Received: 23 December 2022 | Revised: 26 April 2023 | Accepted: 26 April 2023

DOI: 10.1111/trf.17400

BLOOD DONORS AND BLOOD COLLECTION

TRANSFUSION

Young apheresis platelet donors show significant and sustained growth over the last decade in the US, 2010–2019: A favorable sign of the resiliency of the platelet supply

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Abstract

Background: Platelet demand continues to rise and US hospitals frequently face shortages. The peak median age of apheresis platelet donors (APD) is believed to have increased over the last decade, raising concerns that the APD base is not being adequately replenished with young donors.

Study Design/Methods: American Red Cross (ARC) apheresis platelet collections were evaluated from calendar years 2010 through 2019. APD, products per procedure/split rate (PPP) and donation frequencies were stratified into age groups.

Results/Findings: The number of unique APD from calendar year 2010 through 2019 in the ARC donor pool increased from 87,573 to 115,372 donors, representing a 31.7% overall growth. Donors in the 16–40 year-old (y) age group increased by 78.8% overall, with the largest absolute increases seen in the 26–30 y (4852 donors, 99.9% growth), followed by the 31–35 y (3991, 94.1%) group. Donors aged 56+ increased by 50.4% overall, with the largest increase seen in the 66–70 y (5988 donors, 108.1% growth) group. Middle-aged donors, aged 41–55 y, demonstrated a decrease of 16.5%. Over the last decade, the youngest age groups (16–40 y) comprised 61.3% of first-time donors (FTD). Annual donation frequency increased with increasing age and PPP. The highest donation frequencies were seen in the oldest age groups.

Conclusion: Although the peak median age of APD increased over the study period, relative contribution of the 16–40 y APD base also increased. Older donors exhibited the highest donation frequencies and thus contributed the largest volume of apheresis platelet units. Platelet donor activity declined in the middle age (41–55 y) group.

KEYWORDS
donors

1 | INTRODUCTION

Every year in the United States (US), nearly 21 million blood components (red blood cells [RBCs], platelets, and plasma) are transfused, extending and improving the lives of more than 4 million Americans with transfusion needs.[1–4] These components are almost exclusively collected from volunteer blood donors.[1] Blood is used for a wide spectrum of healthcare services including elective and trauma surgeries, cancer treatment, and obstetric care.[1,4,5] From 2000 to 2020, the transfusion recipient rate per capita for RBCs in the US has decreased by 2% per year, primarily driven by economic incentives to reduce blood procurement costs combined with the publication of dozens of studies demonstrating equivalent or improved outcomes among patients who are transfused more frugally.[6–8] Advances in less invasive surgery and off-label use of antifibrinolytics have also reduced the need for transfusions in select situations.[9–12]

However, while demand for RBC transfusion has moderated, platelet demand has risen by 10%–15%, causing demand to exceed supply.[1,13,14] In a 2019 survey of 995 US hospitals, only 5.8% of respondents never experienced constrained platelet availability while 18.7% reported postponement of surgical services and 31.8% reported postponement of outpatient transfusions due to inadequate platelet availability.[1,15] From 2014 to 2019, the American Red Cross (ARC), which operates 172 apheresis donor centers in 35 states and distributes greater than 40% of blood in the US, increased its distribution of apheresis platelet units by 16.6%, representing a 3.3% increase each year. During the study period reflected in the 2019 NBCUS survey, the ARC observed a 3.9% increase in platelet distributions per year.[15] These demand trends are expected to continue to increase due to an aging population and observed increases in the use of bone marrow/hematopoietic stem cell transplant.[1,16,17]

It has been previously reported that the median age of blood donors, in particular platelet donors, has been rising by evaluating the peak age of donors over time.[14,16–18] Stubbs et al., reported that the peak age of apheresis platelet donors (APD) increased from the 41-45 y group in 2001 versus the 56–60 y group in 2017.[14] Such data have largely led to the predominant view in the industry that the US platelet supply may be at risk due to an aging donor population, who experience greater health- or medication-related deferrals and who will eventually exit the donor pool.[14] A widely debated question is whether the platelet donor pool is being adequately refreshed with younger donors. To evaluate this question and address the vulnerability of the platelet supply, we evaluated platelet donor demographics in the ARC over a 10-year period from 2010 to 2019.

