

# Using Google Ads to recruit and retain a cohort considering abortion in the United States☆☆☆

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## ABSTRACT

**Objective:** The objective was to develop and test the feasibility of a methodology to recruit and retain individuals in the United States (US) who were considering abortion at the point of searching for an abortion clinic.

**Study design:** We conducted the Google Ads Abortion Access Study, a national cohort study using a novel recruitment method – recruiting people searching for abortion care on Google. Advertisements for the study were displayed in search results. Users who clicked on the advertisement were directed to a landing page explaining the study and then to a screening form. Participants were eligible if they reported being pregnant and considering abortion. They completed an online baseline survey and 4 weeks later were invited by email or text message to complete a follow-up survey.

**Results:** Over the course of 8 months, we recruited a racially/ethnically and geographically diverse cohort considering an abortion using Google Ads. After removing fraudulent cases, we recruited 1706 respondents, and among these, 1464 (86%) provided contact information for follow-up. Among those providing contact information, 1005 completed the follow-up survey, resulting in a 69% follow-up rate. Older age, white race, higher education, difficulty meeting basic needs, being not religious/spiritual and having no previous births were associated with higher follow-up. Total cost of the ads was \$31.99 per completed baseline + follow-up survey.

**Conclusion:** Researchers can use online advertising to successfully recruit populations early in their abortion-seeking process to understand the barriers they face and how to improve abortion access. Disadvantages include high cost and a small potential for fraudulent data.

**Implications:** Google Ads is a feasible tool to recruit and follow a diverse sample of individuals who are considering abortion for studies investigating the barriers they face in obtaining a wanted abortion.

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## 1. Introduction

One major challenge of researching barriers to abortion care is that individuals who face the most insurmountable challenges are difficult to identify. They may never reach an abortion provider, so the full effects are difficult to measure. To address this concern, several studies [1–4] have used large state-level datasets to attempt to quantify changes in the number of abortion patients over time. One study found the number

of abortions in Texas decreased by about 13% statewide after restrictions shuttered 21 abortion-providing facilities [4].

To date, no studies have been able to survey pregnant people while they are considering abortion to investigate the barriers they face. Internet recruitment is a logical way to reach this specific population. As many as 93%–97% of Americans ages 12–49 use the Internet [5], and 50%–66% of women search for health information on the Internet [6]. One national study demonstrated that the volume of Internet searches for abortion is greater in states with more restrictions and reduced availability of services [7], and more than half of women surveyed at a Nebraska abortion clinic reported finding the clinic through an online search [8].

Previous studies using Google Ads for participant recruitment have been relatively successful. Some of the limitations of these studies have been lack of incentives and limited monitoring of the specific search “keywords” that maximized the number of people who clicked on an ad and continued to the survey [9,10]. To our knowledge, only

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one previous abortion study used Google Ads to recruit survey respondents. This study documented substantial interest in learning more about self-managed abortion, particularly among adolescents [11].

In this methods paper, we describe a novel methodology to survey people considering abortion before they attempt to access care, employing Google advertising to recruit individuals searching the Internet for abortion providers. We present sufficient detail so that other researchers can adapt and utilize this method for a one-time survey or repeated surveys. We also describe the effectiveness of this method to recruit and retain participants over time.

## 2. Methods

### 2.1. Enrollment procedures

The Google Ads Abortion Access Study is a prospective study, recruiting people at the point of their online Google search using specific keywords related to abortion and following up 4 weeks later. The study was conducted to understand how state restrictions impact the likelihood of obtaining a wanted abortion and those findings will be reported in a separate paper. The study was approved by the University of California, San Francisco's (UCSF) Institutional Review Board (IRB; approval #: 16-20627). The IRB did not require parental consent for minors primarily because all participants were pregnant and could consent for their own care and, thus, decisions to participate in research.

