

**RWANDA BIOMEDICAL CENTRE
BIOMEDICAL SERVICES DEPARTMENT
BLOOD TRANSFUSION DIVISION**

ANNUAL REPORT

2024



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i. Preamble

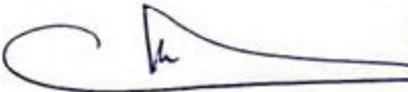
The Rwanda Biomedical Centre (RBC), through its Blood Transfusion Division, remains committed to ensuring a safe, sufficient, and accessible blood supply for all who need it. Blood transfusion is a critical component of Rwanda's healthcare system, playing a vital role in saving lives, supporting emergency medical care, maternal health, surgical procedures, and the treatment of various medical conditions such as severe anemia and blood disorders.

In alignment with Sustainable Development Goal 3 (SDG 3): Good Health and Well-being, RBC continues to enhance blood donation services, strengthen supply chain efficiency, and uphold the highest standards of safety and quality in blood collection, testing, processing, and distribution. Access to safe blood is fundamental to achieving universal health coverage, reducing maternal and child mortality, and addressing health emergencies key targets under SDG 3 (Reproductive, maternal, newborn and child health and infectious diseases).

The 2024 Blood Transfusion Division Report highlights the progress made in expanding blood donation initiatives, improving transfusion services, and fostering partnerships to ensure sustainability. It also outlines the challenges and strategies implemented to strengthen Rwanda's national blood transfusion system, reinforcing its role in achieving a healthier and more resilient society.

Through continued collaboration with healthcare providers, partners, and voluntary blood donors, RBC remains dedicated to advancing Rwanda's public health priorities and contributing to the global vision of "Health for All."

RBC thanks everyone who, in one way or another, supported blood services in Rwanda in 2024. You saved lives of thousands of people.

The seal of the Rwanda Biomedical Centre is circular, featuring a central emblem with a caduceus (a staff with two snakes) and a sun. The text "RWANDA BIOMEDICAL CENTER" is written around the perimeter of the seal.

Prof. MUVUNYI Mambo Claude
Director General
Rwanda Biomedical Centre

ii. Message of the Head of Biomedical Services Department

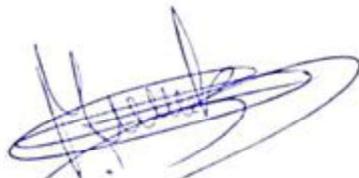
The Rwanda Biomedical Centre (RBC) remains steadfast in its mission to enhance healthcare delivery through high-quality biomedical services, with blood transfusion standing as a cornerstone of life-saving interventions. A well-functioning blood transfusion system is critical to ensuring that patients in need—whether due to surgical procedures, maternal health complications, trauma, or chronic illnesses—receive safe and timely transfusions.

Blood Transfusion Division (BTD) has made significant strides in advancing hemovigilance and strengthening the quality management system to safeguard both donors and recipients. The implementation of a comprehensive hemovigilance system ensures continuous monitoring of blood safety, allowing for early detection and management of adverse transfusion reactions. This proactive approach enhances patient safety and upholds the highest standards of care.

Furthermore, our quality management system (QMS) remains a pillar of excellence in blood transfusion services. Through stringent screening, rigorous testing, and adherence to international best practices, we continue to guarantee a safe, sufficient, and accessible blood supply across Rwanda. Continuous training, capacity-building initiatives, and the adoption of innovative technologies have further reinforced the reliability of our transfusion services.

As we present the 2024 Blood Transfusion Division Annual Report, we acknowledge the dedication of our healthcare professionals, blood donors, and stakeholders who contribute tirelessly to this vital cause. The collective commitment to safety, efficiency, and sustainability in blood transfusion services strengthens Rwanda's healthcare system and aligns with our national and global health priorities.

We remain committed to expanding blood donation programs, enhancing supply chain efficiency, and fostering partnerships to ensure universal access to safe blood. Together, we will continue to save lives and advance healthcare excellence in Rwanda.



Dr. MUKAGATARE Isabelle
Head of Biomedical Services Department
Rwanda Biomedical Centre



iii. Note of blood transfusion division manager

The Blood Transfusion Division (BTD) of the Rwanda Biomedical Centre (RBC) is pleased to present the 2024 Annual Report, highlighting the achievements, progress, and ongoing efforts in ensuring a safe, sufficient, and accessible blood supply across the country.

In 2024, 84,383 blood units were successfully collected through voluntary blood donation Drives, community outreach programs, and strategic collaborations with institutions and local leaders. This marks a continued improvement in national blood availability, ensuring that hospitals receive the life-saving resources they need.

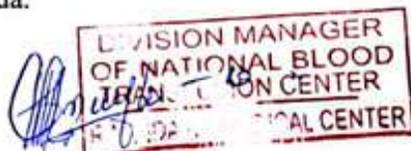
One of our key performance indicators is hospital satisfaction, and we are proud to report an increase in the timely supply and availability of blood components for medical procedures, trauma care, maternal health, and chronic illness management from 99.47% in 2023 to 99.72% in 2024. Through enhanced logistics, supply chain improvements, and strengthened communication with healthcare facilities, as well as delivering blood via Drone technology by Zipline, we have significantly reduced shortages and delays. Our goal remains to achieve 100% hospital satisfaction by 2025, ensuring that no patient in need of a transfusion is left without access to safe blood.

A crucial part of our success has been the invaluable role of Blood Donor Representatives and local leaders, who have been instrumental in mobilizing communities, raising awareness about voluntary blood donation, and fostering a culture of regular blood donation. Their dedication has contributed to an increase in repeat donors, a key factor in maintaining a sustainable and safe blood supply.

Additionally, we have continued to strengthen our quality management system and hemovigilance framework to guarantee the highest safety standards. Through advanced screening methods, efficient donor care, and rigorous monitoring of transfusion practices, we have upheld the integrity of Rwanda's blood transfusion services. Looking ahead, we will focus on:

- Expanding blood donation programs to reach more voluntary donors.
- Enhancing hospital engagement and feedback mechanisms.
- Strengthening the cold chain system to improve blood storage and distribution.
- Investing in digital solutions for better tracking and management of blood resources.

On behalf of the Blood Transfusion Division, I extend my sincere gratitude to all donors, healthcare professionals, partners, and community leaders for their unwavering commitment. Together, we are building a more resilient, responsive, and life-saving blood transfusion system for Rwanda.



Dr. MUYOMBO Thomas
Blood Transfusion Division Manager
Rwanda Biomedical Centre

iv. Essential Abbreviations

ABCP	Annual Blood Collection Plan
AfSBT	Africa Society for Blood Transfusion
BBU	Bio-Banking Unit
BCB(s)	Blood Collection Buse(s)
BCU(s)	Blood Component Unit(s)
BDR(s)	Blood Donor Representative(s)
BIOS	Biomedical Services
BTB	Blood Transfusion Division
CHUK	Centre Hospitalier Universitaire de Kigali
CoK	City of Kigali
CRYO(s)	Cryoprecipitate(s)
CTB	Cornea Tissue Banking
DA	Direct Antiglobulin
DH	District Hospital
DIC	Disseminated Intravascular Coagulation
DNA	Deoxyribo-Nucleic Acid
FFP(s)	Fresh frozen plasma(s)
HBV	Hepatitis B Virus
HC	Health Centre
HCV	Hepatitis C Virus
HF(s)	Health facilitie(s)
HIV	Human Immunodeficiency Viruses
IA	Indirect Antiglobulin
IBBS(s)	International Blood Banking Standard(s)
IBD(s)	Irregular blood donor(s)
IC25	Intwari Club 25
KFH	King Faisal Hospital
L2TH	Level 2 Teaching Hospital
MoD	Ministry of Defense
MoH	Ministry of Health
NAT	Nucleic Acid Testing
NBD(s)	New blood donor(s)
Number	Number
PLT(s)	Platelet(s)
QMS	Quality Management System
RBC(s)	Red blood cell(s)
RBC	Rwanda Biomedical Centre
RBD(s)	Regular blood donor(s)
RCBT(s)	Regional Centre(s) for Blood Transfusion
RDF	Rwanda Defense Forces
RMRTH	Rwanda Military Referral Teaching Hospital
RNP	Rwanda National Police
RPTBD(s)	Repeat Blood Donor(s)
SDG	Sustainable Development Goal

- THF(s)** Transfusing Health Facilitie(s)
- TTI(s)** Transfusion Transmitted Infection(s)
- TV** Television
- UAS** Unmanned Aerial Systems
- UHC** Universal Health Coverage
- VNRBD** Voluntary Non-remunerated Blood Donations
- WBD** Whole Blood Donations

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vi. Background of blood transfusion services in Rwanda

The Blood Transfusion Division (BTD) of the Rwanda Biomedical Centre (RBC) is the national authority responsible for ensuring the availability, safety, and quality of blood and blood products in Rwanda. Established to support the country's healthcare system, BTD plays a critical role in providing life-saving blood transfusion services to hospitals and healthcare facilities nationwide.

BTD comprises of six (units): Five (5) RCBTs (Regional Centres for Blood Transfusion) and one (1) BBU (Bio-Banking Unit). RCBTs are located in all administrative provinces and the CoK (City of Kigali) and are responsible for mobilization and recruitment of blood donors as well as blood collection, processing and distribution. BBU is new in (BTD) and is responsible for CTB (Cornea Tissue Banking). BBU is located at RMRTH (Rwanda Military Referral and Teaching Hospital) in the CoK.

Mandate

The mission of Blood Transfusion Division (BTD) is *“To provide safe, effective and adequate blood and blood products and cornea tissues to all patients in need”*. Its vision is *“To be a centre of excellence in the region”* by conforming to the IBBS (International Blood Banking Standards). This can only be achieved through the continual professional development and conforming to relevant technological advances in blood transfusion services.

