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Have we reached a new baseline for blood collection and transfusion in the United States? National Blood Collection and Utilization Survey, 2023

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Abstract

Background: Data from the National Blood Collection and Utilization Survey (NBCUS) suggest a stabilization in blood collections and transfusions following years of decline. Data from the 2023 NBCUS were analyzed to further understand national trends in US blood availability.

Study Design and Methods: In February 2024, all community-based (53) and hospital-based (104) blood collection centers, and a sample of transfusing hospitals were surveyed. National estimates were calculated for the number of blood and blood components collected, distributed, transfused, rejected on testing, and outdated in 2023, compared with 2021. Weighting and imputation were used for nonresponses and missing data, respectively.

Results: Overall, 96% of community-based blood centers and 85.7% of transfusing hospitals responded. During 2023, 11,586,000 units of whole blood and apheresis RBCs were collected (95% confidence interval (CI): 11,180,000–11,991,000), and 10,328,000 (95% CI: 9922,000–10,733,000) were transfused, a 1.7% and 4.1% decline compared with 2021, respectively. The total available supply (after outdates and rejections) declined by 0.5%. Total platelet units distributed (2618,000; 95% CI: 2483,000–2753,000) and transfused (2220,000; 95% CI: 2040,000–2400,000) increased by 3.6% and 2.1%, respectively, since 2021. Transfusion of pathogen-reduced platelet units (1258,000) increased by 49.2% since 2021. Plasma distributions (3032,000; 95% CI: 2764,000–3300,000) and transfusions (1882,000; 95% CI: 1765,000–

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CONFLICT OF INTEREST STATEMENT

The authors have disclosed no conflicts of interest.

1998,000) declined since 2021. Overall, 123,000 units were rejected on testing for transfusion-transmitted infections.

Discussion: The 2023 NBCUS indicates further stabilization in the blood supply, suggesting the establishment of a new baseline for blood availability.

Keywords

blood supply; blood transfusion; infectious disease testing

1 | INTRODUCTION

Blood transfusions are lifesaving therapies and one of the most commonly performed medical procedures in the United States.^{1,2} Despite the ubiquity of transfusions in health care in the United States, during 2008–2017, blood transfusions and collections declined substantially. This trend was attributed to several factors, including the implementation of patient blood management programs, improved clinical treatment of anemia, and the increasing frequency of minimally invasive surgery. More recent data collected between 2019 and 2021 suggested a stabilization in the national blood supply and further pointed to the need for ongoing monitoring to ensure that blood availability meets demand.³

Since 1971, efforts to measure the adequacy of the US blood supply and understand trends in blood collection and utilization have been conducted. Since 2013, the U.S. Centers for Disease Control and Prevention (CDC) and the Office of the Assistant Secretary for Health (OASH) have conducted the biennial National Blood Collection and Utilization Survey (NBCUS).^{3–7} The NBCUS provides nationally representative estimates of blood collection and utilization, which help inform national blood policy, blood-related regulatory efforts, and emergency preparedness.

To understand the current dynamics of blood collection and use in the United States, 2023 data on blood and blood component collection, distribution, and transfusion were analyzed. Additional data on transfusion-transmitted infection screening marker reactivity are included.

2 | STUDY DESIGN AND METHODS

The methods used to develop, manage, and analyze the 2023 NBCUS have been previously described.^{3–7} The sampling frame consists of two portions: (1) acute care hospitals and (2) blood collection sites (community-based and within hospitals). The 2021 American Hospital Association (AHA) database was used to determine the acute care hospital survey sampling frame. The sampling frame was enhanced in July 2023 by comparing it with AHA's monthly updates of facilities that had opened or closed since 2021. Acute care hospitals were excluded if they: (a) performed <100 inpatient surgeries annually; (b) were in a US territory or freely associated state; (c) were operated by the military or Department of Justice; or (d) were classified as a rehabilitation, long-term acute care, or a psychiatric hospital. After exclusion, 3543 hospitals were included in the sampling frame, and 2478 were chosen as part of the sample (Figure 1). Acute care hospitals were categorized

based on the number of inpatient surgeries performed in 2021: 100–999, 1000–1399, 1400–2399, 2400–4999, 5000–7999, and >8000. Forty percent of hospitals performing 100–999 inpatient surgeries annually were randomly selected ($n = 708/1773$); 100% of hospitals performing ≥ 1000 inpatient surgeries annually were included.

The U.S. Food and Drug Administration's (FDA) Blood Establishment Registration (BER) database was used to develop the sampling frame for community-based and acute care hospital blood collectors. All blood collecting centers were sent a survey. Community-based blood centers were stratified into the following categories based on the number of whole blood or red blood cell (RBC) units collected in 2021: <50,000, 50,000 to 199,999, 200,000 to 399,000, and >400,000 units.

