First-time blood donors: demographic trends

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BACKGROUND: With changing demographics of the United States population and the continuous need to recruit new donors, it is important to monitor the demographic profile of first-time donors and to evaluate changes in the donor pool to improve recruitment targeting.
STUDY DESIGN AND METHODS: First-time whole blood (n = 901,862) donors at five United States blood centers between 1991 and 1996 were analyzed.
RESULTS: The total number of first-time donors appears to be decreasing. Over the 6-year period, there was an overall increase in the proportion of Hispanic and other minority first-time donors and a concurrent decrease in the proportion of white donors at Retrovirus Epidemiology Donor Study centers. Other variables, including age, sex, and education, did not show a consistent trend.
CONCLUSION: The demographic profile of first-time donors is changing. These data highlight the importance for blood centers to continuously monitor the donor population. A better understanding of the donor population may help blood centers adjust their donor outreach, recruitment, and retention programs. New recruitment efforts appear needed to counter general apathy toward donating blood, and minority groups appear to be receptive to becoming blood donors.

ABBREVIATION: REDS = Retrovirus Epidemiology Donor Study.

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The United States blood supply is facing increasing demands while collection rates have been decreasing gradually over the past two decades.[1] Although approximately 60 percent of the population is eligible to donate, only five percent donates currently.[2] Members of racial and ethnic minorities are less likely than whites to donate.[3] Many blood centers have introduced specialized recruitment programs aimed at first-time donors in an attempt to increase the donor pool. Some of the programs have targeted specific minority groups. As an example, one successful regional recruitment program, the "For the love of us" campaign, was designed specifically to increase awareness in African American communities.[4]

The demographic composition of the United States population is changing dramatically with a decrease in the percentage of whites, who traditionally make up most of the donor base. Between 1980 and 1990, the Hispanic population in the United States increased by 53 percent as a result of immigration and high birth rates. The growth rate in the Hispanic population was approximately 12 times higher than that of non-Hispanic whites. It is projected that by 2005, Hispanics will outnumber non-Hispanic blacks and become the largest minority group in the country.[5]

Despite these trends, little is known about changes in the demographic profile of contemporary United States donors. While anecdotal evidence from blood centers appears to indicate a shift in donor demographics, analysis of donor profiles is often not possible because of the absence of routinely collected demographic data. Changes in donor demographics may be more evident among first-time donors given the combination of vigorous donor recruitment efforts and shifts in the composition of the general population. Demographic information can provide blood centers with a way to monitor the trends of their current donors, identify potential populations, and adjust their donor recruitment and retention strategies. This report describes demographic trends for a large group of first-time community donors from five diverse United States blood centers participating in the Retrovirus Epidemiology Donor Study (REDS), sponsored by the National Heart, Lung, and Blood Institute.

MATERIALS AND METHODS

The design of REDS has been described in detail previously.[6] Briefly, REDS has collected donor demographics and routine laboratory screening and confirmatory test results on all donations at five participating blood centers since 1991. The REDS centers represent large and diverse geographic areas: American Red Cross Blood Services, Greater Chesapeake and Potomac region (Baltimore, MD, and Washington, DC), the Southeastern Michigan region (Detroit, MI), and the Southern California region (Los Angeles, CA); the Blood Centers of the Pacific in San Francisco, CA; and the Oklahoma Blood Institute in Oklahoma City, OK. Westat in Rockville, MD, serves as the coordinating center.

Data were analyzed for 901,862 first-time community whole blood donors, 18 years or older, who gave whole blood at one of the REDS centers from 1991 to 1996. Demographic data were collected with the use of a short study questionnaire at the time of donation. The data were categorized into the following groups: age (<25, 25-34, 35-44, 45-54, and 55+ years of age); sex (male and female); race and ethnicity (white non-Hispanic, black non-Hispanic, Hispanic, Asian, and other non-Hispanic); country of birth (United States and non-United States); and education (less than high school, high school diploma, some college, college degree, and post-graduate education).