Blood collection and supply

Rwanda follows a 100% voluntary blood donation policy, recognizing that voluntary, unpaid blood donors provide the safest source of blood. Blood is collected from fixed donation sites, mobile blood drives, and community outreach programs organized in collaboration with institutions, local authorities, and partner organizations. The collected blood is tested and processed into components such as red blood cells, plasma, and platelets to meet diverse patient needs.

Hemovigilance and quality management

To enhance patient safety, BTD has established a hemovigilance system to monitor and track adverse reactions related to blood transfusions. Additionally, a quality management system (QMS) is in place to ensure that all operational procedures adhere to best practices and international standards.

Key Partnerships and community engagement

BTD works closely with hospitals, health centers, donor representatives, local leaders, and international partners to strengthen blood transfusion services. Public awareness campaigns and educational initiatives encourage regular blood donation and foster a culture of sustained voluntary donation.

Future goals

BTD aims to achieve 100% hospital satisfaction by 2025, ensuring that all healthcare facilities receive timely and adequate blood supplies. Other priorities include expanding donation programs, improving blood distribution logistics, and leveraging digital health solutions for better tracking and efficiency.

Through its continued efforts, the Rwanda Blood Transfusion Division remains a pillar of healthcare resilience, saving lives and contributing to universal health coverage (UHC) in Rwanda.

vii. Mission, vision and main services**Mission**

“To provide safe, effective and adequate blood and blood products to all patients in need”

Vision

“To be a Centre of excellence by conforming to the International Blood Banking Standards.”

Main Services

BTD has two major services: Blood donor mobilization and laboratory.

Blood donor mobilization undergoes the following activities:

- Blood donor education, recruitment and retention
- Blood collection preparations
- Blood donor selection and counseling
- Blood collections
- Notifications
- Quality management system

Laboratory undergoes the following activities:

- Serology
- Immuno – Hematology
- Component production
- Distribution
- Hemovigilance

Biobanking Unit

- Harvesting cornea
- Cornea processing Component production
- Cornea distribution

viii. Blood Transfusion Division achievement

Blood collection buses

In 2022, BTD was honored to receive two professional Blood Collection Buses (BCBs) donated by the IMBUTO FOUNDATION through the Ministry of Defense (MoD). These buses have enabled BTD to conduct blood collection camps in urban areas more efficiently. Previously, BTD used to set up tents and mobile logistics for these camps, which posed challenges during adverse weather conditions, impacting the expected blood yield and hospital satisfaction. With the new BCBs, operations continue seamlessly despite challenging weather conditions. Both BCBs are fully operational since September 2022.

Intwari Club 25

The Intwari Club 25 (IC25), designates a group of donors who commit to donating whole blood 25 times every 7 years or donating by apheresis 25 times every 2 years. The primary goal is to attain national blood self-sufficiency and enhance awareness of blood donation, particularly among young people. IC25 was inaugurated on February 14, 2022, at the Kigali Convention Center, Rwanda.

Cornea Tissue Bank

The Bio-Banking Unit (BBU) is a recent addition to Rwanda Biomedical Centre (RBC) under the Blood Transfusion Division (BTD), focusing on Cornea Tissue Banking (CTB). Established in 2023, BBU operates within Rwanda Military Hospital (RMH).

Blood delivery using drones

In a bid to improve accessibility to blood and other essential medicines and to shorten the turnaround time between ordering and receiving blood, Rwanda has embraced using UAS (Unmanned Aerial Systems) / Drones as an effective and efficient mode of delivering blood to patients. Rwanda leads the world in the use of the Drone technology in delivering blood and other medicines in case of emergency. BTD is delivering blood using Drones since 2016.

AfSBT level 3 accreditation

Since 2017, RBC / Blood Transfusion Division has an AfSBT Level 3 accreditation. In recent colorful event took place on February 14, 2023, this accreditation has been renewed at the 3rd time. BTD will maintain this accreditation for a period of 4 years (2023 – 2026).

1. BLOOD COLLECTION, PROCESSING AND DISTRIBUTION KEY INDICATORS

1.1. Blood collection sites in 2024

RCBTs	RURAL	SCHOOLS	TOTAL
KIGALI	155	19	174
BUTARE	58	42	100
KARONGI	52	64	116
RUHENGERI	55	48	103
RWAMAGANA	70	43	113
TOTAL	390	216	606

Source: RBC/BTD data indicators assessment 2024

This table provides data on the number of blood collection sites categorized by rural areas and schools across different Regional Centers for Blood Transfusion (RCBTs).

In 2024, RCBTs collected blood from 606 sites. Rural sites: 390 (64.4%). School-based sites: 216 (35.6%). Blood collection is more focused on rural areas, likely due to community mobilization efforts. Kigali Had the Highest Number of Collection Sites (174 Total).

Rural sites (155) are the largest among all RCBTs. Only 19 school sites, which is the lowest among all RCBTs. Karongi had the highest number of school-based sites (64). Ruhengeri also had a balanced rural (55) and school (48) distribution. Karongi Had the Second-Highest Total Collection Sites (113) after Kigali.

Besides those blood collection sites, there are other occasional sites: RDF barracks, RNP communities, embassies, churches, public places blood collection sites. BTD has also fixed site at every RCBTs.

1.2. Blood collection sites in 2024 vs 2023

RCBTs	2024			2023		
	RURAL	SCHOOLS	TOTAL	RURAL	SCHOOLS	TOTAL
KIGALI	155	19	174	129	28	157
BUTARE	58	42	100	56	41	97
KARONGI	52	64	116	62	63	125
RUHENGERI	55	48	103	62	44	106
RWAMAGANA	70	43	113	57	47	104
TOTAL	390	216	606	366	223	589

Source: RBC/BTD data indicators assessment 2024

This table highlights the changes in blood collection sites across rural areas and schools in different Regional Centers for Blood Transfusion (RCBTs) from 2023 to 2024.

Each year, Regional Centers for Blood Transfusion (RCBTs) evaluate and opt to shutter specific blood collection sites based on previous 3 years' performance. Simultaneously, they establish new sites to meet the escalating demand from Transfusing Health Facilities (THFs).

In 2024, 17 new sites were added. Consequently, the total number of blood collection sites in 2024 increased to 606 from 589 sites that the BTD had in 2023.

Overall increase in blood collection sites: 2024: 606 total sites. 2023: 589 total sites. Increase of 17 sites (+2.9%).

Growth in rural collection sites (+6.6%): 2024: 390 rural sites vs. 2023: 366 rural sites. Increase of 24 sites. Shows a stronger focus on reaching rural donors.

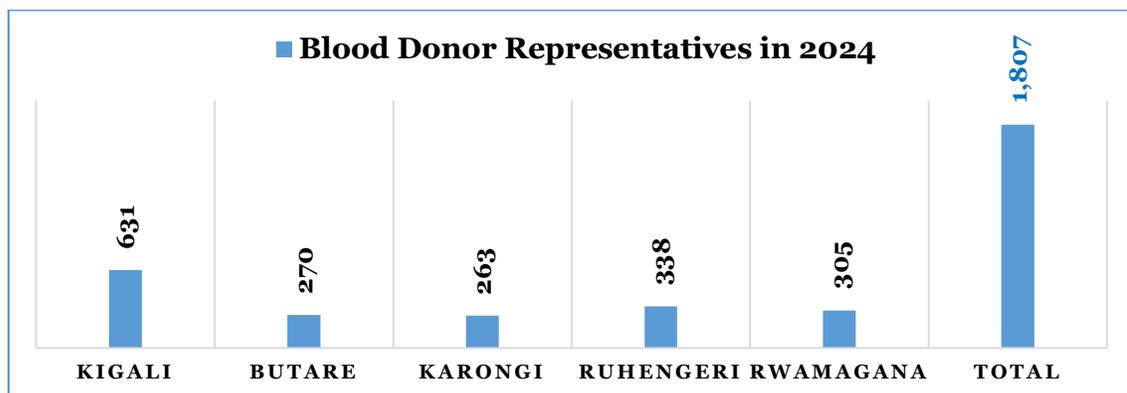
School-based blood collection sites saw a slight decline of 3.1%: Dropping from 223 in 2023 to 216 in 2024. This reduction of 7 sites is mainly due to secondary schools now enrolling more students under the age of 18, the minimum age required to donate blood in Rwanda and also BTB's goal to shift from school-based sites to rural (community) based sites as they are more reliable.

Significant increase in Kigali's collection sites: 2024: 174 sites vs. 2023: 157 sites (+17 sites, +10.8%). The increase mainly came from rural sites (+26), while school sites dropped (-9).

Rwamagana also showed strong growth: 2024: 113 sites vs. 2023: 104 sites (+9 sites, +8.7%). Both rural (+13 sites) and schools (-4 sites) changed. Rural collection expansion seems to be a key strategy.

Karongi and Ruhengeri showed a decline: Karongi: 116 sites (2024) vs. 125 sites (2023) (-9 sites, -7.2%). Ruhengeri: 103 sites (2024) vs. 106 sites (2023) (-3 sites, -2.8%). Rural blood collection declined due to weather-related transport issues and damaged unpaved roads make access difficult.

1.3. Blood donor representatives in 2024



Source: RBC/BTD data indicators assessment 2024

BDR.s (Blood Donor Representatives) are small committees between 3 and 5 people representing blood donors on a blood collection site. They play a big role in identifying potential blood donors and keep encouraging them to continue donating blood. They closely work with BTB staff in preparing blood collections Drives on the dates fixed by both parties. BDR.s follow-up on blood donors after donating blood while BTB staff went back. BDR.s work as a bridge between BTB and blood donors. A solid network of volunteers and donor advocates supporting blood donation efforts. This bar chart presents the number of Blood Donor Representatives in 2024 across five Regional Centers for Blood Transfusion (RCBTs).