Participating facilities were sent a REDCap (Research Electronic Data Capture, Nashville, Tennessee) survey link to confirm their contact information, which took place from October 2023 until January 2024. In March 2024, the 2023 NBCUS was launched. The survey consisted of two sections: one pertaining to blood collection and the other pertaining to transfusions.

Response rates were calculated using the American Association of Public Opinion Research (AAPOR) guidelines.⁸ All sampled facilities were asked whether they collected blood in 2023; only those that responded yes were considered eligible for the blood collection section. Similarly, facilities were asked if they transfused blood in 2023 as eligibility to respond to the blood transfusion section. Response rates were calculated for each section following AAPOR Response Rate 4 (RR4), which includes completed and partial responses in the numerator and the denominator.⁸ All eligible facilities were included, as well as an estimated number of facilities with unknown eligibility (unanswered question regarding whether they collected blood or transfused blood in 2023).

To account for survey non-responses, weighting was used and calculated as the ratio of the total number of eligible participants to the total number of respondents. Community-based blood collection centers (BCC) in the strata with 400,000 or more RBC collections were designated a non-response weight of 1.0. The Taylor Series method was used to calculate confidence intervals (CI).⁹

Multiple imputation with chained equations was used to account for missing data entries among survey respondents. A two-step imputation process was used to accommodate distributions skewed toward zero using established imputation factors from previous surveys. Imputed variables were all continuous and non-normally distributed. Multiple imputation was applied to whole blood and apheresis RBCs collected, distributed, rejected, outdated, and transfused, and to whole blood-derived and apheresis platelets, plasma, and cryoprecipitated antihemophilic factor (AHF) units distributed and transfused. Data on reactive units rejected for specific disease markers were collected for the first time for the following pathogens: human immunodeficiency virus (HIV), Human T-cell lymphotropic virus type 1 and 2 (HTLV-1/2), *Treponema pallidum*, *Trypanosoma cruzi*, West Nile virus, *Babesia* spp., and hepatitis B and C viruses. Those data are reported unweighted and without imputation. Whole blood-derived platelets were expressed as apheresis equivalents based

on the reported pool size. In a sub-analysis, differences in the unweighted number of RBC units transfused were calculated by comparing matched data among acute care hospitals that completed both the 2021 and 2023 surveys to better understand trends.

National rates of whole blood and RBC units collected per 1000 population were calculated by dividing the total estimated number of units collected, before the removal of rejected units, by the 2023 US population aged 16–64 years. National rates of whole blood and RBC units transfused per 1000 population were calculated by dividing the total estimated number of units transfused by the entire 2023 US age-stratified population estimated from the U.S. Census Bureau.¹⁰ All analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA).

This activity was reviewed by the CDC and was conducted consistent with applicable federal law and CDC policy.ⁱ

3 | RESULTS

3.1 | Survey participation

A total of 53 non-hospital, community-based blood collection facilities and 104 hospital-based BCCs (Figure 1) were included in the 2023 NBCUS sample. The response rate for all blood-collecting facilities was 92.8%. Among community-based BCCs, 96% ($n = 51/53$) responded. Using AAPOR criteria, an estimated 90.3% of hospital-based BCCs responded. Overall, 2,478 acute care hospitals were included in the sample, of which 710 conducted less than 1,000 inpatient surgical procedures annually; ~85.7% of all facilities that transfused blood in 2023 responded.

The total number of community-based blood collection centers ($N = 53$) was unchanged compared with 2021, although the number of hospital-based blood collection facilities included in the sample increased (104 in 2023 vs. 90 in 2021). Compared with 2021, the number of blood collectors within each stratum was similar in 2023, except for one facility that shifted from collecting 50,000–199,999 RBCs to less than 50,000 RBCs.

3.2 | Whole blood and RBC collections and transfusions

During 2023, the five largest community blood centers collected 66.3% of all RBCs and whole blood. The total number of whole blood and RBC units collected, transfused, and outdated in 2023 is shown in Table 1. During 2023, 11,586,000 (95% CI 11,180,000–11,991,000) units of whole blood and apheresis RBCs were collected, a 1.7% decrease compared with 2021 (Table 1). The majority (99.9%; 9,578,000 [95% CI 9,185,000–9,971,000]) of collected whole blood units were nondirected allogeneic units. Apheresis RBC units collected increased by 3.4% from 2021 to 2023 (1,931,000 vs. 1,997,000 [95% CI 1,832,000–2,161,000]). From 2021 to 2023, whole blood and RBCs rejected on testing for abnormal disease markers increased (1.7%) and rejections for other reasons decreased (22.5%) including for an insufficient volume of blood or a broken bag (Table 1). After

ⁱSee e.g., 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq. Also see e.g., 45 C.F.R. part 46.102(1) (2), 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.

rejections, the total supply for 2023 was 10,975,000 (95% CI: 10,583,000–11,368,000) units of whole blood and RBCs, a 0.5% decrease compared with 2021.