We used Google Ads to recruit participants. Ads were displayed from August 2017 to April 2018. The ads appeared in the search results of people searching Google using specific keywords (generally at the top or bottom of the list of search results). In collaboration with a digital marketing firm, we used Google Ads Keyword Planner to determine keywords that would be both specific enough that they would genuinely be used by individuals searching for information on how to access abortion and broad enough to capture individuals at various stages in the decision-making process. We also used estimates of cost per ad click to determine the keywords that would provide the most engagement for the amount spent. Ad cost per click estimates were determined based on the average amount that other advertisers were simultaneously bidding per click for the same keywords.

Initially, we grouped our campaign keywords into three categories, termed "High Intent," "Medication Abortion" and "Price Sensitive." Examples of keywords in each of these categories are in Table 1 (a complete list is available from the authors upon request). Later in the campaign, we also started using what we termed "Broad" keywords to increase enrollment from specific states (described below).

**Table 1**  
Campaigns and sample keywords used to recruit study participants, Google Ads Abortion Access Study

Category (number of keywords in campaign)	Sample keywords <sup>a</sup>
High Intent (213)	<ul style="list-style-type: none"> <li>• [abortion centers near me]</li> <li>• + women's + abortion + clinic</li> <li>• + closest + abortion + clinic + to + me</li> <li>• "i need an abortion"</li> </ul>
Medication Abortion (194)	<ul style="list-style-type: none"> <li>• [where can i get abortion pills]</li> <li>• "buy abortion pill online"</li> <li>• + where + can + i + get + an + abortion + pill + near + me</li> </ul>
Price Sensitive (107)	<ul style="list-style-type: none"> <li>• + how + much + is + abortion</li> <li>• [average cost of abortion]</li> <li>• "cheap abortion clinics near me"</li> </ul>
Broad (8)	<ul style="list-style-type: none"> <li>• "abortion"</li> <li>• + abortions</li> </ul>

<sup>a</sup> Each category is mutually exclusive. We used a variety of search approaches, including that keywords could appear in any order (indicated by "+"), keywords that had to appear exactly as shown in the search string but could include additional words before or after (indicated by keywords in quotations "") and exact keyword matches with no additional words before or after it (indicated by keywords in brackets []).

The specific ad text was also optimized in consultation with the digital marketing company. We used two headlines and the description section of each ad to describe the key messages of the survey: the survey was for people considering abortion, it was confidential, it was being conducted by a university, and they would be eligible to receive up to \$50 for participating. Some ads also included motivational text on how participation could help other women in a similar situation (see sample ads in Fig. 1).

One benefit of using Google Ads for recruitment is its ability to target specific geographies. Our initial goal was to recruit 20 participants from every state so as to capture experiences of those in less populated states. Therefore, we monitored the enrollment and follow-up of participants for each state daily and when we met our goal, stopped running ads in that state. This ensured that the entire sample was not made up of only participants from the most populated states. However, after determining that some states were underrepresented with 6 months of recruitment remaining, we added a "Broad" category of keywords into our ad campaign for 12 small-population states to increase recruitment in those states (Table 1). The other 38 states (and Washington, DC) continued their ad campaigns using the previous three keyword categories. Additionally, for the last 2 months of recruitment, we increased our ad spend in the lowest recruitment states by 12.5%.

Individuals who clicked on the link in the ad were randomly directed to one of two landing web pages (Fig. 2) with more information about the study. Having landing pages improved the quality score of the ads (as determined by Google), which subsequently reduced the amount we had to pay to rank higher in Google searches. The landing pages also clearly explained the purpose of the study to increase the likelihood that those clicking through to the survey would be eligible and consent to participate. People interested in participating clicked on a hyperlinked button on the landing page that led them to a Qualtrics form where they completed two eligibility questions: whether they were pregnant and whether they were considering abortion. Qualtrics then placed a "cookie" within their Internet browser which prevented them from re-entering the survey (even if they tried to follow the link through the ad additional times).

