28.

22. Cavley J, Ruhm CJ. “The economics of risky health behaviors.” In: Pauly MV, McGuire TG, Barros PP, eds. Handbook of Health Economics. Vol 2. Elsevier; 2012:95–199.

23. Anderson M; Pew Research Center. Americans aren’t sold on plastic surgery: few have had it done, opinions mostly mixed. Pew Research Center: Medicine and Health; 2016. Available at https://www.pewresearch.org/fact-tank/2016/10/18/americans-arentsold-on-plastic-surgery-few-have-had-it-done-opinionsmostly-mixed/. Accessed March 21, 2022.

24. Bureau U. S. C. United States Census Bureau Quick Facts. census.gov. 2021. Available at https://www.census.gov/quickfacts/fact/table/US/PST045221. Accessed March 22, 2022.