Global status report on blood safety and availability 2025

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Preface

Since 1975, the World Health Assembly has consistently underscored the global imperative of blood safety and availability through the adoption of multiple resolutions. These actions have elevated blood safety as a priority within both global and national health agendas. Today, the World Health Organization (WHO) blood programme operates within the Department of Medicines and Health Products Policies and Standards. Together with other programmes in the department, it contributes to achieving WHO's 14th Programme of Work strategic objective: strengthening national health systems and ensuring universal access to health services, health products, and technologies.

A cornerstone of this effort is the Global Database on Blood Safety (GDBS), which collects and consolidates essential data from countries worldwide. These data encompass indicators across the entire transfusion chain – from donor recruitment to recipient care – providing a robust evidence base for policy dialogue and decision-making. GDBS global status reports inform WHO's global strategies on blood safety and underpin initiatives such as the WHO Action Framework to Advance Universal Access to Safe, Effective and Quality-Assured Blood Products 2026–2030.

The *Global status report on blood safety and availability 2025* highlights persistent challenges, notably inadequate governance and insufficient, unsustainable financing of blood services, which remain major barriers in many low- and middle-income countries (LMICs). The report also provides updates on progress made by Member States in diversifying plasma collection and advancing toward a sustainable and secure global supply chain for plasma-derived medicinal products. Acknowledging the limitations of measuring system components such as governance and regulatory oversight through a small set of survey indicators, this report also incorporates country case studies to illustrate practical approaches and lessons learned.

Access to sufficient, secure supplies of blood and blood products, coupled with safe transfusion practices, is a fundamental component of resilient health systems and a critical enabler of universal health coverage. Despite notable progress over the past decade, universal access to safe blood and blood products remains elusive for many countries. Achieving sufficiency, safety, accessibility and equity will require sustained commitment, rigorous monitoring and coordinated action at both national and global levels.

I thank all ministries of health for their vital contributions to the WHO Global Database on Blood Safety. Your engagement is key to advancing safe and equitable access to blood and blood products worldwide. I encourage you to continue supporting WHO and Member States by providing timely data reporting and feedback, which are essential for monitoring progress and guiding coordinated action. Together, we can strengthen health systems and further advance universal access to safe blood and blood products.

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List of abbreviations and acronyms

AABB	Association for the Advancement of Blood and Biotherapies
Ab	antibodies
AfSBT	Africa Society for Blood Transfusion
Ag	antigens
anti-HBc	hepatitis B core antibody
AP	apheresis
CI	confidence interval
cryo	cryoprecipitate
EQAS	external quality assessment scheme(s)
FFP	fresh frozen plasma
FP	fresh plasma
GDBS	Global Database on Blood Safety
GMP	good manufacturing practice
HBsAg	hepatitis B surface antigen
HBV	hepatitis B virus
HCV	hepatitis C virus
HEV	hepatitis E virus
HICs	high-income countries
HIV	human immunodeficiency virus
HTLV	human T-lymphotropic virus
IQR	interquartile range
IVIG	intravenous immunoglobulin
LMICs	low- and middle-income countries
NAT	nucleic acid amplification testing
NBTS	national blood transfusion service
PBM	patient blood management
PDMP	plasma-derived medicinal product
PLT	platelets
RNA	ribonucleic acid
RR	relative risk
SARA	Service Availability and Readiness Assessment
TTI	transfusion-transmissible infection
VNRD	voluntary non-remunerated donation
WB	whole blood
WHO	World Health Organization

chapter 1

Introduction

Established in 1998, the WHO Global Database on Blood Safety (GDBS) (*1*) collects and analyses data on blood collection, testing, processing and clinical transfusion, as well as progress by WHO Member States in ensuring quality-assured plasma for plasma-derived medicinal products (PDMPs). The GDBS tracks the status and advancement of countries in establishing governance and the appropriate organization of national blood supply and clinical transfusion systems.

The WHO *Global status report on blood safety and availability 2025*, based on data reported by Member States through the GDBS, provides an overview of global status and trends in blood supply, safety, sufficiency and usage. It shows how countries are progressing towards achieving the goal of a well governed and effective national blood system.

This chapter describes the survey design, response rates, data included for analysis and key considerations for interpreting findings.

Data included for analysis were primarily for 2023, as reported by 153 countries. To give a more complete overview of the global situation, data for 2020 for two countries and data for 2018 from 13 countries were used where 2023 data were not available. These 168 countries[1] account for a total population of 7.2 billion, representing 97% of the global population. Annex 1 presents a list of the 168 countries with the GDBS data being analysed for this report (African Region 45 of 47; Region of the Americas 31 of 35; South-East Asia Region 11 of 11;[2] European Region 42 of 53; Eastern Mediterranean Region 17 of 21; and Western Pacific Region 22 of 27).

Data were collected from ministries of health (with some responses from national blood services) using standardized terminology for consistency. Validation was conducted through WHO regional and country offices, with follow-up on discrepancies and comparisons with other sources where possible. Throughout the questionnaire, comment boxes were included after certain Yes/No questions or at the end of each section, allowing countries to provide additional information or explanations in cases where a simple Yes/No response would not adequately capture the nuanced situation. However, not all data could be systematically verified, and responses on policies or mechanisms may reflect individual interpretation.

[1] For simplicity, data from these 168 countries are referred to as GDBS 2023 data throughout the report.

[2] In accordance with resolution WHA78.25 (2025), Indonesia was reassigned to the WHO Western Pacific Region as of 27 May 2025. In this instance, data analysis had already been completed with data pertaining to Indonesia included in the South-East Asia regional aggregates. WHO regional comparisons must be done with caution.

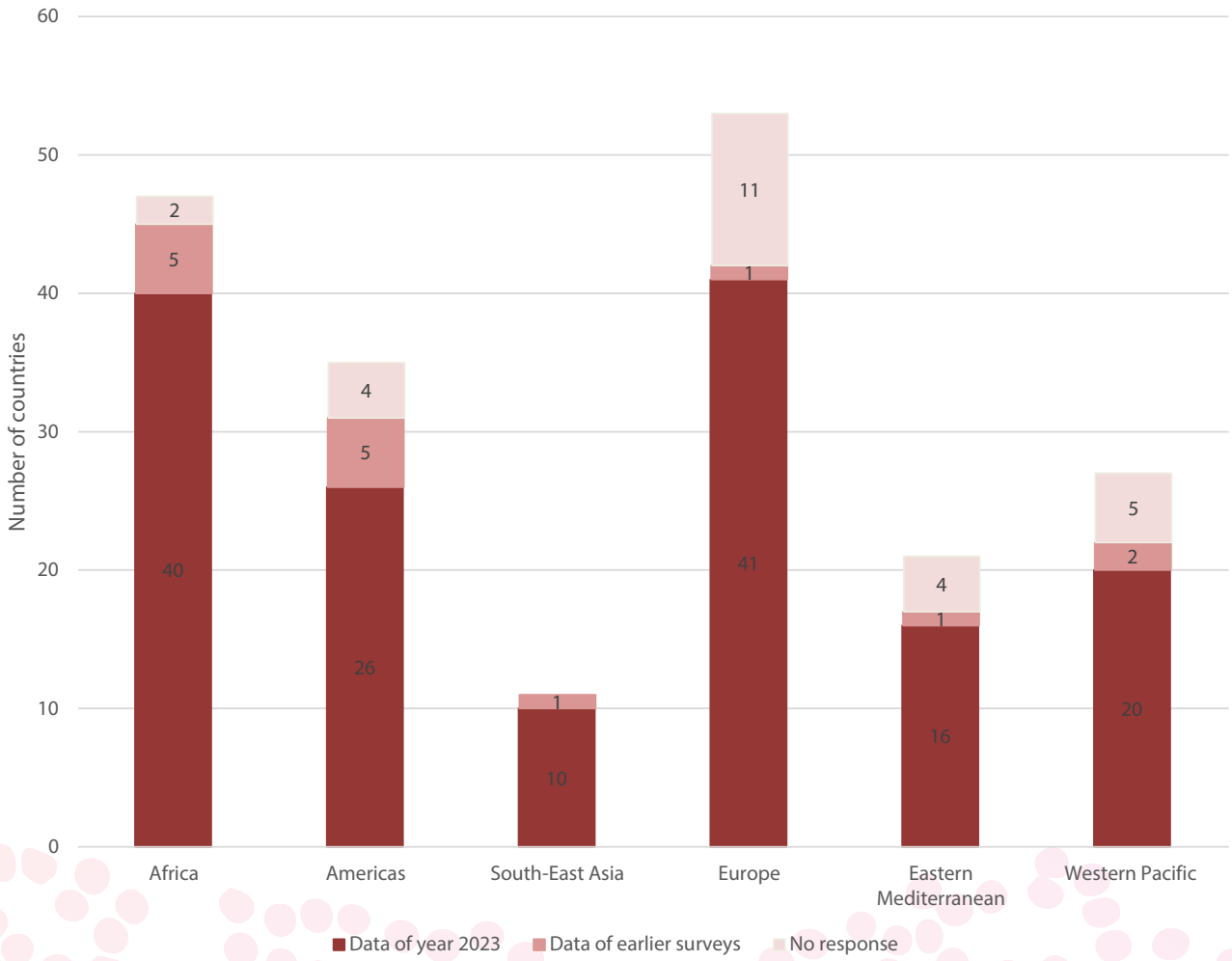
Data were usually analysed by WHO region and World Bank income group. Because aggregated trends of some key indicators can be skewed by countries with large collection or transfusion numbers, supplemental country-level analysis was included in some cases to provide a more nuanced perspective.

Not all 168 respondents answered every question, leading to small sample sizes in some regional or economic group analyses. These findings should be interpreted with caution, as nonresponse bias may occur if countries with less favourable situations are more likely to leave questions unanswered. Sample sizes (n) are shown with reported statistics.

The 2023 survey was sent to all 194 Member States. Forty-one Member States (21%) did not provide a response. The regional distribution of non-respondents (the percentage of non-responders of all countries in the region) was seven (15%) in the African Region, nine (26%) in the Region of the Americas, one (9%) in the South-East Asia Region, 12 (23%) in the European Region, five (24%) in the Eastern Mediterranean Region and seven (26%) in the Western Pacific Region. Data from previous surveys (13 for 2018 and two for 2020) were used where available, but there remain 26 Member States for which no information was available – two (4%) in the African Region, four (11%) in the Region of the Americas, zero (0%) in the South-East Asia Region, 11 (21%) in the European Region, four (19%) in the Eastern Mediterranean Region and five (19%) in the Western Pacific Region (Fig. 1.1). The population of the 26 Member States with no information constitute less than 3% of the global population. Variations in response rate by region needs to be taken into account when comparing regional differences in the survey data.

It is important to gather comprehensive data to ensure an accurate reflection of the global blood safety situation and ministries of health are encouraged to provide regular feedback to these surveys.

Fig. 1.1 Regional distribution of data sources used in the analysis



chapter 2

Organization and management of national blood transfusion services

2.1 Policy and governance

A total of 135 countries (80%) had a unit within the ministry of health (or other government department) with responsibility for governing all activities related to provision and transfusion of blood and blood products (Table 2.1). In addition, 133 countries (79%) had a national blood policy and 103 countries (61%) had a multiyear national strategic plan for blood safety. In 120 countries (71%) there was specific legislation or other legal instruments covering the safety and quality of blood and blood products for transfusion. In 99 countries (59%), a national blood committee (or equivalent) assisted the ministry of health in formulating policy and plans, setting standards and advising on key issues. In 89 countries (53%), an annual report of activities of the national blood programmes was published.

Table 2.1 Policy and governance results: responses by countries, 2023

Provision	Yes	No	No information
Unit within the ministry of health responsible for blood transfusion	135	29	4
National blood policy	133	31	4
Multiyear strategic plan for blood safety	103	52	13
Specific legislation covering safety and quality of blood and blood products	120	44	4
National blood committee	99	64	5
Published annual report	89	62	17

A number of responding countries did not provide answers to these fundamental policy questions. Countries that provided a No answer may be those with effective blood transfusion services but with different policy and governance arrangements in place, or those where there was a lack of effective policy and governance, which could have an adverse impact on transfusion capacity and safety. It is important to distinguish between these two scenarios. Follow-up of these responses may be appropriate to determine if questions or definitions should be modified in future questionnaires to ensure that all effective policy and governance models are accommodated and reported accordingly.

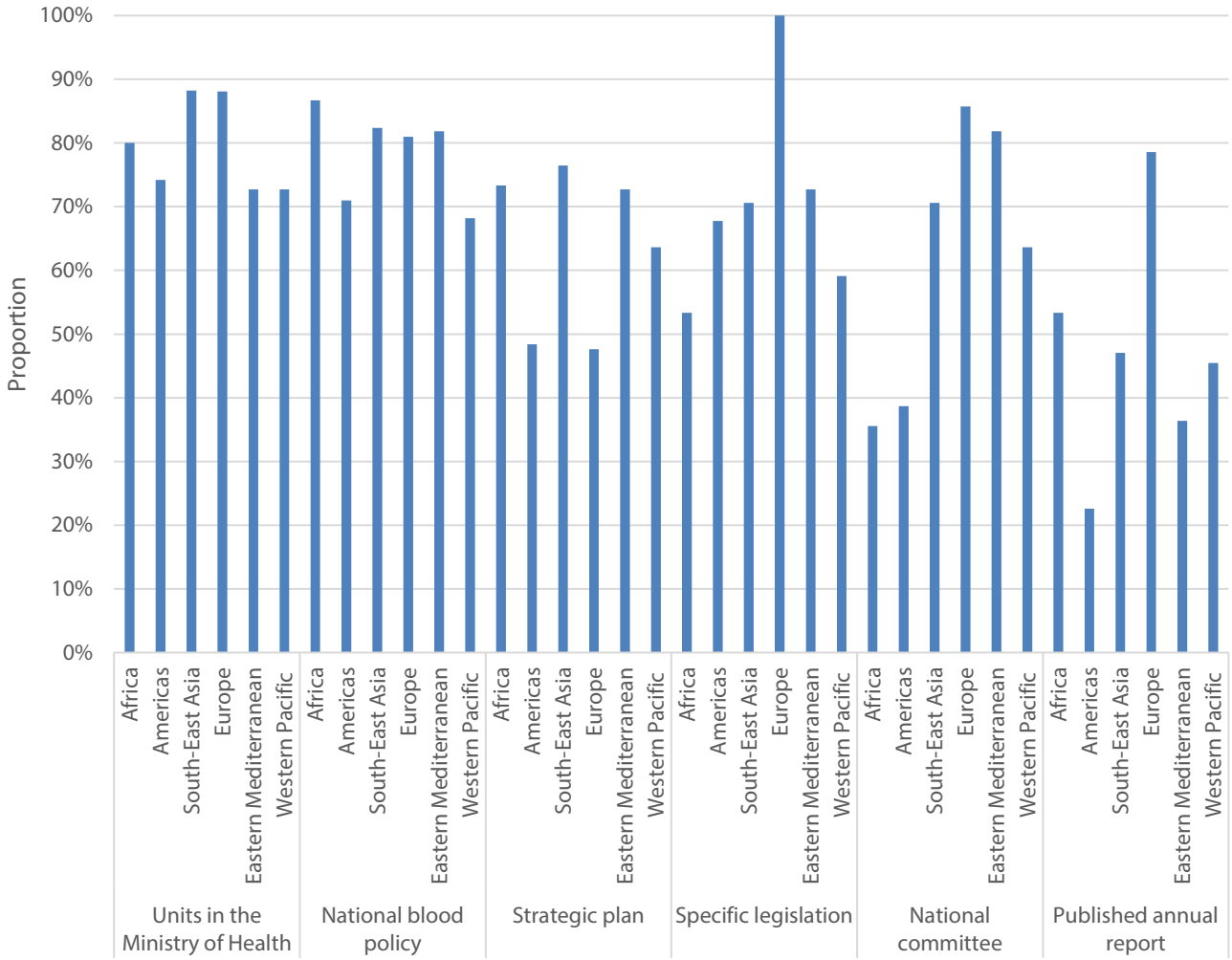
Compared with the data from 2018, some additional countries reported having specific legislation or other legal instruments in place to ensure the safety and quality of blood and blood products for transfusion. Box 1 shows how

legislation was developed in Ghana in 2022. However, the absence of such legislation in many (29%) countries remains a significant concern. Registration, licensing, regulation and inspection of blood services, all of which are essential to ensuring safety, quality and availability of blood, require an appropriate legislative framework to operate effectively. The national blood policy and multiyear strategic plan then translate the law into priorities and resources needed to implement the law, while published annual reports underpin transparency, accountability and continuous improvement.