Those eligible for the study continued to a study description and provided electronic informed consent. They then completed a 10 minute baseline survey including questions on sociodemographics, gestation, pregnancy history, their relationship with the person they became pregnant with, abortion stigma and decision certainty regarding their abortion decision. Respondents were asked their city, state, and zip code. Finally, they were asked for an email address and/or cell phone number for their follow-up survey invitation. Initially, eligible participants were randomly directed to one of two remuneration arms of the survey: (1) they received \$10 for completing the baseline survey, with the opportunity to receive \$40 after completing the follow-up survey, or (2) they received \$0 for completing the baseline survey, with the opportunity to receive \$50 after completing the follow-up survey. After 10 days of study enrollment, there was no difference in enrollment between the groups, so all respondents were routed to the \$0/\$50 arm to maximize the reimbursement amount available to people who completed the follow-up survey.

Considering an Abortion? - Confidential Survey - Get \$50  
 googlestudy.ansirh.org  
 Earn \$50 for 25 minutes of your time. University Study (UCSF).

Confidential Abortion Survey - Get \$50 gift card for 25 mins.  
 googlestudy.ansirh.org  
 Help other women in your situation. University Study.

Fig. 1. Samples of Google Ads.

**UCSF**

## Are you pregnant and considering your options?

Participate in a confidential study from UCSF and receive a \$50 Target or Walmart gift card

**COMPLETE THE FIRST SURVEY**

You are not alone. Over half of pregnancies in the United States are unplanned, and knowing what your options are can be confusing.

Researchers at the University of California, San Francisco are conducting a study to get a deeper understanding of how people make pregnancy decisions.

**HOW DO I PARTICIPATE IN THIS CONFIDENTIAL STUDY AND HOW LONG WILL IT TAKE?**

There are 2 short surveys. You can complete the first survey now by clicking on the button below - it will take about 10 minutes. In 4 weeks we will contact you to complete the second survey which will take about 15 minutes.

**YOUR GIFT**

After you complete the second survey you will receive a \$50 gift card to Target or Walmart - your choice.

**HOW WILL THE STUDY HELP OTHERS?**

This important research will help identify and remove barriers, giving women access to the full range of options when making their pregnancy decisions.

You can also request a copy of the survey results.

**WHO IS DOING THE STUDY?**

Advancing New Standards in Reproductive Health (ANSIRH) is a collaborative research group at the University of California, San Francisco. Our mission is to conduct innovative and rigorous research on complex issues related to people's sexual and reproductive lives.

**PRIVATE AND CONFIDENTIAL**

Your privacy is very important. You need to provide an email or phone number to participate, but all personal details will be kept confidential.

**Complete the First Survey**  
It will take about 10 minutes of your time.

**START NOW**

Fig. 2. Example of landing page (variant 1) displaying key study details and links to the baseline survey.

### 2.2. Follow-up

Participants received an email or text message 2 weeks after enrollment reminding them that they would receive a link to complete the follow-up survey in 2 weeks. Then, 4 weeks after initial enrollment, each participant received a Qualtrics-generated email or text message inviting them to complete the follow-up survey. We chose 4 weeks because we hypothesized that would give most participants enough time

to locate and visit an abortion provider for those who wanted to, yet still be soon enough for the participant to remember the process they went through. The first question in the follow-up survey asked if the participant was still pregnant. Depending on their response, most participants then completed a 15 minute survey, tailored for their pregnancy status. Participants were asked about barriers they faced accessing abortion, decision certainty, whether they had visited a crisis pregnancy center, and if they had tried to self-induce an abortion. We conducted cognitive

interviews with a sample of six patients seeking abortion care at the Women's Options Clinic at UCSF's Zuckerberg San Francisco General Hospital to pre-test interpretation and comprehension of both baseline and follow-up surveys.

After completing the follow-up survey, respondents were sent an e-gift card to their choice of either Target or Walmart. Respondents who reported they had had a miscarriage were not eligible to complete the follow-up survey, but received a \$10 e-gift card, and those who responded that they had any other pregnancy outcome (e.g., birth, never pregnant) were not eligible to receive a gift card. Participants were contacted to complete the follow-up survey up to five times, with the final contact a phone call. All messages to participants came from a dedicated study email address and phone number and all communication was labeled as coming from UCSF with a generic study name that did not mention pregnancy or abortion.