2 | METHODS

ARC apheresis platelet collections were evaluated from calendar years 2010 through 2019. The American Red Cross did not specifically target donors of any age group with messaging engagement or incentives during this time period. Donors were stratified into 13 age groups (16–18 years, 19–22, 23–25, 26–30, 31–35, 36–40, 41–45, 46–50, 51–55, 56–60, 61–65, 66–70, 71+). For each age group, the following were obtained from the Blood Establishment Computer System (eProgesa, MAK System, Paris, France) and Webi (SAP/Webi, Germany): total number of APD per year, total number of first-time apheresis platelet donors (FTD) per year, annual apheresis platelet procedures, annual platelet collections in units, and number of donations by single, double, and triple platelet products. The number of apheresis platelet units that were collected and distributed to hospitals 2010–2019 was obtained from SAP/Webi and the ARC billing system (CFS, Oracle, Austin, TX). The "glm" procedure in SAS (v. 9.4, Cary, NC, USA) was used to fit an ordinary multiple regression model to determine the effect of donor age and donation year toward the variances in overall percentage of APD to determine year-over-year percent change for total APD, FTD, relative percent representation of each age group, products per procedure/split rate (PPP), and annual donation frequency for donors whose donations result in single, double, and triple collections.

3 | RESULTS

3.1 | Trends in total apheresis platelet donors from 2010 to 2019 reflects an increase in both younger and older donors

The number of unique APD from calendar years 2010 through 2019 in the ARC donor pool increased from 87,573 to 115,372 donors, representing a 31.7% overall growth (Table 1). Each age group greater than 60 y demonstrated significant growth in relative representation, in aggregate increasing by 8.1%, with the largest increase in the 66–70 y (6.3%–10.0%) group (Figure 1A). Similar to what has been published,[18] we observed a shift toward an older age of peak representation of APD (peak A1 to A2, Figure 1A). The 51–55 y demonstrated the largest representation (16.1%, peak A1) of APD in 2010 while the 56–60 y demonstrated the largest representation (12.6%, peak A2) of APD in 2019. But notably, although the peak has shifted to an older age group, their relative representation has declined over time. By contrast, the graph shows an increase in relative representation of ages 16–40 y

TABLE 1 Total apheresis platelet donors by age by year.

Age band	CY2010	CY2011	CY2012	CY2013	CY2014	CY2015	CY2016	CY2017	CY2018	CY2019
16–18	794	839	816	893	983	1265	1409	1857	1399	1575
19–22	3350	3401	3381	3978	3750	4458	4664	5301	4796	5482
23–25	2764	2984	3154	3864	3685	4293	4530	5071	4761	5172
26–30	4856	5483	5552	6273	6076	6825	7640	8695	8914	9708
31–35	4242	4666	5012	5469	5325	6182	6905	7751	7613	8233
36–40	5272	5056	4717	4921	4588	5216	5932	7014	7089	7867
41–45	7616	7562	7205	6928	6162	6312	6264	6597	6760	7081
46–50	11,704	11,278	10,348	9845	8767	8680	8994	9605	9216	9102
51–55	14,133	13,986	13,778	13,565	12,381	12,407	12,480	12,334	11,745	11,760
56–60	13,463	13,938	13,759	14,301	13,821	13,894	14,344	14,869	14,443	14,510
61–65	9771	10,661	10,979	11,651	11,839	12,477	13,225	13,909	13,887	14,432
66–70	5538	5859	6446	7451	7848	8627	9527	10,295	10,725	11,526
71+	4070	4384	4644	5172	5615	6046	6605	7265	7986	8924
Totals	87,573	90,097	89,791	94,311	90,840	96,682	102,519	110,563	109,334	115,372

between 2010 and 2019, in aggregate increasing by 8.7%, with the largest increases in 26–30 y (5.5% to 8.4%), and 31–35 y (4.8% to 7.1%) (Figure 1A). However, APD in the middle-aged groups 41–60 y demonstrated declines in relative representation, in aggregate decreasing by 16.8%. The shift in percent by age group of total APD (i.e., a decrease of 2.8% from 2010 to 2019 in the 55–60 y and an increase of 2.9% among the 26–30 y) was not statistically significant but imply a changing paradigm of percent of platelet donors with aging population. This graph demonstrated relative representation of each age group, thus a greater degree of growth in one age sector, such as the >60 age groups, may deemphasize conspicuous growth in other age segments, such as between ages 23 and 30 y (peak B).

To better understand growth trends, each age group in 2019 was compared with that same age group in 2010, reflected by its percent change (Figure 1B). Notably, younger donors (16–40 y) as well as older donors (>55 y) both demonstrated substantial growth. The largest percent increases were seen in the 66–70 y (5538–11,526, delta 5988, +108.1%), 71+ y (4070–8924, delta 4854, +119.3%) and 26–30 y (4856–9708, delta 4852, +99.9%) groups. Increases were seen in the younger groups of 16–18 y (794–1575, delta 781, +98.4%), 31–35 y (4242–8233, delta 3991, +94.1%), and 23–25 y (2764–5172, delta 2408, +87.1%). In 2019, the largest absolute numbers of APD were in the 56–60 y (14,510), 61–65 y (14,432), 51–55 y (11,760), and 66–70 y (11,526) groups with donors in the 26–30 y (9708) and 31–35 y (8233) groups following closely behind with robust and growing representation. However, donors between 41 and 55 y declined. In 2019, the youngest age groups (16–40 y) represented 33.0% of all APD, the middle-ages (41–55 y) represented 24.2% and the oldest age groups (>55 y) represented 42.8% of APD. While the changes within any age group were not statistically significant from year to year, the cumulative changes for each age group, when comparing 2019 to 2010, were statistically significant ($p < .05$).

