Motivations to donate blood: demographic comparisons

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BACKGROUND: Understanding blood donor motivations is crucial to improving effectiveness of donor recruitment and retention programs.

STUDY DESIGN AND METHODS: Data from a 1998 survey of 92,581 U.S. blood donors were used to evaluate factors influencing the decision to donate in various demographic groups. Data were weighted to adjust for response and sample design.

RESULTS: Of 52,650 respondents, 45,588 gave whole-blood (WB) donations. Among all demographic groups, the major reasons to donate were altruism (75-87%) and awareness of the need for blood (34-43%). Except for first-time donors and those ≤25 years old, blood drive organizers and/or recruiters were more important than family and/or peers in encouraging donors (13-19% vs. 1-8%). Although 59 to 63 percent of donors said they would be encouraged to donate by reminders originating from the blood bank, for some, the contact would have a negative effect and discourage donation. Discouragement would be higher if they were reminded by a telephone call (14%) rather than by a letter or e-mail (4%) or an appeal (2%) from the blood bank.

CONCLUSION: WB donations appear to be made primarily for altruistic reasons and in response to appeals for blood. Ways to build on this humanitarianism and take advantage of new communication routes, such as e-mail, need to be developed.

The National Blood Data Resource Center has reported that the margin between demand for transfusable blood components and blood collections in the United States is currently critically low,[1] and warnings of blood shortages are frequent in the popular press.[2] Only 5 percent of eligible people donate yearly in the United States,[3] and up to 50 percent of first-time donors may never return for a second donation.[4] Furthermore, the FDA has estimated that the proposed new deferral criteria for European travelers who may have been exposed to variant CJD may result in a 4.6- to 5.3-percent donor loss, whereas implementation of more stringent criteria by the American Red Cross could potentially result in a 7.8- to 9.1-percent donor loss.[5] Inducing more people to donate blood and increasing retention of and frequency of donations by current donors have therefore become a priority for most blood centers. To increase effectiveness of existing donor recruitment and retention programs, factors that encourage donation must be identified and evaluated.

A body of literature has identified altruism as the primary reason given for donating, with awareness of the need for blood, social pressure, need to replace blood used by family or friend, and increased self-esteem and recognition also serving as important motivators.[6-14] Ex-

ABBREVIATIONS: REDS = Retrovirus Epidemiology Donor Study; WB = whole blood.

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Supported by NHLBI contracts N01-HB-97077 (superseded by N01-HB-47114), N01-HB-97078, N01-HB-97079, N01-HB-97080, N01-HB-97081, and N01-HB-97082.

Received for publication April 4, 2001; revision received August 28, 2001, and accepted August 29, 2001.

TRANSFUSION 2002;42:216-225.

ternal factors such as social pressure from friends or family and incentives such as gifts and rewards have also been described as being important early motivators.[15-17] These external pressures become less important as the donor continues to donate and develops a blood donor role identity, an event that appears to occur after the third or fourth donation.[15,18] There is also evidence that first-time donors who give primarily in response to an external factor are less likely to return than donors who gave their first donation for intrinsic reasons, including altruism, personal values and interests, and a sense of responsibility.[15]

Whether altruism is really the major motive underlying most donations is still under debate. First, most of the studies that have evaluated donors' motivations were conducted before the 1990s, and it is not clear whether changes in our culture and society in the last decade have had an impact on the donor's motives for donating. Second, not all studies have found that humanitarianism was the main reason for donation. For example, Condie et al.[19] reported that peer pressure was the major motivator in their study population, and they could not find any difference in the level of altruism or social responsibility between donors and nondonors.

It is not only important to reassess what currently motivates individuals to donate, but also whether motivations differ by demographic group. If reasons to donate are a function of age, gender, and other demographic characteristics, targeted recruitment and retention programs tailored to specific subgroups could be of value and should be considered.

To improve our understanding of the factors that motivate donors to return and to assess demographic differences, we evaluated reasons to donate, influencing factors, and potential responses to a variety of reminders in community whole-blood (WB) donors who answered an anonymous mail survey conducted by the Retrovirus Epidemiology Donor Study (REDS), a multicenter program sponsored by the National Heart, Lung, and Blood Institute.

TABLE 1. Questions on opinions and beliefs about donating blood

When you last donated blood, why did you donate?
- Felt it was the right thing to do.
- Heard that blood was needed.
- Wanted to receive an item or gift that was being offered to blood donors (e.g., time off from work, a T-shirt, a coffee mug, or some other item of value).
- Wanted to receive special recognition or an award for donating.
- A family member, friend, coworker, or someone else close to me strongly encouraged me.
- A blood drive organizer or recruiter encouraged me.
- A doctor told me to donate for health reasons.
- Believe that donating is good for my health.
- Wanted the results from having my blood tested for an infectious disease (e.g., HIV or hepatitis).

The last time you donated blood, did someone or something strongly influence you to donate?
If yes, who or what influenced you the most?
- A spouse or sex partner.
- Some other family member.
- A coworker or friend.
- My employer.
- Radio/TV/newspaper.
- A letter or call from the blood bank.
- A blood drive organizer or recruiter.
- Other (please specify).