Figure 2 shows the number of units rejected on testing by infectious disease marker. During 2023, 72,139 units were rejected on testing following reactive testing by one of eight infectious disease markers (as recommended by the FDA), with the largest number of units rejected for hepatitis B virus (32,944) and the lowest for *Babesia* spp. (611).

Compared with 2021, total transfused units of whole blood and RBCs decreased by 4.1% (10,764,000 vs. 10,328,000; 95% CI: 9,922,000–10,733,000), while autologous and directed allogeneic units transfused decreased by 50% and 70%, respectively. Outdated units of whole blood or RBCs increased by 13.8% from 2021 to 2023 (Table 1).

Figure 3A,B shows the historical trends in RBCs transfused and distributed (units collected minus units rejected and outdated at the blood center) and the number of RBC collections and transfusions per 1000 population. RBCs distributed and transfused showed a substantial decline from 2008 through 2017, with a stabilization in the trend since 2019. Nationally, transfusions declined slightly in 2023 (–4.0%) and since 2019 have fluctuated by 1–5% during the last three NBCUS. Continuing the trend observed from 2019 to 2021, the number of RBCs distributed has remained stable, fluctuating between 0.4% and 1.4% per survey (Figure 3A). The difference in the number of RBC units distributed (10,975,000) and transfused (10,328,000) equated to a surplus supply of ~647,000 units nationally. Compared with 2021, RBC collections and transfusions per 1,000 population in 2023 decreased (57.7 vs. 56.6 collected and 33.7 vs. 32.0 transfused), although the point estimates for 2021 are within the 95% CI for 2023 (Figure 3B).

3.3 | RBCs transfused by hospital size and by location within a healthcare facility

Table 2 shows the matched comparison among 1,455 acute care hospitals, by surgical volume strata, that provided data in both the 2021 and 2023 NBCUS. The median difference in RBCs transfused decreased for every surgical volume stratum, with an overall median decline of 3.4%. The magnitude of the difference in the matched analysis was inversely related to surgical volume, with the smallest surgical volume stratum reporting the greatest median difference in RBCs transfused (Table 2).

The number of RBC units transfused by hospital setting in 2023 and the difference between matched facilities that were reported in 2021 and 2023 are shown in Table 3. Inpatient medicine (including hematology/oncology) reported the greatest number of RBCs transfused by location in 2023 (3,642,000 units [95% CI: 3,328,000–3,956,000]), and neonatal reported the fewest (116,000 units [95% CI: 81,000–150,000]), a decline of 1.7% and 18.1%, respectively, compared with 2021. The emergency department was the only setting where RBC units transfused increased compared with 2021 in both the overall (2.7%) and the matched analysis (8.3%).

3.4 | Platelet, plasma, and cryoprecipitate units distributed and transfused

Platelets, plasma, and cryoprecipitate units distributed, transfused, and outdated in 2023 are shown in Table 4. Overall, 2,618,000 platelet units were distributed in 2023, 3.6% higher

than in 2021. Of these, 98% (2,557,000) were apheresis platelet collections. Compared with 2021, whole-blood-derived platelet, plasma, and cryoprecipitate distributions in 2023 declined by 43.1% (107,000 vs. 61,000 units), 2.6% (3,114,000 vs. 3,032,000 units), and 1.7% (2,449,000 vs. 2,407,000 units), respectively.

During 2023, the total number of platelet units transfused (2,220,000 units [95% CI: 2,040,000–2,400,000]) increased by 2.1% compared with 2021. Of these, most (97%, 2,160,000) were apheresis platelets. The transfusion of pathogen-reduced apheresis platelets increased by 49.2% (1,258,000 units [95% CI: 1,099,000–1,416,000]) compared with 2021 and comprised more than half of all apheresis platelet transfusions in 2023. Units outdated at transfusing hospitals were mostly unchanged (–0.3%).

The number of platelet units transfused by hospital setting in 2023 and the difference between matched facilities that were reported in 2021 and 2023 are shown in Table 5. Inpatient medicine (including hematology/oncology) reported the greatest number of platelets transfused by location in 2023 (800,000 units [95% CI: 659,000–942,000]) and obstetrics/gynecology reported the fewest (16,000 units [95% CI: 10,000–22,000]), which represented a 1.8% decrease and a 12.2% increase, respectively, compared with 2021. Both emergency department (107,000 units) and critical care (400,000 units) reported an increase in platelet transfusions in both the overall and matched analyses compared with 2021.

4 | DISCUSSION

Following several years of declining national blood collection and utilization during 2008–2017, the findings from this analysis of the 2023 NBCUS suggest a continued stabilization in the blood supply, consistent with the plateau observed during the 2019 and 2021 reports.^{3,7} Although RBCs and whole blood transfusions declined slightly compared with 2021, transfusions only varied from 1% to 5% during recent NBCUS cycles (2019–2023).^{3,7} Coupled with the stabilization in blood collections nationally, these findings suggest a new baseline for blood availability has been established in the United States. The response rate for the 2023 NBCUS was the highest ever recorded, most notably among blood collectors in community-based and hospital-based collection centers, adding to the precision of the findings described here.