### 2.3. Efforts to minimize fraud

We took several steps to reduce fraudulent responses. Within the Qualtrics survey platform, we required participants to complete a "captcha" before screening for eligibility to prevent automated software from taking the survey. We added a tag to the survey to prevent search engines from finding and presenting it in search results (separate from our ads). We also prevented participants from taking the baseline survey more than once by using embedded cookies within Qualtrics (mentioned above). While people who clear their cookies could in theory take the baseline survey again, our team also manually reviewed respondents to try to detect duplicates. Once a week, the study research assistants reviewed the IP addresses and phone numbers of enrolled participants and excluded duplicate entries. Additionally, at follow-up, when asked what happened with their pregnancy, participants who

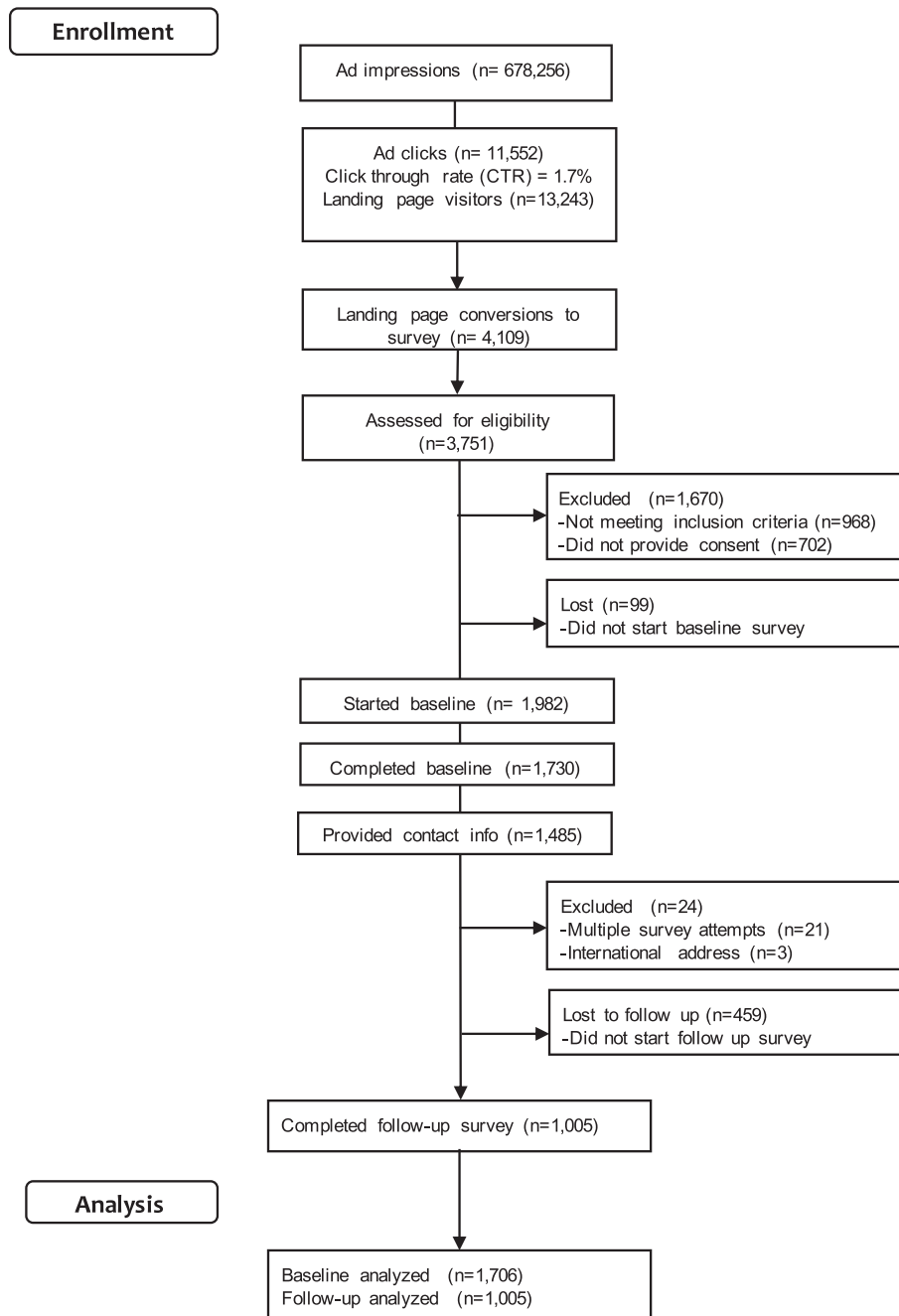


Fig. 3. CONSORT diagram.