3.2 | First-time apheresis platelet donor trends remained stable

Most eligible individuals do not donate blood.[19,20] Recruiting qualified donors into the regular, active donor base is a complex process. Studies indicate that FTD who returned to donate soon after their first donation were more likely to become regular donors.[19,20] All age groups experienced the addition of FTD each year of the study period with a total of 15,883 new donors added to the APD base from 2010 to 2019 (Figure 2). FTD for each age group over the decade totaled 1140 (16–18 y), 2221 (19–22 y), 1609 (23–25 y), 2152 (26–30 y), 1450 (31–35 y), 1159 (36–40 y), 1137 (41–45 y), 1189 (46–50 y), 1118 (51–55 y), 974 (56–60 y), 809 (61–65 y), 506 (66–70 y), and 419 (71+ y). Donors 19–35 y represented the largest number of FTD overall. Of all FTD presenting over the last decade, the youngest age groups (16–40 y) comprised 61.3%, the mid-range age groups (41–55 y) 21.7%, and the oldest age groups 17.0%.

In 2010, the relative representation of FTD was highest in the 19–22 y (14.5% of total FTD), 26–30 y (11.1%),

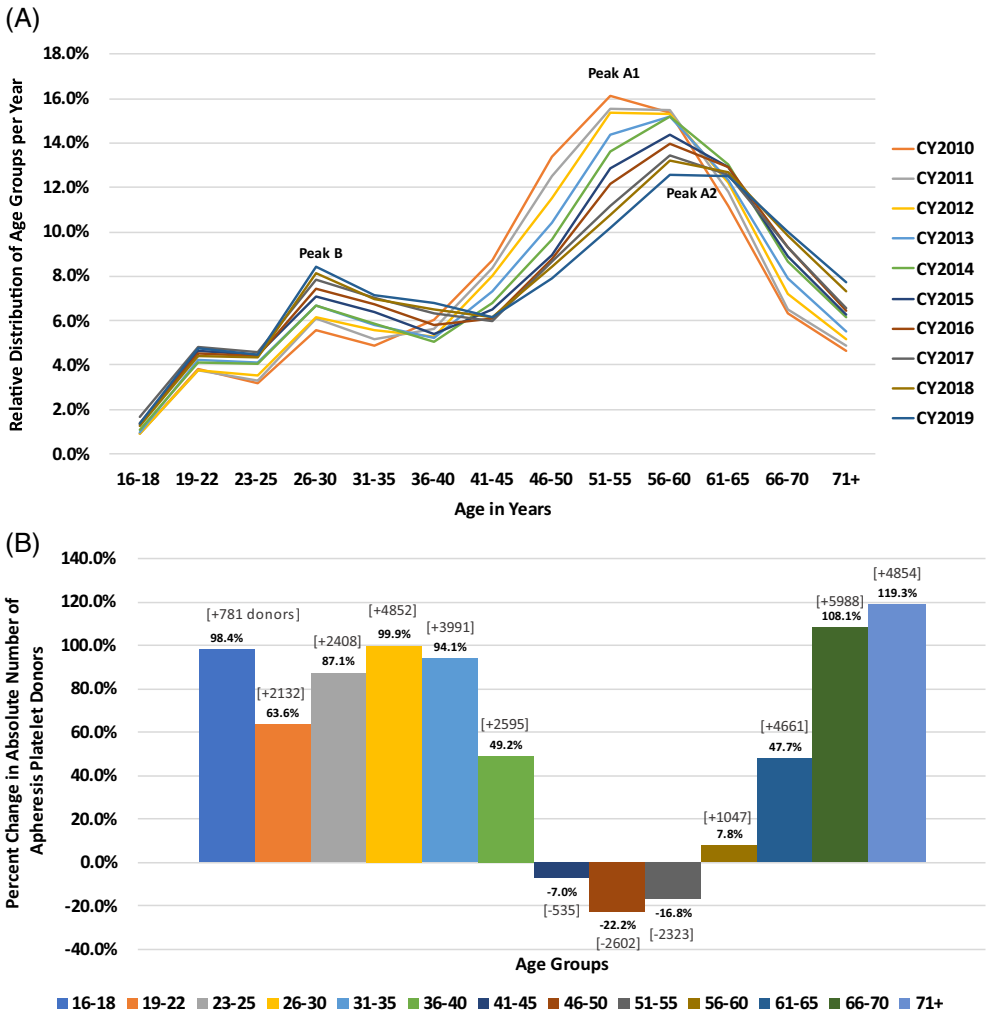

FIGURE 1 (A) Relative distribution of age groups among all apheresis platelet donors from 2010 through 2019. Relative age distribution among all apheresis platelet donors from 2010 through 2019, with peak representation of 51–55 y at 16.1% in 2010 (Peak A1) shifting to 56–60 y at 12.6% and 61–65 y at 12.5% in 2019 (Peak A2). Concomitant growth is observed in the 19–22 through 31–35 y age groups with the peak representation of younger age groups at 26–30 y increasing from 5.5% in 2010 to 8.4% in 2019 (Peak B). (B) Percent change in absolute number of apheresis platelet donors in each age group in 2019 compared with 2010. Percent change of total number of apheresis platelet donors in each age group from 2010 to 2019 demonstrates strong growth in absolute number of donors with young donors in age groups 16–18 through 36–40 y demonstrating rates of increase comparable to the oldest age groups. The mid-range age groups 41–45 through 51–55 y show decreases in absolute donors. [Color figure can be viewed at wileyonlinelibrary.com]