Kigali has the highest number of 631 representatives followed by Ruhengeri with 338, whereas Butare, Karongi and Rwamagana have fewer representatives with 270, 263 and 305 respectively. **Total Blood Donor Representatives: 1,807.**

1.4. Blood collection sessions in 2024

RCBTs	PLANNED	PERFORMED	%
KIGALI	504	549	108.93
BUTARE	363	366	100.83
KARONGI	401	345	86.03
RUHENGERI	414	383	92.51
RWAMAGANA	367	350	95.37
TOTAL	2,049	1,993	97.27

Source: RBC/BTD data indicators assessment 2024

In the 2024 Annual Blood Collection Plan (ABCP), Regional Centers for Blood Transfusion (RCBTs) scheduled a total of 2,049 blood collection sessions and successfully conducted 1,993 by year-end, resulting in an overall performance rate of 97.27%. The accompanying table outlines the planned versus actual sessions across various RCBTs, showing that Kigali exceeded its target with a performance rate of 108.93%, while all other centers performed close to their targets, each surpassing 90%.

1.5. Planned vs collected blood units in 2024

RCBTs	PLANNED UNITS	COLLECTED UNITS	%
KIGALI	26,593	27,759	104.38
BUTARE	14,709	14,150	96.20
KARONGI	15,159	13,492	89.00
RUHENGERI	17,695	14,751	83.36
RWAMAGANA	14,992	14,231	94.92
TOTAL	89,148	84,383	94.65

Source: RBC/BTD data indicators assessment 2024

This table presents a comparative overview of the 2024 blood collection targets versus actual units collected across Regional Centers for Blood Transfusion (RCBTs). Under the ABCP 2024, the centers aimed to collect 89,148 blood units, and by year-end, they had collected 84,383 units, resulting in a performance rate of 94.65%.

Overall collection rate fell short of the target: Total planned units: 89,148. Total collected units: 84,383. Overall achievement rate: 94.65%

Kigali exceeded its target: Planned: 26,593. Collected: 27,759 (104.38% achieved).

Ruhengeri had the lowest collection rate: Planned: 17,695. Collected: 14,751 (83.36% achieved).

Karongi achieved its goal at below 90%: Planned: 15,159. Collected: 13,492 (89.00% achieved).

Butare and Rwamagana were slightly below target: Butare: 96.20% of the target met. Rwamagana: 94.92% of the target met. Both regions were close to their planned collection numbers but still achieved with good rate of above 90%.

1.6. Collected blood units in 2024 vs 2023

RCBTs	2024	2023
	Collected blood units	Collected blood units
KIGALI	27,759	28,947
BUTARE	14,150	14,372
KARONGI	13,492	14,282
RUHENGERI	14,751	15,864
RWAMAGANA	14,231	13,347
TOTAL	84,383	86,812

Source: RBC/BTD data indicators assessment 2024

This table presents a comparison of blood units collected in 2024 vs. 2023 across different Regional Centers for Blood Transfusion (RCBTs).

Overall blood collection declined in 2024: Total collected in 2024: 84,383 units. Total collected in 2023: 86,812 units. Decline: -2,429 units (-2.8%)

Kigali had the largest decline: 2024: 27,759 units | 2023: 28,947 units. Dropped by 1,188 units (-4.1%).

Butare, Karongi, and Ruhengeri also declined: Butare: -222 units (-1.5%). Karongi: -790 units (-5.5%). Ruhengeri: -1,113 units (-7%). Most significant Dr.op: Ruhengeri (-7%).

Rwamagana was the only region with an increase: 2024: 14,231 units | 2023: 13,347 units. Increase: +884 units (+6.6%).

In general, BTD focus to the rational use of blood and blood products in Transfusing Health facilities. The decrease in collected blood units was not a problem. The hospital satisfaction increased from 99.47% to 99.72%.

1.7. Blood donations by gender in 2024

RCBTs	MALE		FEMALE		TOTAL
	Number	%	Number	%	
KIGALI	19,355	69.73	8,404	30.27	27,759
BUTARE	10,050	71.02	4,100	28.98	14,150
KARONGI	8,878	65.80	4,614	34.20	13,492
RUHENGERI	11,336	76.85	3,415	23.15	14,751
RWAMAGANA	9,775	68.69	4,456	31.31	14,231
TOTAL	59,394	70.39	24,989	29.61	84,383

Source: RBC/BTD data indicators assessment 2024

This table highlights blood donations by gender across different Regional Centers for Blood Transfusion (RCBTs) in 2024. Blood units donated by male were more than twice as many as units donated by females: Total male donors: 59,394 (70.39%). Total female donors: 24,989 (29.61%).

- **Highest male participation:** Ruhengeri (76.85%): Ruhengeri had the highest male donor rate (76.85%) and the lowest female participation (23.15%).
- **Highest female participation: Karongi (34.20%):** Karongi had the highest female donor percentage (34.20%).
- **Kigali had the most female donors in absolute numbers:** Kigali: 8,404 female donors (30.27%).

The low number of donations by females is caused by the criteria excluding them to regularly donate blood; including but not limited to menstruation, pregnancy, breast-feeding and so on.

1.8. Blood donors by gender in 2024

RCBTs	MALE		FEMALE		TOTAL
	Number	%	Number	%2	
KIGALI	13,323	22.70	5,507	9.38	18,830
BUTARE	7,425	12.65	2,672	4.55	10,097
KARONGI	6,782	11.56	3,078	5.24	9,860
RUHENGERI	7,753	13.21	2,576	4.39	10,329
RWAMAGANA	7,039	11.99	2,533	4.32	9,572
TOTAL	42,322	72.11	16,366	27.89	58,688

Source: RBC/BTD data indicators assessment 2024

This table presents the distribution of blood donors by gender across different Regional Centers for Blood Transfusion (RCBTs) in 2024. It shows that 84,383 blood units the BTM collected in 2024 were donated by 58,688 blood donors.

Blood donors by gender: 72.11% of total donors were male (42,322 out of 58,688). 27.89% of total donors were female (16,366 out of 58,688).

Kigali had the highest number of donors: Total donors: 18,830 (largest contributor). Male donors: 13,323 (22.7%), Female donors: 5,507 (9.38%).

Karongi had the highest female participation: Female donors: 3,078 (5.24%), the highest percentage among all RCBTs. Male donors: 6,782 (11.56%), making Karongi one of the more balanced regions.

Ruhengeri & Rwamagana had the lowest female participation: Ruhengeri: 2,576 female donors (4.39%); Rwamagana: 2,533 female donors (4.32%), the lowest among all regions.

1.9. Donations / units by blood groups in 2024

RCBTs	O+	O-	A+	A-	B+	B-	AB+	AB-	TOTAL
KIGALI	13,122	1,279	6,457	411	4,953	277	1,183	77	27,759
BUTARE	6,743	652	3,286	214	2,595	125	496	39	14,150
KARONGI	6,580	459	3,137	156	2,463	145	530	22	13,492
RUHENGERI	6,881	542	3,748	158	2,637	143	624	18	14,751
RWAMAGANA	6,965	499	3,379	185	2,489	141	560	13	14,231
TOTAL	40,291	3,431	20,007	1,124	15,137	831	3,393	169	84,383

Source: RBC/BTD data indicators assessment 2024

This table presents blood donations by blood group in 2024 across the five Regional Centers for Blood Transfusion (RCBTs).

O+ is the most donated blood type (47.75% of total donations): 40,291 O+ units were collected, making it the dominant blood type. O+ is widely needed, making this a positive indicator for blood supply.

Low supply of rare blood types (AB- & B-): AB- had the lowest collection: Only 169 units (0.2%). B- donations were also low: 831 units (0.98%). These rare types are crucial for specific medical emergencies, highlighting the need for targeted donor recruitment.

Kigali leads in total donations: 27,759 total units, with the highest numbers in O+ (13,122), A+ (6,457), and B+ (4,953). Being the capital, Kigali has more donors and demand, but rare blood types remain low.

Ruhengeri has the highest A+ donations: 3,748 A+ units were collected, the highest among all RCBTs. This indicates a strong presence of A+ donors in the region.

Rwamagana has a high rate of o+ donations. 6,965 o+ units were collected, second only to Kigali.

1.10. Blood donors by blood groups in 2024

TYPE	Kigali		Butare		Karongi		Ruhengeri		Rwamagana		TOT	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
O+	8,473	14.44	4,459	7.60	4,367	7.44	4,648	7.92	4,617	7.87	26,564	45.26
O-	840	1.43	368	0.63	338	0.58	348	0.59	352	0.60	2,246	3.83
A+	5,084	8.66	3,533	6.02	2,961	5.05	3,112	5.30	2,380	4.06	17,070	29.09
A-	264	0.45	95	0.16	102	0.17	105	0.18	127	0.22	693	1.18
B+	3,161	5.39	1,322	2.25	1,624	2.77	1,637	2.79	1,623	2.77	9,367	15.96
B-	156	0.27	57	0.10	96	0.16	82	0.14	92	0.16	483	0.82
AB+	779	1.33	237	0.40	356	0.61	376	0.64	363	0.62	2,111	3.60
AB-	73	0.12	26	0.04	16	0.03	21	0.04	18	0.03	154	0.26
TOTAL	18,830	32.08	10,097	17.20	9,860	16.80	10,329	17.60	9,572	16.31	58,688	100.00

Source: RBC/BTD data indicators assessment 2024

This table presents the distribution of blood donors by blood type across different Regional Centers for Blood Transfusion (RCBTs) in 2024.

O+ is the Most Common Blood Group: 45.26% of all donors (26,564 out of 58,688) had O+ blood type. This aligns with global trends where O+ is the most prevalent blood group.