initially reported an outcome that would make them ineligible to complete the follow-up (i.e., miscarriage, never pregnant) were not able or permitted to change their response to one that would make them eligible. Finally, we dropped from the analysis anyone who did not arrive at the Qualtrics survey from our landing web page or whose responses appeared otherwise fraudulent.

2.4. Data analysis

We described the number of people at each stage of the online recruitment and enrollment and associated costs. We then described the characteristics of the baseline and follow-up samples. Finally, we developed a multivariable logistic regression model to assess the baseline characteristics associated with completing the follow-up survey. All analyses were done in Stata 15.

3. Results

3.1. Recruitment

Throughout the 9 months of recruitment, the Google Ads made 678,256 impressions (the number of times they were shown in

search results) with a total of 11,552 clicks on the ads, representing a click-through rate (CTR) of about 1.7% (Fig. 3). A total of 1982 people were eligible, consented to participate and started the baseline survey. While 1730 completed the baseline survey, 1485 of these provided contact information for follow-up. We removed 3 participants who reported living outside the US and 21 who were found to have made multiple attempts to take the survey or were referred to the survey from an external site.

The final baseline analytic sample included 1706 participants, and among these, 1464 (86%) provided contact information at the end of the survey for follow-up. Among those who provided contact information, 1005 completed the follow-up survey for a 69% follow-up rate (Table 2). The total cost of these ads was \$32,154. This breaks down to a cost per click of \$2.78, a cost per completed baseline survey of \$18.85, a cost per completed baseline survey with contact information of \$21.98, and a cost per completed follow-up survey of \$31.99. These costs do not include participant remunerations.

As recruitment efforts were based on a sampling strategy stratified by state, we recruited at least eight participants in every state. We recruited fewer than the target of 20 participants in 8 states, and these tended to be states with smaller populations (Fig. 4).

**Table 2**  
Characteristics of the complete sample providing baseline and follow up data, Google Ads Abortion Access Study

	Completed baseline (n = 1706)	Completed baseline and provided contact information (n = 1464)	Completed follow-up (n = 1005)
	%	%	%
Sociodemographic characteristics			
Age			
12–17	3.8	3.1	2.1
18–24	36.7	35.8	33.0
25–34	46.4	47.3	50.9
35+	13.2	13.9	13.9
Race/ethnicity			
White	47.5	49.5	53.1
Black or African–American	28.7	27.7	25.0
Hispanic/Latinx	14.3	13.3	12.1
Asian	2.1	1.9	1.7
American Indian or Alaska Native	1.9	1.8	1.9
Native Hawaiian/Pacific Islander	0.9	0.9	0.7
Multiracial/other	4.7	4.8	5.5
Region			
West	22.5	22.8	23.5
Midwest	26.3	26.3	26.1
Northeast	18.6	18.3	18.5
South	32.6	32.6	31.9
Education			
Less than high school	14.1	13.5	10.9
High school graduate/GED	39.3	38.4	34.9
Associate degree, some college or technical school	35.6	36.9	40.8
College graduate or professional degree	11.0	11.2	13.3
Employed full or part time	55.0	54.9	57.1
Reported difficulty meeting basic needs most or all of the time	51.9	50.9	54.1
Health Insurance			
Private/state exchange	21.9	22.1	24.0
Medicaid/Medicare	53.9	54.3	53.0
None/other/not sure	24.2	23.6	23.0
Religiosity			
Not at all religious/spiritual	28.1	28.3	29.2
Somewhat religious/spiritual	57.9	58.1	58.4
Very religious/spiritual	14.0	13.6	12.4
Currently has a main partner	72.1	72.3	73.0
Gestational age at baseline			
≤10 weeks	78.0	78.3	79.0
10.1–14 weeks	11.1	11.5	11.9
14.1–20 weeks	6.5	5.9	5.2
≥20.1 weeks	2.2	2.1	1.7
Missing	2.3	2.1	2.2
Previously pregnant	73.3	74.7	74.7
Previously had an abortion	27.0	27.9	28.4
Previously had childbirth	67.6	68.8	67.3