and 16–18 y (10.5%). The relative representation of FTD in 2019 was highest in the 26–30 y (13.9%), 19–22 y (12.0%) and 31–35 y (11.4%) age groups. The effect of age group on the model was statistically significant ($p < .0001$) whereas the year of collection was not (Figure S1). Thus, in a given year, the percentage of FTD differed significantly between age groups. These differences persisted throughout the decade, but the changes within each age bracket did not vary significantly over time. Thus, for the total growth of the APD base from 87,573 in 2010 to 115,372 in 2019, nearly equal proportions came from the youngest (16–40 y, 16,759 donors) and the oldest (56–71+ y, 16,550) donors.

3.3 | Product per procedure rate/split rate (PPP) by age group

A platelet collection may yield a single, double or triple transfusable platelet product, each meeting the US minimum threshold of 3.0×10^{11} platelets/unit. Blood collectors typically split collections with high yields into two or more products as a method to increase product availability. In 2019, 21.2% of all donations produced singles, 50.8% produced doubles, and 28.0% produced triples. Successive increases in PPP were observed in the 16–45 y groups with the highest PPP seen in the 36–40 y and 41–45 y age groups at 2.13 in 2019. Thereafter, the PPP

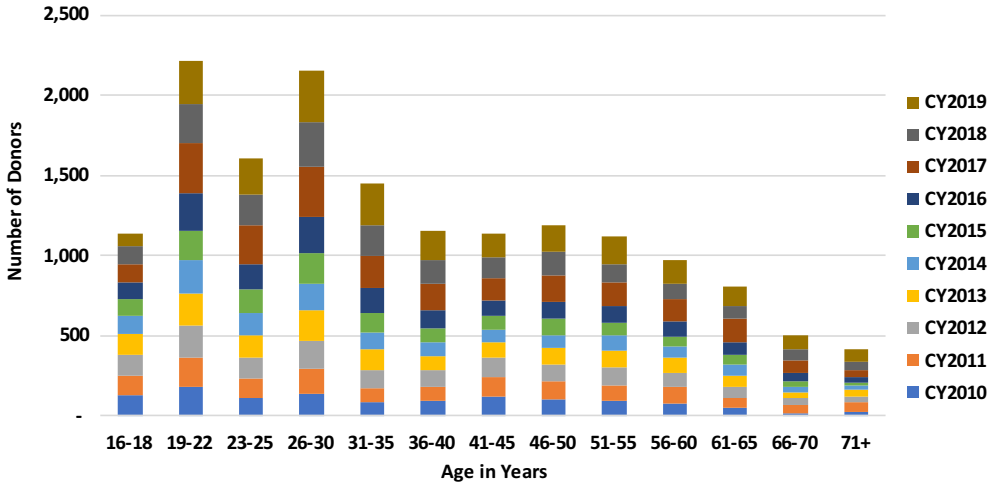

FIGURE 2 Absolute number of first-time donors within each age group from 2010 through 2019. Total number of first-time donors within each age group from 2010 through 2019 demonstrate the highest numbers of first-time donors are seen in the youngest age groups. [Color figure can be viewed at wileyonlinelibrary.com]