Kigali contributed the highest number of O+ donors (8,473 or 14.44%).

O- is the most important universal donor but least common: Only 3.83% of total donors (2,246 donors) had O- blood, which is crucial for emergency transfusions. Kigali had the highest O- contributions (840 donors or 1.43%). This highlights the need for targeted donor recruitment efforts for O-.

A+ is the second most common blood type: 29.09% of total donors (17,070 donors) had A+ blood. Kigali had the largest share (5,084 donors or 8.66%).

Rare blood groups (A-, B-, AB-) have very few donors: A- (1.18%), B- (0.82%), and AB- (0.26%) are the least common blood types. AB- is extremely rare, with only 154 total donors (0.26%) in all regions.

Blood type distribution across RCBTs is relatively: Each region follows the general trend, with O+ being the highest and AB- being the lowest. Kigali consistently contributed the most donors across all blood groups.

1.11. Blood donors by age in 2024

AGE	18-25		26-35		36-45		46-60		61+Above		TOTAL
	Number	%	Number	%	Number	%	Number	%	Number	%	
KIGALI	7,258	38.5	3,068	16.3	5,377	28.6	3,091	16.4	36	0.2	18,830
BUTARE	4,599	45.5	2,121	21.0	1,858	18.4	1,491	14.8	28	0.3	10,097
KARONGI	5,810	58.9	1,736	17.6	1,352	13.7	928	9.4	34	0.3	9,860
RUHENGERI	5,192	50.3	2,185	21.2	1,933	18.7	1,001	9.7	18	0.2	10,329
RWAMAGANA	4,221	44.1	2,132	22.3	2,182	22.8	1,015	10.6	22	0.2	9,572
TOTAL	27,080	46.1	11,242	19.2	12,702	21.6	7,526	12.8	138	0.2	58,688

Source: RBC/BTD data indicators assessment 2024

This table presents the age distribution of blood donors across different Regional Centers for Blood Transfusion (RCBTs) in 2024.

Young donors (18-25 years) contribute the most: 46.1% of total donors (27,080 out of 58,688) are aged 18-25. This shows strong participation from youth, particularly in Karongi (58.9%) and Ruhengeri (50.3%). University and high school mobilization efforts have been effective in attracting young donors.

Middle-age groups (26-45 years) show moderate contribution: Blood donors aged 26–35 accounted for 19.2% (11,242 individuals), while those aged 36–45 represented 21.6% (12,702 individuals). Although these age groups continue to play an important role in blood donation, their contribution remains lower than that of younger donors.

Older age groups (46+ years) donate the least: Donors aged 46–60 made up 12.8% of the total (7,526 individuals), while those aged 61 and above contributed just 0.2% (138 individuals), reflecting minimal participation—likely influenced by health limitations and eligibility requirements.

RCBTs differences in donor age distribution:

- Karongi has the highest youth participation (58.9% of donors are 18-25).
- Rwamagana has a balanced age distribution, with 22.8% of donors in the 36-45 age group, the highest among all RCBTs.
- Butare has a high youth contribution (45.5%) but fewer donors aged 46+ (only 15.1%).

1.12. Regularity: Blood units donated by NBD (New blood donors), IBD (Irregular Blood Donors) and RBD (Regular blood donors) in 2024

RCBTs	New Blood Donor		Irregular Blood Donor		Regular Blood Donor		TOTAL
	Number	%	Number	%	Number	%	
KIGALI	6,156	22.18	8,114	29.23	13,489	48.59	27,759
BUTARE	4,479	31.65	2,981	21.07	6,690	47.28	14,150
KARONGI	4,248	31.49	4,803	35.60	4,441	32.92	13,492
RUHENGERI	4,772	32.35	4,175	28.30	5,804	39.35	14,751
RWAMAGANA	5,131	36.06	3,698	25.99	5,402	37.96	14,231
TOTAL	24,786	29.37	23,771	28.17	35,826	42.46	84,383

Source: RBC/BTD data indicators assessment 2024

Who are the New, Irregular and Regular blood donors?

- **NBD (New blood donor)** is a person who donates blood for the first time.
- **RBD (Regular blood donor)** is a person who has donated at least three (3) times with at most 12 months' intervals.
- **IBD (Irregular blood donor)** is a person who donated blood more than twice but fails to donate at least once in 12 months.

1.13. Blood units donated by RPBDs (Repeat Blood Donors) in 2024

RCBTs	Irregular Donations	Regular Donations	Repeat Donations	% per Total donations
KIGALI	8,114	13,489	21,603	77.82
BUTARE	2,981	6,690	9,671	68.35
KARONGI	4,803	4,441	9,244	68.51
RUHENGERI	4,175	5,804	9,979	67.65
RWAMAGANA	3,698	5,402	9,100	63.94
TOTAL	23,771	35,826	59,597	70.63

Source: RBC/BTD data indicators assessment 2024

***Who is a RPBD (Repeat Blood Donor) :** RPBD (Repeat blood donor) is individual who regularly donates blood multiple times over a period of time. Both (IBD) Irregular Blood Donor plus (RBD) Regular Blood Donor are RPBDs.

1.14. Collected blood units using apheresis technology

An apheresis machine is a state-of-the-art modern technology where the machine receives blood drawn from a donor's body and separates it into various components: plasma, platelets, white and red blood cells. It then isolates and collects one of these components while others are returned to the body. This technology has improved hospital satisfaction especially concerning platelets, mostly used for treating cancer patients.

Apheresis vs WBDs (Whole Blood Donations) in 2024

TOTAL	Whole blood donations	Apheresis donations	% of Apheresis donations
84,383	83,783	600	0.71%

Source: RBC/BTD data indicators assessment 2024

In 2024, there were 84,383 total blood donations. 83,783 were whole blood and 600 were apheresis donations, which accounted for just 0.71% of the total. The table highlights the dominance of whole blood over the specialized apheresis method.

2. LABORATORY KEY INDICATORS

2.1. Blood testing and processing overview

In 2024, 84,383 blood units were tested using Alinity machines (for HIV 1&2, HCV, HBV, Syphilis), QWALYS 3 (for ABO, Rh, and extended blood grouping), and the T-ACE Machines for blood components' separation. Key screening parameters included blood group compatibility and early detection of infectious markers. A total of 126,837 Blood Component Units (BCUs), including RBCs, plasma, platelets, and cryoprecipitate, were separated and issued to Transfusing Health Facilities (THFs). The prevalence rate of Transfusion-Transmissible Infections (TTIs) stood at 0.86%, underscoring the safety and reliability of the blood supply system.

2.2. Summary of TTIs among New, Irregular and Regular blood donors

TTIs	HIV	HBV	HCV	SYPHILIS	TOTAL
New Blood Donors	26	180	145	170	521
Irregular Blood Donors	10	11	21	76	118
Regular Blood Donors	2	2	6	35	45
TOTAL TTIs	38	193	172	281	684
TOTAL DONATIONS	84,383	84,383	84,383	84,383	84,383
% PER TTIs	5.56%	28.22%	25.15%	41.08%	100%
% PER TOTAL DONATIONS	0.05%	0.23%	0.20%	0.33%	0.81

Source: RBC/BTD data indicators assessment 2024

2.3. Confirmed HIV reactive in 2024

TTIs	HIV			
	New Donor	Irregular Donor	Regular Donor	TOT Donors
KIGALI	7	4	1	12
BUTARE	4	1	0	5
KARONGI	7	1	0	8
RUHENGERI	3	1	1	5
RWAMAGANA	5	3	0	8
TOTAL	26	10	2	38

Source: RBC/BTD data indicators assessment 2024

In 2024, a total of 38 blood donors were confirmed HIV reactive across five RCBTs. Kigali had the highest number of cases (12), followed by Karongi and Rwamagana (8 each), while Butare and Ruhengeri each reported 5 cases. New donors represented the largest share with 26 confirmed cases, irregular donors accounted for 10, and regular donors only 2. This pattern mirrors the trend seen with other TTIs, indicating that new and irregular donors are more likely to test positive, underscoring the importance of targeted education and pre-donation screening for these groups.

2.4. Confirmed HBV reactive in 2024

TTIs	HBV			
	New Donor	Irregular Donor	Regular Donor	TOT Donors
KIGALI	52	2	1	55
BUTARE	25	0	0	25
KARONGI	39	2	0	41
RUHENGERI	32	3	0	35
RWAMAGANA	32	4	1	37
TOTAL	180	11	2	193

Source: RBC/BTD data indicators assessment 2024,

In 2024, a total of 193 blood donors across five RCBTs were confirmed reactive for HBV (Hepatitis B Virus). Kigali recorded the highest number with 55 HBV-reactive donors, followed by Karongi (41), Rwamagana (37), Ruhengeri (35), and Butare (25). Among these, new donors accounted for the majority of cases (180), while irregular donors contributed 11 cases and regular donors only 2. This distribution suggests that new donors are the most affected group, highlighting a potential need for enhanced screening and awareness efforts among first-time blood donors.

2.4. Confirmed HCV reactive in 2024

TTIs	HCV			
RCBTs	New Donor	Irregular Donor	Regular Donor	TOT Donors
KIGALI	28	6	3	37
BUTARE	28	5	1	34
KARONGI	30	2	1	33
RUHENGERI	28	4	0	32
RWAMAGANA	31	4	1	36
TOTAL	145	21	6	172

Source: RBC/BTD data indicators assessment 2024

In 2024, a total of 172 blood donors were confirmed reactive for HCV (Hepatitis C Virus) across five RCBTs. Kigali led with 37 cases, closely followed by Rwamagana (36), Butare (34), Karongi (33), and Ruhengeri (32). New donors made up the majority with 145 confirmed cases, while irregular donors contributed 21 and regular donors 6. Compared to HIV and HBV, HCV showed a relatively higher prevalence among all donor categories, including regular donors. This suggests a broader distribution of HCV risk and reinforces the need for consistent screening protocols across all donor types, not just first-time participants.