Consistent with the findings in this study, the European Blood Alliance has documented declining blood collections followed by a flattening trend.¹¹ The stabilization of the US blood supply observed here may be due to a variety of reasons. Blood collection establishments have likely reached greater sustainability, as is evidenced by less consolidation in recent years, primarily among community-based blood collectors. In 2017, there were 65 community blood collectors, followed by a decline to 53 in 2019. This number has remained constant through 2023, coinciding with the plateau in collections during that period. The impact of consolidation of blood establishments is further reflected in the proportion of blood collected by the five largest entities, which comprised 56.9% of all units collected in 2015 and increased to 66.3% in 2023.⁵ Although stable, blood collections (total available supply) have returned to pre-COVID-19 pandemic levels, and the gap between

blood collection and transfusions widened, suggesting more robust elasticity in the blood supply nationally.¹²

Previous studies have suggested that future demand for RBCs may increase due to an aging population and increasing prevalence of medical conditions requiring transfusions.³ However, in keeping with findings of a 2023 European Commission report on blood safety noting declining utilization (0.6%–8.9%) among 15 countries, the present analyses observed a decline (4%) in US RBC transfusions, supporting the hypothesis of widening adoption of patient blood management and other clinical practices which lead to the conservation of blood components.¹³ Additionally, advancements in less-invasive surgical procedures and the use of pharmacologic alternatives to transfusion have likely contributed to reductions in RBC utilization. In contrast, transfusions in emergency and critical care settings increased in every NBCUS from 2017 to 2021. However, in 2023 the trend in emergency department blood use slowed. While this may reflect changes in the epidemiology of injury,^{14,15} additional study is required to further understand this observation.

Efforts to improve blood safety during the last 20 years have substantially reduced the infectious disease risk to the US blood supply. Currently, platelet blood components pose the greatest risk of infection from bacteria due to their storage at room temperature. Furthermore, whole-blood-derived pooled platelets were associated with a higher risk of infectious disease transmission due to more donor exposure in a single unit.¹⁶ The findings from this analysis showed a continued shift away from whole-blood derived platelets in favor of apheresis platelets, which have historically been associated with a lower risk of viral blood-borne pathogen transmission risk.¹⁶ Additionally, blood establishments continued to implement platelet safety measures by adopting pathogen-reduction technology (PRT). In 2023, the proportion of apheresis platelets subjected to PRT increased substantially (49.2%). Though PRT does provide enhanced safety, some infectious risks persist, including spore-forming bacteria, rapidly proliferating pathogens, non-lipid enveloped viruses, and manufacturing-level contamination of blood collection kits.^{17–19} While PRT has enhanced platelet safety, similar pathogen inactivation technologies are currently unavailable for RBCs and other control methods are necessary.²⁰

Variables regarding discarded units of blood due to reactive infectious disease testing by eight disease markers were newly added to the 2023 NBC US. The findings indicate that most (67%) of the reactive units were associated with hepatitis B virus or *T. pallidum*, which may reflect recent increases in the incidence of syphilis and previously described studies that have demonstrated that two-thirds of people living with hepatitis B virus may be unaware of their infection.^{21,22} While data on specific disease markers cannot be directly compared with previous NBCUS, the number of units rejected on testing has more than doubled since 2015. This may reflect an expansion of blood donation screening to include pathogens such as *Babesia* spp. and highlights the effectiveness of these blood safety measures to mitigate disease transmission risk.

These findings are subject to the following limitations. Data presented here provide the only national estimates of the blood supply based on blood collected and transfused in the United States. While the NBCUS includes annual aggregate totals reported by blood

establishments and healthcare facilities, these data are cross-sectional and do not provide insight into seasonal or monthly changes. Localized or contained periodic blood shortages cannot be quantified using these data. While response rates were robust, not all blood collection establishments or transfusing facilities responded to the survey. To account for this, weighting and imputation were used. The impact on overall estimates presented here is likely minimal. Transfusion-transmitted infection testing described here included positive screening test results resulting in product discard. Results of confirmatory testing were not included in this survey, and all discarded products may not represent true infection.

The NBCUS continues to serve as the most accurate source of estimating RBC collections and transfusions in the United States. Findings from the 2023 NBCUS indicate a continued stabilization in blood transfusions and collections, suggesting a new baseline for blood availability has been established in the United States. Additionally, the 2023 NBCUS estimates suggest the US blood supply was able to exceed demand on an aggregate, annualized, national level. CDC and CASH will continue to monitor blood collection and transfusion trends to inform national policy and strategic planning; these efforts are critical to maintaining a safe and secure blood supply.