Across the WHO regions (ranked by percentage), 15 (68%) countries in the Western Pacific, 22 (71%) in the Americas, 34 (81%) in Europe, 14 (82%) in the Eastern Mediterranean, nine (82%) in South-East Asia and 39 (87%) in Africa reported having a national blood policy. Similarly, 20 (48%) countries in Europe, 15 (48%) in the Americas, 14 (64%) in the Western Pacific, 33 (73%) in Africa, eight (73%) in South-East Asia and 13 (76%) in the Eastern Mediterranean reported having a multiyear strategic plan for blood safety in 2023 (Fig. 2.1).

A total of 120 countries (71%) reported the existence of specific legislation covering the safety and quality of blood transfusion, compared with 113 (66%) in 2018 and 92 (56%) in 2008. Across WHO regions (ranked by percentage), 24 (53%) countries in Africa, 13 (59%) in the Western Pacific, 21 (68%) in the Americas, 12 (71%) in the Eastern Mediterranean, eight (73%) in South-East Asia and 42 (100%) in Europe reported having such legislation (Fig. 2.1).

Fig. 2.1 Governance mechanisms for blood transfusion by WHO region, 2023



Box 1. Development of the Ghana National Blood Service Law

The legislative process leading to the enactment of the National Blood Service Act, 2022 (Act 1042) began with a policy proposal by the then National Blood Service (NBS), which was an entity without legislative backing. The proposal sought to establish NBS as a statutory body under the Ministry of Health.

In line with a government developmental agenda and due process, the Minister for Health endorsed and advanced the proposal by developing the National Blood Service Policy, as a basis for the Bill; and a draft National Blood Service Bill, setting out the provisions that needed to be legislated. The NBS and Ministry of Health worked together closely and conducted several multisectoral stakeholder consultations on both documents.

The draft Bill was then submitted by the Ministry of Health to the Office of the Attorney-General for legislative drafting. Subsequently, the Policy and the draft Bill were transmitted to Cabinet through a Cabinet Memorandum, which detailed the policy options and implications and stakeholder consultations, to seek executive approval.

Following Cabinet approval in March 2020, the Bill was laid before Parliament by the Minister for Health (commonly referred to as the "first reading"). After laying, the Bill was referred to the Parliamentary Select Committee on Health for the second reading. In line with procedure, the Select Committee invited the public to submit memoranda which were extensively and thoroughly discussed, and the Bill was modified accordingly.

The Select Committee subsequently compiled and submitted its report to Parliament for consideration and adoption during the third reading of the Bill. After receiving parliamentary approval, the Bill was transmitted to the President of the Republic of Ghana for Presidential Assent.

The Bill became law in December 2022 and was published in the official Government Gazette as the National Blood Service Act, 2022 (Act 1042). This Act established the NBS as a body corporate with perpetual succession.

The enactment of the National Blood Service Act, 2022 represents a major milestone in Ghana's efforts to strengthen its national blood system and aligns with global standards promoting a safe and sustainable blood supply.

Following the passage of the Act, the NBS is currently developing subsidiary legislation to provide detailed provisions for its implementation, translating the broad framework of the parent Act into actionable regulations.

Source: National Blood Service Act, 2020 (https://ghalii.org/akn/gh/act/2020/1042/eng@2020-12-29).

2.2 Inspection and licensing

The survey asked 139 of the 168 responding countries about the existence of a national regulatory authority for blood establishments. This question was not included for most countries in the Region of the Americas, except for Canada and the United States. Among the countries that were asked, 81 of 139 (58%) countries had a national regulatory or competent authority for blood establishments.

107 of 168 countries (64%) had a system of regular inspection of blood transfusion services by the national regulatory agency or another entity. Similarly, 104 countries (62%) had a system of licensing of the national blood transfusion service (NBTS) or other blood transfusion services by the national regulatory agency or another entity. 68 countries (40%) indicated that some of their blood establishments are accredited. The type of accreditation varied with some holding blood transfusion-specific accreditation (e.g. Association for the Advancement of Blood and Biotherapies [AABB], African Society for Blood Transfusion [AfSBT]) and other having more general ISO accreditation for medical laboratories and quality systems. It would be helpful to gather more detailed information on accreditation in a future survey (Table 2.2).

Table 2.2 Inspection and licensing results for responding countries, 2023

	Yes	No	No information
Is there a national regulatory authority for blood establishments?	81	42	16
Is there a system of regular inspection(s) of the NBTS/blood transfusion service(s) by the national regulatory agency or another entity?	107	51	10
Is there a system of licensing of the NBTS/blood transfusion service(s) by the national regulatory agency or another entity?	104	48	16
Are NBTS/blood transfusion service(s) accredited?	68	88	12

A total of 29 countries – 17 in Africa, two in the Americas, three in South-East Asia, one in the Eastern Mediterranean and six in the Western Pacific – reported the absence of all three of the above-mentioned inspection, licensing and accreditation mechanisms. A total of 38 countries reported an absence of both licensing and accreditation. This lack of oversight for the safety and quality of blood supplies in these countries is a serious concern.

Compared with the 2018 GDBS survey data, the number of countries responding No has decreased. However, more countries chose not to answer the questions, which may reflect the nuanced reality of diverse programmes in place and highlight limitations in the GDBS questionnaire's ability to capture accurate information through its current survey format. A more comprehensive assessment using the WHO Global Benchmarking Tool Plus Blood (GBT+Blood) (*2*, *3*) could provide more accurate and detailed insights into blood regulation systems in countries.

Ensuring a safe and effective blood supply requires a well-defined system of governance. Such a system needs to:

- clearly document which organizations are authorized to participate in provision and use of blood;
- define standards that such organizations and their employees are required to satisfy;
- maintain appropriate independent oversight to ensure compliance with such standards; and
- have the means to enforce compliance.

The mechanisms to achieve these governance objectives will vary from country to country. However, it is incumbent on governments to ensure that a system is in place that can effectively deliver all of these outcomes. Box 2 describes the governance arrangements of the blood sector in Australia. For the governance arrangements of other countries reporting to WHO, see Annex 10.

The WHO *Aide-mémoire: developing a national blood system for ministries of health* states: "Regulatory mechanisms should be established for the control, inspection and licensing of blood transfusion services to enforce blood product standards and monitor product safety" (*4*). The number of countries that lack systems to license and inspect blood transfusion services continues to be a serious concern.

Across the WHO regions (ranked by percentage), a system of inspection was reported in 16 (36%) countries in Africa, 19 (61%) in the Americas, 11 (65%) in the Eastern Mediterranean, 15 (68%) in the Western Pacific, eight (73%) in South-East Asia and 39 (93%) in Europe. Compared with 2018 GDBS survey data, there has been little to no change in the figures or percentages reported for this indicator across most regions, except in Europe.

A system of licensing (ranked by percentage) was reported in 17 (38%) countries in Africa, 10 (45%) in the Western Pacific, 19 (61%) in the Americas, seven (64%) in South-East Asia, 36 (86%) in Europe and 15 (88%) in the Eastern Mediterranean. Accreditation of blood transfusion services (ranked by percentage) was reported in seven (23%) countries in the Americas, 12 (27%) in Africa, seven (41%) in the Eastern Mediterranean, five (45%) in South-East Asia, 10 (45%) in the Western Pacific and 27 (64%) in Europe. Among the 12 African countries, seven reported achieving varying levels of accreditation through the AfSBT. In the 2018 GDBS survey, only six out of 42 (14%) countries in the African Region reported accreditation of blood transfusion services.

The existence of a national regulatory authority for blood establishments (ranked by percentage) was reported in 18 countries (40%) in Africa, 11 (50%) in the Western Pacific, nine (53%) in the Eastern Mediterranean, six (55%) in South-East Asia and 35 (83%) in Europe. The GDBS survey on the existence of a national regulatory authority for blood establishments does not include countries in the Region of the Americas, except for Canada and the United States of America.

Box 2. Governance arrangements, regulations and financing of the blood sector in Australia

Australia operates a nationally coordinated, government-led blood system designed to ensure a safe, secure and affordable blood supply for all citizens. The federated system was established in 2003 following the signing of the National Blood Agreement, by the Commonwealth, six states and two territories. The Agreement created a unified framework for policy, governance and funding, following major reviews that identified inefficiencies, fragmentation and rising costs.

The National Blood Authority (NBA), operating under the National Blood Authority Act 2003, is a statutory body and portfolio agency of the Australian Government Department of Health and Aged Care. It is the central agency responsible for managing and coordinating the supply of blood, blood products and blood services to meet the needs of Australian patients, within the resources and policy parameters set by all Australian governments.

The national policy is determined by health ministers. The Jurisdictional Blood Committee, comprising of senior officials from each jurisdiction, advises the NBA on jurisdictional matters related to planning, production, supply and budgeting for the national blood supply.

Funding for the blood system is shared between the Australian Government (63%) and the states and territories (37%). Blood and blood products are provided at no cost to patients. In 2023–2024, the government allocated approximately AUD$ 1.7 billion for the supply of blood and blood products and services.

The NBA negotiates and manages contracts for the supply of blood and blood products. Suppliers include the Australian Red Cross Lifeblood (Lifeblood) – the sole collector and supplier of fresh blood products. All blood and plasma donations in Australia are collected from voluntary, non-remunerated donors, with over 1.64 million donations recorded in 2023–2024. Donated plasma is supplied to CSL Behring – Australia's sole fractionator – for processing into plasma-derived products for Australian patients. In 2023–2024 nearly 870 tonnes of plasma was collected.

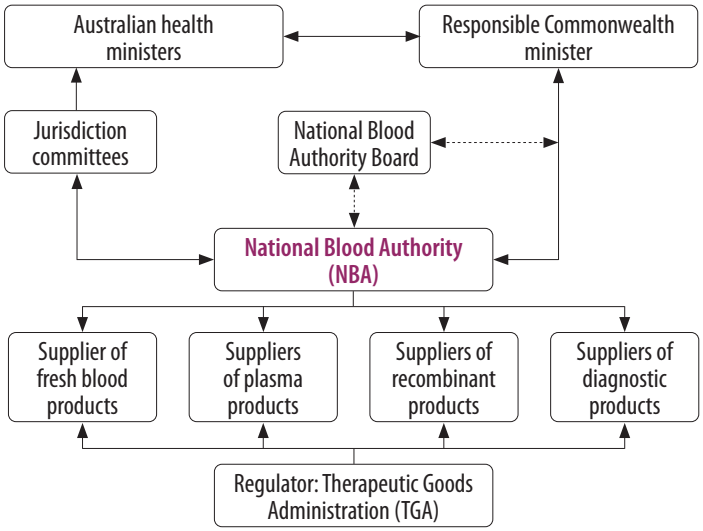
The NBA also funds and manages the development of guidelines and resources for blood product use and management, including the patient blood management guidelines, which are based on systematic reviews of scientific literature and clinical expert consensus.

Hospitals and laboratories order blood and blood products through national online blood sector systems managed by the NBA. These systems support health professionals in managing product orders, patient treatments, inventory and reporting.

The manufacture, supply and administration of all blood and blood products, whether Australian or imported, must meet strict standards. Additional legislation governing the safety and quality of blood and blood products includes the Therapeutic Goods Act 1989 and the National Safety and Quality Health Service Standards (NSQHS). Responsibility for producing safe and effective blood products rests with the manufacturers of those products.

Box 2. Governance arrangements, regulations and financing of the blood sector in Australia (continued)

The key governing bodies in the Australian blood sector and their relationships are summarized below.



Further information on strategic priorities and performance is available in the NBA's corporate plan and *2023–24 annual report*.

Therapeutic Goods Administration (TGA)

The TGA regulates blood, blood components and plasma derivative products in Australia under the Therapeutic Goods Act 1989. Its responsibilities include licensing manufacturers, establishing product standards, conducting inspections and audits of manufacturing facilities and product compliance, issuing directives such as donor deferrals and managing product recalls. The TGA also monitors adverse events related to transfusions and sets standards for donor selection to ensure products are safe, high quality and effective.

National Safety and Quality Health Service Standards (NSQHS)

These standards, developed by the Australian Commission on Safety and Quality in Health Care, are a set of eight standards used to accredit all health service organizations across a broad range of health care areas.

The purpose of the standards is to increase safety, improve the quality of health care and protect patients from harm. The standards describe the level of care that health service organizations should provide and the systems needed to deliver such care.

The NBA collaborated with the Commission and blood sector stakeholders to develop the Blood Management Standard, which aims to improve patient outcomes by:

- identifying risks;
- using strategies that optimize and conserve a patient's own blood; and
- ensuring that any blood and blood products that patients receive are safe and appropriate.

The Blood Management Standard covers all elements in the blood management and clinical transfusion process and includes the patient blood management (PBM) principles. It also defines three criteria and 10 actions that health service organizations must meet in:

- clinical governance and quality improvement to support blood management;
- prescribing and clinical use of blood and blood products; and
- managing the availability and safety of blood and blood products.

Box 2. Governance arrangements, regulations and financing of the blood sector in Australia (continued)

All public and private hospitals, day procedure services and public dental practices or health service organizations are required to be accredited to the NSQHS. The Commission uses feedback to identify areas where health services may require additional support or tools and to maintain and update the safety and quality standards assessed against the Blood Management Standard.