Pearson chi-square was used to test for temporal changes in donor demographic variables. Multivariable logistic regression models (PROC CATMOD, SAS Institute, Cary, NC) were used to test the significance of the demographic shifts while adjusting for other confounding demographic variables.[7]

RESULTS

Figure 1 shows the trends in the numbers of first-time donors overall and by blood collection area between 1991 and 1996. Overall, the total number of first-time donors decreased by 6.7 percent, from 161,843 in 1991 to 150,923 in 1996 ($p<0.001$). The number of first-time donors decreased in both the Baltimore/Washington and the Southeastern Michigan areas, whereas the number in the Oklahoma and Southern California areas increased. The increase in Southern California area was the most dramatic: from 34,150 to 54,449, almost 60 percent. The number of first-time donors in Northern California remained relatively constant over the 6-year period.

Table 1 shows the demographic characteristics of first-time donors for the entire 1991-1996 period. A high proportion of first-time donors were young (63.6% were less than 35 years old), male (52.4%), white non-Hispanic (73.8%), United States-born (88.3%), and well educated (32.3% had a college or higher education).

While age, sex, and education did not show a consistent trend over the 6-year-period (data not shown), there

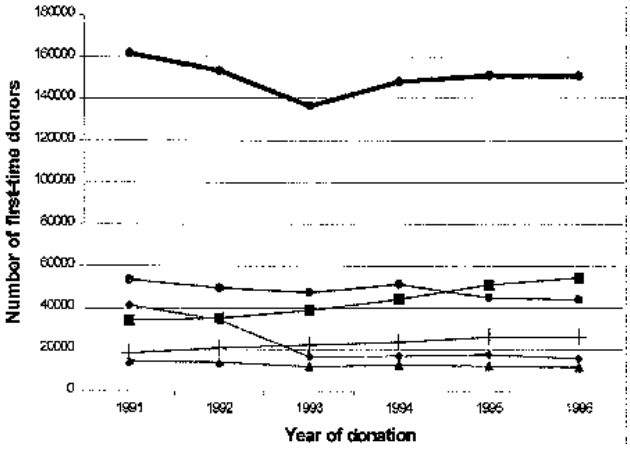

Fig. 1. Overall trends in REDS first-time donors by region, 1991-1996. Baltimore/Washington, ●; Michigan, ◆; Southern California, ■; Northern California, ▲; Oklahoma, |; Total, ●

TABLE 1. Demographic characteristics of first-time donors, 1991-1996 REDS data

	Number	Percentage
Age		
<25	307,803	34.1
25-34	265,861	29.5
35-44	186,065	20.6
45-54	98,350	10.9
55+	43,783	4.9
Sex		
Male	472,672	52.4
Female	429,090	47.6
Missing	100	0.0
Race/ethnicity		
Asian	39,269	4.4
Black, non-Hispanic	77,221	8.6
Hispanic	76,281	8.5
Other, non-Hispanic	16,296	1.8
White, non-Hispanic	665,936	73.8
Missing	26,859	3.0
Country of birth		
United States	796,147	88.3
Non-United States	91,900	10.2
Missing	13,815	1.5
Education		
<High school	109,159	12.1
High school graduate	169,482	18.8
Some college	301,895	33.5
College graduate	196,342	21.8
Postgraduate college	94,366	10.5
Missing	30,618	3.4

was a significant increase in the proportion of non-United States-born donors in each area (Table 2, $p<0.001$). For example, the percentage of non-United States-born first-time donors during the 6-year period increased from 16.9 percent in 1991 to 21.6 percent in 1996 in the Southern California area. In Oklahoma, the percentage increased from 3.4 percent to 4.9 percent in the same period. The number of non-United States-born donors in both areas approximately doubled. For the Baltimore/Washington and North-

TABLE 2. Country of birth of first-time donors, 1991-1996 REDS data*

	Born in USA		Born outside of USA	
	Number	Percentage	Number	Percentage
Baltimore/Washington				
1991	3,028	5.6	49,673	92.6
1992	2,773	5.6	46,470	93.7
1993	3,127	6.6	43,962	92.9
1994	3,536	6.9	47,458	92.6
1995	3,126	7.0	41,378	92.5
1996	3,101	7.1	40,315	92.0
Southeastern Michigan				
1991	1,977	4.8	38,519	93.4
1992	1,631	4.8	32,557	95.0
1993	868	5.3	15,476	94.5
1994	908	5.4	15,928	94.4
1995	981	5.6	16,385	94.0
1996	876	5.6	14,573	93.9
Southern California				
1991	5,774	16.9	27,533	80.6
1992	6,128	17.5	28,146	80.3
1993	7,131	18.4	30,802	79.5
1994	8,185	18.6	34,726	79.0
1995	10,645	20.9	38,045	74.6
1996	11,732	21.6	38,234	70.2
Northern California				
1991	1,907	13.1	12,642	86.8
1992	1,872	13.5	11,981	86.5
1993	1,659	14.1	10,072	85.8
1994	1,684	13.4	10,852	86.6
1995	1,694	14.1	10,300	85.9
1996	1,708	15.0	9,658	85.0
Oklahoma				
1991	627	3.4	17,626	96.6
1992	811	3.9	19,923	98.1
1993	917	4.1	21,229	95.8
1994	1,049	4.5	22,445	95.5
1995	1,197	4.6	24,758	95.3
1996	1,248	4.9	24,481	95.1