Disclaimer:

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

Abbreviations:

AAPOR	American Association of Public Opinion Research
AHA	American Hospital Association
AHF	Antihemophilic Factor
BCC	Blood Collection Center
BER	Blood Establishment Registry
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval
FDA	Food and Drug Administration
NBCUS	National Blood Collection and Utilization Survey
OASH	Office of the Assistant Secretary for Health
RBC	Red Blood Cell
REDCap	Research Electronic Data Capture
SUROPIP	Inpatient Surgical Procedures per Year

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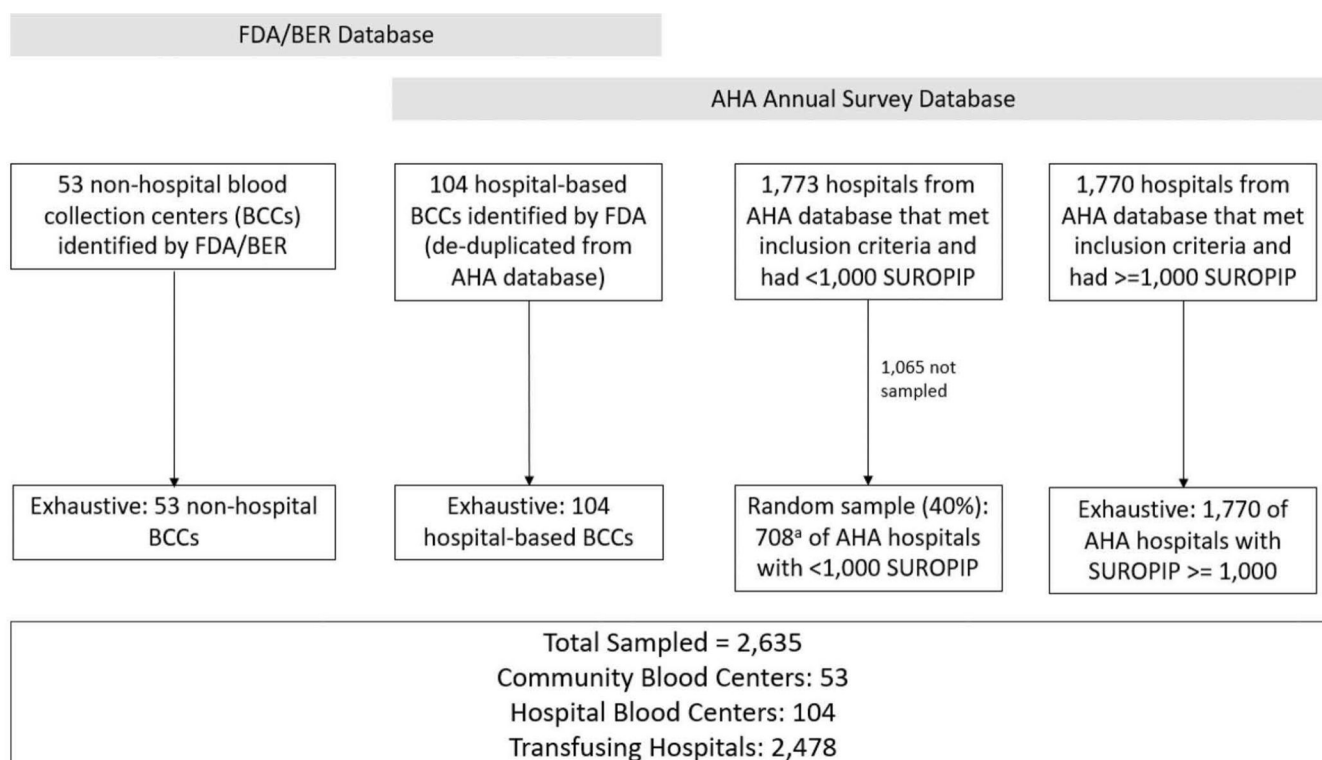
**FIGURE 1.**

Diagram depicting sampling source, sampling frame, and facilities included in the sample for the 2023 National Blood Collection and Utilization Survey. AHA, American Hospital Association; FDA/BER, Food and Drug Administration's Blood Establishment Registry; SUROPIP, Inpatient surgical procedures per year. ^aAfter sampling the chosen facilities, two facilities believed to have SUROPIP ≥ 1000 were found to have <1000 SUROPIP. The final total of the random sample of AHA hospitals with <1000 SUROPIP was 710.