2.5. Confirmed SYPHILIS reactive in 2024

TTIs	SYPHILIS			
RCBTs	New Donor	Irregular Donor	Regular Donor	TOT Donors
KIGALI	32	18	19	69
BUTARE	30	19	2	51
KARONGI	46	15	5	66
RUHENGERI	29	13	4	46
RWAMAGANA	33	11	5	49
TOTAL	170	76	35	281

Source: RBC/BTD data indicators assessment 2024

In 2024, syphilis was confirmed in 281 blood donors across five RCBTs, marking the highest total among all transfusion-transmissible infections reported. Karongi recorded 66 cases, Kigali 69, Butare 51, Rwamagana 49, and Ruhengeri 46. Unlike other infections, syphilis showed a more balanced distribution across donor categories: 170 cases were from new donors, 76 from irregular donors and 35 from regular donors. It suggests possible gaps in follow-up screening or post-donation health monitoring, emphasizing the need for strengthened surveillance and education efforts across all donor groups.

2.7. Reduction in Total TTIs

TTIs 2024 vs 2023			
YEARS	Total Donations	Total TTIs	% of TTIs per Total Donations
2024	84,383	684	0.81
2023	86,812	748	0.86

Source: RBC/BTD data indicators assessment 2023 and 2024

The 2024 data indicate a positive trend in blood safety, with a reduction in both total Transfusion-Transmissible Infections (TTIs) and infection rates. TTIs dropped from 748 cases in 2023 to 684 in 2024, a decrease of 64 cases, suggesting enhanced donor screening and increased awareness of blood borne infections. Additionally, the TTI rate improved from 0.86% to 0.81%, a slight yet meaningful decline that reflects improved donor selection and a safer blood supply.

Conclusion about TTIs

The data suggests that screening efforts are effective, as TTIs are relatively low. However, new donor education and stricter pre-donation screening could help to reduce TTIs further. Regular blood donors are the safest group for blood donation, reinforcing the importance of donor retention programs.

3. HOSPITAL SATISFACTION IN 2024

3.1. Hospital satisfaction (Demand Vs Supply)

Hospital satisfaction by RCBTs and ZIPLINE			
Category	Demand	Supply	Satisfaction (%)
RCBTs	55,852	55,852	100.00%
Zipline	71,346	70,985	99.49%
Overall Satisfaction	127,198	126,837	99.72%

Source: RBC/BTD data indicators assessment 2024

This table evaluates hospital satisfaction with blood supply services provided by RCBTs (Regional Blood Centers) and ZIPLINE (a medical Drone delivery service), based on demand and supply data.

RCBTs achieved 100% satisfaction: All 55,852 blood unit requests were fully met by RCBTs, indicating efficient supply management.

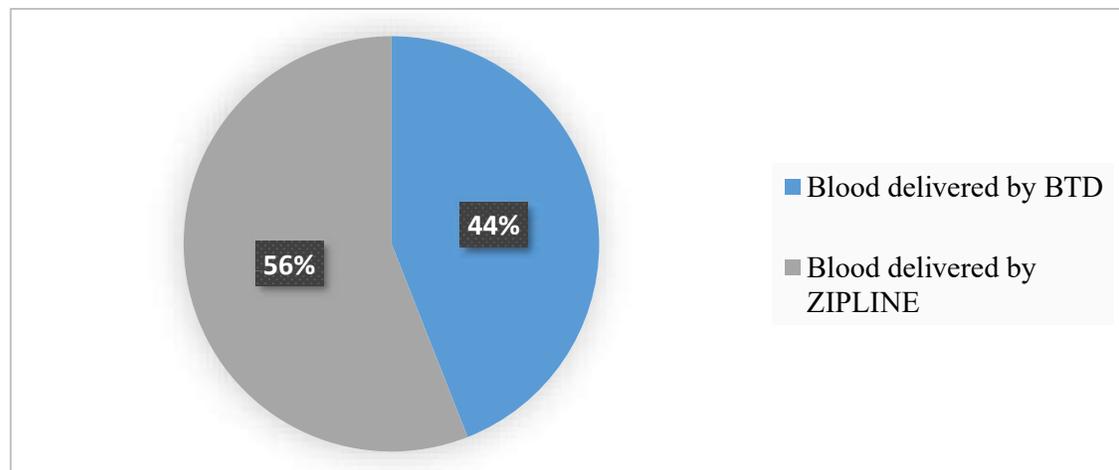
ZIPLINE satisfaction rate (99.49%) shows a slight shortfall: Out of 71,346 blood units requested from Zipline, 70,985 were successfully supplied, resulting in a shortfall of 361 units. This slight gap is mainly due to logistical challenges, such as stock limitations that occasionally require waiting for certain blood components from the BTD Kigali central lab.

Overall hospital satisfaction is very high (99.72%): 126,837 blood units were supplied out of 127,198 requested, showing a well-functioning blood distribution system. The shortfall is only 361 units (0.28%), which is minimal.

Conclusion

- RCBTs are meeting hospital demand perfectly (100%), while ZIPLINE is also highly efficient (99.49%) but with a minor shortfall.
- The overall blood supply system is highly reliable (99.72%), ensuring hospitals receive nearly all the blood they need.
- Improvement in ZIPLINE logistics or stock levels could help to close the small supply gap.

3.2. Blood delivery by BTD through RCBTs vs Zipline in 2024



Source: RBC/BTD data indicators assessment 2024

ZIPLINE is now handling a larger share (56%) of blood deliveries compared to BTD (44%), showing that Drone-based delivery is playing a significant role in blood supply. This suggests an increasing reliance on Drone technology for blood supply, likely due to speed, efficiency, and accessibility in remote areas.

3.3. Conclusion

Blood Collection: The Annual Blood Collection Plan (ABCP) targeted 2,049 sessions, and 1,993 were executed, achieving an impressive performance rate of 97.27%. A total of 84,383 blood donations were collected, largely composed of whole blood (83,783), with a minor share from apheresis (600 donations or 0.71%). Youth donors remained the dominant contributors, though older age groups continued to participate. The prevalence rate for Transfusion-Transmissible Infections (TTIs) stood at 0.81%, signaling robust safety protocols. Syphilis (0.33%), HBV (0.23%), and HCV (0.20%) were the most frequently detected infections, predominantly among new donors, highlighting the importance of first-time donor screening.

Laboratory processing: Advanced equipment such as the Architect i2000SR, QWALYS 3, and T-ACE Machine, enabled effective screening for infectious markers (HIV 1&2, HCV, HBV, Syphilis), blood grouping, and confirmatory tests. From these donations, 126,837 Blood Component Units (BCUs) were successfully separated, including red blood cells, plasma, platelets, and cryoprecipitate. This ensured optimized resource use and better matching for transfusing health facilities (THFs).

Hospital distribution & satisfaction: With an impressive hospital satisfaction rate of 99.76%, blood distribution through RCBTs and ZIPLINE proved highly efficient, strengthening confidence in the reliability and responsiveness of the national delivery system.

Overall impact: Together, these figures reflect a high-performing and tightly coordinated blood system. From planning and donor mobilization to testing and hospital delivery, Rwanda's national blood service maintained exceptional safety, responsiveness, and operational consistency throughout 2024.

4. HEMOVIGILANCE KEY INDICATORS

4.1. Rwanda Blood Transfusion Division (BTD) Hemovigilance System

The Blood Transfusion Division (BTD) under the Rwanda Biomedical Center (RBC) is responsible for ensuring the safety, quality, and efficiency of blood and blood products across the country. A key component of this responsibility is the hemovigilance system, which is designed to monitor, detect, report, and prevent adverse reactions and events related to the entire blood transfusion chain—from donation to transfusion. The hemovigilance system in Rwanda aims to enhance transfusion safety through a structured approach that includes but not limited to:

Hospital supervisions: Regular visits to healthcare facilities to assess blood transfusion practices, ensure compliance with national guidelines, and provide recommendations for improvement.

Mentorships: On-the-job support and coaching for healthcare professionals involved in blood transfusion services to enhance their knowledge and technical skills.

Trainings: Capacity-building programs for healthcare workers, laboratory staff, and blood bank personnel to improve their understanding of hemovigilance principles, adverse reaction reporting, and best practices in transfusion medicine.

Adverse events monitoring and reporting: A systematic process for identifying, documenting, and analyzing transfusion-related reactions to enhance patient safety and improve blood product handling.

Data collection and analysis: Continuous evaluation of transfusion-related incidents to identify trends, assess risks, and implement corrective measures.

By implementing these activities, the BTD hemovigilance system plays a crucial role in minimizing transfusion-related risks, ensuring patient safety, and strengthening the overall quality of blood transfusion services in Rwanda. Through collaboration with healthcare institutions and professionals, the system promotes continuous improvement and aligns with international best practices in transfusion medicine.

4.2. Key hemovigilance indicators in 2024

4.2.1. Planned vs performed supervisions

RCBTs	Planned	Performed	Performance rate (%)
KIGALI	213	213	100.00
BUTARE	47	29	61.70
KARONGI	20	10	50.00
RUHENGERI	37	6	16.22
RWAMAGANA	0	0	0.00
TOTAL	317	258	81.39

Source: RBC/BTD data indicators assessment 2024

The table presents data on planned vs. performed supervisions across different Regional Centers for Blood Transfusion (RCBTs) in Rwanda, as assessed in 2024.

Overall performance

A total of 317 supervisions were planned, out of which 258 were successfully conducted. The overall performance rate is 81.39%, indicating a relatively good achievement but with room for improvement.