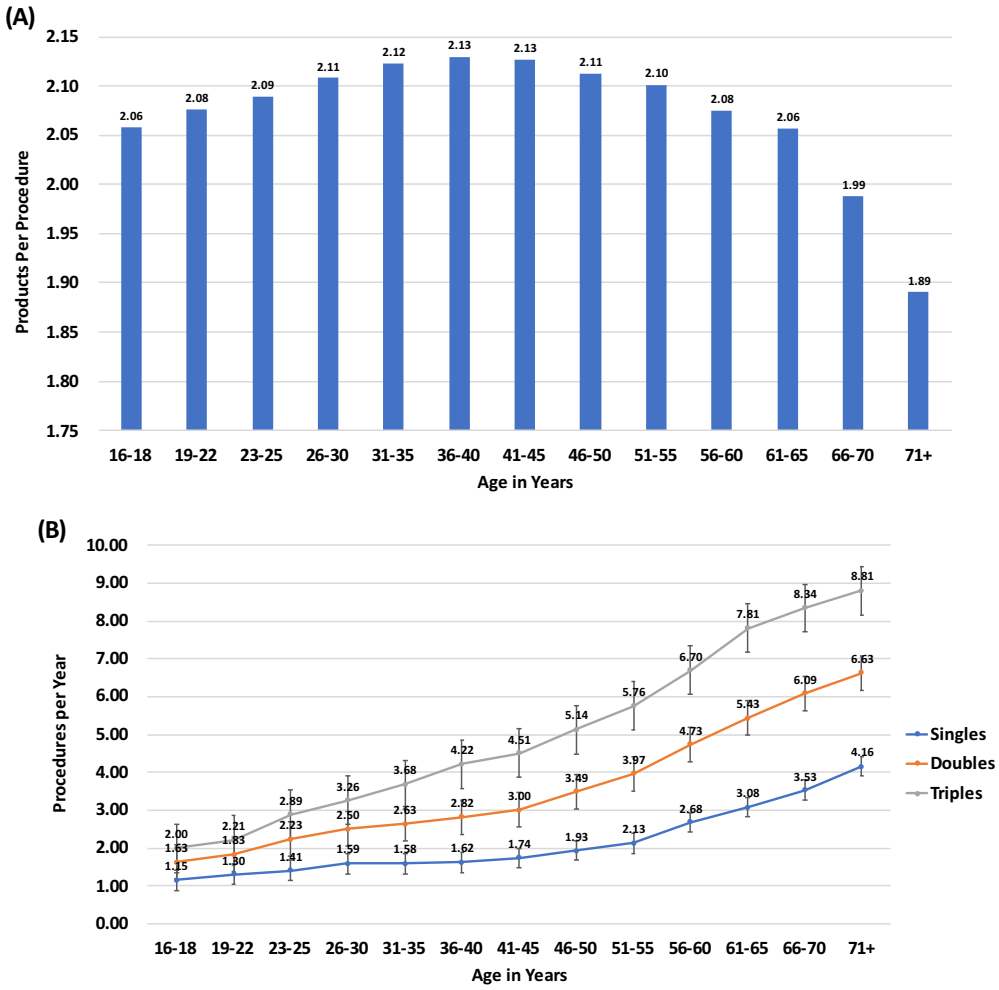

FIGURE 3 (A) Average number of products per procedure (PPP) by age group in 2019. Products per procedure (PPP) by age group in 2019 demonstrate variable average that peaks in the mid-range age groups and decreases with increasing age and known physiologic decreases in platelet counts. (B) Annual procedure frequency of single, double and triple apheresis platelet collections for each age group in 2019. Annual procedure frequency of single, double and triple apheresis platelet collections for each age group in 2019 demonstrates an increasing donation frequency with increasing age and increasing products per procedure. [Color figure can be viewed at wileyonlinelibrary.com]

decreased with age with the lowest PPP seen in the 71+ y age group at 1.89 (Figure 3A).

Over the study period, each age group consistently produced doubles, with a concomitant decrease in the proportion of donors producing singles in all age groups except the 46–50 y and 51–55 y age groups which demonstrated stable levels between 2014 and 2019. An increase in the proportion of donors producing triples was seen across all ages. The greatest increases in triple collections were seen in the youngest ages: 16–18 y (+9.4%), 19–22 y (+7.7%), 23–25 y (+6.3%), and 26–30 y (+5.3%). The rate of doubles in each age group has remained around 50% (range 48.4%–55.7%). All groups between 16 and 65 y demonstrated an average PPP of greater than 2.05,

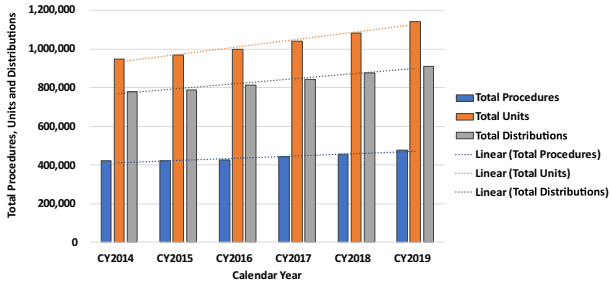

FIGURE 4 Total apheresis platelet procedures performed, units collected, and units distributed per year from 2014 through 2019. Total apheresis platelet procedures, units and distributions from 2014 through 2019 demonstrating growth in apheresis procedures, apheresis platelet units collected, and total apheresis platelet units distributed. [Color figure can be viewed at wileyonlinelibrary.com]

peaking at 2.13, with only the >65 y groups demonstrating a PPP less than 2.00.