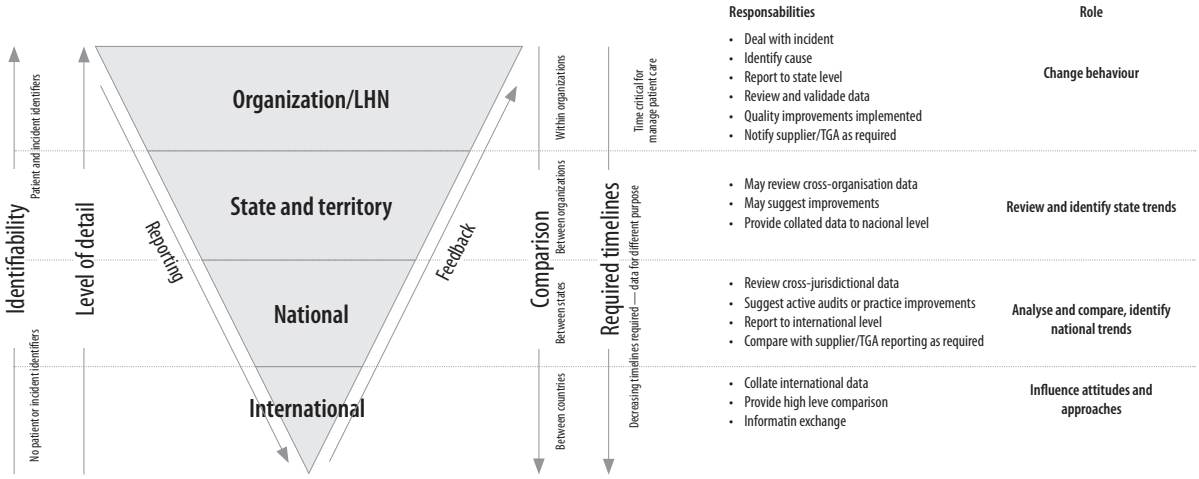
Haemovigilance

In addition to blood testing and donor screening, other haemovigilance processes are in place to safeguard the blood supply. Haemovigilance refers to the surveillance of the entire blood transfusion chain, from blood donation to patient follow-up after transfusion. It is a set of processes and procedures to:

- improve blood and blood product management; and
- monitor and improve safety for people donating or receiving blood.

The Strategic Framework for the National Haemovigilance Programme outlines the roles and responsibilities for haemovigilance in Australia at the national, jurisdictional and local level and is maintained by the NBA.

Haemovigilance in Australia – Roles and responsabilities



For further information on the strategic framework for the National Haemovigilance Program, see www.blood.gov.au/strategic-framework-national-haemovigilance-program.

The management of transfusion-related incidents and the implementation of haemovigilance process and governance improvements is the responsibility of local health services or in some circumstances the state or territory.

The NBA is responsible for the Australian Haemovigilance Minimum Data Set (AHMDS), which provides transfusion-related adverse event (TRAE) definitions (for fresh blood only) to enable consistent data collection and analysis of adverse events occurring in Australian health service organizations. Haemovigilance data are collated by states and territories and submitted to the NBA, which publishes the results (see Haemovigilance reporting | National Blood Authority).

The Haemovigilance Advisory Committee provides advice to the NBA on the Australian Haemovigilance Report, adverse event reporting originating from health services, and on national blood transfusion safety priorities including opportunities for haemovigilance improvements.

Adverse events related to other blood products are the responsibly of the TGA, Australia's national regulator.

2.3 Finance

A total of 141 countries (83.9%) reported that funding of transfusion services is provided by government budget or cost recovery. Table 2.3 shows more details of the funding models.

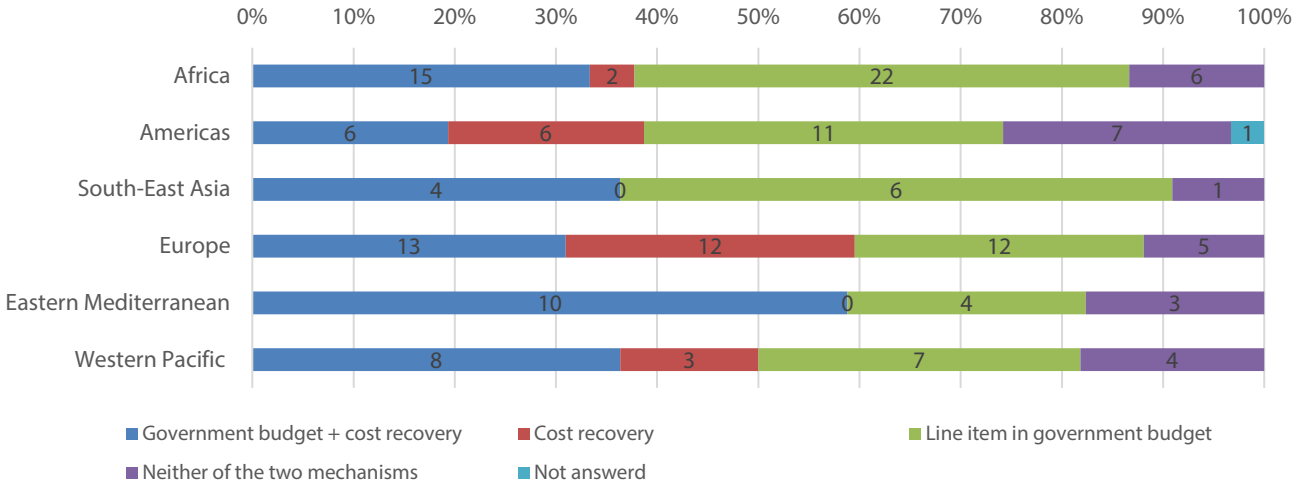
Table 2.3 Funding models for responding countries, 2023

Funding models	Number	%
Government budget + cost recovery system	56	33.3
Government budget has a specific line item for blood transfusion services	62	36.9
Cost recovery system for blood transfusion services	23	13.7
Neither of the two mechanisms	26	15.5
No response for both questions	1	0.6

These figures show little change from the last report, and it is of concern that 26 countries (15.5%) have neither a government budget nor a cost recovery system in place for the blood transfusion service.

Across WHO regions, 60% of countries (25 of 42) in Europe reported financing blood services through a cost recovery scheme, either partially or entirely. In Africa, government budget allocations were the main financing mechanism, where 49% of countries (22 of 45) financed blood services solely through government budget allocation (Fig. 2.2). Cost recovery reported might either be from the patient, hospitals, or be covered by health insurance.

Fig. 2.2 Systems of blood services financing



Caution is advised when interpreting the responses from the 26 countries that answered No to both questions in the GDBS questionnaire regarding mechanisms for financing blood services.[3] A review of comments provided by three of these countries (one in the Western Pacific and two in Europe) revealed that the actual situation may be more nuanced. For example, one country noted that "the government has not dedicated any funds for blood services; all funding is derived from hospital laboratory budgets". Two countries indicated that "blood establishments are hospital departments fully funded by the government, but the exact amount allocated is difficult to ascertain". Future questionnaires should be improved to include options such as "other financing mechanisms," along with space for countries to describe their actual funding arrangements in more detail.

[3] The two questions asked in GDBS 2023 questionnaire are: "2.8 Does the government budget include a specific line item for the NBTS/Blood establishments within the Ministry of Health or another government entity?"; and "2.9 Is there a system of cost-recovery for blood collection, processing, distribution and transfusion? (e.g. via health insurance schemes, direct payments, such as user fees, etc.)".

Thirty-six (56 in 2018) countries reported receiving financial support from international agencies or other organizations for blood services and 59 (74 in 2018) countries reported receiving technical support from international agencies or other organizations for blood services. Further information is provided in Table 2.4.

Table 2.4 International financial and technical support, 2023

Financial support from international agencies or other organizations for blood services	Technical support from international agencies or other organizations for blood services	Number
Yes	Yes	22
Yes	No	14
No	Yes	37

Countries receiving financial support included 19 (accounting for 42% of the reporting countries) in Africa, two (6%) in the Americas, five (60%) in South-East Asia, three (7%) in Europe, four (24%) in the Eastern Mediterranean and three (14%) in the Western Pacific.

Countries receiving technical support included 18 countries (40%) in Africa, 11 (35%) in the Americas, eight (73%) in South-East Asia, eight (19%) in Europe, seven (41%) in the Eastern Mediterranean and seven (32%) in the Western Pacific.

These figures indicate that, in comparison to the data from 2013 and 2018, international support and cooperation for blood safety, in particular for countries in Africa, has steadily declined over the period. International support and cooperation had played important roles in developing effective national blood systems and ensuring blood safety (*5, 6*). The trend of decreasing international support since the last report is of concern as many resource-limited countries still need such support. Additionally, this signals that domestic financing must expand to ensure blood safety and availability for the population.

Seventy-three countries provided data on the total funding[4] for the operation of the blood centres covered by the report. Looking at the relationship between total funding and total blood donations reported, varying funding levels per collection were found across country income groups (Table 2.5). In general, funding per collection was higher in more economically developed countries. There were also variations among countries in the same income group. It is of concern that many low- and lower-middle-income countries reported that funding per collection was very low, with three countries in these groups indicating that their funding sources were heavily dependent (over 50%) on external support.

Table 2.5 Total funding per collection by World Bank income group, 2023

World Bank income group	Total funding per collection (US$) (median, interquartile range [IQR])
High (n = 21)	323 (157–565)
Upper middle (n = 18)	126 (50–239)
Lower middle (n = 20)	53 (27–77)
Low (n = 14)	40 (21–94)

Whether through government budget allocations, cost recovery systems, combined mechanisms or other financing approaches, it is critical and urgent for all the Member States to establish a system that ensures sustainable, adequate and consistent funding for their blood programme. This system should be aligned with the broader national health financing framework. It is important that such a system does not create financial barriers for patients who require blood transfusions.

[4] The questions asked in GDBS 2023 questionnaire is: "2.11 What is the total funding (in US dollars) for operating the blood centres covered in this report (including staffing and operation)?" The following funding categories were collected: (i) Total funding; (ii) Total direct funding; (iii) Total funding from fees and cost recovery; and (iv) Total funding from external donors.

chapter 3

Collection of blood and blood components

3.1 Global overview of blood collection

It is estimated that just over 120 million blood donations were made in 2023. Of these, 111 million were whole blood donations and 9.4 million were apheresis donations (Table 3.1). These donations were collected from all types of blood donors: voluntary non-remunerated, family or replacement, and paid. This global estimate is based on collection data provided by 164 of the 168 responding countries. Four countries did not submit collection figures and were therefore excluded from the global estimation. The estimation has taken into consideration the partial data provided by a few countries with the reported figures being adjusted to reflect national totals based on the estimated coverage percentage of their data. Annex 1 provides a note on how the estimation of global blood collection was performed.

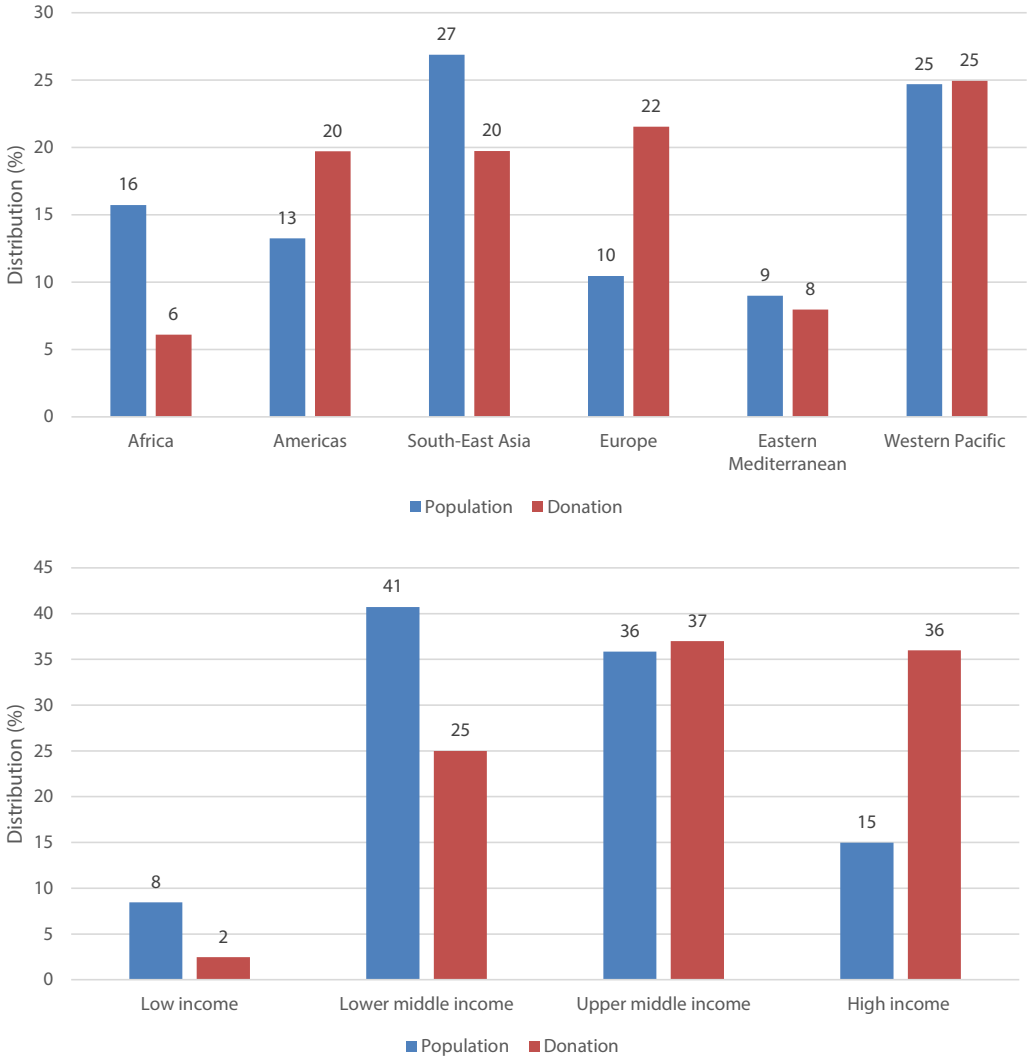
Table 3.1 Estimated blood donations by WHO region, 2023

Region	Estimated whole blood donations (millions)	Estimated apheresis donations (millions)	Total (millions)	% of global population
Africa	6.7	0.09	6.8	16%
Americas	21.8	1.7	23.5	13%
South-East Asia	22.0	0.05	22.0	27%
Europe	24.0	3.3	27.3	10%
Eastern Mediterranean	8.8	0.9	9.7	9%
Western Pacific	27.7	3.4	31.1	25%
Global (rounded totals)	**111.0**	**9.4**	**120.4**	**100%**

When the donation and population data are correlated and analysed by WHO region and World Bank income group, the level of availability of blood for transfusion is found to vary across WHO regions and World Bank income groups. For example, 45 countries in the African Region collected a total of about 6.7 million blood donations; these accounted for only about 6% of global donations, although these countries are home to around 16% of the global population. In the European Region, the number of reported donations represented 22% of the global total, though the region is inhabited by only 10% of the global population. Similarly, countries in the high-income group collected 36% of global donations, though their populations only account for 15% of the global population. Countries in the low-income

and lower-middle-income groups collected 2% and 25% of global donations, respectively, though their populations represent 8% and 41% of the global

Fig. 3.1 Distribution (percentage) of population and blood donations by WHO region and World Bank income group, 2023



There were wide variations in blood donation rates among countries, ranging from 0.4 to 53.0 per 1000 population. The whole blood donation rate (median) was 28.9 donations per 1000 population per year (range 9.8–53.8) in high-income countries (HICs), 18.2 (range 5.0–48.8) in upper-middle-income countries, 8.5 (range 1.7–25.6) in lower-middle-income countries and 4.5 (range 0.4–10.7) in low-income countries. Across WHO regions, the donation rates ranged as follows: 0.6 to 41.1 (median 6.0) in Africa, 1.7 to 39.6 (median 15.2) in the Americas, 3.7 to 43.1 (median 9.7) in South-East Asia, 5.0 to 53.8 (median 30.9) in Europe, 0.4 to 48.8 (median 14.2) in the Eastern Mediterranean and 5.6 to 45.5 (median 16.9) in the Western Pacific.