Performance by RCBTs

- **Kigali:** Achieved 100% of its planned supervisions (213/213), demonstrating full compliance.
- **Butare:** Completed 29 out of 47 planned supervisions, leading to a 61.70% performance rate.
- **Karongi:** Had a 50.00% performance rate, completing 10 out of 20 planned supervisions.
- **Ruhengeri:** With a performance rate of just 16.22%, only 6 out of 37 planned supervisions were completed, mainly due to limited vehicle availability, which constrained staff mobility and disrupted execution.
- **Rwamagana:** Had no scheduled supervisions, primarily due to a shortage of vehicles for staff transportation, which hindered operational planning.

In 2024, Kigali demonstrated full compliance by completing all 213 planned supervisions (100%), while Butare achieved a 61.70% performance rate with 29 out of 47 sessions. Karongi reached 50.00% (10/20), and Ruhengeri faced significant logistical constraints, completing only 6 out of 37 (16.22%). Rwamagana did not schedule any supervisions due to limited staff transport, which hindered planning altogether.

4.2.2. Planned vs performed mentorship sessions

RCBTs	Planned	Performed	Performance rate (%)
KIGALI	213	213	100.00
BUTARE	33	24	72.73
KARONGI	12	12	100.00
RUHENGERI	39	18	46.15
RWAMAGANA	0	0	0.00
TOTAL	297	267	89.90

Source: RBC/BTD data indicators assessment 2024

Overall Performance

A total of 297 activities were planned, out of which 267 were successfully performed. The overall performance rate is 89.90%, indicating a high level of achievement.

Performance by RCBTs

- **Kigali:** Achieved 100% of its planned activities (213/213).
- **Karongi:** Also achieved 100% performance (12/12).
- **Butare:** Completed 24 out of 33 planned activities, resulting in a 72.73% performance rate.
- **Ruhengeri:** Had the lowest performance among centers that had planned activities, completing 18 out of 39, giving a 46.15% performance rate.

- **Rwamagana:** Mentorship activities were not scheduled, mainly because of limited staff transportation due to a shortage of vehicles disrupted operational planning.

RCBT performance ranged from full compliance in Kigali and Karongi to lower execution in Ruhengeri (46.15%), while Rwamagana had no scheduled activities due to transport constraints.

4.2.3. Planned vs performed data collection sessions

RCBTs	Planned	Performed	Performance rate (%)
KIGALI	213	213	100.00
BUTARE	42	24	57.14
KARONGI	40	34	85.00
RUHENGERI	43	39	90.70
RWAMAGANA	40	33	82.50
TOTAL	378	343	90.74

Source: RBC/BTD data indicators assessment 2024

The table presents data on planned vs. performed data collection sessions across different Regional Centers for Blood Transfusion (RCBTs) in Rwanda, as assessed in 2024.

Overall performance: A total of 378 data collection sessions were planned, out of which 343 were successfully conducted. The overall performance rate is 90.74%, indicating a strong achievement.

Performance by RCBTs

- **Kigali:** Successfully completed all 213 planned data collection sessions, reaching a 100% execution rate.
- **Butare:** Performed 24 out of 42 sessions, with a 57.14% performance rate, indicating challenges in execution.
- **Karongi:** Completed 34 out of 40 sessions, achieving an 85.00% performance rate.
- **Ruhengeri:** Performed 39 out of 43 sessions, achieving a 90.70% performance rate, which is very close to full execution.
- **Rwamagana:** Conducted 33 out of 40 planned sessions, with an 82.50% performance rate.

In 2024, RCBT data collection rates varied widely: Kigali completed all 213 sessions (100%), Ruhengeri reached 90.70% (39/43), Karongi 85.00% (34/40), Rwamagana 82.50% (33/40), while Butare lagged at 57.14% (24/42) due to vehicle shortages.

4.2.4. Planned vs performed training sessions

RCBTs	Planned	Performed	Performance rate (%)
KIGALI	9	9	100.00
BUTARE	0	0	0.00
KARONGI	12	12	100.00
RUHENGERI	33	16	48.48
RWAMAGANA	2	0	0.00
TOTAL	56	37	66.07

Source: RBC/BTD data indicators assessment 2024

Overall performance

Out of 56 planned hospital-based training sessions, 37 were successfully delivered, resulting in a performance rate of 66.07%. This reflects a moderate implementation level across targeted health facilities.

Performance by RCBTs

- **Kigali:** Achieved 100% of its planned training sessions (9/9).
- **Karongi:** Also achieved 100% performance (12/12).
- **Ruhengeri:** Conducted 16 out of 33 planned sessions, with a 48.48% performance rate, showing that more than half of the planned trainings were not completed.
- **Butare and Rwamagana:** Had 0% performance, meaning no training sessions were conducted, despite Rwamagana having 2 planned sessions. This was caused by the lack of vehicles to transport staff.

Training session performance across RCBTs was uneven – Kigali and Karongi delivered fully (100%), Ruhengeri completed less than half (48.48%), while Butare and Rwamagana conducted none, largely due to transport constraints.

4.3. The most indications for blood transfusion in 2024 (all RCBTs)

RCBT KIGALI

#	INDICATIONS	BLOOD COMPONENTS				TOTAL	%
		RBCs	PLTs	FFPs	CRYOs		
1	Anemia	6,519	410	54	0	6,983	41.61
2	PPH	2,155	394	399	232	3,180	18.95
3	Bleeding	1,213	174	82	53	1,522	9.07
4	Cancers	1,115	235	54	18	1,422	8.47
5	Sepsis	764	462	151	42	1,419	8.46
6	Thrombocytopenia	198	925	68	9	1,200	7.15
7	Abortion	413	10	8	6	437	2.60
8	Ectopic pregnancy	193	25	19	0	237	1.41
9	Peritonitis	144	0	0	0	144	0.86
10	Uterine rupture	55	20	10	0	85	0.51
TOTAL		12,769	2,655	845	360	16,629	100.00

Source: RBC/BTD data indicators assessment 2024

RCBT BUTARE

#	INDICATIONS	BLOOD COMPONENTS				TOTAL	%
		RBCs	PLTs	FFPs	CRYOs		
1	Anemia	3,429	262	29	3	3,723	30.38
2	PPH	2,036	578	607	403	3,624	29.57
3	Bleeding	928	229	148	76	1,381	11.27
4	Thrombocytopenia	75	991	22	0	1,088	8.88
5	Sepsis	536	273	37	1	847	6.91
6	Malaria	479	164	4	2	649	5.3
7	Abortion	321	60	35	19	435	3.55
8	Pancytopenia	87	187	29	5	308	2.51
9	Placenta Praevia	94	38	30	38	200	1.63
TOTAL		7,985	2,782	941	547	12,255	100

Source: RBC/BTD data indicators assessment 2024

RCBT KARONGI

#	INDICATIONS	BLOOD COMPONENTS				TOTAL	%
		RBCs	PLTs	FFPs	CRYOs		
1	PPH	1,255	319	359	202	2,135	35.98
2	Anemia	1,832	140	20	5	1,997	33.65
3	Thrombocytopenia	79	308	7	3	397	6.69
4	Malaria	296	87	4	0	387	6.52
5	Sepsis	244	92	4	0	340	5.73
6	Abortion	314	4	8	0	326	5.49
7	Ectopic pregnancy	55	23	25	16	119	2.01
8	Cancer	59	50	4	3	116	1.95
9	Chronic Disease	94	21	2	0	117	1.97
TOTAL		4,228	1,044	433	229	5,934	4,228

Source: RBC/BTD data indicators assessment 2024

RCBT RUHENGERI

#	INDICATIONS	BLOOD COMPONENTS				TOTAL	%
		RBCs	PLTs	FFPs	CRYOs		
1	Anemia	1,583	147	31	7	1,768	31.61
2	Cancers	619	673	35	4	1,331	23.79
3	PPH	501	171	160	82	914	16.34
4	Bleeding	647	109	84	19	859	15.36
5	Thrombocytopenia	3	257	0	0	260	4.65
6	Abortion	168	32	24	0	224	4
7	Malaria	100	36	8	0	144	2.57
8	Sepsis	49	45	0	0	94	1.68
TOTAL		3,670	1,470	342	112	5,594	100

Source: RBC/BTD data indicators assessment 2024

RCBT RWAMAGANA

#	INDICATIONS	BLOOD COMPONENTS				TOTAL	%
		RBCs	PLTs	FFPs	CRYOs		
1	Anemia	6,610	568	142	22	7,342	43.21
2	PPH	2,481	874	869	289	4,513	26.56
3	Bleeding	1,384	333	256	78	2,051	12.07
4	Thrombocytopenia	78	794	26	0	898	5.28
5	Uterine rupture	289	126	137	55	607	3.57
6	Ectopic pregnancy	267	75	72	36	450	2.65
7	Abortion	395	18	16	4	433	2.55
8	Sepsis	180	120	18	3	321	1.89
9	Cancer	135	190	38	14	377	2.22
TOTAL		11,819	3,098	1,574	501	16,992	100.00

Source: RBC/BTD data indicators assessment 2024

ALL RCBTs (BTD Level)

#	INDICATIONS	BLOOD COMPONENTS				TOTAL	%
		RBCs	PLTs	FFPs	CRYOs		
1	Anemia	19,973	1,527	276	37	21,813	39.66
2	PPH	8,428	2,336	2,394	1,208	14,366	26.12
3	Bleeding	3,851	813	536	222	5,422	9.86
4	Thrombocytopenia	433	3,275	123	12	3,843	6.99
5	Sepsis	1,773	992	210	46	3,021	5.49
6	Cancers	1,769	918	97	30	2,814	5.12
7	Abortion	1,611	124	91	29	1,855	3.37
8	Malaria	875	287	16	2	1,180	2.15
9	Uterine rupture	344	146	147	55	692	1.26
TOTAL		39,057	10,418	3,890	1,641	55,006	100.00

Source: RBC/BTD data indicators assessment 2024

BLOOD COMPONENT USAGE BY INDICATION

This table details blood component usage across different medical conditions, broken down by red blood cells (RBCs), platelets (PLTs), fresh frozen plasma (FFPs), and cryoprecipitate (CRYOs). It also calculates the total number of blood components used and the percentage of total usage contributed by each condition. Here's a breakdown of key insights:

Anemia (39.03%): Anemia accounts for the highest demand in blood component usage, representing nearly 39% of all transfusions. This condition primarily requires red blood cells (RBCs), with 19,650 units used. Other components like platelets, fresh frozen plasma (FFP), and cryoprecipitate (CRYO) are rarely needed, underscoring that the main treatment focus is restoring red blood cell levels. It also shows a diagnostic gap in blood transfusion indications as it does not show the cause of anemia.