3.4 | The highest annual procedure frequency was observed in older age groups

Procedure frequency in each age group for each PPP category (singles, doubles, triples) was relatively constant over time. In 2019, the annual procedure frequency for all age groups was 2.46 for singles, 4.11 for doubles, and 5.48 for triples. Procedure frequency consistently increased with increasing PPP and increasing age (Figure 3B). In 2019, the lowest annual procedure frequencies were observed in the 16–18 y age group at 1.15 donations/year for those donating singles, and 2.00 donations/year for those donating triples. The highest annual procedure frequencies were observed in the 71+ y age group at 4.16 donations/year for those donating singles, and 8.81 donations/year for those donating triples. Increasing age and increasing PPP were directly associated with an increased annual donation frequency.

3.5 | High total productive platelet units from older donors driven by frequency of donations

While older APD have a slightly lower average PPP than younger donors, the high total number of older donors, paired with high donation frequencies, resulted in the largest contributions to platelet inventories. Yearly total collection of apheresis platelet units increased by 163% from 2010 (434,778 units) to 2019 (1,142,607 units) (Figure 4). The number of apheresis platelet units contributed by each age group has increased for all age groups, each year (Table 2). All age groups between 16 and 40 y demonstrated increases in percent contributions to total apheresis platelet units collected (15.0%–19.7%), as did all age groups >60 y (28.2%–42.6%) from 2010 to 2019. Percent contribution to total apheresis platelet units from donors 41 to 60 y demonstrated a decrease from 56.7 to 37.7%. Age groups contributing the greatest number of units in 2010 were 56–60 y (79,187 units, 18.2%), 51–55 y (77,093 units, 17.7%), and 61–65 y (59,788 units, 13.8%). In 2019, the comparable groups were 61–65 y (195,067 units, 17.1%; a 3.3% increase over 2010), 56–60 y (172,215 units, 15.1%; a 3.1% decrease over 2010) and 66–70 y (163,276 units, 14.3% increase).

4 | DISCUSSION

Considerable concerns have been raised regarding the "aging out" of the APD population calling into question the resiliency of the platelet supply in the US.[14,18] While RBC distributions to hospitals have declined, ARC's platelet distributions have increased by 16.6% (778,775–907,851) over the last decade from 2010 to 2019.[21,22] Therefore, a reliable and sustainable APD base is essential to support patient care. But is the donor base "aging out"? Similar to previous reports, our study confirmed that the median age of APD continues to increase.[14,18,23] However, we report that this has been counterbalanced by growth in the younger donor base, particularly with the youngest ages (16–40 y), and with vigorous growth in absolute number of donors among most of the APD base. The exception is with middle-aged individuals who have declined in absolute and relative representation compared with both younger and older donors.

Considering total APD and FTD, PPP and annual donation frequency, each age group has demonstrated different strengths affecting their contributions to total units collected (Tables 3 and 4). Our study found that the six youngest age groups (16–40 y) represented 33.0% of all APD and 58.7% of all FTD in 2019. Younger donors also represented 61.3% of all FTD over the last decade; thus, young donors demonstrated growth in both absolute number, as well as their relative representation of the total APD base (Table 3). PPP was greater than 2.05 for all groups in this age range, peaking at 2.13. Young donors demonstrated the lowest donation frequency (1.15–2.22 donations/year), strong PPP and strong FTD engagement with a contribution of 19.7% toward total apheresis platelet units collected in 2019, up from 15.1% in 2010. Thus, the youngest donors represented a substantial and growing proportion of the total APD base

TABLE 2 Total apheresis platelet unit contributions by age by year.

Age band	CY2010	CY2011	CY2012	CY2013	CY2014	CY2015	CY2016	CY2017	CY2018	CY2019
16–18	1436	1555	1454	2490	3576	4388	4683	6038	4537	5364
19–22	7746	7388	7575	12,534	17,678	20,247	19,714	21,265	20,515	22,290
23–25	7601	7876	8350	14,738	20,755	23,200	25,735	26,868	25,795	26,914
26–30	14,604	16,483	16,746	27,759	38,752	41,874	46,896	50,440	54,217	58,279
31–35	14,621	15,141	15,823	24,934	37,132	43,015	47,218	49,898	51,509	54,246
36–40	19,403	17,992	16,148	24,736	34,856	36,784	40,324	48,424	52,742	58,238
41–45	32,589	30,486	28,323	38,919	52,997	51,327	49,732	47,736	51,422	56,037
46–50	57,772	53,446	47,349	64,254	85,240	81,524	79,348	81,132	80,164	82,438
51–55	77,093	74,736	71,939	100,973	143,029	134,998	131,318	125,449	121,229	119,670
56–60	79,187	80,783	78,642	116,719	171,778	167,970	168,737	171,535	171,388	172,215
61–65	59,788	64,491	65,909	100,056	157,430	165,259	170,400	178,854	187,959	195,067
66–70	35,037	36,617	40,637	65,763	106,485	115,464	127,456	135,342	147,312	163,276
71+	27,901	30,245	31,606	48,362	77,431	82,868	86,398	97,148	112,529	128,573
Totals	434,778	437,239	430,501	642,237	947,139	968,918	997,959	1,040,129	1,081,318	1,142,607

TABLE 3 Summary of strong, moderate, and weak attributes for each age group and overall contribution of annual apheresis platelet collections.