There are many ways of reminding donors that their blood is needed. What effect would each of the following reminders have on your decision to donate blood in the future? (Donors could choose between "would encourage me," "would discourage me," and "would make no difference to me" for each proposed reminder.)
- A telephone call from the blood bank?
- A letter or email from the blood bank?
- An appeal from your local blood bank on TV, radio, or in the newspaper?
- An appeal from a national organization or spokesperson on TV, radio, or in the newspaper?
- A call or letter from an organization such as a religious group, social club, or fraternal group?

MATERIALS AND METHODS

Survey instrument

The 1998 REDS Survey has been described in detail elsewhere.[20] Briefly, in 1998, REDS conducted a mailed, anonymous survey of 92,581 allogeneic (WB, directed, apheresis) donors to improve understanding of the factors that influence individuals to donate blood. Reasons for donating, influencing factors, and projected response (encouraged, discouraged, makes no difference) to a variety of reminders were evaluated (Table 1). Demographic characteristics, including age, sex, race/ethnicity, and level of education, were also assessed. Eight geographically diverse U.S. blood centers participated in this effort: the American Red Cross Biomedical Services Greater Chesapeake and Potomac (Baltimore, MD; Washington, DC), Southeastern Michigan (Detroit, MI), and Southern California (Los Angeles, CA) regions; the Blood Centers of the Pacific-Irwin (San Francisco, CA); the Oklahoma Blood Institute (Oklahoma City, OK); the New York Blood Center (New York, NY); the Lifeblood Mid-South Regional Blood Center (Memphis, TN), and the Blood Bank of San Bernardino and Riverside Counties (San Bernardino, CA).

A questionnaire was sent to 8 to 18 percent of eligible allogeneic donors who had given blood between April and October 1998 at each participating blood center. Donors were eligible on their first reported donation if the donation type was WB, directed or apheresis, if age at donation was 18 years or more, and if either all laboratory test results were available or one of the available serologic tests was positive (screened repeat reactive). To compensate for projected lower response rates for various donor groups, we oversampled first-time donors, donors

younger than 25 years old, and donors in minority racial and ethnic groups.

Of questionnaires received, 83.6 percent were obtained from a first mailing and 16.4 percent from a second mailing sent to donors who did not return a postcard, indicating that they had already responded. Questionnaires were anonymous (no individual identifiers retained) but had an affixed sticker indicating whether the donor had given blood for the first time at the center (first-time) or not (repeat) and whether at least one of the screening tests routinely performed at time of donation was reactive. The 1998 REDS survey protocol was approved by the Institutional Review Board at each center.

Donor classification

Information about demographics and type of donation was derived from self report on the questionnaire. Only donors whose last donation was WB were included in the analysis. Donors who reported last giving an apheresis or directed donation were excluded from the analysis.

Repeat donors were defined as donors who either indicated at the time of donation that this was not the first time they gave blood at the center or had prior donations documented in the REDS database. In contrast, first-time donors indicated that this was the first time they donated at the center and had no prior donation record in the database. Frequency of donation for repeat donors was assessed by asking donors on the questionnaire to indicate the number of donations given in the last 10 years. Based on their response, we further classified repeat donors as having given 1 to 5 donations, 6 to 20 donations, or >20 donations in the last 10 years.

Statistical analysis

Prevalence of reasons to donate, influencing factors, and responses to reminders offered in the future (percent encouraged, discouraged, or indifferent) were calculated with sample weights to adjust for differential sampling and response rates (WESVAR software program, Westat, Rockville, MD).[21] Missing information was excluded from the analysis. The highest percentage of missing demographic data was observed for race/ethnicity, with 2 percent of respondents not reporting this information; 2 percent of donors did not answer the influencing factor question, whereas ≤6 percent of donors did not indicate how they would react to a reminder. We computed weighted chi-squares[22-24] to compare demographic responses. We also calculated adjusted ORs and 95-percent CIs by weighted logistic regression,[21] entering simultaneously in the models age as a continuous variable and all other demographic variables as indicator variables representing predefined groups (an indicator variable for first-time vs. repeat status was also included). A separate model was constructed for each binary outcome variable (yes vs. no), which were as follows: 1) whether a donor had identified a particular factor as his/her reason to donate, 2) whether the donor had been strongly influenced by someone or something to donate, and 3) whether a reminder offered in the future would encourage (vs. make no difference or discourage) the donor to return. Results were considered significant if p value ≤0.05 or if the 95-percent CI around the OR excluded 1.0.

RESULTS

Of 92,581 donors sampled, 52,650 returned their questionnaire (57% response rate). Older, repeat, and women donors were more likely to respond than younger, first-time, or men donors. We identified 6704 first-time and 38,884 repeat donors among 45,588 allogeneic WB respondents (7062 donors were not included in this analysis because they had given an apheresis or directed WB donation). Of the repeat donors, 30,628 (79%) could be classified by prior donation frequency based on their questionnaire responses: 23 percent (n = 6931) gave 1 to 5 donations, 52 percent (n = 15,962) gave 6 to 20 donations, and 25 percent (n = 7735) gave >20 donations in the past 10 years.