* Percentages may not add up to 100 because of missing data.

ern California areas, the numbers of non-United States-born donors were relatively stable. The increases in the percentage of non-United States-born donors are the result of the substantial decrease in the number of United States-born donors. This is particularly evident for Southeastern Michigan, where there was a substantial decrease in United States-born donors.

Table 3 shows the race and ethnicity distribution of first-time donors by area and year. All areas experienced an increase in the proportion of Hispanic, black, and Asian first-time donors and a decrease in their white counterparts, although the extent of this change varied. Changes across the years in each area were significant ($p<0.001$). The increase in Hispanic first-time donors was particularly substantial in the Southern California (16.7% in 1991 to 23.9% in 1996), and Oklahoma areas (3.0% in 1991 to 7.1% in 1996). In both areas, the numbers of Hispanic first-time donors more than doubled. While the numbers are small, the Baltimore/Washington area also saw an increase in Hispanic first-time donors.

Overall, the increases in Asian and black first-time donors were relatively small compared with the increases in Hispanic donors (range of percentage increase in the five areas: Asian, 0.7-1.9; black, 0.6-3.7; Hispanic, 1.2-7.2).

To assess whether the observed increases in minority donors are confounded by changes in other demographic variables, donor age, sex, country of birth, education, and center were all entered into logistic regression models. The race and ethnicity term remained significant ($p<0.001$) after adjustment. That means the increasing number of minority donors could not be explained by concurrent changes in other demographic variables, such as country of birth.

DISCUSSION

This is one of few studies describing contemporary changes in the demographic composition of first-time blood donors in the United States. The data yielded several conclusions. First, the overall number of first-time donors appeared to decrease between 1991 and 1996. In three collection centers, fewer white individuals donated blood for the first time in 1996 than in 1991, possibly reflecting an increased national apathy toward donating blood. Although this finding is based on data collected at five United States blood centers, the results are consistent with information indicating an alarming downward trend in the number of blood collections in recent years.[1] These data indicate the ever-challenging task facing many blood centers to recruit a stable level of first-time donors to ensure adequacy of the blood supply.

Second, the data revealed increasing trends in the proportion of non-United States-born and minority first-time donors at all centers. The increase was most substantial at two blood centers, Oklahoma and Southern California. Changes in the former may be secondary to the gradual expansion of the blood center's collection area in recent years (oral communication, Smith J, 1996).

In addition to continuous donor recruitment efforts, as reflected by the increase in first-time donors in all race and ethnicity groups, the Southern California center launched a special recruitment program for Hispanic communities in 1993. Introduction of bilingual blood center staff and awareness campaigns were major components of this program. The campaign no doubt contributed to the increased Hispanic first-time donors in the area from 5,703 in 1991 to 13,027 in 1996 (Table 3), a 128-percent increase. With the use of 1991-1996 United States Census projections,[8,9] this donor increase was compared with trends in the general population, 18 years or older, in the area. The Census projected the Hispanic population growth at 16 percent, from approximately 3.1 million to 3.6 million during the same period. The much larger increase in the Hispanic donors compared with the population growth indicates that the