Attributes	Youngest (16–40 y)	Mid-range (41–55 y)	Oldest (56–71+ y)
Strongest	• Greatest # FTD in 2019 • Greatest # FTD in last decade • Growth in total APD	• PPP: 2.10–2.13	• Donation frequency: 2.68–8.81 donations/year • Growth in total APD
Moderate	• PPP: 2.06–2.13	• Donation frequency: 1.74–5.76 donations/y	
Weakest	• Donation frequency: 1.15–4.22 donations/year	• Decline in absolute APD	• PPP: 1.89–2.08
Annual platelet contribution	• Lowest	• Moderate	• Highest

and represented the majority of FTD both in the last decade and in 2019, despite the absence of focused engagement. However, FTD have higher rate of no-show/cancelation, deferrals, and complications.[24–26] Future studies should focus on augmenting the donation frequency of young donors, perhaps by reducing complications.

By contrast, middle-aged donors 41–55 y represented 24.2% of the total APD base in 2019 and have shown a decline in absolute number as well as relative representation (Table 3). However, FTD from the same age bracket have remained stable over the last decade (21.7% of all FTD over the last decade and 21.4% of all FTD in 2019), perhaps suggesting a lower return rate. After combining high PPP and moderate donation frequency, these age groups contributed 22.6% of apheresis platelet units collected in 2019, down from 38.5% in 2010. According to the US census, the population between 40 and 54 y dropped between 2010 and 2019, both in terms of absolute number of people within those groups and also the percentage of the total population represented by them.[27] This decline correlates with observed changes in relative representation of each age group to the platelet donor population during that time period. Additionally, this middle-age group has been called the "sandwich" generation, with nearly half of adults in their 40s and 50s bearing responsibilities that include child-rearing and parent caregiving, all while in the peak years of career performance. With apheresis procedures requiring up to 3 h end-to-end, time constraints may pose the most significant challenge to donor retention in these age groups.

The four oldest age groups (56–71+ y) demonstrated growth in both absolute number, and relative representation of the total APD base. Although their PPP was the lowest of all age groups (1.89–2.08), attributable to a physiologic decrease in platelet count,[28–30] they had the highest donation frequency of all age groups (2.68–8.81 donations/year), hence contributing 57.7% of total apheresis

TABLE 4 Summary of APD, FTD, average products per procedure (PPP), annual donation frequency by PPP and total apheresis platelet units collected by age group in 2019, with five highest age groups in each category highlighted.

Age group (years)	Total APD (2019)	FTD (2019)	Average PPP	Annual donation frequency (singles)	Annual donation frequency (doubles)	Annual donation frequency (triples)	Total apheresis platelet units contributed
16–18	1575	80	2.06	1.15	1.63	2.00	5364
19–22	5482	274	2.08	1.30	1.83	2.21	22,290
23–25	5172	224	2.09	1.41	2.23	2.89	26,914
26–30	9708	315	2.11	1.59	2.50	3.26	58,279
31–35	8233	260	2.12	1.58	2.63	3.68	54,246
36–40	7867	182	2.13	1.62	2.82	4.22	58,238
41–45	7081	149	2.13	1.74	3.00	4.51	56,037
46–50	9102	163	2.11	1.93	3.49	5.14	82,438
51–55	11,760	175	2.10	2.13	3.97	5.76	119,670
56–60	14,510	151	2.08	2.68	4.73	6.70	172,215
61–65	14,432	124	2.06	3.08	5.43	7.81	195,067
66–70	11,526	93	1.99	3.53	6.09	8.34	163,276
71+	8924	84	1.89	4.16	6.63	8.81	128,573
All	115,372	2274	2.07	2.46	4.11	5.48	1,142,607

platelet units collected in 2019, up from 46.4% in 2010 (Table 3). Growth in the oldest age groups may not necessarily be a point of concern but a strategic choice because these donors were likely motivated, available, easier to retain, less likely to be deferred, and had similar adverse event rates as donors between 21 and 50 y (unpublished data). Our study showed that these donors typically provided doubles and paired with higher donation frequencies, were strong contributors to total apheresis platelet collections. Growth in the oldest age group of APD, as donors "age up" into the most productive cohort, have the potential to sustain platelet collections before they "age out" and growth in this group could be viewed as a strength rather than a concern. A direct correlation was observed between PPP and donation frequency, which may suggest that when donors understand that they are contributing more, they in turn may be more motivated to donate. It is also possible that donors who generally donate singles had lower baseline platelet counts and could periodically be deferred for low platelet count, thus increasing their donation interval and reducing their donation frequency. Surveys continue to affirm that APD are motivated by altruism, similar to whole blood donors.[31,32] A survey by the ARC demonstrated that 91% of APD stated they continue to donate out of desire to contribute to their community while only 15% of lapsed donors (absence of donation within the prior 24 months) stated monetary incentives would drive them back to donate.[31] However, France et al., also report that individuals both with and without a history of previous blood donation might be motivated by financial remuneration.[32]

4.1 | What do we know about paid platelet donors?