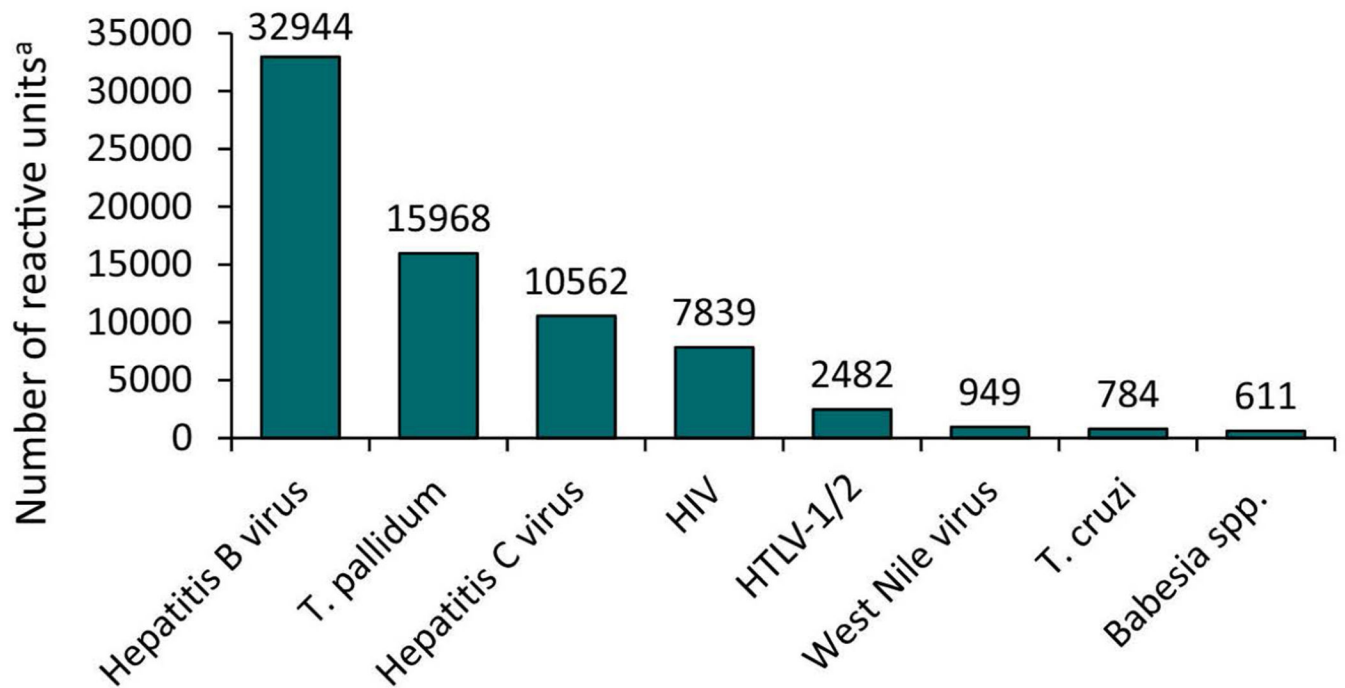
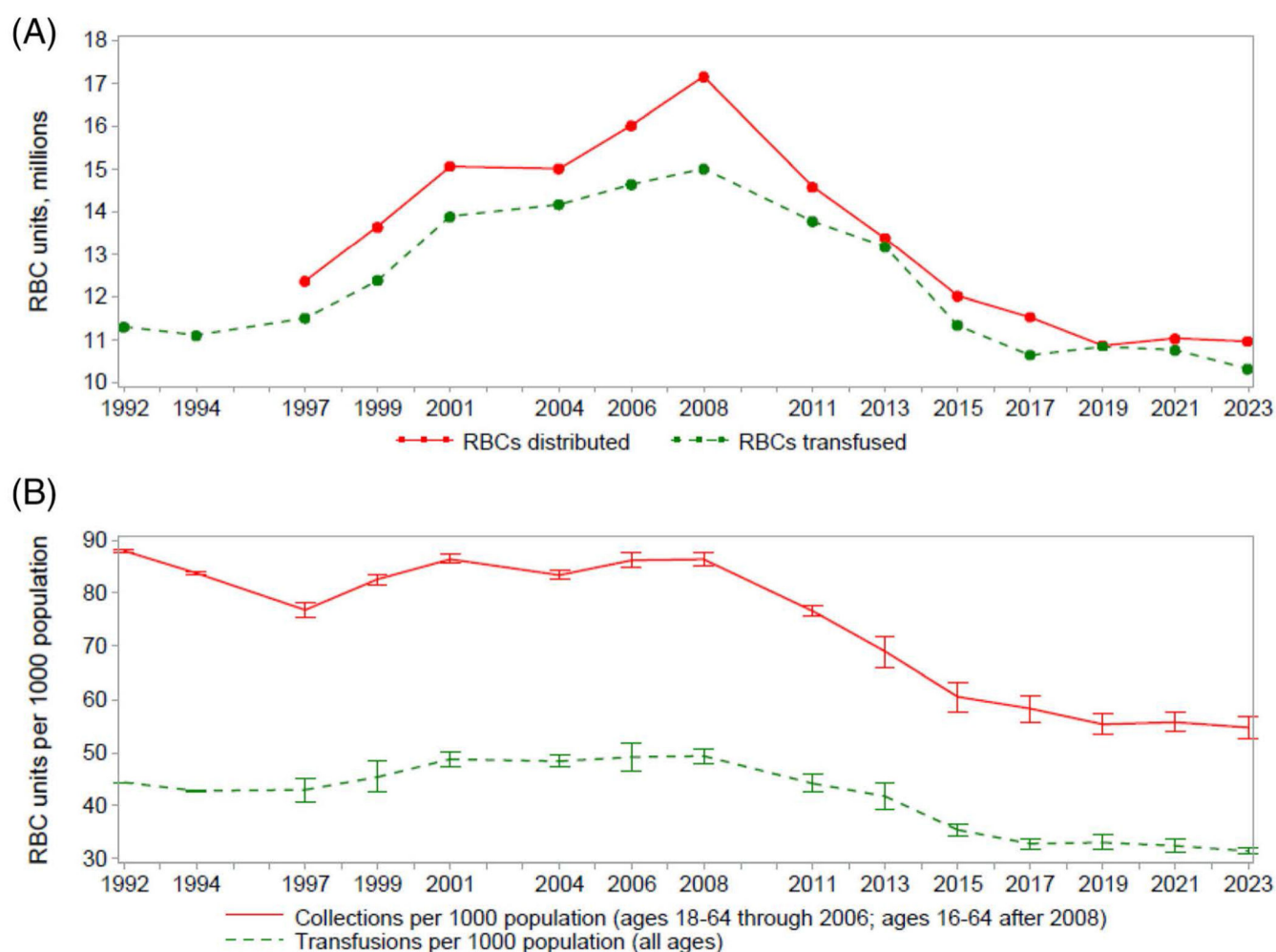