Fifty-five countries reported collecting less than 10 whole blood donations per 1000 population per year in 2023. Of these, 36 countries are in the WHO African Region, four in the Region of the Americas, six in the South-East Asia Region, three in the European Region, three in the Eastern Mediterranean Region and three in the Western Pacific Region. Twenty-four countries reported collecting less than five whole blood donations per 1000 population per year in 2023. Of these, 18 countries are in the WHO African Region, one in the Region of the Americas, three in the South-East Asia Region and two in the Eastern Mediterranean Region. By World Bank income group, 13 of these 24 countries

are low-income countries and 11 are lower-middle-income countries (Figs 3.2 and 3.3). Countries collecting less than five donations per 1000 population would face severe constraints in meeting essential transfusion needs.

Fig. 3.2 Distribution of countries by number of whole blood donations per 1000 population, 2023

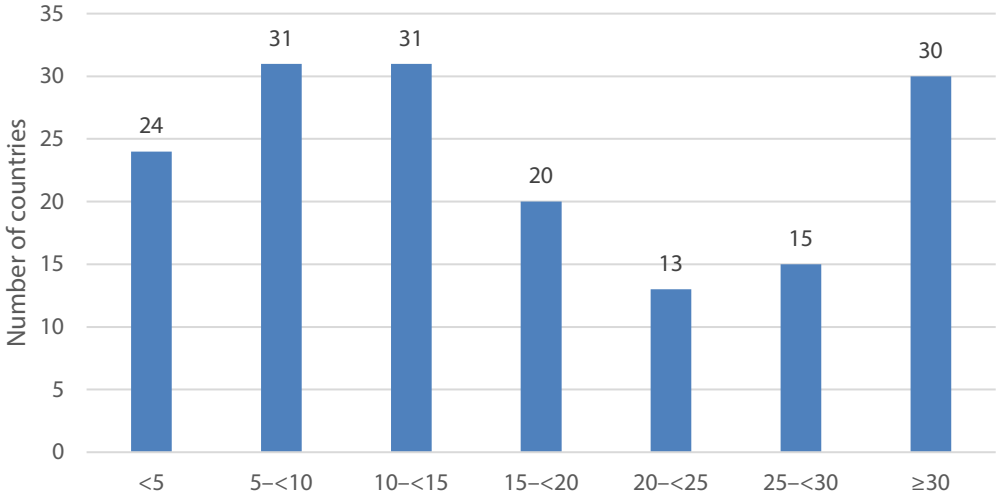
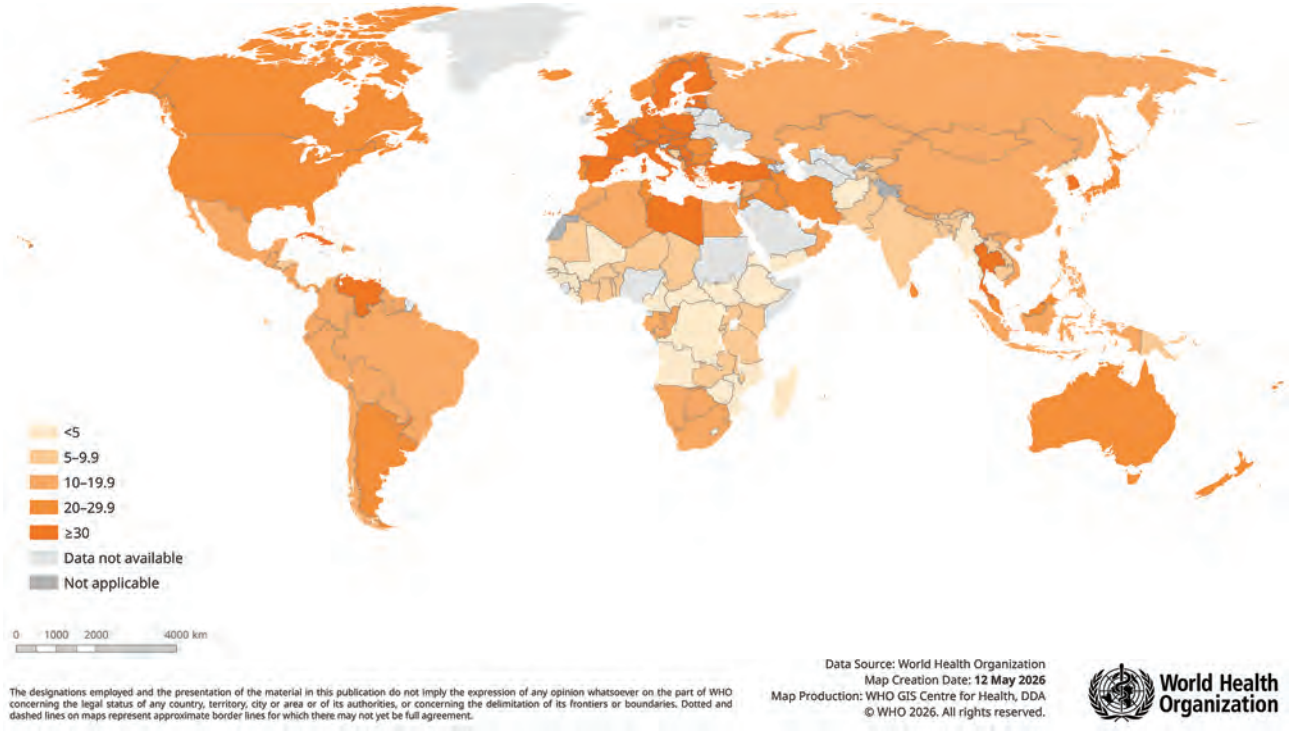


Fig. 3.3 Whole blood donations per 1000 population, 2023

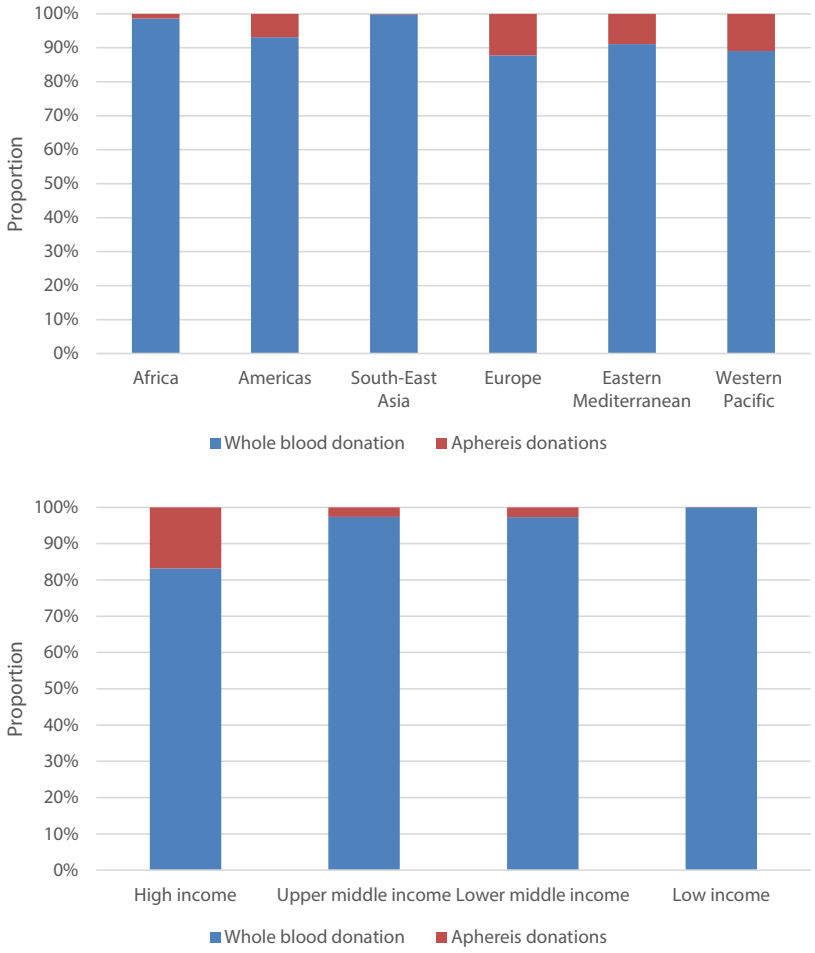


3.2 Whole blood collection and apheresis collection

From section 3.2 on, the data used in analysing the types of blood donations, processing, testing, discarding and clinical use, are as reported by countries, including partial data reported by countries (see Annex 1 for explanatory notes), rather than the estimated number based on the data coverage percentage. Where appropriate, analysis by WHO region and World Bank income group was also conducted.

Of the 168 responding countries, 103 reported both the number of whole blood donations and donations collected through apheresis procedures. Among the remaining 65 countries, 61 reported only the number of collections of whole blood donations. Four countries did not provide data on any type of blood donation. Of the 116 million total donations reported to the GDBS worldwide in 2023, 92% (107 million) were donated as whole blood and 7.8% (9.1 million) were collected through apheresis procedures. In HICs, 16.8% of all donations were collected through apheresis, compared with 2.7% in upper-middle-income countries and 2.6% in lower-middle-income countries. Across WHO regions, apheresis donations were mainly reported (in ranking of the total collections) in the European Region, the Western Pacific Region, the Region of the Americas and the Region of the Eastern Mediterranean, where 12.2%, 10.9%, 7.1% and 8.9%, (respectively) of the total donations were collected through apheresis procedures (Fig. 3.4).

Fig. 3.4 Method of collection of blood donations by WHO region and World Bank income group, 2023



3.3 Types of blood donations

3.3.1 Whole blood donations collected from VNRD and other types of donors

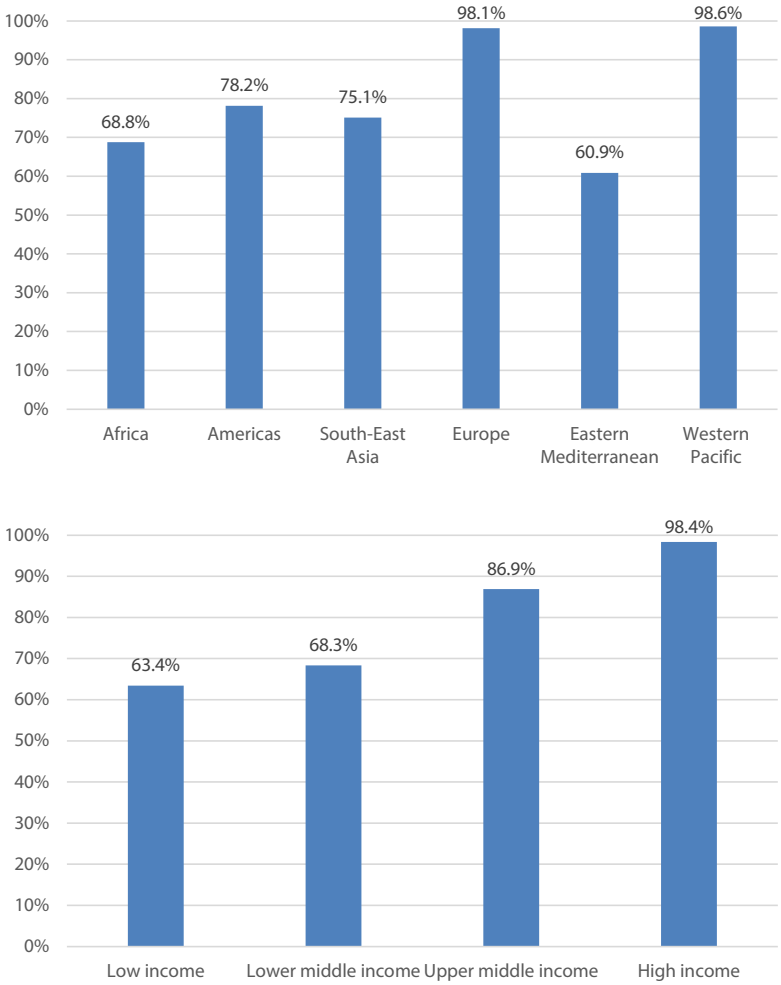
Overall, of the total 107 million whole blood donations reported to WHO GDBS, 91.4 million (85.4%) were reported as voluntary non-remunerated donation (VNRD), 14.4 million (13.5%) as family or replacement donations and 230 000 (0.2%) as paid blood donations. The categories of the other 0.9% (955 000) of donations were unknown.

In 2023, the proportion of voluntary non-remunerated whole blood donations in high-income, upper-middle-income, lower-middle-income and low-income groups were 98.4%, 86.9%, 68.3% and 63.4%, respectively. Higher income groups

in general had a higher proportion of blood collected from voluntary non-remunerated blood donors in surveyed countries (Fig. 3.5).

When analysed by WHO region, the proportion of voluntary non-remunerated whole blood donations varied from 60.9% in the Eastern Mediterranean Region to as high as 98.1% in the European Region and 98.6% in the Western Pacific Region. The proportion of VNRD in the African Region, South-East Asia Region and Region of the Americas was 68.8%, 75.1% and 78.2%, respectively (Fig. 3.5).