All allogeneic WB respondents were included in the analyses presented later here, although results were unchanged if donors with a reactive screening test (1.6%) were excluded from the analyses.

Reasons to donate

The percentages of donors who gave for a particular reason are presented stratified by demographic characteristics and first-time versus repeat status in Table 2. The ORs comparing the odds of donating for a specific reason within demographic groups are shown in Table 3 adjusted for other demographic variables and for first-time versus repeat status.

As shown in Table 2, the most commonly reported reasons to donate were because “it was the right thing to do” (81%), “I heard that blood was needed” (39%), “a blood drive organizer or recruiter encouraged me” (15%), and “I believe that donating is good for my health” (9%). Many donors identified more than one reason to donate, with only 42 percent choosing that “it was the right thing to do” as their sole reason to donate, 8 percent choosing “I heard that blood was needed,” 5 percent choosing a blood drive organizer or recruiter, and 1 percent choosing “donating is good for my health.” Wanting special recognition or an award for donating (0.6%) and being told by a doctor to donate for health reasons (0.4%) ranked last as reasons for donating. This pattern, or ranking order for reasons to donate (based on the percentage of donors motivated to give by a particular reason), held for all demographic groups except for first-time and ≤25-year-old donors who ranked “donating because of a fam-

TABLE 2. Reasons to donate at time of last donation

	It was the right thing to do	Heard blood was needed	Blood drive organizer or recruiter	Donating is good for my health	Wanted an item or gift	Family, friend, coworker	Wanted infectious disease test results	Wanted special recognition or award	A doctor told me to donate for health reasons
	%	%	%	%	%	%	%	%	%
Total*	81.07	39.09	15.46	9.36	5.72	4.96	2.41	0.63	0.35
Age									
≤25	84.00	39.48	11.60	8.73	7.23	9.91	6.23	1.48	0.16
26-35	83.29	37.92	12.87	8.32	7.76	6.05	3.57	0.44	0.17
36-45	81.72	39.09	15.62	9.27	6.11	4.53	1.62	0.50	0.30
46-55	79.95	38.33	17.57	9.05	4.31	3.48	1.18	0.61	0.42
56-65	76.99	40.93	18.89	12.30	3.44	2.42	1.03	0.46	0.60
66+	74.61	43.02	19.30	11.79	1.78	1.90	0.44	0.64	1.18
p value	<0.001	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sex									
Man	80.60	34.86	15.57	12.38	5.86	5.02	2.68	0.73	0.56
Woman	81.57	42.93	15.32	6.55	5.59	4.95	2.17	0.55	0.15
p value	0.02	<0.001	0.50	<0.001	0.29	0.75	0.001	0.03	<0.001
Race/ethnicity									
Asian	81.66	38.23	13.38	10.29	5.97	5.16	3.87	1.70	0.70
Hispanic	75.51	40.00	13.88	7.33	6.47	6.70	4.02	1.15	0.13
Other	80.30	34.08	12.78	10.66	9.51	7.84	2.74	0.96	0.32
Black	77.01	37.04	16.76	5.80	7.65	4.42	3.26	0.79	0.06
White	81.80	39.25	15.61	9.63	5.40	4.81	2.12	0.55	0.37
p value	<0.001	0.14	0.02	<0.001	<0.001	<0.007	0.001	0.01	0.07†
Education									
≤High school	77.01	39.97	15.66	9.88	5.43	6.19	2.98	0.81	0.41
Some college‡	79.04	40.18	14.63	9.95	6.60	5.26	2.47	0.65	0.31
≥Bachelor's degree	84.00	37.87	15.99	8.65	5.10	4.38	2.19	0.56	0.35
p value	<0.001	<0.001	0.006	<0.001	<0.001	<0.001	0.06	0.24	0.62
Donor status									
FT	77.99	33.63	13.45	6.12	5.85	11.71	3.90	0.62	0.40
RPT	81.99	40.72	16.05	10.33	5.68	2.96	1.96	0.64	0.33
p value	<0.001	<0.001	<0.001	<0.001	0.58	<0.001	<0.001	0.85	0.46
FT	77.99	33.63	13.45	6.12	5.85	11.71	3.90	0.62	0.40
RPT 1-5/10 years	78.31	42.85	17.83	7.88	5.94	5.83	2.97	0.48	0.27
RPT 6-20/10 years	82.20	41.79	16.96	9.76	5.66	2.44	1.68	0.53	0.34
RPT >20/10 years	86.62	39.37	13.70	14.25	5.91	1.38	1.78	0.90	0.38
p value	<0.001	<0.001	<0.001	<0.001	0.84	<0.001	<0.001	0.02	0.63

* The sum of the percentages across reasons to donate is more than 100 percent because donors could indicate more than one reason to donate.
† Testing white versus non-white donors.
‡ Some college refers to some college level of education or an associate degree.

ily member, friend, co-worker, or someone close to them" (11.7% first-time, 9.9% ≤25 years old) higher than "donating because it was good for their health" (6.1% first-time, 8.7% ≤25 years old). First-time and ≤25-year-old donors were about as likely to identify family/peers or blood drive organizers/recruiters as a reason to donate, in contrast to other demographic groups, in which the organizer/recruiter had a more influential role.