Postpartum Hemorrhage (PPH) (26.12%): PPH is the second-largest contributor to blood component usage, accounting for 26.12% of the total blood products used. There is a significant demand for RBCs (8,428 units), platelets (2,336 units), FFPs (2,394 units), and CRYOs (1,208 units), reflecting the need to manage acute blood loss and coagulopathy typically seen in this condition. The relatively higher usage of platelets and CRYOs suggests coagulation abnormalities like disseminated intravascular coagulation (DIC).

Bleeding (9.86%): Bleeding conditions, including trauma or surgical bleeding, make up 9.86% of total blood product usage. High usage of RBCs (3,851 units) and platelets (813 units) implies a significant need for both blood replacement and platelet support.

Thrombocytopenia (6.99%): Thrombocytopenia, often associated with diseases like leukemia, or bone marrow disorders, accounts for 6.99% of blood usage. The high demand for platelets (3,275 units) underscores the need to manage severe platelet deficiencies, with minimal use of RBCs and plasma.

Sepsis (5.49%): Sepsis contributes 5.49% to total blood usage, with substantial platelet use (992 units) and FFP requirements (210 units), indicating coagulation dysfunction such as DIC or multi-organ failure.

Cancers (5.12%): Cancer patients, likely undergoing chemotherapy, account for 5.12% of the total blood components used. There is a notable need for platelets (918 units) due to chemotherapy-induced thrombocytopenia, with moderate RBC usage (1,769 units) for anemia caused by bone marrow suppression.

Abortion (3.37%): Abortion cases, typically those involving significant hemorrhage, contribute 3.37% to blood component usage. The primary need is for RBCs (1,611 units), indicating cases of heavy bleeding or complications during miscarriage or pregnancy termination.

Malaria (2.15%): Malaria accounts for 2.15% of blood product usage, primarily involving red blood cells (875 units) and, to a lesser extent, platelets (287 units). In severe cases, malaria can destroy red blood cells, leading to anemia, and reduce platelet levels, causing thrombocytopenia. These complications increase the need for blood transfusions.

Uterine Rupture (1.26%): Uterine rupture contributes 1.26% of total blood component use, primarily requiring RBCs (344 units) and some platelets (146 units). The usage reflects blood loss in obstetric emergencies, where significant transfusion support is needed.

Decompensated Anemia (0.63%): Decompensated anemia accounts for 0.63% of all blood product usage, mainly involving red blood cells (323 units). It rarely requires platelets or plasma. This condition refers to severe anemia that doesn't improve with standard treatments, making blood transfusion necessary.

Anemia and PPH are the largest contributors to blood component usage, accounting for 65.15% of the total demand, with a predominant need for RBCs and varying requirements for platelets and plasma. Conditions like sepsis, cancers, and thrombocytopenia have high platelet requirements, highlighting the importance of platelets in treating coagulopathies, especially in critical care. Other conditions such as abortion and malaria contribute smaller percentages, but they also require significant RBCs to manage hemorrhage or anemia. Decompensated anemia and uterine rupture make up the smallest contributions, but they still indicate cases of severe blood loss requiring transfusion support.

4.4. Adverse transfusion reactions

15 adverse transfusion reactions reported across all hospitals:

- 6 reactions were from KIGALI
- 9 reactions came from KARONGI
- Adverse reactions were predominantly by allergic reactions with no serious immunologic or non-immunologic reactions reported.
- The clinical symptoms observed included fever, chills, and dyspnea, but no major complications such as hypotension or jaundice were recorded.
- The highest number of reactions and symptoms were reported in KARONGI, with 9 adverse reactions in total.
- This shows an under reporting of adverse transfusion reactions in hospitals which requires more efforts to encourage hospital physicians to report adverse transfusion reactions.

4.5. Distribution of key equipment

RCBT KIGALI

Equipment		Hospitals Requested	Served Hospitals	%	Requested Quantity	Delivered Quantity	%
1	Refrigerators	14	14	100.00	14	14	100.00
2	Blood warmers	17	16	94.12	68	64	94.12
TOTAL		31	30	96.77	82	78.00	95.12

Source: RBC/BTD data indicators assessment 2024

- **Served hospitals with new refrigerators:** KFH, CHUK, RMRTH, Kabgayi, Kacyiru, Masaka DH, Kibagabaga, Muhima, Nyamata and Byumba hospital.
- **Served hospitals with used refrigerators :** Rutongo, Rutare, Rilima, Remera-Rukoma and Ruli.
- **Blood warmers:** 16 hospitals that requested blood warmers, each one received 4 except Nyarugenge was not served because they were in rehabilitation.

RCBT BUTARE

Equipment	Hospitals Requested	Served Hospitals	%	Requested Quantity	Delivered Quantity	%	
	1	Refrigerators		12	7		58.33
2	Blood warmers	12	12	100.00	52	52	100.00
TOTAL		24	19	79.17	64	59	92.19

Source: RBC/BTD data indicators assessment 2024

- **Served hospitals with refrigerators:** CHUB, Kabutare, Kaduha, Nyanza, Gatagara, Kigeme and Gakoma.
- **Un-served hospital (s):** Kibirizi, Gikonko, Gitwe, Munini and Ruhango.

Blood Warmers: CHUB, Kabutare, Kaduha, Nyanza, Gatagara, Kigeme, Gakoma, Kibirizi, Gikonko, Gitwe, Munini and Ruhango.

NB: Private transfusing clinics would like to get at least 1 blood warmer each and CHUB should be considered differently basing on data analysis.

RCBT KARONGI

Equipment		Hospitals Requested	Served Hospitals	%	Requested Quantity	Delivered Quantity	%
1	Refrigerators	5	4	80.00	5	4	80.00
2	Blood warmers	9	9	100.00	36	36	100.00
TOTAL		14	13	92.86	41	40.00	97.56

Source: RBC/BTD data indicators assessment 2024

- **Served hospitals with refrigerators:** Kibuye, Bushenge, Murunda and Mibilizi.
- **Un-served hospital (s):** Mugonero Hospital.
- **Blood Warmers:** All 9 hospitals that requested blood warmers, each one received 4.

RCBT RUHENGARI

Equipment		Hospitals Requested	Served Hospitals	%	Requested Quantity	Delivered Quantity	%
1	Refrigerators	9	7	77.78	9	7	77.78
2	Blood warmers	11	11	100.00	44	44	100.00
TOTAL		20	18	90.00	53	51.00	96.23

Source: RBC/BTD data indicators assessment 2024

- **Served hospitals with refrigerators:** Ruhengeri L2TH, Butaro L2TH, Shyira DH, Nemba DH, Gatonde DH, Byumba L2TH and Gisenyi L2TH.
- **Un-served hospital (s):** Kinihira PH, Bigogwe MHC.
- **Blood Warmers:** All 11 HF's that requested blood warmers, each one received 4.

RCBT RWAMAGANA

Equipments		Hospitals Requested	Served Hospitals	%	Requested Quantity	Delivered Quantity	%
1	Refrigerators	10	5	50.00	10	5	50.00
2	Blood warmers	10	10	100.00	40	40	100.00
TOTAL		20	15	75.00	50	45.00	90.00

Source: RBC/BTD data indicators assessment 2024

- **Served hospitals with refrigerators:** Rwamagana L2TH, Kibungo L2TH, Kiziguro DH, Kirehe DH and Nyagatare DH.
- **Un-served hospital (s) with refrigerators:** Gatunda DH, Rwinkwavu DH, Ngarama DH, Gahini DH and Mahama HC.
- **Blood Warmers:** All 10 public HF's that requested blood warmers, each one received 4.
- **The private HF - Ste Therese Clinic** - has not received any blood warmer.