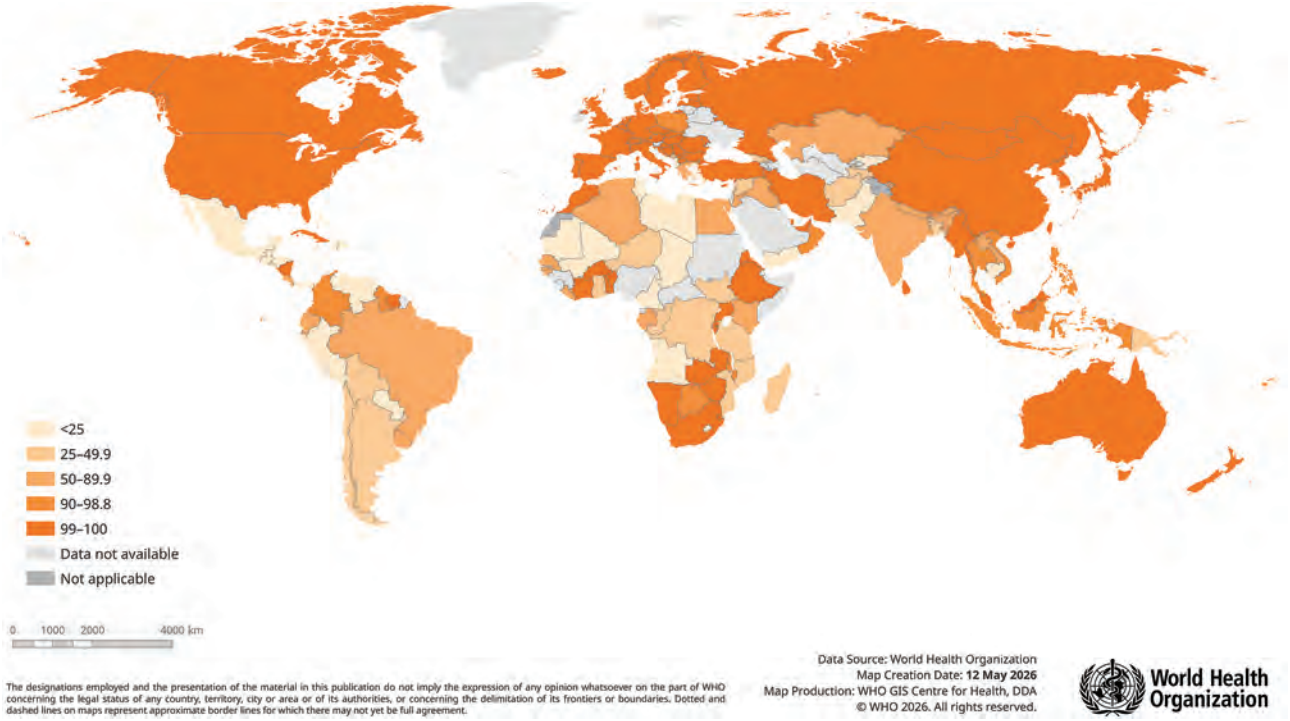
Fig. 3.5 Proportions of voluntary non-remunerated whole blood donations by WHO region and World Bank income group, 2023



While reviewing and comparing the proportion of collections via VNRD at the regional or economic group level can provide useful insights, it also carries the risk of obscuring important country-level variations and trends. Therefore, it is essential to monitor this key indicator at the individual country level. Globally, 80 countries collected more than 90% of their whole blood donations from VNRD: 16 in the African Region, seven in the Region of the Americas, six in the South-East Asia Region, 33 in the European Region, six in the Eastern Mediterranean Region and 12 in the Western Pacific Region. Seventy countries reported collecting 100% or over 99% of their blood supply from VNRD. Fifty-nine countries (16 in Africa, 20 in the Americas, three in South-East Asia, five in Europe, eight in the Eastern Mediterranean and seven in the Western Pacific) remained considerably dependent on family or replacement and paid blood donors, with these donations accounting for more than 50% of their blood supplies in 2023.

Fig. 3.6 shows the geographical distribution by country of the proportion of voluntary non-remunerated whole blood donations.

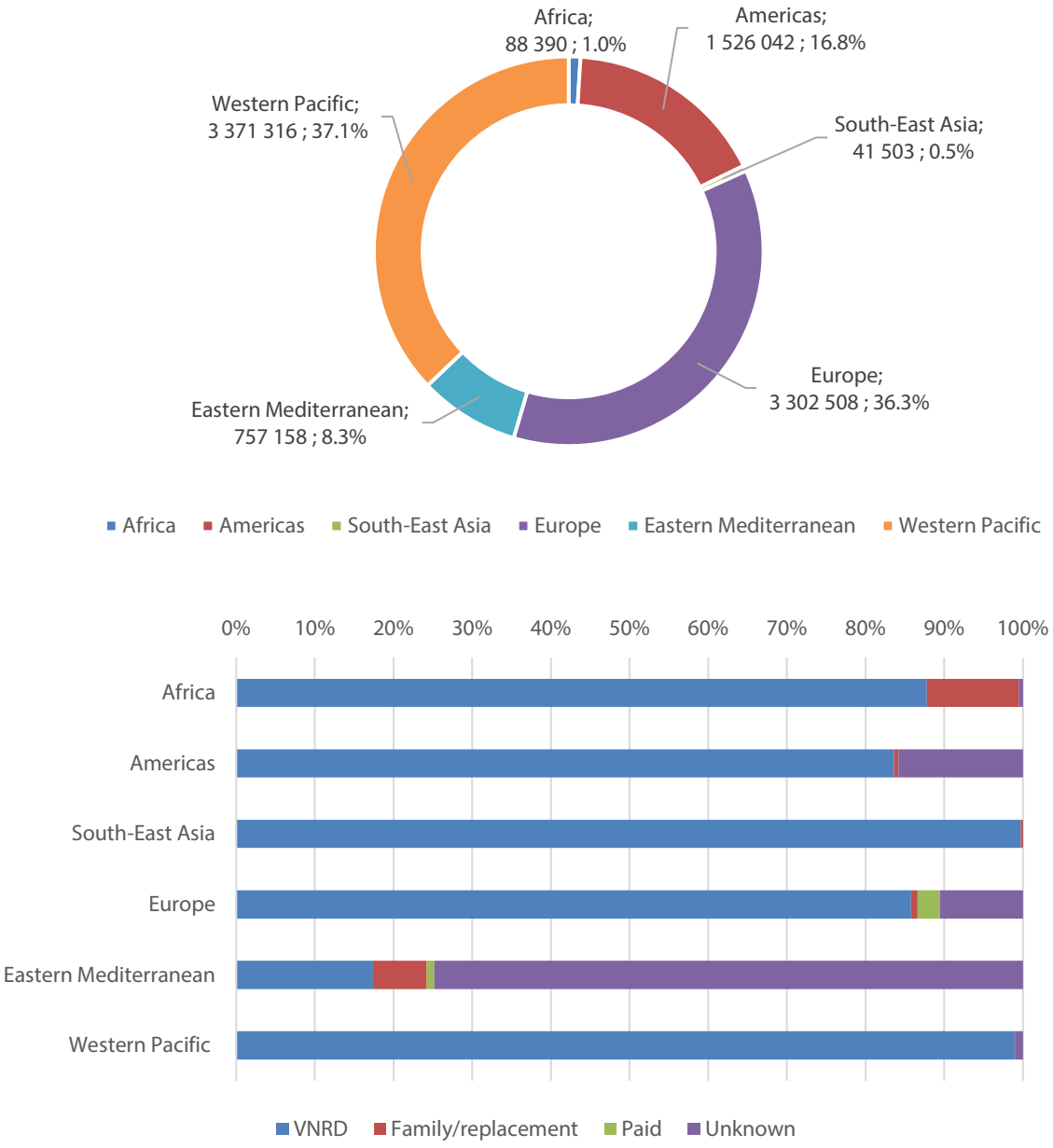
Fig. 3.6 Proportion of voluntary non-remunerated whole blood donations by country, 2023



3.3.2 Apheresis donations for clinical transfusion collected from VNRD and other types of donors

Globally, 84.7% of 9.1 million apheresis donations for clinical transfusion that were reported to WHO GDBS were given by VNRD, 1.1% by family or replacement donors and 1.1% by paid donors. The categories of the other 13.1% of donations were unknown. In the European Region, 85.8% of the 3.3 million apheresis donations were from VNRD, 0.8% from family or replacement donors, 2.9% from paid donors and 10.5% with the type of donations unknown. In the Western Pacific Region, the majority of the collections reported were from VNRD, totalling 3.4 million (98.9%). 83.6% of 1.5 million apheresis donations were collected from VNRD in the Region of the Americas, 0.6% from family or replacement donors and 15.8% with the type of donations unknown. In the Eastern Mediterranean Region, 17.4% of the total 0.8 million apheresis donations were from VNRD, 6.8% from family or replacement donors, 1.0% from paid donors and 74.8% with the type of donations unknown (Fig. 3.7). This report consistently documents that a high percentage of apheresis donations in certain WHO regions are reported as "donation type unknown" or "other type". To improve data accuracy in future surveys, the GDBS data collection tool should be enhanced to better capture donation type information.

Fig. 3.7 Total number of apheresis donations and distribution of donation types by WHO region, 2023



3.4 Trends in whole blood collections globally, 2013–2023

To assess the global trends in whole blood collections over the 10-year period, whole blood collection data from a total of 132 countries (Africa 37, Americas 23, South-East Asia seven, Europe 36, Eastern Mediterranean 12, Western Pacific 17), which were either reported to the GDBS by the countries for the years 2013, 2018 and 2023 or estimated when data for specific years were missing using the data for the years immediately before or after the year with missing data, were compiled and analysed.

Overall, total blood collections from all donor types increased by 8%, rising from 70.2 million in 2013 to 75.7 million in 2018. Between 2018 and 2023, collections further increased by 10%, reaching 83.5 million. Collections from VNRD also showed a consistent upward trend, increasing by 9% from 60.7 million in 2013 to 66.1 million in 2018, and by another 9% to 72.3 million in 2023 (Table 3.2).

By WHO region, all regions except Europe reported a steady increasing trend in total whole blood collections from all types of blood donors, as well as in donations from VNRD over the 10-year period. In the European Region, collections from VNRD increased slightly between 2013 and 2018, but then declined by 3% from 2018 to 2023. Overall collections from all donor types in Europe decreased by 3% between 2013 and 2018, followed by a further 4% decline from 2018 to 2023 (Table 3.2, Fig. 3.8).

Table 3.2 Voluntary non-remunerated donation and total whole blood collection in 132 countries (millions) by WHO region, 2013–2023

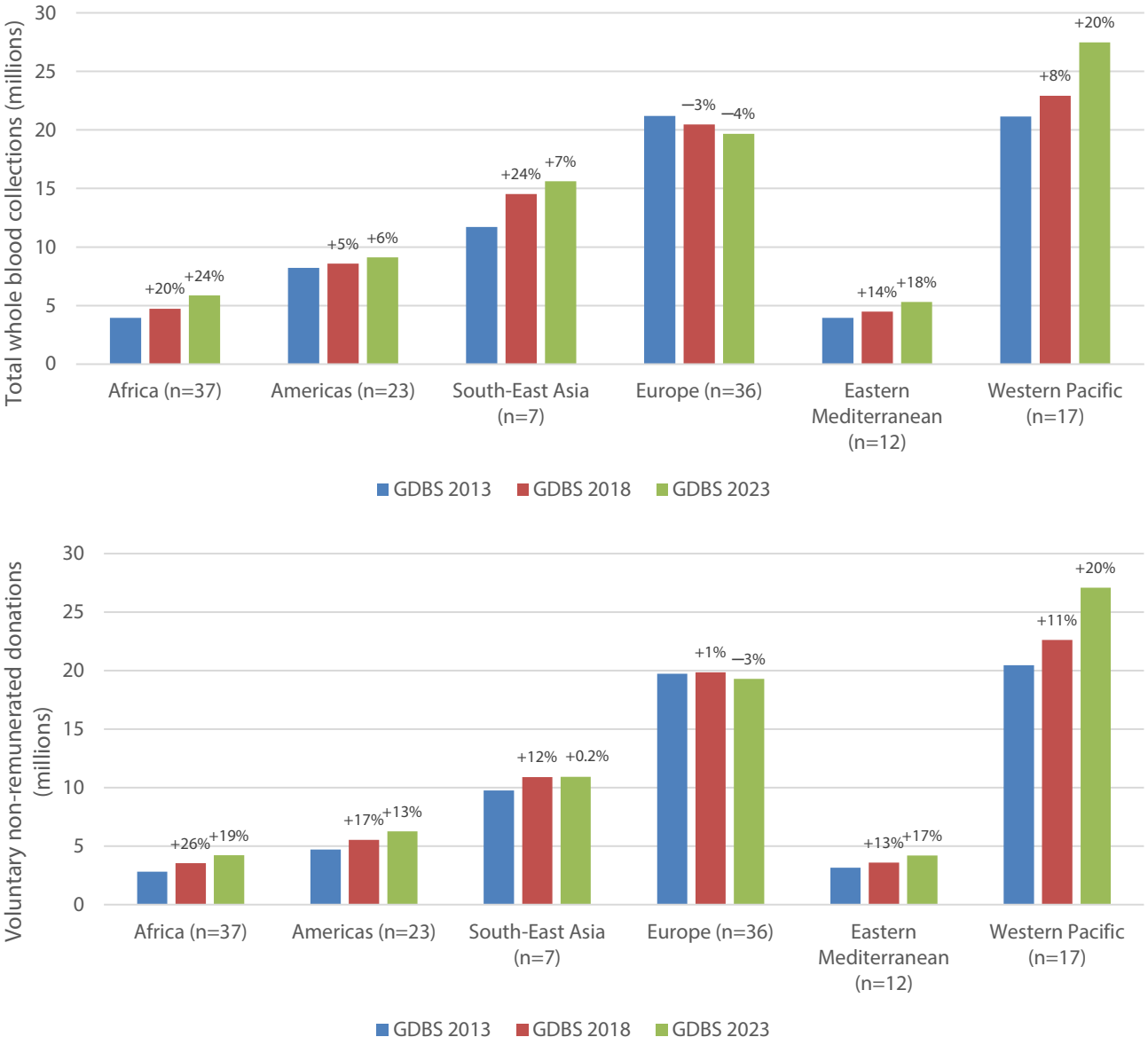
Region	Donation type	2013	2018	2023	Difference 2013–2018	Difference 2018–2023
Africa (n = 37)	VNRD	2.82	3.55	4.22	+26%	+19%
	Total donations	3.95	4.72	5.86	+20%	+24%
Americas (n = 23)[a]	VNRD	4.73	5.54	6.28	+17%	+13%
	Total donations	8.21	8.58	9.12	+5%	+6%
South-East Asia (n = 7)[b]	VNRD	9.77	10.91	10.93	+12%	+0.2%
	Total donations	11.71	14.53	17.61	+24%	+7%
Europe (n = 36)	VNRD	19.73	19.85	19.29	+1%	−3%
	Total donations	21.20	20.47	19.67	−3%	−4%
Eastern Mediterranean (n = 12)	VNRD	3.18	3.60	4.21	+13%	+17%
	Total donations	3.94	4.48	5.30	+14%	+18%
Western Pacific (n = 17)	VNRD	20.46	22.63	27.49	+11%	+20%
	Total donations	21.15	22.92	27.08	+8%	+20%
Total (n = 132)	VNRD	60.68	66.07	72.27	+9%	+9%
	Total donations	70.17	75.70	83.54	+8%	+10%

Notes:

[a] The 25 countries in the Region of the Americas did not include United States of America.

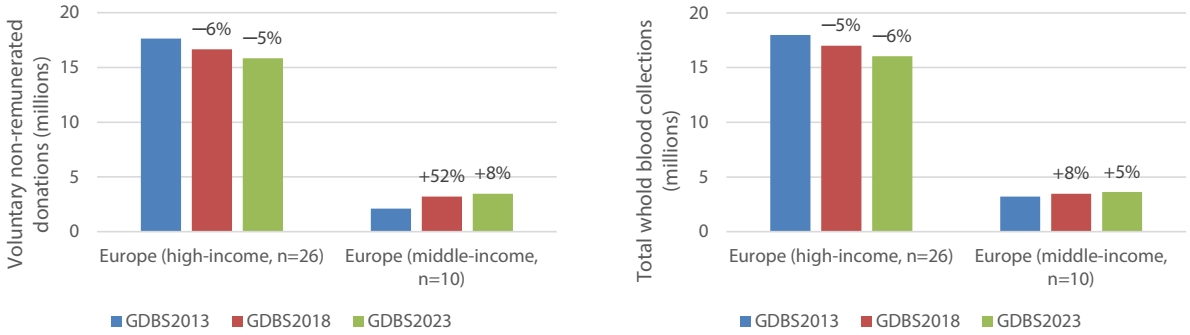
[b] The seven countries included in the South-East Asia Region did not included India, which reports collection of a very large number of blood donations every year.