TABLE 3. Race and ethnicity of first-time donors, 1991-1996 REDS data*

	Asian		Black		Hispanic		Other		White	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Baltimore/Washington										
1991	1,023	1.9	6,380	11.9	210	0.4	564	1.1	43,615	81.3
1992	1,004	2.0	5,951	12.0	404	0.8	518	1.0	40,417	81.5
1993	1,100	2.3	5,928	12.5	830	1.8	465	1.0	38,565	81.5
1994	1,216	2.4	6,736	13.1	991	1.9	521	1.0	41,334	80.7
1995	1,209	2.7	6,029	13.5	890	2.0	490	1.1	35,777	80.0
1996	1,150	2.6	5,819	13.3	926	2.1	557	1.3	34,748	79.3
Southeastern Michigan										
1991	657	1.6	3,445	8.4	497	1.2	197	0.5	35,732	86.7
1992	602	1.8	3,015	8.8	644	1.9	222	0.7	29,558	86.3
1993	395	2.4	1,690	10.3	368	2.3	121	0.7	13,754	84.0
1994	404	2.4	1,855	11.0	415	2.5	158	0.9	13,985	82.9
1995	455	2.6	1,882	10.8	470	2.7	150	0.9	14,361	82.4
1996	390	2.5	1,546	10.0	375	2.4	143	0.9	12,963	83.5
Southern California										
1991	2,249	6.6	1,333	3.9	5,703	16.7	525	1.5	22,925	67.1
1992	2,837	8.1	1,614	4.6	6,546	18.7	626	1.8	22,271	63.6
1993	3,354	8.7	2,051	5.3	8,104	20.9	794	2.1	23,262	60.0
1994	3,621	8.2	2,096	4.8	9,285	21.1	887	2.0	26,462	60.2
1995	4,326	8.5	2,496	4.9	12,303	24.1	1,105	2.2	27,332	53.6
1996	4,517	8.3	2,687	4.9	13,027	23.9	1,157	2.1	26,485	48.6
Northern California										
1991	1,237	8.5	650	4.5	1,064	7.3	271	1.9	11,297	77.6
1992	1,228	8.9	699	5.0	1,180	8.5	250	1.8	10,458	75.5
1993	1,137	9.7	574	4.9	962	8.2	285	2.4	8,757	74.6
1994	1,107	8.8	576	4.6	1,034	8.3	303	2.4	9,502	75.8
1995	1,125	9.4	539	4.5	1,083	9.0	304	2.5	8,924	74.4
1996	1,182	10.4	575	5.1	1,047	9.2	326	2.9	8,209	72.2
Oklahoma										
1991	143	0.8	972	5.3	547	3.0	705	3.9	15,678	85.9
1992	200	1.0	1,526	7.4	994	4.8	758	3.7	16,745	80.8
1993	276	1.3	1,841	8.3	1,346	6.1	829	3.7	17,034	76.9
1994	346	1.5	2,153	9.2	1,449	6.2	936	4.0	17,754	75.5
1995	356	1.4	2,237	8.6	1,749	6.7	993	3.8	19,471	75.0
1996	423	1.6	2,326	9.0	1,838	7.1	1,136	4.4	18,561	72.1

* Percentages may not add up to 100 because of missing data.

special recruitment program has been a success. The campaigns also appeared to have a "spill-over" effect by attracting first-time donors of other races and ethnicities. The increases in white, black, and Asian first-time donors were 16, 102, and 101 percent, much higher than the Census-projected population changes of –8, –4, and +17 percent, respectively.

These data may prove useful in predicting the future profile of the donor population. If the observed trends continue, the traditional racial and ethnic composition of the United States donor pool[10] could change substantially, assuming that these results can be extrapolated to the entire United States (REDS sites collect over one million donations a year or approximately 8% of donations in the United States). Other centers may be experiencing similar trends, although in areas where the general population undergoes less change, fluctuations in donor demographic data may be less evident. Nevertheless, the Southern California experience illustrates the importance of monitoring donor demographic changes and adjusting recruitment strategies accordingly. The resultant targeted community-based campaigns may be an effective way to attract first-time donors who were rarely contacted before.

Unfortunately, it was not possible to evaluate whether demographic shifts in first-time donors paralleled population shifts in catchment areas for the other four centers, because of the lack of comparable United States Census data. However, it is important to note that the donor population is not directly comparable to the general population. In this study, first-time donors were compared with the general population residing in the same area using projected census data. In line with previous findings, donors were more likely to be young, white, and more educated (data not shown). A better comparison group in this study could have been those persons in the general population who are eligible to donate. However, these data are not available.

In summary, this study shows the changing demographic profile of first-time donors. Changes in the composition of the local population require blood centers to continuously reevaluate and adjust their donor outreach, recruitment, and retention programs. The Southern California experience highlights the importance of such endeavors.

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