Some demographic differences that were present in the unadjusted analyses (Table 2) persisted after adjustment for other demographics and first-time versus repeat status (Table 3). Younger donors were more likely to report that they "felt it was the right thing to do," that a family member, friend, or coworker encouraged them to donate, that they wanted to receive a gift, and that they wanted the results from tests for infectious diseases such as the HIV or the HCV (ORs per 10 year increase of 0.55 to 0.82; Table 3). Conversely, the odds of being encouraged to donate by a blood drive organizer or recruiter was 1.11 times higher for each decade increase in age (OR = 1.11; Table 3).

First-time donors were more likely to indicate that they donated blood because a family member, friend, or coworker encouraged them (OR = 3.70) or because they wanted to be tested for infections (OR = 1.41) than repeat donors. The latter were more likely to donate for any of the other reasons (ORs from 0.59 to 0.90, $p < 0.01$).

Donors with a college or higher degree were more likely to donate because "it was the right thing to do" (OR = 1.51) but were less likely to donate to improve their health (OR = 0.74) or because of family-peer influence (OR = 0.78) than donors with a high school or lesser edu-

TABLE 3. Adjusted ORs* (95% CI) comparing reasons to donate among demographic groups

	It was the right thing to do	Heard blood was needed	Blood drive organizer/ recruiter encouraged me	Donating is good for my health	Wanted an item/gift	Family member, friend, coworker, or someone close to me strongly encouraged me	Wanted infectious disease test results
	OR* (95% CI)	OR* (95% CI)	OR* (95% CI)	OR* (95% CI)	OR* (95% CI)	OR* (95% CI)	OR* (95% CI)
Age (per 10-year increase)	0.82 (0.80-0.83)†	1.00 (0.98-1.02)	1.11 (1.08-1.13)†	1.00 (0.96-1.04)	0.74 (0.71-0.77)†	0.74 (0.71-0.77)†	0.55 (0.51-0.59)†
Sex							
Man	0.92 (0.87-0.97)‡	0.70 (0.67-0.74)†	0.96 (0.91-1.02)	1.99 (1.85-2.14)†	1.16 (1.05-1.28)‡	1.20 (1.07-1.34)‡	1.53 (1.33-1.75)†
Woman	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Race/ethnicity							
Asian	0.89 (0.75-1.06)	1.04 (0.90-1.20)	0.93 (0.75-1.15)	1.19 (0.92-1.55)	0.91 (0.70-1.19)	0.68 (0.47-0.97)§	1.10 (0.73-1.66)
Hispanic	0.68 (0.60-0.77)†	1.04 (0.93-1.17)	1.01 (0.90-1.13)	0.79 (0.65-0.96)§	1.02 (0.83-1.26)	0.96 (0.76-1.23)	1.29 (0.96-1.73)
Other	0.87 (0.68-1.12)	0.81 (0.66-1.00)	0.87 (0.65-1.15)	1.14 (0.85-1.54)	1.60 (1.17-2.19)‡	1.24 (0.80-1.92)	0.91 (0.52-1.57)
Black	0.77 (0.68-0.87)†	0.88 (0.77-1.02)	1.13 (0.96-1.33)	0.62 (0.49-0.79)†	1.40 (1.14-1.72)‡	0.75 (0.58-0.97)§	1.47 (1.04-2.10)§
White	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Education							
≥College	1.51 (1.38-01.66)†	0.95 (0.89-1.01)	1.04 (0.95-1.14)	0.74 (0.68-0.81)†	0.97 (0.84-1.11)	0.78 (0.67-0.91)‡	0.96 (0.73-1.26)
Some college‖	1.09 (0.99-1.19)	1.01 (0.94-1.09)	0.95 (0.86-1.04)	0.99 (0.90-1.10)	1.20 (1.01-1.42)§	0.90 (0.77-1.05)	0.92 (0.71-1.19)
≤High school	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Status							
FT	0.72 (0.67-0.78)†	0.73 (0.69-0.77)†	0.90 (0.83-0.97)‡	0.59 (0.50-0.69)†	0.83 (0.73-0.95)‡	3.70 (3.25-4.21)†	1.41 (1.19-1.66)†
Repeat	1.0	1.0	1.0	1.0	1.0	1.0	1.0

* The adjusted models included age (as a continuous variable), sex, race/ethnicity, education, and first-time/repeat status.
† p value <0.001.
‡ 0.01 <p value ≤0.001.
§ 0.05 <p value ≤0.01.
‖ Some college refers to some college level of education or an associate degree.

cation. The role of family and peers was slightly more important in men than in women donors (OR = 1.20). Men donors also donated more often because they thought donating was good for their health (OR = 1.99), to get tested for infectious diseases (OR = 1.53), and to receive an item and/or gift (OR = 1.16); conversely, women cited "it was the right thing to do" (OR = 0.92) and having "heard that blood was needed" (OR = 0.70) slightly more often.