Fig. 3.8 Total whole blood collections and voluntary non-remunerated donations (millions) by WHO region, 2013–2023



Regional changes in the number of blood collections can be disproportionately influenced by a few countries with large collection volumes, potentially masking diverse trends at the individual country level. The patterns of change among countries within a WHO region can also vary substantially. This is exemplified by further disaggregation of data from the European Region into HICs and LMICs, which reveals contrasting trends: blood collections in HICs show a decreasing trend, while those in LMICs show an increasing trend over both 5-year periods (Fig. 3.9). Similar patterns also exist in other WHO regions, particularly in the Americas and the Western Pacific. The decline in blood collection and use in HICs, particularly Europe and North America, most likely is associated with PBM and changing clinical practice as seen with other studies.

Fig. 3.9 Change of total whole blood collections and voluntary non-remunerated donations (millions) in Europe by World Bank income group, 2018–2023



To better capture the country-level trends, average annual rates of change in total whole blood collections and VNRD collections were calculated separately for the periods 2013–2018 and 2018–2023. Countries with an average annual increase of more than 1% in both periods were identified as showing potentially a sustained upward trend, while those with a decrease of more than 1% in both periods were flagged as showing potentially a persistent downward trend. These thresholds were arbitrarily selected for the simplicity of analysis.

Forty-one (31% of 132) countries reported increases in VNRD collections during both periods, with average annual growth rates exceeding 1%. These countries were from: Africa 19 (51% of 37), Americas five (22% of 23), South-East Asia two (29% of seven), Europe four (11% of 36), Eastern Mediterranean five (42% of 12) and Western Pacific six (35% of 17). An additional 15 countries (Africa two, Americas two, South-East Asia one, Europe seven, Eastern Mediterranean two, Western Pacific one) also showed increasing trends in VNRD collections during both periods. However, in these cases, at least one of the average annual increase rates was below 1% (but still above zero), suggesting a more moderate upward trend (Table 3.3).

In contrast, across both periods (2013–2018 and 2018–2023), 11 countries (8% of 132) (Africa one, Americas one, Europe eight, Eastern Mediterranean: one) reported average annual decreases greater than 1% in VNRD collections, suggesting a sustained downward trend. Notably, the eight European countries in this group are HICs where 100% of blood units are collected from VNRD. An additional 12 countries (Americas two, Europe eight, South-East Asia one, Western Pacific one) also showed declines in VNRD collections during both periods, though with more moderate decreases (between 0% and –1%) (Table 3.3).

Table 3.3 Number of countries reporting increases or decreases in voluntary non-remunerated blood donations during 2013–2023 and 2018–2023, by WHO region

Region	Increase in both periods[a]	Decrease in both periods[b]	Decrease in the earlier period, increase in the later period	Increase in the earlier period decrease in the later period
Africa (n = 37)	21 (19)	1 (1)	6	9
Americas (n = 23)	7 (5)	3 (1)	5	8
South-East Asia (n = 7)	3 (2)	1 (0)	1	2
Europe (n = 36)	11 (4)	16 (8)	4	5
Eastern Mediterranean (n = 12)	7 (5)	1 (1)	2	2
Western Pacific (n = 17)	7 (6)	1 (0)	4	5
Total (n = 132)	**56 (41)**	**23 (11)**	**22**	**31**

Notes:

[a] The numbers in parentheses indicate the number of countries that reported an average annual increase in VNRD collections greater than 1% in both periods.

[b] The numbers in parentheses indicate the number of countries that reported an average annual decrease in VNRD collections greater than 1% in both periods.

Furthermore, data from the three rounds of surveys show that 22 countries experienced a decrease in VNRD collections from 2013 to 2018, followed by an increase from 2018 to 2023. Conversely, 31 countries showed an increase in the first period, followed by a decline in the second.

Table 3.4 presents the results of a similar analysis of total whole blood collections across the same 132 countries. Except in Europe, all other regions show that more countries reported an increase or a sustained increase in total whole blood collections. This suggests that, in some countries, the rise in total collections was driven by types of blood donations other than VNRD.

Table 3.4 Number of countries reporting increases or decreases in total collections of whole blood donations during 2013–2023 and 2018–2023, by WHO region

Region	Increase in both periods[a]	Decrease in both periods[b]	Decrease in the earlier period, increase in the later period	Increase in the earlier period decrease in the later period
Africa (n = 37)	30 (26)	0 (0)	4	3
Americas (n = 23)	12 (9)	2 (1)	4	5
South-East Asia (n = 7)	6 (4)	1 (1)	0	0
Europe (n = 36)	8 (5)	17 (10)	6	5
Eastern Mediterranean (n = 12)	11(6)	0 (0)	0	1
Western Pacific (n = 17)	11 (10)	1 (0)	3	2
Total (n = 132)	**78 (60)**	**21 (12)**	**17**	**16**

Notes:
[a] The numbers in parentheses indicate the number of countries that reported an average annual increase in total collections greater than 1% in both periods.
[b] The numbers in parentheses indicate the number of countries that reported an average annual decrease in total collections greater than 1% in both periods.

Annex 4 presents data on total whole blood collections and collections from VNRD from three rounds of the GDBS survey, based on data collected for the years 2013, 2018 and 2023, covering 132 countries.

Care must be taken in drawing conclusions from this trend information as the changes are generally small and may be influenced by other factors; however, some inferences may be drawn from the information.

Overall, 56 countries (42% of 132) reported increases in blood collections from VNRD, 78 countries (59% of 132) reported increases in total whole blood collections during the 2013–2018 and 2018–2023 periods. However, the percentage of total blood collection that is from VNRD has remained stable at 86%. The small increase in blood collections in these countries may reflect broader improvements in blood collection and transfusion services. Contributing factors may include the expansion of health services aimed at achieving more equitable access to care, efforts by national governments and development partners to strengthen national blood systems in priority countries, improved data collection/reporting systems and population growth.

In addition to findings presented in previous and current reports, many industrialized countries have experienced a decline in blood collection and transfusion over the past decade (*7–9*). Evidence suggests that the decline is partly attributable to the adoption of more restrictive transfusion practices by clinicians and the implementation of PBM management programmes (*10, 11*). Where the decline in collections is not in response to reduced demand the trend may be driven by multiple factors, including low birth rates, a shortage of young donors to replace an ageing donor population and the absence of culturally sensitive recruitment campaigns. Some HICs (Australia, Japan and New Zealand, based on Annex 4 of this report) have reversed the decline seen in 2013–2018, shifting to an upward trend between 2018 and 2023, or reported having stabilized their supply (*12, 13*).

Of greater concern are countries with lower donation rates, where collections from VNRD have shown a downward trend over the same period. In these contexts, the decline may jeopardize the adequacy of the blood supply. Targeted strategies are urgently needed to overcome cultural barriers to blood donation and to implement effective campaigns that promote VNRD.

3.5 Profile of blood donors

3.5.1 Donor sex and age profile

Data from 117 countries on the sex profile of blood donors show that, globally the percentage of blood donations given by female donors was 29%, with country values ranging widely from 0.6% to 81%. The Eastern Mediterranean Region had the lowest proportion of donations given by female donors (Table 3.5), though significant variation exists within the region. Of 13 countries in the Eastern Mediterranean reporting data on the sex distribution of blood donations, 10 reported that less than 10% of donations were given by female donors. In contrast the United Arab Emirates (48%), Tunisia (30%), Syrian Arab Republic (13%), Egypt and Oman reported notably higher proportions.

Table 3.5 Blood donations from female donors by WHO region (median and range, %), 2023

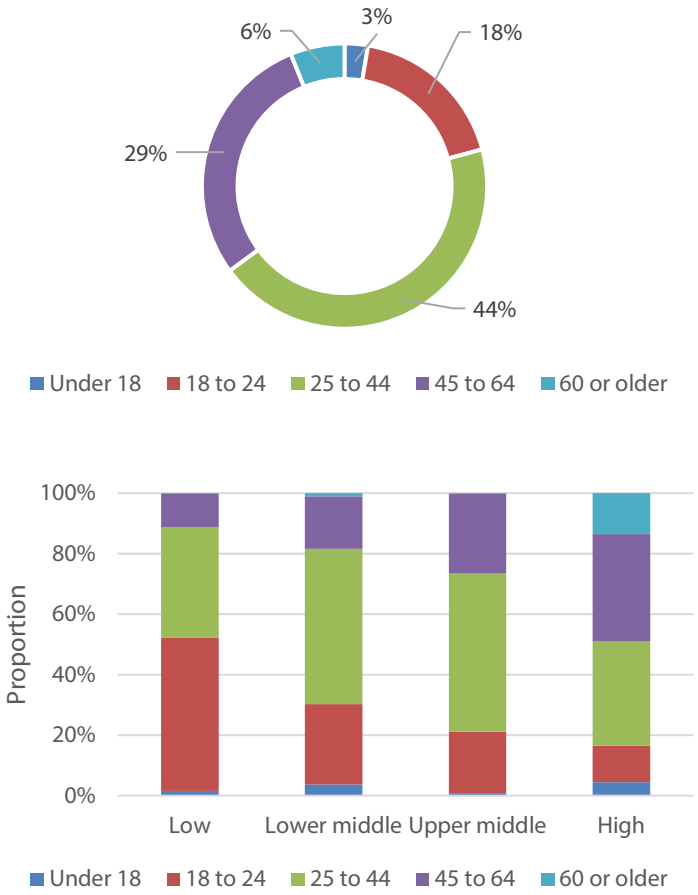
Region	Median	Range	IQR
Africa (n = 35)	23	6–54	13–34
Americas (n = 10)	46	28–63	35–53
South-East Asia (n = 10)	25	3–70	21–42
Europe (n = 28)	35	11–53	26–47
Eastern Mediterranean (n = 16)	5	0.6–48	3–8
Western Pacific (n =18)	33	10–81	20–43

A total of 120 countries (Africa 29, Americas 14, South-East Asia six, Europe 34, Eastern Mediterranean 15, Western Pacific 22) reported data on the number of donations given by donors of different age groups (Fig. 3.10). The global distribution of donations by age of donor was: < 18 years 3%, 18–24 years 18%, 25–44 years 44%, 45–64 years 29%, 65+years 6%. It should be noted that the age group ranges are unequal in size, which means the contribution of the 18–24 group may be underestimated. Proportionally more young people donate blood in LMICs than in HICs: 52% of blood donations were given by donors aged 24 years or younger in low-income countries, 30% in lower-middle-income countries, 21% in upper-middle-income countries and 16% in HICs (Fig. 3.10).

Analysis of country-level data reveals a consistent pattern: the median proportion of donations from donors aged 24 years or younger is highest in low-income countries at 44% (IQR: 24%–56%), followed by 33% in lower-middle-income countries (IQR: 20%–54%), 21% in upper-middle-income countries (IQR: 16%–23%) and 10% in HICs (IQR: 7%–14%). However, notable variation exists among countries within each income group. This may mainly reflect the age structure of the populations, and differences in associated age-related factors such as poor health and lack of mobility in developed and developing countries. Proportionally there are more young people in developing countries, and there are relatively more older people in developed countries.

Analysing demographic information about blood donors at the national or blood donor programme level can provide valuable insights into donor behaviour and trends (*14*). This information is essential for formulating and monitoring donor recruitment strategies to meet blood supply needs and achieve self-sufficiency. It can also help identify and address barriers to blood donation faced by specific population groups.

Fig. 3.10 Contribution to donations by donors of different age groups and by World Bank income group, 2023



3.5.2 Repeat donors and first-time donors

A total of 96 countries (low income 10, lower middle income 30, upper middle income 23 and high income 33) reported data on the number of voluntary non-remunerated whole blood donations given by first-time donors and repeat donors. Overall, the percentage of whole blood donations given by repeat VNRD in countries ranged widely from less than 0.2% to 100% (median 60%). Table 3.6 shows the proportions of donations given by repeat VNRD by World Bank income group.

The ability to provide data on repeat donors depends on the sophistication of the blood donor record system. In some countries it may not be possible to link the donor to previous donation events so all donors present as first-time even though they may have donated before.

Table 3.6 Donations given by repeat voluntary non-remunerated blood donors by World Bank income group (median, range and IQR, %), 2023

World Bank income group	Median	Range	IQR
Low income (n = 10)	43	6–75	–
Lower middle income (n = 30)	36	1–85	16–54
Upper middle income (n = 23)	56	0.2–96	31–63
High income (n = 33)	89	25–100[a]	68–93

Note:
[a] Iceland reported that all 10 841 collections were from repeat VNRD. It also noted that there were 1608 new donors, from whom only samples were taken during their first visit to the blood bank.

A proxy measure for regular blood donations is the frequency of donations per donor per year. Data reported to the WHO GDBS on the number of active whole blood donors who donate at least once during the reporting period and the number of donations these donors had given in 2023 were provided by 68 countries: four low-income countries, 14 lower-middle-income countries, 14 upper-middle-income countries and 36 HICs. Overall, each donor donated 1.46 (median) whole blood donations on average in 2023 with the range from 1.02 to 2.10 (IQR: 1.26–1.76). Blood collected from first-time and repeat donor numbers, along with average donation frequency, are key indicators to monitor at both national and blood service levels. Maintaining a regular donor base is essential for ensuring a sufficient and safe blood supply, while ongoing recruitment of new donors is equally important to sustain and grow that base.

3.5.3 Donor deferral

Data on deferral from blood donation were provided by 117 countries (33 high income, 37 upper middle income, 36 lower middle income and 11 low income). The total deferral rates (the percentage of deferrals among all blood donor presentations) varied widely among countries, from less than 1% to over 58%. The median rate of total deferral was 13%. Table 3.7 shows the donor deferral rate, by World Bank income group. The wide range of donor deferral likely reflects substantial differences in donor selection criteria, pre-donation screening practices and donor baseline health across the countries. Evidence from many studies have shown that higher deferral rates are often seen where there is a high prevalence of anaemia or infectious risks, especially among female and first-time donors. This highlights a potential opportunity for targeted interventions such as addressing iron deficiency anaemia amongst donors that in turn increase donor eligibility, improve retention and contribute to broader public health benefits.

Table 3.7 Donor deferral rate by World Bank income group (median and IQR, %)

World Bank income group	Median	IQR
Low income (n = 11)	9	5–15
Lower middle income (n = 36)	11	8–20
Upper middle income (n = 37)	14	10–24
High income (n = 33)	13	11–18

Donor selection plays a critical role in ensuring the safety of both blood donors and patients receiving transfusions. Appropriate screening helps prevent adverse reactions in donors and reduces the risk of transmitting infections or other complications to recipients. These criteria typically include health status, age, weight, and risk factors for transfusion-transmissible infections (TTIs).

Globally, 80% of reporting countries (135 out of 168) have established national donor selection criteria to assess donor suitability for blood donation. By WHO region, the proportion of countries with national donor selection criteria are 78% in Africa, 65% in the Americas, 82% in South-East Asia, 83% in Europe, 95% in the Eastern Mediterranean and 91% in the Western Pacific.

chapter 4

Processing of whole blood donations into components

Blood collected in an anticoagulant can be stored and transfused to a patient in an unmodified state. This is known as whole blood transfusion. However, blood may be used more effectively if it is separated into components (red cell concentrates, fresh frozen plasma [FFP], cryoprecipitate and platelet concentrates), so that it can meet the needs of more than one patient. The relative effectiveness and benefits of whole blood versus component therapy may vary by clinical context.