Among those who provided contact information, older age, white race, higher education, difficulty meeting basic needs, being not at all religious/spiritual and having no previous births were associated with higher follow-up (Table 3). Participants ages 25–34 were more likely to complete follow-up than those ages 18–24 [adjusted odds ratio (aOR) = 1.63, 95% confidence interval (CI): 1.22–2.18]. Black/African-American (aOR = 0.68, 95% CI: 0.51–0.90) and Hispanic/Latinx (aOR = 0.64, 95% CI: 0.45–0.91) participants were less likely to follow up than White participants. Those with an associate degree, some college or technical school (aOR = 1.77, 95% CI: 1.34–2.34) or college degrees (aOR = 2.16, 95% CI: 1.34–3.47) were more likely than those with a high school education to complete follow-up. Those reporting difficulty meeting basic needs most or all of the time (aOR = 1.49, 95% CI: 1.17–1.89) were more likely to follow up. Those identifying as very religious/spiritual (aOR = 0.59, 95% CI: 0.40–0.87) and those having had a previous childbirth were less likely to follow up (aOR = 0.59, 95% CI: 0.38–0.90).

#### 4. Discussion

In this study, we found that recruiting and retaining people considering abortion are feasible using Google Ads and we recommend this methodology to other researchers to survey this hard-to-reach population. In particular, this methodology is useful to study the impact of specific abortion restrictions because it is possible to reach and recruit residents of specific states. Abortion research too often surveys individuals who have reached clinics or must rely on state-mandated abortion data. Recruiting respondents using the Internet enables researchers to reach people earlier in the care seeking and/or decision-making process to better understand how a variety of factors contribute to their decisions and ability to have an abortion.

Employing web-based advertising proved to be a useful methodology to recruit hard-to-reach populations and those most in need of outreach. This method is uniquely suited for reaching individuals

living in the most restrictive states. It may also be particularly effective in recruiting adolescents, which is important when studying barriers to abortion care, as a previous study found that they demonstrate more interest in searching for abortion care on the Internet [11]. This method is most effective for cross-sectional surveys; however, it can also be used for following participants over time, with appropriate remuneration for participant time. The observed follow-up rate (69%) was consistent with other clinic-based studies [12–14]. Loss to follow-up was higher among people of color, reflecting structural barriers to participating in research, as well as historical systematic abuse and mistreatment in health care and medical research that can lead to distrust of research among people of color [15].

This methodology comes with a few disadvantages, particularly high costs. Recruiting the required number of participants in less populated states (which often have more abortion restrictions) within budget constraints proved to be our primary challenge. Another limitation is the limited ability to verify the authenticity of participants. However, we included several validity checks to minimize fraudulent responses and also excluded entire cases when we suspected the response was fraudulent.

The findings of this study have important implications for researchers of barriers to abortion. We were able to harness the power of online search tools to recruit a very specific population seeking abortion resources before attempting to reach an abortion provider. As barriers to abortion access increase [16,17], researchers must continue to innovate in their research designs. We encourage other researchers to use these and other creative methods to ensure that this population is represented in research.