Black donors were more likely than white donors to donate to receive an item and/or gift (OR = 1.40) or to be tested for an infectious agent (overall OR = 1.47; this association mainly held true for donors with some college or higher level of education). Black and hispanic donors were less likely than white donors to report donating because "it was the right thing to do" or because it would benefit their health. Black and asian donors were also less likely to report being encouraged to donate by a family member, friend, or coworker, although these associations were only marginally significant (p = 0.03).

Influencing factors

Only 27 percent of donors reported having been strongly influenced to donate by someone (family, friend/coworker, employer, blood bank staff) or something (the media, letter, or call from the blood bank). The major influencing factors identified were a blood drive organizer or recruiter (7.2%), a letter or call from the blood bank (6.8%), and a coworker or friend (3.7%), whereas other factors each influenced approximately 2 percent of the donors to donate.

Whereas donors with a college degree or higher level of education were less likely to be strongly influenced than donors with a high school diploma or lesser level of education (OR = 0.89, 95% CI 0.84-0.96, p = 0.002), the odds of being strongly influenced was 1.11 times higher for each decade that age increased (OR = 1.11, p <0.001). Women (29%), first-time (34%), and Hispanic (32%) donors were more likely to be strongly influenced to donate than men (25%, p < 0.001), repeat (25%, p <0.001), and White (26%, p < 0.001) donors, respectively.

The nature of the influencing factors varied within demographic groups. Coworkers and friends played a relatively more important role in ≤25-year-old, first-time, or hispanic donors. The proportion of influenced donors that were encouraged by a coworker or friend (≤25 years old, 27%; first-time, 29%; hispanic, 21%) was similar or higher to the proportion obtained for a blood drive organizer/recruiter or for a letter or call from the blood bank. These proportions were 21 percent for ≤25 year olds, 23 percent for first-time, and 26 percent for hispanics for a blood drive organizer or recruiter; and 15 percent for ≤25

yeas olds, 4 percent for first-time, and 20 percent for hispanics for a letter or call from the blood bank. For all other groups, the blood bank was more influential in attracting blood donors than coworkers or friends, with a letter or call from the blood bank becoming more important as donation frequency increased.

Donation reminders

Donors were asked what effect various reminders would have on their decision to donate in the future. The majority of donors appeared to be encouraged by reminders originating from the blood bank, with a telephone call appealing to 60 percent of donors, a letter or an e-mail to 63 percent, and an appeal from the local blood bank on TV, radio, or newspaper to 59 percent. Donors appeared less encouraged by a television, radio, or newspaper appeal from a national organization or spokesperson (42%) or by a call or letter from an organization such as a religious group, social club, or fraternal group (46%). Although most donors (59-63%) appeared encouraged by reminders originating from the blood bank, some reported that they would be discouraged from donating by these reminders. A higher percentage of donors appeared to be discouraged by a telephone call (14%) than by a letter or e-mail (4%) or an appeal (2%) from the blood bank. Furthermore, whereas 12 percent of donors reported that they would be discouraged by a call or letter from a religious or social organization, only 3 percent of donors said they would be discouraged by an appeal from a national organization. As can be seen in Figure 1, this pattern held for all demographic groups, except for older donors (≥66 years old), who would prefer receiving a telephone call from the blood bank or a call or letter from a social or religious organization.

Table 4 outlines differences in demographic groups by comparing the odds of being encouraged (vs. discouraged or indifferent) between demographic groups, after adjustment for other demographics and first-time versus repeat status. As previously mentioned, older donors were more likely to be encouraged by a call from the blood bank (OR = 1.11 for every 10-year age increase) or by a call/letter from a social or religious organization (OR = 1.22 for every 10-year age increase). The latter association appeared to hold true for all racial/ethnic groups except for asian donors, where there was no increased encouragement by a social or religious call/letter with age (data not shown). Men were always less likely to be encouraged than women, regardless of the nature of the reminder. Asian donors also always appear to be less encouraged than white donors except for 1) ≤high school asian donors who, in contrast to more educated donors, were more encouraged by a letter/e-mail from the blood bank (68%) than white donors (60%) and 2) an appeal from a national organization on television, radio, or newspaper. First-time donors were less likely to be encouraged by telephone calls, particularly if originating from the blood bank, than repeat donors (OR = 0.60). Donors with a higher level of education (≥college) appeared to favor receiving a letter or e-mail from the blood bank and were generally less encouraged by reminders not originating from the blood bank than donors with a high school diploma or less. More highly educated donors were also more likely to be discouraged by a telephone call from the blood bank, irrespective of age (16% of donors with ≥college were discouraged compared with 14% for some college/associate degree and 10% for ≤high school).