Based on data reported to the GDBS by 142 countries, 90% of whole blood donations collected globally were processed into components: 98% in HICs, 94% in upper-middle-income countries, 81% in lower-middle-income countries and 52% in low-income countries.

Across the WHO regions, the percentages for processing blood into components were 66% in the African Region, 81% in the South-East Asia Region and greater than 90% in other regions (Fig. 4.1).

Fig. 4.1 Percentages of whole blood donations processed into components by WHO region and World Bank income group, 2023 (%)

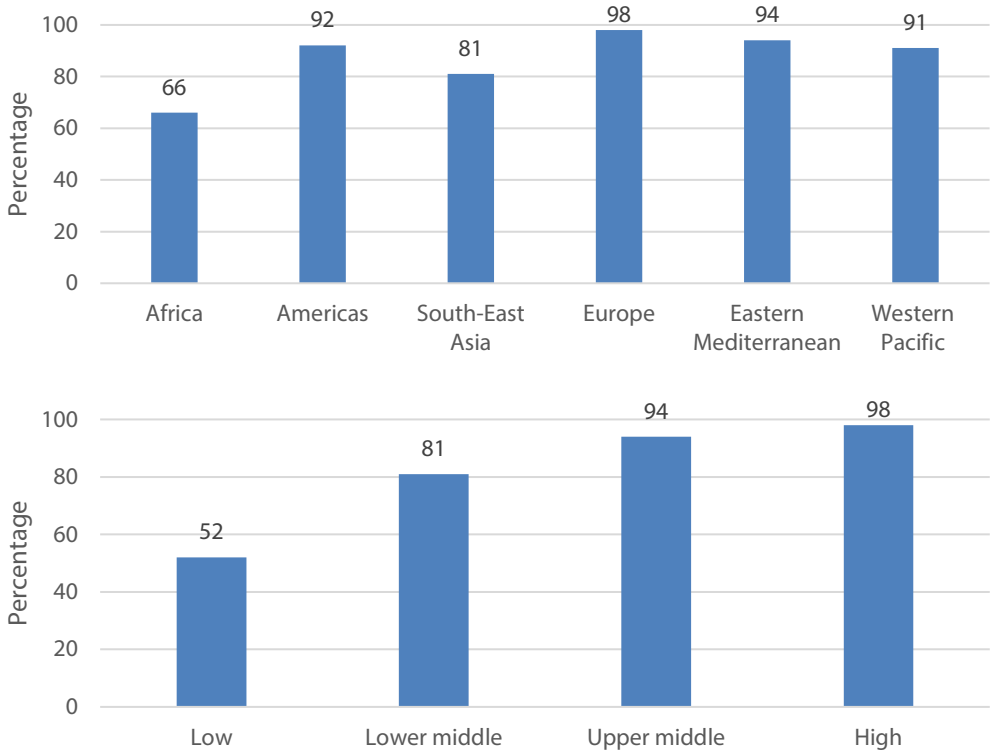


Table 4.1 shows the number of countries processing blood donations into components in different percentage groupings, by WHO region. In almost all countries in Europe (38/39) over 90% of whole blood donations were separated into components. In other WHO regions, between 47% (18/38 in Africa) and 79% (11/14 in the Eastern Mediterranean) of countries reported that over 90% of whole blood donations were separated into components. Around 37% (14/38) of countries in Africa, 11.5% (3/26) of countries in the Americas, 11.1% (2/18) of countries in the Western Pacific and 7% (1/14) of countries in the Eastern Mediterranean reported that less than 50% of whole blood donations were separated into components.

Table 4.1 Proportion of blood donations processed into components: number of countries in each percentage grouping by WHO region, 2023

Region	< 25%	25–49.9%	50–74.9%	75–89.9%	90–100%
Africa (n = 38)	10	4	3	3	18
Americas (n = 26)	1	2	2	2	19
South-East Asia (n = 8)	0	0	2	1	5
Europe (n = 39)	0	0	0	1	38
Eastern Mediterranean (n = 14)	1	0	2	0	11
Western Pacific (n = 19)	1	1	2	1	13

Table 4.2 shows the number of countries processing different blood components from whole blood donations by WHO region. Across the WHO regions, the percentages for processing red cell and FFP components were 77% (34/44) in the African Region, 97% (29/30) in the Region of Americas, 88% (7/8) in the South-East Asia Region, 98% (39/40)

in the European Region, 93% (14/15) in the Eastern Mediterranean Region and 79% (15/19) in the Western Pacific Region. Many countries also processed platelets and cryoprecipitate components in addition to red cell and FFP. The percentage of countries processing platelets were 75% in the African Region, 100% in the Region of Americas, 88% in the South-East Asia Region, 98% in the European Region, 87% in the Eastern Mediterranean Region and 74% in the Western Pacific Region. The percentages of countries processing cryoprecipitate components were 27% in the African Region, 77% in the Region of Americas, 63% in the South-East Asia Region, 55% in the European Region, 80% in the Eastern Mediterranean Region and 47% in the Western Pacific Region.

Table 4.2 Number of countries reporting that components of red cell, FFP, platelets and cryoprecipitate were prepared from whole blood, 2023

Region	Red cell + FFP	Platelets	Cryoprecipitate
Africa (n = 44)	34	33	12
Americas (n = 30)[a]	29	30	23
South-East Asia (n = 8)	7	7	5
Europe (n = 40)[b]	39	39	22
Eastern Mediterranean (n = 15)	14	13	12
Western Pacific (n = 19)[c]	15	14	9

Notes:
[a] Including four countries (Bahamas, Haiti, Saint Kitts and Nevis and the United States of America) only reported preparing plasma instead of FFP.
[b] Including three countries (Denmark, Finland and Luxembourg) only reported preparing plasma instead of FFP.
[c] Including two countries (New Zealand and Viet Nam) only reported preparing plasma instead of FFP.

Components can be prepared from whole blood donations or directly through apheresis procedures.

Among 144 countries (47 high income, 40 upper middle income, 45 lower middle income and 12 low income) that reported components prepared from whole blood, the following totals were produced from 83.5 million whole blood donations:

- 65.4 million units of red cells;
- 28.3 million units of platelets;
- 42.8 million units of FFP;
- 13.9 million units of frozen plasma (FP);
- 5.3 million units of cryoprecipitate.

Additionally, 94 countries (42 high income, 28 upper middle income, 23 lower middle income and one low income) that reported components prepared from both whole blood and apheresis donations indicated that the following were produced from 9.0 million apheresis donations:

- 1 million units of apheresis red cells;
- 5.8 million adult-dose units of platelets;
- 5 million units of apheresis plasma.

Table 4.3 presents the number of component units produced by 144 countries, grouped by World Bank income group classification, along with data on whole blood and apheresis donations.

For detailed information on the units of blood components prepared, refer to Annex 5.

Table 4.3 Units (in thousand) of blood components prepared in 144 countries, 2023

		Donations	Red cells	Platelets	FFP	FP	Cryoprecipitates
High income (n = 47)	Whole blood	35 559	26 523	14 079	10 495	7 150	3 007 134
	Apheresis	7 070	917	4 832[a]	3 924[b]	NA	NA
Upper middle income (n = 40)	Whole blood	20 235	18 465	7 973	18 052	5373	1 480 375
	Apheresis	1 153	64	820[a]	1 073[b]	NA	NA
Lower middle income (n = 45)	Whole blood	25 996	19 616	5 958	14 073	1 298	809 061
	Apheresis	731	4	150[a]	3[b]	NA	NA
Low income (n = 12)	Whole blood	1 700	820	249	202	92	5 315
	Apheresis	0.7	0	706[a]	0.01[b]	NA	NA
Global (n = 144)	Whole blood	83 490	65 424	28 259[a]	42 821	13 913	5 301 885
	Apheresis	8 955	985	5 802	5 000[b]	NA	NA

Notes:
[a] Unit in adult dosage.
[b] Reported as apheresis plasma.

As part of the GDBS 2023 survey, 139 countries were asked: "Does any blood establishment provide pathogen-reduced blood or components?" In the Americas Region this question was only asked in Canada and the United States. During the reporting period, 34 (24% of those surveyed) countries (three in Africa, two in the Americas,[5] three in South-East Asia, 19 in Europe, four in the Eastern Mediterranean and three in the Western Pacific) responded affirmatively, indicating that their blood services provided pathogen-reduced blood or components. In response to the open-ended question requesting a concise description of the pathogen-reduced components and technologies used, 30 countries provided details on either the types of components processed, the technologies applied, or both. In these 30 countries, 11 reported that both platelets and plasma (either all stock or partial stock) were pathogen-reduced, and 10 indicated that platelets (either all stock or on demand) were pathogen-reduced, one mentioned pathogen reduction for plasma and cryoprecipitates, without specifying the extent of treatment. It would be helpful to gather more detailed information on application of pathogen reduction technology in a future survey. Pathogen reduction is mostly conducted in HICs in Europe and a few in the Americas and Western Pacific regions.

Information on discarded blood donations was provided by 118 countries (32 high income, 29 upper middle income, 41 lower middle income and 16 low income). Reactivity for markers of transfusion-transmissible infectious agents, outdated stock and incomplete collection are among the main reasons for discard. The median total discard rate is 7.7% in low-income countries, 6.7% in lower-middle-income countries, 5.9% in upper-middle-income countries and 5.8% in high-income countries. Evidence of the presence of transfusion-transmissible infectious agents is the most common reason for discard in low-income countries, with a median discard rate of 4.5%. Discard rates due to reactivity for markers of transfusion-transmissible infectious agents for lower-middle-income, upper-middle-income and high-income countries are 3.2%, 1.9% and 0.6%, respectively.

[5] Canada and the United States of America. Other 28 countries were not included in the survey for this specific question.

chapter 5

Laboratory screening of blood donations

5.1 Laboratory screening policy

The following subsections analyse the data on laboratory screening policy according to the target for screening.

5.1.1 HIV, hepatitis B virus and hepatitis C virus

Questions were asked on the policy related to the minimum requirements for laboratory screening of blood. Of the 168 responding countries, 165 reported having a policy of screening all blood donations for human immunodeficiency virus (HIV). Three countries did not answer the questions. Overall, 92 countries reported a serology only screening policy, including 25 countries which reported testing for HIV-1/2 antibodies (Ab), while 67 countries reported testing for combined HIV-1/2 antibodies and antigens (combined Ab/Ag). A total of 73 countries reported testing HIV ribonucleic acid (RNA) using nucleic acid amplification testing (NAT) in addition to serology testing (Table 5.1).

Table 5.1 Distribution of blood laboratory screening policies for HIV-1/2 by WHO region, 2023

Region	Serology only		Serology + NAT[a]	Unanswered
	Anti-HIV-1/2	Combined Ab/Ag		
Africa (n = 45)	5	31	8	1
Americas (n = 31)[b]	7	16	8	0
South-East Asia (n = 11)	5	2	4	0
Europe (n = 42)	0	5	36	1
Eastern Mediterranean (n = 17)	1	10	6	0
Western Pacific (n = 22)	7	3	11	1
Global (n = 168)	**25**	**67**	**73**	**3**

Notes:

[a] Colombia, Czechia, Ecuador, Iran (Islamic Republic of), Paraguay, Philippines, Nepal and Slovak Republic reported selective HIV NAT screening policy.

[b] Data for 2023 were unavailable; information from earlier years (2017 or 2018) was used for the analysis for seven countries: Bolivia (Plurinational State of), Haiti, Nicaragua, Peru, Saint Kitts and Nevis, Uruguay and Venezuela (Bolivarian Republic of).

Of the 168 responding countries, 164 reported having a policy of screening all blood donations for hepatitis B virus (HBV). Four countries did not answer the questions on HBV testing policy. A total of 164 countries reported having a policy of testing all blood donations for hepatitis B surface antigen (HBsAg). A total of 57 countries reported having a policy of hepatitis B core antibody (anti-HBc) testing either for all donations or for selective donations in addition to testing for HBsAg and 71 countries reported using NAT for HBV in addition to serology testing (Table 5.2).

Table 5.2 Distribution of blood laboratory screening policies for HBV by WHO region, 2023

Region	Serology only		Serology +NAT		Unanswered
	HBsAg only	HBsAg + anti-HBc[a]	HBsAg + NAT[b]	HBsAg + anti-HBc[c] +NAT[d]	
Africa (n = 45)	32	4	5	2	2
Americas (n = 31)[e]	8	16	1	6	0
South-East Asia (n = 11)	5	2	2	2	0
Europe (n = 42)	4	1	22	14	1
Eastern Mediterranean (n = 17)	5	5	1	6	0
Western Pacific (n = 22)	10	0	7	4	1
Global (n = 168)	**70**	**23**	**37**	**34**	**4**

Notes:
[a] Nicaragua and Norway reported selective anti-HBc screening policy.
[b] Nepal reported selective HBV NAT screening policy.
[c] Albania, Australia, Croatia, Hungary, Iran (Islamic Republic of), Luxembourg, New Zealand, South Africa, Thailand and United Kingdom reported selective anti-HBc screening policy.
[d] Colombia, Czechia, Iran (Islamic Republic of), Paraguay, Philippines and Slovak Republic reported selective HBV NAT screening policy.
[e] Data for 2023 were unavailable; information from earlier years (2017 or 2018) was used for the analysis for seven countries: Bolivia (Plurinational State of), Haiti, Nicaragua, Peru, Saint Kitts and Nevis, Uruguay and Venezuela (Bolivarian Republic of).

Of the 168 responding countries, 164 reported having a policy of screening all blood donations for hepatitis C virus (HCV). Four countries did not answer the questions on HCV testing policy. In these 164 countries, all reported having a policy of serology testing of HCV antibodies or combined HCV Ag/Ab for all blood donations, and 74 countries reported also having a policy of NAT in addition to the serology testing for all blood donations or selected donations (Table 5.3).

Table 5.3 Distribution of blood laboratory screening policies for HCV by WHO region, 2023

Region	Serology (anti-HCV or combined Ab/Ag) only	Serology + NAT[a]	Unanswered
Africa (n = 45)	36	8	1
Americas (n = 31)[b]	23	7	1
South-East Asia (n = 11)	7	4	0
Europe (n = 42)	5	36	1
Eastern Mediterranean (n = 17)	9	8	0
Western Pacific (n = 22)	10	11	1
Global (n = 168)	90	74	4

Notes:
[a] Colombia, Czechia, Iran (Islamic Republic of), Mali, Nepal, Paraguay, Philippines and Slovak Republic reported selective HCV NAT screening policy.
[b] Data for 2023 were unavailable; information from earlier years (2017 or 2018) was used for the analysis for seven countries: Bolivia (Plurinational State of), Haiti, Nicaragua, Peru, Saint Kitts and Nevis, Uruguay and Venezuela (Bolivarian Republic of).

5.1.2 Syphilis

Two countries reported implementing a policy of not routinely performing syphilis testing for blood donations. Two other countries reported a selective testing policy for syphilis. Four countries (one each in Africa, Europe, Eastern

Mediterranean and Western Pacific) did not answer the questions on syphilis testing policy. All other 160 responding countries had a policy of performing syphilis testing for all donations.

5.1.3 Chagas disease

Twenty-one countries in the region of Americas reported having a policy of testing all blood donations for *Trypanosoma cruzi*. Thirteen countries (two in the Americas, nine in Europe and two in the Western Pacific) reported a selective testing policy for *T. cruzi* (Table 5.4).