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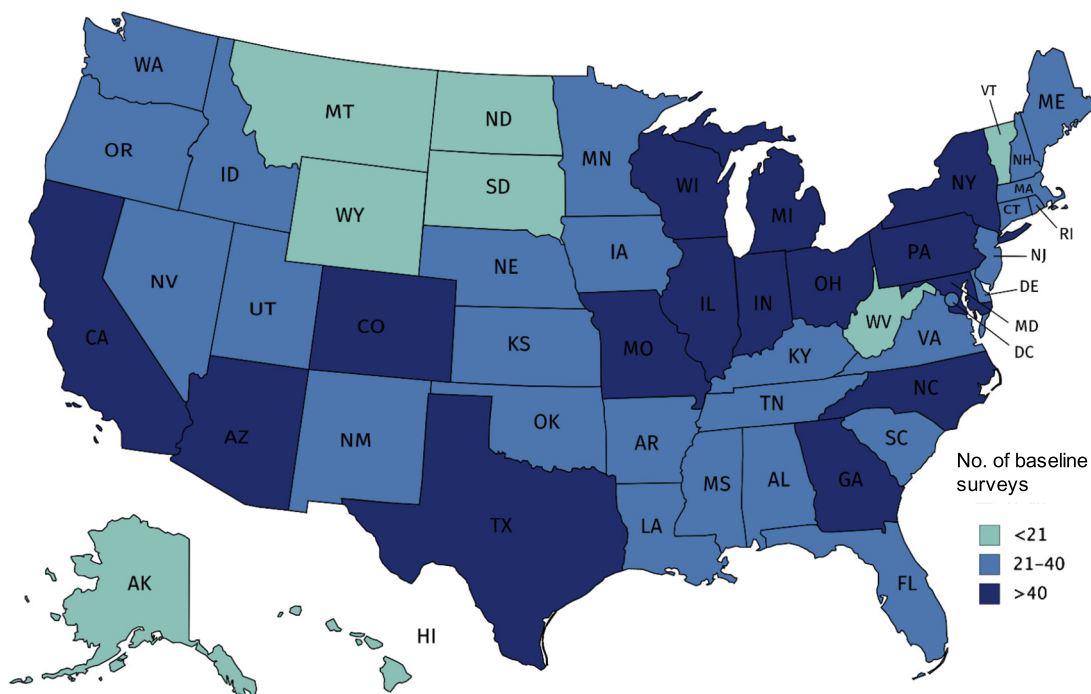


Fig. 4. Distribution of the baseline sample by number in each state.

**Table 3**Adjusted odds of completing follow-up among those who provided contact information at baseline, Google Ads Abortion Access Study (*n* = 1464)

	%	aOR	95% CI
<b>Age</b>			
12–17	46.7	0.56	0.28–1.12
18–24	63.4	Reference	
25–34	74.0	<b>1.63</b>	1.22–2.18
35+	69.0	1.17	0.78–1.76
<b>Race/ethnicity</b>			
White	73.7	Reference	
Black or African-American	62.0	<b>0.68</b>	0.51–0.90
Hispanic/Latinx	62.6	<b>0.64</b>	0.45–0.91
Asian	60.7	0.45	0.20–1.03
American Indian or Alaska Native	70.4	1.07	0.44–2.58
Native Hawaiian/Pacific Islander	53.9	0.48	0.15–1.51
Multiracial/Other	77.5	1.41	0.77–2.60
<b>Region</b>			
West	70.7	1.04	0.71–1.52
Midwest	68.1	1.02	0.71–1.46
Northeast	69.4	Reference	
South	67.3	1.04	0.74–1.47
<b>Education</b>			
Less than high school	55.6	0.84	0.58–1.21
High school graduate/GED	62.5	Reference	
Associate degree, some college or technical school	75.9	<b>1.77</b>	1.34–2.34
College graduate or professional degree	81.7	<b>2.16</b>	1.34–3.47
<b>Employment</b>			
Employed full or part time	71.4	1.05	0.82–1.35
Not employed	65.3	Reference	
<b>Difficulty meeting basic needs</b>			
Most or all of the time	73.0	<b>1.49</b>	1.17–1.89
Some of the time, rarely, or never	64.1	Reference	
<b>Health insurance</b>			
Private/state exchange	74.6	Reference	
Medicaid/Medicare	67.0	1.04	0.74–1.45
None/other/not sure	66.8	1.08	0.74–1.56
<b>Religiosity</b>			
Not at all religious/spiritual	70.8	Reference	
Somewhat religious/spiritual	69.0	0.86	0.65–1.13
Very religious/spiritual	62.8	<b>0.59</b>	0.40–0.87
<b>Partnership status</b>			
Current main partner	69.3	Reference	
Does not have a main partner	66.9	0.96	0.74–1.25
<b>Gestational age at baseline</b>			
≤10 weeks	69.2	Reference	
10.1–14 weeks	71.4	1.18	0.81–1.71
14.1–20 weeks	59.8	0.70	0.44–1.12
≥20.1 weeks	54.8	0.64	0.30–1.37
Missing	71.0	1.17	0.52–2.62
<b>Previous pregnancies</b>			
0	68.7	Reference	
1 or more	68.7	1.26	0.80–1.97
<b>Previous abortions</b>			
0	68.2	Reference	
1 or more	69.9	0.87	0.65–1.16
<b>Previous childbirths</b>			
0	72.0	Reference	
1 or more	67.1	<b>0.59</b>	0.38–0.90