DISCUSSION

Compatible with previous reports,[9,13] altruism and being aware that blood is needed are still reported as the most important reasons for donating. When evaluating whether reasons to donate differed by demographic subgroups, we found that the relative importance of the motives did not change except in first-time and young donors. Both groups listed altruism and blood need as their primary reasons to donate but were about as likely to be influenced by a family, friend, or coworker as by a blood drive organizer and/or recruiter. In all groups, very few donated to get recognition or because they were told by a doctor to donate for health reasons.

It may also be possible to recruit and retain particular donor groups if their specific motivations to give blood are known. Although the demographic differences we found in reasons to donate were usually small, characterization of these differences may provide a basis for more targeted recruitment or retention efforts. Messages highlighting altruistic values and stressing the need for blood, using, for example, "real" patient experiences, should appeal to all demographic groups.

Younger, women, white or asian, and more highly educated donors were more likely to report giving because they felt "it was the right thing to do" than their respective counterparts (older, men, black and hispanic, lesser educated donors). These findings concur with results from a survey administered in the 1960s to 5581 individuals immediately after their donation showing that women, college-educated, and young donors were more likely to give for humanitarian reasons.[6]

Perceived need for blood was the second most commonly identified motive for donating. Giving blood for this reason may reflect 1) intrinsic or altruistic values, that is, giving because others need blood, 2) the need to ensure that blood will be available for oneself, a family member, or a friend, and 3) whether information relating to the presence of a blood shortage was easily accessible to the individual. Women and repeat donors were approximately 40 percent more likely to donate for this motive than men or first-time donors. These findings are