**5. BLOOD DONOR MOBILIZATION ACTIVITIES
PERFORMED BY RCBTs**

5.1. Meeting with local leaders and BDRs (Blood Donor Representatives)

Meeting with local leaders

RCBTs	Sessions	Estimated participants
KIGALI	0	0
BUTARE	0	0
KARONGI	4	114
RUHENGERI	10	317
RWAMAGANA	7	90
TOTAL	21	521

Source: RBC/BTD data indicators assessment 2024

Meeting with BDRs (Blood Donor Representatives)

RCBTs	Sessions	Est. Number
KIGALI	2	630
BUTARE	1	300
KARONGI	0	0
RUHENGERI	0	0
RWAMAGANA	0	0
TOTAL	1	300

Source: RBC/BTD data indicators assessment 2024

5.2. Mass mobilization and media campaigns

Mass mobilization and blood collection campaigns

RCBTs	Sessions	Est. Units
KIGALI	0	0
BUTARE	21	1183
KARONGI	8	745
RUHENGERI	13	1090
RWAMAGANA	0	0
TOTAL	42	3018

Source: RBC/BTD data indicators assessment 2024

Number of radio talks and TV Shows

RCBTs	Radio	TV
KIGALI	5	3
BUTARE	2	0
KARONGI	2	0
RUHENGERI	4	0
RWAMAGANA	7	3
TOTAL	18	3

Source: RBC/BTD data indicators assessment 2024

5.3. IC25 (Intwari Club 25)

Number of institutions visited for mass mobilization of Intwari Club 25

#	RCBT / Province	Location 1	Location 2
1	RCBT Butare (Southern Province)	25/9/2024: UR Huye	26/09/2024: RP Huye College
2	RCBT Ruhengeri (Northern Province)	02/10/2024: INES Ruhengeri	09/10/2024: UR-CAVM Busogo
3	RCBT Karongi (Western Province)	11/10/2024: Kibogora Polytechnic	16/10/2024: RP Karongi college
4	RCBT Rwamagana (Eastern Province)	04/10/24: UR Rukara	05/10/2024: UR Nyagatare campus
5	RCBT Kigali (City of Kigali)	23/10/2024: UR College of science and Technology	15/11/2024: Kepler University

Source: RBC/BTD data indicators assessment 2024

The table outlines the institutions visited for mass mobilization of Intwari Club 25, a likely initiative to encourage voluntary blood donation among students and young people. The campaign was conducted across five Regional Centers for Blood Transfusion (RCBTs) in different provinces and Kigali City.

- **Total institutions visited:** 10 universities and colleges.
- **Coverage across provinces:** Each RCBT conducted mobilization at two institutions in its region.
- **Targeted Institutions:** Primarily universities and polytechnic colleges, which suggests an effort to engage young, healthy donors to sustain blood donation efforts.
- **Period:** Events were held from September to November 2024, ensuring continuous outreach rather than a one-time effort.

Significance of the Mobilization

- **Sustaining Blood Supply:** University students are a key target for regular, voluntary, and non-remunerated blood donation, which helps maintain a stable blood supply.
- **Health Awareness:** Encouraging youth to donate promotes broader health consciousness and altruism.
- **Long-term Impact:** Building a strong blood donor culture in universities ensures a sustainable donor pool for future needs.

Number of enrolled members and blood units they donated

RCBTs	Kigali		Butare		Karongi		Ruhengeri		Rwamagana		TOTAL	
	Number	Units	Number	Units	Number	Units	Number	Units	Number	Units	Number	Units
JANUARY	8	20	3	3	3	3	12	12	2	2	28	40
FEBRUARY	12	25	5	5	1	1	16	16	5	5	39	52
MARCH	5	5	12	12	4	4	15	15	7	7	43	43
APRIL	17	17	2	2	3	3	5	5	10	10	37	37
MAY	6	6	6	6	3	3	7	7	9	9	31	31
JUNE	18	26	13	13	6	6	11	11	8	8	56	64
JULY	10	13	3	3	3	3	4	4	7	7	27	30
AUGUST	7	10	3	3	2	2	3	3	6	6	21	24
SEPTEMBER	13	20	3	3	6	6	4	4	7	7	33	40
OCTOBER	5	5	6	6	40	40	6	6	6	6	63	63
NOVEMBER	12	12	9	9	2	2	10	10	9	9	42	42
DECEMBER	20	20	5	5	0	0	14	14	10	10	49	49
TOTAL	133	179	70	70	73	73	107	107	86	86	469	515

Source: RBC/BTD data indicators assessment 2024

Rate of donations by IC25 members in 2024

RCBTs	Donated by Non-IC25 members	Rate (%)	Donated by IC25 members	Rate (%)	All donations
KIGALI	27,580	32.68	179	0.21	27,759
BUTARE	14,080	16.69	70	0.08	14,150
KARONGI	13,419	15.90	73	0.09	13,492
RUHENGERI	14,644	17.35	107	0.13	14,751
RWAMAGANA	14,145	16.76	86	0.10	14,231
TOTAL	83,868	99.39	515	0.61	84,383

Source: RBC/BTD data indicators assessment 2024

The data reveals the distribution of blood donations between Intwari Club 25 (IC25) members and non-IC25 members across different Regional Centers for Blood Transfusion (RCBTs).

Non-IC25 Members Contributed More Than IC25 Members. Non-IC25 members accounted for 99.39% of total donations (83,868 out of 84,383). IC25 members contributed only 0.61% (515 donations). This suggests that while IC25 plays a role, the majority of blood donations come from the general population.

RCBT Kigali Had the Highest Contribution. 27,580 donations (32.68%) were from non-IC25 members. IC25 members contributed 179 donations (0.21%). Other RCBTs Had a Similar Distribution.

- Butare: 16.69% of donations came from non-IC25 members, only 0.08% from IC25.
- Karongi: 15.90% from non-IC25 members, 0.09% from IC25.
- Ruhengeri: 17.35% from non-IC25 members, 0.13% from IC25.
- Rwamagana: 16.76% from non-IC25 members, 0.10% from IC25.

IC25's participation is very low, suggesting a need to strengthen its mobilization efforts. Here are recommendations to increase IC25 Contributions:

- **Enhance university engagement** by conducting more awareness campaigns and events to encourage students to donate.
- **Improve IC25 member retention** by offering recognition programs and incentives for repeat donors.
- **Expand outreach beyond schools** by targeting young professionals and working youth who might be willing to join IC25.
- **Leverage social media & influencers** by using digital platforms to promote the impact of youth blood donation.

General conclusion

The 2024 Annual Report of the Blood Transfusion Division highlights significant progress and challenges in blood collection, processing, distribution, and safety, as well as innovations in delivery and donor mobilization efforts. Below are the key takeaways:

Blood collection, processing, and distribution – Key indicators

A total of 84,383 blood donations were collected in 2024, with 99.39% coming from non-IC25 members and only 0.61% from IC25 members. Performance of all RCBTs (planned units: 89,148 vs collected units: 84,383) stands at 94.65%. Blood processing followed strict quality and safety protocols, ensuring compliance with national and international standards. Blood component demand from hospitals remained high, requiring efficient distribution and inventory management to prevent shortages.

Laboratory – Key indicators

Blood safety screenings were conducted for all donations, ensuring a 100% compliance rate in testing for transfusion-transmissible infections (HIV, Hepatitis B & C, Syphilis). Quality control measures were enhanced, leading to improved efficiency in component separation and storage conditions. The introduction of advanced testing techniques further strengthened the reliability of blood and blood component safety.

Hospital satisfaction – Demand vs. Supply

The demand for blood components remained high, particularly for emergency cases (maternal health, pediatric patients, trauma cases, and chronic diseases such as cancer). Hospital satisfaction (demand: 127,198 units vs supply: 126,837 units) stands at 99.72%. This demonstrates efficient and continuous coordination between hospitals and blood banks improved timely access to required blood products.

Delivery of blood using ZIPLINE drones

The use of Zipline Drones significantly reduced delivery time, especially in remote and hard-to-reach areas. Emergency deliveries were completed within minutes rather than hours, enhancing response time for critical cases. The Drone delivery system ensured consistent blood supply to rural hospitals, reducing wastage and improving access to life-saving transfusions.

Hemovigilance system – Monitoring & Safety

The hemovigilance system recorded and monitored adverse transfusion reactions, ensuring safe and effective blood usage. Traceability of blood components was enhanced, improving patient safety. Training programs were conducted for hospital staff to reinforce proper transfusion practices and adverse reaction management.

Blood donor mobilization activities in 2024

Mass mobilization campaigns were conducted, targeting universities, workplaces, and communities. The Intwari Club 25 program engaged young donors, though its contribution remained low (0.61% of total donations), indicating a need for more engagement efforts.

Collaboration with corporate organizations, religious institutions, and NGOs led to an increase in voluntary non-remunerated blood donations (VNRBD).

Final remarks

The 2024 Blood Transfusion Division report highlights strong progress in blood collection, processing, and distribution, while also addressing challenges in demand vs. supply, donor retention, and logistics. Innovations like ZIPLINE Drone delivery and enhanced hemovigilance systems significantly improved efficiency and patient safety. Going forward, sustained donor engagement, expanded community outreach, and technological advancements will be crucial in ensuring a stable, safe, and sufficient blood supply for all.

Future plans and projects

100% hospital satisfaction While the hospital satisfaction rate stands 99,72% in 2024, BTD is projecting to satisfy health facilities' demands at 100% by 2025.

NAT (Nucleic Acid Testing) BTD is planning to introduce the NAT (Nucleic Acid Testing). It is a molecular technology for screening blood donations aimed at reducing the risk of TTIs (Transfusion Transmitted Infections) in the recipients, thus providing an additional layer of blood safety. NAT technology is highly sensitive and specific for viral nucleic acids.

It is based on amplification of targeted regions of viral ribonucleic acid or deoxyribonucleic acid (DNA) and detects them earlier than the other screening methods thus, narrowing the window period of HIV, HBV and hepatitis C virus (HCV) infections.

NAT also adds the benefit of resolving false reactive donations on serological methods which is very important for donor notification and counseling. This technology is planned to be implemented in the Financial Year 2024 – 2025.

Plasma derived medicinal product Blood plasma fractionation is a general process of separating the various components of plasma, a component of blood obtained through blood fractionation; to save plasma that is usually discarded.

RBC is planning to cooperate with advanced plasma fractionation plants and start exporting its excess manufacturing of stable blood products that are needed in managing various hematological plasma for disease conditions.

Partners and sponsors

Africa Society of Blood Transfusion

Belgian Red Cross

Global Fund

Imbuto Foundation

Indian Association in Rwanda

Local Leaders

National Youth Council

Religious congregations

Rwanda Defense Force

Rwanda National Police

Rwanda Red Cross

Schools, Universities and colleges

ZIPLINE Rwanda

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