FIGURE 2.

Number of reactive units^a on testing for eight infectious disease markers during 2023 as reported to the National Blood Collection and Utilization Survey: *Treponema pallidum*, HIV, West Nile Virus, *Babesia* spp., *Trypanosoma cruzi*, Human T-lymphotropic virus 1, and hepatitis B and C virus. ^aThe sum of reactive units does not equal the total for rejected on testing because not all facilities provided data for specific disease markers.

**FIGURE 3.**

(A) Trends in RBC distributions (i.e., units collected minus units rejected and outdated at the blood center) and transfusions, and (B) RBC collections and transfusions per 1000 population, United States, from the National Blood Collection and Utilization Survey, 1992–2023.

TABLE 1

Estimated numbers of whole blood and RBC units collected, transfused, and outdated in 2023 and 2021 (expressed in thousands) in the United States, as reported to the National Blood Collection and Utilization Survey.

	Blood centers	Hospitals	Combined 2023 totals	95% CI	2021 Totals ^a	% change 2023–2021
Collections						
Whole Blood units						
Allogeneic, nondirected	9,218	360	9,578	(9,185–9,971)	9,842	–2.7%
Autologous	2	0	3	(2–3)	3	0.0%
Directed	5	3	8	(6–10)	9	–11.1%
Apheresis RBC units ^b	1,986	10	1,997	(1,832–2,161)	1,931	3.4%
Total Supply	11,212	374	11,586	(11,180–11,991)	11,784	–1.7%
Rejected on testing	119	4	123	(108–138)	121	1.7%
Rejected for other reasons ^c	467	21	488	(441–535)	630	–22.5%
Total available supply	10,626	349	10,975	(10,583–11,368)	11,033	–0.5%
Transfusions						
Allogeneic, nondirected		10,323		(9,918–10,729)	10,752	–4.0%
Autologous		1			2	–50.0%
Directed		3		(2–4)	10	–70.0%
Total transfusions		10,328		(9,922–10,733)	10,764	–4.1%
Outdated whole blood or RBCs	172	176	347	(259–435)	305	13.8%

^a2021 total was obtained from the 2021 NBCUS report.³

^bApheresis RBC units include allogeneic, autologous, directed, and concurrent collections.

^cUnits rejected for other reasons do not include outdated units.

TABLE 2
Percent difference in allogeneic RBC units transfused in 2023 and 2021 from matched hospitals participating in the National Blood Collection and Utilization Survey.

Surgical volume category	N ^a	Median (mean)	2023 allogeneic RBCs ^d	Median % difference ^b	IQR of % difference ^c
1. 100–999 surgeries per year	209	513 (632)		–11.4%	32.2%
2. 1000–1399 surgeries per year	192	1,468 (1590)		–4.1%	25.0%
3. 1400–2399 surgeries per year	340	2,272 (2,466)		–3.9%	19.3%
4. 2400–4999 surgeries per year	419	3,999 (4355)		–2.6%	17.6%
5. 5000–7999 surgeries per year	153	7,056 (7,587)		–2.6%	15.7%
6. 8000+ surgeries per year	142	15,295 (17,814)		–1.2%	13.8%
Total	1,455	2,895 (4,667)		–3.4%	19.9%

^aBased on matched facilities reporting allogeneic red blood cells in both 2021 and 2023 NBCUS surveys.

^bMedian % difference calculated as 100*(2023–2021)/2021.

^cInterquartile range (75th – 25th percentile).