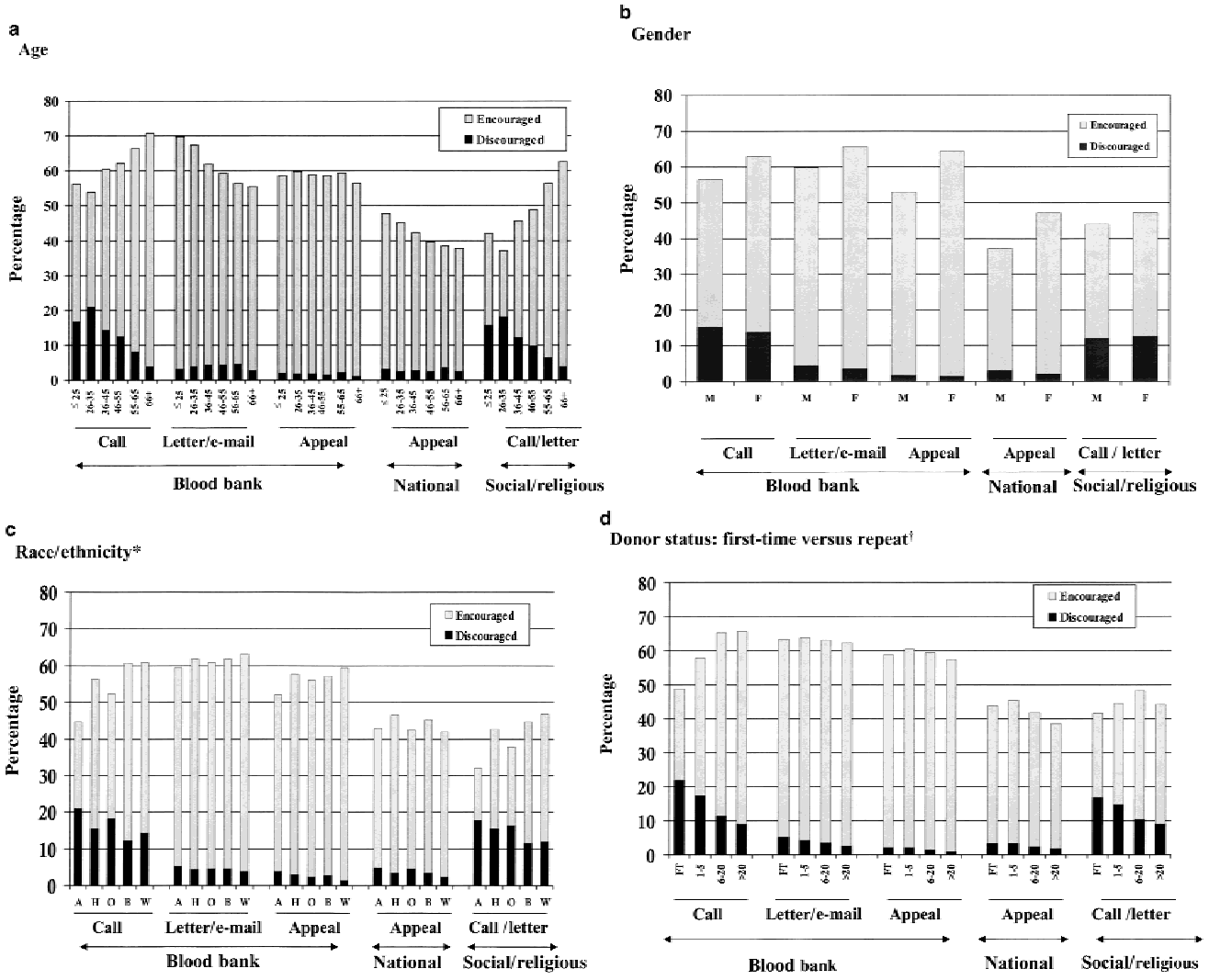

Fig. 1. Potential response to reminders by demographics. a) Age. b) Sex. c) Race/ethnicity. d) Donor status: first time versus repeat. *A, Asian; H, Hispanic; O, Other; B, black non-hispanic; and W, white non-hispanic race/ethnicity category. †1-5 refers to repeat donors who have given 1 to 5 donations in the past 10 years, 6-20 to repeat donors who have given 6 to 20 donations in the past 10 years, and >20 to repeat donors who have given >20 donations in the past 10 years.

compatible with increased perceived altruistic values in women and repeat donors.

First-time donors were four times more likely to report being encouraged by family, friends, or coworkers than repeat donors. Piliavin and Callero[15] have highlighted the importance of social pressure early in the donation process. They reported that 43.8 percent of college students came without a friend on their first donation, whereas 70 percent came alone for their fourth donation. Similarly, Bettinghaus and Milkovich[8] found that 40 percent of donors knew at least five friends who donated compared with 19 percent of nondonors. Consistent with London and Hemphill's[6] report, we also found that being encouraged by a friend, family, or peer was a more important factor for young individuals and donors with a high school or lower level of education. Men were also more likely to respond to social pressure than women, and whites and hispanics were more likely to report being encouraged by family or peers than black or asian donors. Furthermore, although a blood drive organizer/recruiter and a letter or call from the blood bank were usually identified as the strongest influencing factors in our study, coworkers and friends were found to be a relatively stronger influence in young, first-time, and hispanic donors. Blood centers should take advantage of the strong influence of family/peer on these groups. For example, student volunteers and family members could help in college and high school recruitment efforts. That such programs are probably effective can be exemplified by a study that found that undergraduate students were

TABLE 4. Adjusted ORs* (95% CI) comparing odds of being encouraged by future reminders among demographic groups

	Telephone call from blood bank	Letter or e-mail from blood bank	Appeal from local blood bank on TV, radio, newspaper	Appeal from a national organization or spokesperson on TV, radio, or newspaper	Call or letter from an organization such as a religious group, social club, or fraternal group
	OR* (95% CI)	OR* (95% CI)	OR* (95% CI)	OR* (95% CI)	OR* (95% CI)
Age (per 10-year increase)	1.11 (1.08-1.13)†	0.82 (0.80-0.83)†	1.00 (0.98-1.02)	0.90 (0.89-0.92)†	1.22 (1.20-1.25)†
Sex					
Man	0.71 (0.68-0.75)†	0.80 (0.77-0.83)†	0.62 (0.58-.65)†	0.69 (0.66-0.73)†	0.84 (0.81-0.87)†
Woman	1.0	1.0	10	1.0	1.0
Race/ethnicity					
Asian	0.63 (0.56-0.71)†	076 (0.66-0.88)†	0.75 (0.64-0.87)†	1.00 (0.87-1.15)	0.64 (0.55-0.74)†
Hispanic	0.91 (0.83-1.00)	0.85 (0.76-0.96)‡	0.91 (0.81-1.02)	1.06 (0.95-1.18)	0.94 (0.84-1.04)
Other	0.77 (0.65-0.92)‡	0.83 (0.67-1.02)	0.84 (0.68-1.05)	0.93 (0.75-1.16)	0.76 (0.61-0.94)§
Black	1.01 (0.90-1.13)	0.91 (0.81-1.03)	0.87 (0.77-0.98)§	1.06 (0.96-1.16)	0.94 (0.85-1.05)
White	1.0	1.0	1.0	1.0	1.0
Education					
≥College	0.92 (0.85-1.00)	1.24 (1.14-1.34)†	1.04 (0.95-1.14)	0.78 (0.73-0.85)†	0.84 (0.77-0.91)†
Some college‖	0.94 (0.87-1.01)	1.12 (1.03-1.21)‡	1.08 (0.99-1.17)	0.95 (0.88-1.04)	0.93 (0.86-1.01)
≤High school	1.0	1.0	1.0	1.0	1.0
Status					
FT	0.60 (0.56-0.64)†	0.95 (0.89-1.01)	0.98 (0.92-1.05)	1.00 (0.93-1.07)	0.92 (0.86-0.99)§
Repeat	1.0	1.0	1.0	1.0	1.0

* The adjusted models included age (as a continuous variable), sex, race/ethnicity, education, and first-time vs. repeat status.
† p value <0.001.
‡ 0.01 <p value ≤0.001.
§ 0.05 <p value ≤0.01.
‖ Some college refers to some college level of education or an associate degree.

more likely to donate if asked by a friend than if asked by a stranger (31% vs. 14% respectively).[25] Media advertisement stressing that giving blood is a socially desirable behavior that conforms to peer expectations may also be useful in recruiting first-time donors.