The adjusted model includes all of the variables shown in the table. Bold aORs indicate statistical significance at  $p < 0.05$ .

**References**

- [1] Colman S, Joyce T. Regulating abortion: impact on patients and providers in Texas. *J Policy Anal Manage* 2011;30:775–97.
- [2] Joyce T. The supply-side economics of abortion. *N Engl J Med* 2011;365:1466–9.
- [3] Meier KJ, Haider-Markel DP, Stanislawski AJ, McFarlane DR. The impact of state-level restrictions on abortion. *Demography* 1996;33:307–12.
- [4] Grossman D, Baum S, Fuentes L, et al. Change in abortion services after implementation of a restrictive law in Texas. *Contraception* 2014;90:496–501.
- [5] Pew Research Center. The web at February 2014;25:2014. <http://www.pewinternet.org/2014/02/25/the-web-at-25-in-the-u-s>.
- [6] CDC/NCHS. National health interview survey, 2009. Inter-university Consortium for Political and Social Research (ICPSR) [distributor]; 2010.
- [7] Reis BY, Brownstein JS. Measuring the impact of health policies using internet search patterns: the case of abortion. *BMC Public Health* 2010;10:514.
- [8] French V, Anthony R, Souder C, Geistkemper C, Drey E, Steinauer J. Influence of clinician referral on Nebraska women's decision-to-abortion time. *Contraception* 2016;93:236–43.
- [9] Barrera AZ, Kelman AR, Munoz RF. Keywords to recruit Spanish- and English-speaking participants: evidence from an online postpartum depression randomized controlled trial. *J Med Internet Res* 2014;16.
- [10] Gross MS, Liu NH, Contreras O, Munoz RF, Leykin Y. Using Google adwords for international multilingual recruitment to health research websites. *J Med Internet Res* 2014;16.
- [11] Jerman J, Onda T, Jones RK. What are people looking for when they Google “self-abortion”? *Contraception* 2018;97:510–4.
- [12] Upadhyay UD, Aztlan-James EA, Rocca CH, Foster DG. Intended pregnancy after receiving vs being denied a wanted abortion. *Contraception* 2019;99:42–7.
- [13] Roberts SCM, Turok DK, Belusa E, Combellick S, Upadhyay UD. Utah's 72-hour waiting period for abortion: experiences among a clinic-based sample of women. *Perspect Sex Reprod Health* 2016;48:179–87.
- [14] Weitz TA, Taylor D, Desai S, et al. Safety of aspiration abortion performed by nurse practitioners, certified nurse midwives, and physician assistants under a California legal waiver. *Am J Public Health* 2013;103:454–61.
- [15] George S, Duran N, Norris K. A systematic review of barriers and facilitators to minority research participation among African Americans, Latinos, Asian Americans, and Pacific Islanders. *Am J Public Health* 2014;104:e16–31.
- [16] Cartwright AF, Karunaratne M, Barr-Walker J, Johns NE, Upadhyay UD. Identifying national availability of abortion care and distance from major us cities: systematic online search. *J Med Internet Res* 2018;20:e186.
- [17] Upadhyay UD. Innovative models are needed for equitable abortion access in the USA. *Lancet Public Health* 2017;2:e484–5.