TABLE 3
Red blood cell units transfused by location in 2023 vs. 2021 (expressed in thousands) as reported to the National Blood Collection and Utilization Survey.

	2023 (95% CI)	2021	% diff	Matched median	% diff
All Surgery (including transplant)	1,222 (1,069–1,374, <i>n</i> = 812)	1181	3.3%	–9.1% (<i>n</i> = 312)	
Emergency Department	1,418 (1,328–1,509, <i>n</i> = 825)	1,380	2.7%	8.3% (<i>n</i> = 315)	
Inpatient Medicine (including hematology/oncology)	3,642 (3,328–3,956, <i>n</i> = 794)	3,703	–1.7%	–7.9% (<i>n</i> = 306)	
Obstetrics/Gynecology	215 (189–242, <i>n</i> = 805)	205	4.6%	–2.5% (<i>n</i> = 239)	
Pediatrics	181 (129–232, <i>n</i> = 801)	164	9.4%	–23.0% (<i>n</i> = 73)	
Neonates	116 (81–150, <i>n</i> = 823)	137	–18.1%	3.8% (<i>n</i> = 133)	
Critical Care	1,661 (1,519–1,802, <i>n</i> = 750)	1776	–6.9%	–5.1% (<i>n</i> = 244)	
Outpatient and non-acute inpatient settings ^a	1,334 (1,132–1,535, <i>n</i> = 783)	1,388	–4.1%	–7.8% (<i>n</i> = 250)	

^a Includes outpatient dialysis, rehabilitation, long term care.

TABLE 4
Estimated number of platelets, plasma, and cryoprecipitate units distributed, transfused, and outdated in 2023 and 2021 (expressed in thousands) in the United States, as reported to the National Blood Collection and Utilization Survey.

	Blood centers	Hospitals	Combined 2023 totals	95% CI	2021 totals ^a	% change 2023–2021
Distributed						
Apheresis platelets	2,458	99	2,557	(2,429–2,685)	2,422	5.6%
Whole blood-derived PLT ^s ^b	54	7	61	(24–98)	107	–43.1%
Total platelets	2,511	107	2,618	(2,483–2,753)	2,528	3.6%
Pathogen-reduced apheresis platelets	1,354	56	1,410	(1,337–1,483)	916	53.9%
Total plasma	2,812	220	3,032	(2,764–3,300)	3,114	–2.6%
Cryoprecipitate ^c	2,291	116	2,407	(2,219–2,595)	2,449	–1.7%
Blood center outdates ^d	93	17	110	(91–129)	214	–48.7%
Transfused						
Apheresis platelets		2,160		(1,988–2,332)	2,091	3.3%
Whole blood-derived PLT ^s ^b		55		(28–83)	80	–30.6%
Total platelets (includes directed units)		2,220		(2,040–2,400)	2,175	2.1%
Pathogen-reduced apheresis platelets		1,258		(1,099–1,416)	843	49.2%
Total plasma		1,882		(1,765–1,998)	2,215	–15.1%
Cryoprecipitate ^c		1,171		(1,012–1,329)	1,248	–6.2%
Hospital outdates ^e		521		(490–552)	523	–0.3%

^a2021 total was obtained from the 2021 NBCUS report.³
^bWhole blood-derived platelets are expressed as apheresis equivalents.
^cCryoprecipitates are expressed as individual unit equivalents.
^dBlood center outdates are units that were outdated at nonhospital and hospital-based blood centers.
^eHospital outdates are units that were outdated at transfusing hospitals.

TABLE 5
Platelet units transfused by location in 2023 and 2021 (expressed in thousands) as reported to the National Blood Collection and Utilization Survey.

	2023 (95% CI)	2021	% diff	Matched median	% diff
All Surgery (including transplant)	318 (242–394, <i>n</i> = 703)	281	11.8%	–9.6% (<i>n</i> = 215)	
Emergency Department	107 (93–121, <i>n</i> = 717)	105	1.3%	6.5% (<i>n</i> = 220)	
Inpatient Medicine (including hematology/oncology)	800 (659–942, <i>n</i> = 707)	815	–1.8%	–0.7% (<i>n</i> = 236)	
Obstetrics/Gynecology	16 (10–22, <i>n</i> = 712)	14	12.2%	–3.7% (<i>n</i> = 120)	
Pediatrics	107 (59–154, <i>n</i> = 713)	92	13.5%	–4.5% (<i>n</i> = 41)	
Neonates	38 (24–51, <i>n</i> = 728)	40	–5.4%	0.0% (<i>n</i> = 73)	
Critical Care	400 (331–468, <i>n</i> = 674)	398	0.5%	7.5% (<i>n</i> = 200)	
Outpatient and non-acute inpatient settings ^a	380 (292–468, <i>n</i> = 697)	322	15.4%	0.0% (<i>n</i> = 171)	

^a Includes outpatient dialysis, rehabilitation, long term care.