Conversely, we found that social pressure did not play as important a role in repeat and older donors. Donors who had given very frequently (>20 donations in the last 10 years) were more likely to give for altruistic reasons, health concerns, or recognition. The donation process appears to evolve as Piliavin and Callero[15] described. Initially friends, family, and peers play a crucial role in inducing an individual to donate; the influence of blood drive organizers and recruiters then gradually replaces that of family and peers. Finally, donating blood becomes a habit with development of a strong role identity and with altruism, a core value.

In our study, a small percentage of donors gave blood for personal benefit, with 9 percent reporting that donating is good for one's health and 6 percent being attracted by items of small value. Men were approximately twice as likely as women to give because it would be good for their health. It is possible that men donors were aware that a lower iron level has been reported as being potentially protective against ischemic heart disease, a theory consistent with the lower rates of heart disease in premenopausal women compared with men.[26] Men donors were also more likely to be attracted by gifts; similarly, blacks and donors with some college education were more likely to have donated to receive a gift than White and college-educated donors, respectively. Being encouraged to donate by items of limited value (gifts) has not been found to be associated with an increased risk of having a reactive screening test or unreported deferrable risk behavior.[27] Hence, a judicious use of gifts that are not readily convertible to cash[28] may be effective for recruitment of some populations without being detrimental to the safety of the blood supply.

Finally, a small percentage of donors (2.41%) reported donating to be tested for an infectious agent such as HIV or hepatitis. Test seeking was 40 to 50 percent more likely to occur in first-time, Black, or men donors. Blood banks should stress during initial contact that it is inappropriate to give blood just to be tested for these infections and give donors a list of affordable alternative test sites. Some individuals may also be under the misconception that their blood is not infected and cannot transmit an infectious agent if negative on screening tests.[29] Donors need to be educated about the possibility of having a false-negative screening test early in the course of infection to increase the likelihood of self deferral or to encourage them to choose the confidential unit exclusion option, when available.

Most blood donors denied having been strongly influenced by the blood bank, the media, or family or peers to donate. Donors, if influenced, were more likely to re-

spond to blood center's staff or programs (letter or call), although friends played a more important role in young, first-time, and Hispanic donors. Consistent with these observations, we found that a high percentage of donors would be encouraged to return if they received reminders originating from the blood bank. Interestingly, except for older (≥66 years old) donors who would favor receiving a telephone call from the blood bank, most donors would prefer receiving a letter or an e-mail from the blood bank (rather than a phone call). Hence, blood centers should consider the use of Web pages or advertisement on the Internet and should evaluate the feasibility of contacting new generations of donors by e-mail as a possible cost-effective recruitment or retention tool. Blood drives can be successfully conducted by using the Internet/e-mail, as exemplified by the "SF blooddrive.com" program conducted in August 2000 in the San Francisco Bay area that attracted more than 150 donors in 2 days.[30]

Our analysis was subject to some limitations. First, our results are based for the most part on self-reports. The questionnaire was anonymous, which should have allowed donors to report truthfully their reasons to donate. However, as Piliaven and Callero[15] noted, donors may be inclined to give as their primary motivator what they perceive is a socially acceptable response rather than their real reason to donate. Further studies that give the donor an opportunity to grade the importance of each influencing factor will be needed to address this issue further. Second, although the statistical analysis was adjusted for nonresponse, our results are based on responses given by 57 percent of the sampled donors. It is possible that respondents were more likely to be altruistic than nonrespondents leading to a potential underestimation of the number of donors giving for nonhumanitarian reasons. Third, because of the large number of statistical tests done in this analysis, caution should be used in drawing conclusion for those associations with a p value exceeding 0.001. Fourth, we found that some reminders would encourage most donors to return. It is difficult to predict, however, whether being encouraged or intending to donate as a result of a reminder directly translates into actual donations (although intention is correlated with action).[31] Fifth, when evaluating potential response to reminders originating from the blood bank, donors were asked whether a letter or an e-mail would encourage or discourage them to donate. Hence, we were not able to separate the effect of a letter from that of an e-mail. Finally, our survey did not assess why individuals in the general population do not donate; further studies of nondonor populations are needed to gather this information.

In conclusion, donors report giving WB donations primarily for altruistic reasons and in response to appeals for blood. Less than 35 percent of donors are strongly influenced by an external factor. Blood centers should continue to build on this humanitarianism and take advantage of the family-peer influences that are especially strong in young and first-time donors. Although blood centers should continue to contact their older donors by telephone, they should consider establishing new communication routes such as e-mail to encourage their younger and more educated donors to return.

ACKNOWLEDGMENTS

The authors thank Edward P. Scott, MD, at the Lifeblood Mid-South Regional Blood Center (Memphis, TN), Debra Kessler, RN MS, at the New York Blood Center (New York, NY), and Joy Fridey, MD, at the Blood Bank of San Bernardino and Riverside Counties (San Bernardino, CA) for their valuable insight. We are also very grateful to the staff at all eight participating blood centers. Without their help, this study would not have been possible.

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