The aging donor population has been, in part, attributed to the declining engagement of younger donors who have been characterized as disinterested in volunteerism relative to older generations.[33,34] It is unknown whether this characterization is particularly true of modern young people, or whether this characterization of younger people as "selfish" represents typical generational rivalry.[35,36] While it may be tempting to categorize donors based on their traditional generational buckets (i.e., Baby Boomers, Millennials, etc.) the reality is that donors of all ages are represented along a continuous spectrum. Any attributes that may appear to be representative of these labeled categories is speculative. It may be more productive to understand donor behavior based on what stage of life an individual is in.

Our data suggest that younger donors were indeed participating in platelet donation. However, assuming that younger people may have different motivations, it is possible that monetary remuneration could entice younger donor engagement. Proponents of the paid platelet donor model provide evidence that previous concerns about blood safety are solved with a pedigreed donor cohort who demonstrate strong donation frequencies with a low rate of infectious diseases in combination with pathogen reduction technology.[14] Remuneration of APD may supplement the US platelet supply but has the potential to destabilize the current

volunteer APD base.[35,36] Moreover, there are data to suggest unique drivers can affect paid donor behavior. For example, the onset of the COVID-19 pandemic caused a sharp drop in both volunteer and paid plasma donations.[37] Interestingly, while the number of whole blood donations stabilized quickly, albeit at a slightly lower level from pre-pandemic, the paid plasma donations did not rebound until close to 2 years later.[37] While the reasons for why the paid plasma donations decreased disproportionately compared to volunteer blood donations with significantly slower pace of recovery are unknown, the data suggest that dynamics controlling the behavior of paid donors are distinct and not impervious to disruption.[37]

This study examined donor behavior over the decade before the start of the pandemic. The COVID-19 pandemic has introduced unpredictable and unprecedented inventory challenges, drawing even greater attention to the lack of resiliency of the blood supply.[38] Proposed solutions include building redundancies into the supply chain which may be independent of and therefore unaffected by donor turnout and recruitment strategies, transparency, and communication of inventory with the infrastructure to support resource sharing, and innovations in data infrastructure, collections and manufacturing.[39,40] Some blood collectors already utilize whole-blood derived platelets as a method to curb the troughs of constrained apheresis collections. Leveraging the volume of this underutilized source of platelets would add to the current inventory without posing a threat to the current system. Innovations that optimize collections and manufacturing processes deserve intellectual and financial attention.

This study was limited in that it represented the findings of one blood center, albeit with a national footprint. The resiliency of the APD base is affected by both donor acquisition and retention. This study did not examine donor retention dynamics. The study data did not include donor center location and other demographic details, nor did it consider policy changes that impact donor eligibility such as organizational shift away from whole blood derived platelets or TRALI-mitigation strategies which occurred over 2013–2016 resulting in loss of many female FTD and return donors. The study also did not consider specific changes in the aging of the population, which can vary by geography.[41,42]

While it is true that older people donate more often and therefore make the largest contributions to the apheresis platelet inventory, our data highlight that over the last decade there has been continuous and strong growth in the youngest age groups, although it is unknown if that growth is sufficient to offset loss of older donors due to aging out and whether it will meet the increasing platelet demand. Since sustainability of the platelet supply is a consequence of both donor acquisition and retention, the long-term stability requires robust engagement of the youngest donors through middle-age sufficient to ensure these donors return when they reach retirement age (or sooner). Understanding donation patterns and behaviors of each donor segment may help to ensure that high PPP and high donation frequency are balanced against the need to continue introducing new, young donors into the donor base.

ACKNOWLEDGMENTS

Kamenna Lee (American Red Cross, Vice President, Marketing & Direct to Donor Recruitment). Tony DiPascuale (American Red Cross, Executive Director, Market Intelligence). Benjamin Jones (American Red Cross, Analyst III, Marketing Research & Planning). Jay Schultz (American Red Cross, Analyst II, Marketing Research & Planning). Greg Seaberg (American Red Cross, Senior Manager, Market Analytics).

CONFLICT OF INTEREST STATEMENT

Pampee P. Young serves on advisory board of Fresenius Kabi and has had advisory roles for Fresenius Kabi and Ortho Diagnostics.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Lasky B, Singh U, Young PP. Young apheresis platelet donors show significant and sustained growth over the last decade in the US, 2010–2019: A favorable sign of the resiliency of the platelet supply. Transfusion. 2023;63(7):1333–43. https://doi.org/10.1111/trf.17400