Table 5.4 Testing strategies for Chagas disease, 2023

Test for all donations	Selective testing
Argentina	Belgium
Belize	Canada
Bolivia (Plurinational State of)	France
Brazil	Italy
Chile	Japan
Colombia	Luxembourg
Costa Rica	New Zealand
Dominican Republic	Norway
Ecuador	Portugal
El Salvador	Spain
Guatemala	Switzerland
Guyana	United Kingdom
Honduras	United States of America
Mexico	
Nicaragua	
Panama	
Paraguay	
Peru	
Suriname	
Trinidad and Tobago	
Uruguay	

5.1.4 Human T-lymphotropic virus

Thirty-one countries reported having the policy of testing all blood donations for human T-lymphotropic virus (HTLV-1/2) antibody. Thirteen countries reported implementing selective testing for donors from specific geographical locations, new donors or donors who have not been tested before (Table 5.5).

Table 5.5 Testing strategies for HTLV-1/2, 2023

Africa	Americas	Europe	Eastern Mediterranean	Western Pacific
Seychelles	Argentina	France[a]	Iran (Islamic Republic of)[a]	Australia[a]
	Bahamas	Greece	Kuwait	China[a]
	Brazil	Luxembourg[a]	Oman	Japan
	Canada	Netherlands (Kingdom of the)[a]	Qatar	New Zealand[a]
	Chile	Norway[a]	United Arab Emirates	Republic of Korea[a]
	Colombia	Portugal[a]		
	Costa Rica	Romania		
	Dominica	Spain[a]		
	Dominican Republic	United Kingdom[a]		
	Ecuador[a]			
	Guyana			
	Haiti			
	Honduras			
	Panama			
	Paraguay			
	Peru			
	Saint Kitts and Nevis			
	Saint Lucia			
	Saint Vincent and the Grenadines			
	Suriname			
	Trinidad and Tobago			
	United States of America			
	Uruguay			
	Venezuela (Bolivarian Republic of)			

Note:
[a] Selective testing.

5.1.5 Malaria

Fifty-two countries reported having a policy of testing for malaria, of which 15 countries (five in Africa, three in Americas, three in South-East Asia, one in Europe, two in the Eastern Mediterranean and one in the Western Pacific) reported testing for all donations. The malaria screening policy in these 52 countries is listed in Table 5.6.

Table 5.6 Testing strategies for malaria, 2023

Region	Testing for all donations (microscopy)	Selective testing (microscopy)	Selective testing (antibody testing)
Africa (n = 6)	Angola Central African Republic Gabon Madagascar[b] Sao Tome and Principe[b]	Gambia[a]	
Americas (n = 5)	Belize Guyana Mexico[b]	Colombia Costa Rica	
South-East Asia (n = 6)	Bangladesh[b] India[a] Sri Lanka	Democratic People's Republic of Korea Indonesia[a] Nepal[b]	
Europe (n = 19)	Kyrgyzstan	Azerbaijan	Belgium Croatia Estonia[c] Finland France Greece[d] Hungary Iceland Italy Luxembourg Netherlands (Kingdom of the) Norway Portugal Slovak Republic Spain Switzerland United Kingdom
Eastern Mediterranean (n = 9)	Afghanistan[a] Yemen[b]	Bahrain United Arab Emirates[e] Pakistan[a]	Kuwait Lebanon Oman Qatar
Western Pacific (n = 7)	Philippines[a]	Malaysia	Australia New Zealand Republic of Korea Singapore[f] Viet Nam[c]

Notes:
[a] Microscopy or antigen testing.
[b] Antigen testing.
[c] Antigen testing or antibody testing.
[d] Microscopy or antigen testing or antibody testing.
[e] Biosynex CellsCheck (automatic).
[f] Polymerase chain reaction (PCR) testing or antibody testing.

5.1.6 Other transfusion-transmissible infections

Sixteen countries (Austria, Canada, Croatia, Cyprus, France, Greece, Italy, Luxembourg, Malta, Netherlands [Kingdom of the], Romania, Slovak Republic, Spain, Switzerland, United Kingdom, United States of America) reported West Nile virus testing policies. The United States of America tested all donations for West Nile virus RNA with NAT in pools or individual donations based on seasonal activity. Canada tested all donations in spring, summer and autumn, and only donations from travellers in winter. Other countries tested selective donations. Oman reported selective testing policies for dengue from dengue reported areas in outbreak seasons.

Eleven countries (France, Japan, Luxembourg, Malta, Netherlands [Kingdom of the], North Macedonia, Singapore, Slovak Republic, Switzerland, Thailand and United Kingdom) reported testing policies of hepatitis E virus (HEV). Except for Luxembourg, Slovak Republic and Thailand, which tested HEV RNA for selective donations, other seven countries tested HEV RNA for all donations.

Five countries (Japan, Netherlands [Kingdom of the], Luxembourg, Poland and Switzerland) reported human parvovirus B19 testing policies. Except for Netherlands (Kingdom of the) and Poland, which tested for selective donations, other countries tested for all donations. Poland also reported selective plasma for fractionation testing policy for hepatitis A virus.

Argentina and Kyrgyzstan reported testing policies for all donations for *Brucella* infection.

5.2 Coverage and quality of laboratory screening of blood donations

Based on GDBS data, 10 countries (excluding four countries reporting implementing a policy of not testing for syphilis or implementing selective testing policy for syphilis testing; four in Africa, two in the Americas, one in Europe, one in the Eastern Mediterranean and two in the Western Pacific) reported not being able to test 100% of the blood collected for one or more of the four TTIs – HIV, HBV, HCV and syphilis. One country (in Europe) reported that 96.1% of donations were tested for HIV. Three countries (two in Africa, and one in Europe) reported not being able to test all donations for HBV, with the percentage of donations tested in these countries ranging from 96.1% to 99.5%. Nine countries (four in Africa, two in the Americas, one in Europe and two in the Western Pacific) reported not being able to test all donations for HCV. The percentage of donations tested ranged from 50.0% to 99.9%. Five countries (excluding four countries reporting implementing a policy of not testing for syphilis or implementing selective testing policy; three in Africa, one in Europe, one in the Eastern Mediterranean) reported not being able to test all donations for syphilis. The percentage of donations tested ranged from 73.0% to 99.5% (Table 5.7).

Table 5.7 Number of countries by WHO region reporting less than 100% donation testing for a major transfusion-transmissible infection, 2023

Region	HIV 1+2	HBV	HCV	Syphilis
Africa (n = 45)	0	2	4	3
Americas (n = 31)	0	0	2	0
South-East Asia (n = 11)	0	0	0	0
Europe (n = 42)	1	1	1	3[a,b]
Eastern Mediterranean (n = 17)	0	0	0	2[a]
Western Pacific (n = 22)	0	0	2	1[b]
Global (n = 168)	**1**	**3**	**9**	**9**

Notes:
[a] One country reported implementing a policy of not testing for syphilis.
[b] One country reported implementing selective testing policy.

Eleven countries (four in Africa, two in South-East Asia, two in Europe, one in the Eastern Mediterranean and two in the Western Pacific) were not able to provide data on the coverage of one or more screening tests for the four key infectious markers of HIV, HBV, HCV and syphilis. This lack of information is a continuing serious concern as it is indicative of a lack of adequate oversight of a key element of blood safety in some countries.

To supplement the assessment of the quality of testing, data on the status of the participation of blood screening laboratories in external quality assessment schemes (EQAS) for the testing of TTIs were analysed. Data on the status of EQAS participation of 3550 laboratories were reported by 141 countries (high income 45, upper middle income 20, lower middle income 39, low income 37). Globally 63% of the blood screening laboratories participated in EQAS for the testing of TTIs. The percentages were 92%, 66%, 48% and 68% for high-, upper-middle, lower-middle and low-income countries, respectively (Table 5.8).

Table 5.8 Proportion of blood screening laboratories participating in external quality assessment scheme (EQAS) for testing of TTIs, by World Bank income group, 2023

World Bank income group	No. blood screening laboratories	No. of the laboratories participating EQAS	Percentage (%)
High (n = 45)	358	330	92
Upper middle (n = 20)	341	226	66
Lower middle (n = 39)	1 394	666	48
Low (n = 37)	1 457	997	68
Global (n = 141)	**3 550**	**2 219**	**63**

Care should be taken in interpreting the data provided above. The results only reflect the status of countries that answered these questions, rather than global status. There is evidence that countries lacking certain quality elements (e.g. full participation of screening laboratories' participation in EQAS) are more likely skip the GDBS questions on quality-assured testing. The countries with no data or no response could be even worse with regard to quality assurance.

According to the GDBS 2023, 33 of 139 countries[6] (14 in Africa, seven in South-East Asia, three in the Eastern Mediterranean and nine in the Western Pacific) reported that all donations (at least seven countries) or a percentage of donations were tested using rapid tests. The use of rapid, simple, single-use devices is generally not recommended

[6] The GDBS survey on the use of rapid tests does not include countries in the Region of Americas, except Canada and the United States of America.

for blood screening. Rapid tests may, however, be considered for use in situations, often in remote or poorly supported areas, where the blood service is not yet developed or blood is needed urgently but banked blood is not available. High-quality testing devices should be in place and the testing should be performed in a quality-assured manner.

5.3 Prevalence of markers of infection in blood donations

Prevalence of an infection among blood donations or the proportion of blood donations with a positive result are directly related to the safety of the blood supply, because they have an impact on the residual risk of distributed blood products for transfusion, and also on the risk due to errors in blood quarantine and release (even though test-positive donations should be discarded). Prevalence of an infection in blood donations is dependent on the prevalence of an infection in the population from which blood donors are selected, and on the effectiveness of donor recruitment and selection processes. Table 5.9 shows the proportion of blood donations with positive or reactive[7] results in screening tests for HIV, HBV, HCV and syphilis, by income group. Globally, the proportions vary greatly, with the lowest proportions in HICs and the highest in low-income countries for all infections.

Table 5.9 Proportions of blood donations with positive/reactive results on screening tests by World Bank income group, 2023

World bank income group	Proportion of blood donations with positive/reactive results (median and IQR, %)			
	HIV	HBV	HCV	Syphilis
High income (n = 46)	0.004 (0.0003–0.03)	0.01 (0.004–0.09)	0.007 (0.002–0.09)	0.03 (0.009–0.17)
Upper middle income (n = 42)	0.08 (0.05–0.18)	0.17 (0.10–0.51)	0.16 (0.06–0.41)	0.45 (0.11–0.96)
Lower middle income (n = 46)	0.25 (0.05–0.80)	1.34 (0.51–4.29)	0.29 (0.10–0.98)	0.79 (0.33–1.58)
Low income (n = 21)	0.81 (0.24–1.40)	1.92 (0.60–5.00)	0.66 (0.33–1.12)	0.91 (0.38–1.60)

Forty-three countries (two in Africa, 23 in the Americas, seven in Europe, six in the Eastern Mediterranean and five in the Western Pacific) reported HTLV-1/2 testing results. Thirty-one countries (one in Africa, 23 in the Americas, four in Europe and three in the Western Pacific) reported Chagas disease testing results. Twenty-seven countries (three in Africa, two in South-East Asia, eight in Europe, eight in the Eastern Mediterranean and six in the Western Pacific) reported testing results for malaria. The testing results of HTLV-1/2, Chagas disease and malaria in these countries, including the selective testing results in some countries, can be found in Annex 7.

In summary, most responding countries report policies for screening all donations for HIV, HBV, HCV and syphilis, and a substantial proportion have introduced NAT for one or more markers. However, there are still gaps in both coverage and quality of testing, particularly in some LMICs, where not all donations are tested for major TTIs, participation in EQAS is incomplete, and rapid diagnostic tests are still used for routine screening. These findings clearly highlighted the need for continued investment in quality-assured testing, external quality assessment and strengthening of blood systems, especially in higher prevalence settings.

[7] See Annex 1 for an explanatory note on the issue of varying testing/confirmatory strategies in countries, on which the reported numbers of positive/reactive test donations and proportion of positive/reactive results in blood donations tested were based.

chapter 6

Clinical use of blood

6.1 Assessing the need and demand for blood

WHO has developed the following definitions to evaluate the differences between need for, demand for and use of blood (see Box 3).

Box 3. Need for, demand for and use of blood

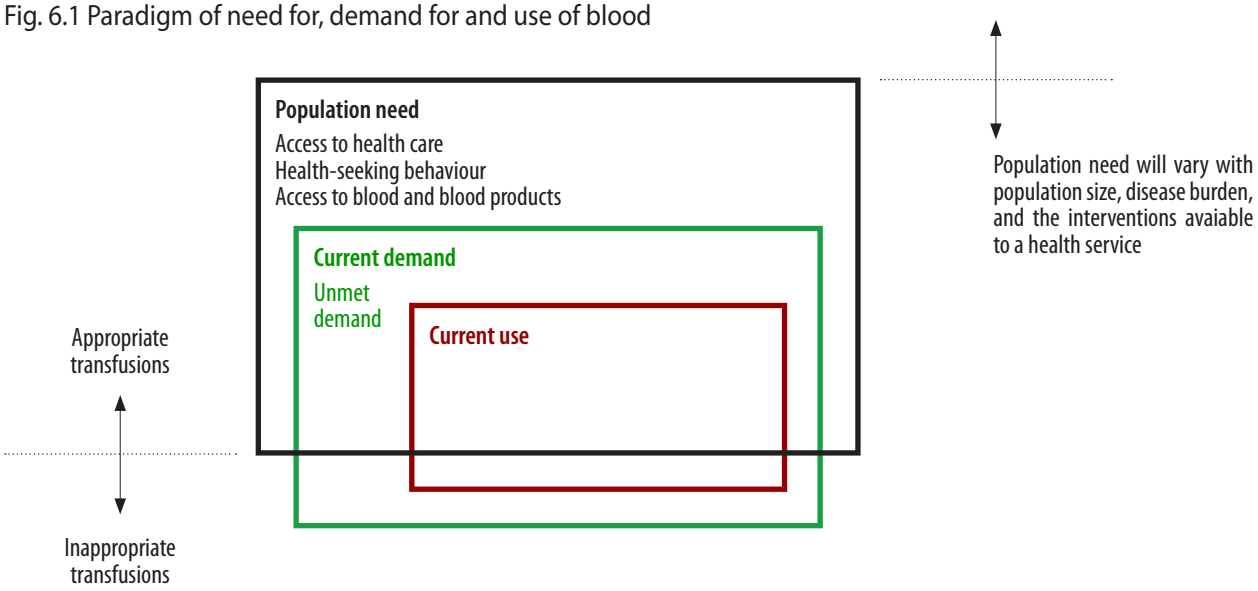
Need: An estimation of the amount of blood needed to meet the transfusion requirements of the patient population according to current policies, clinical guidelines and best practices.

Demand: The amount of blood that would be transfused if all prescriptions for blood were met. Demand may reflect appropriate or inappropriate indications and practices.

Use: The actual amount of blood currently transfused; use may be appropriate or inappropriate.

These definitions, along with Fig. 6.1, summarize current concepts in trying to measure the need for, demand for and use of blood. Many factors influence the requirements for blood to meet the health care needs of a population, disease epidemiology as with all other treatment modalities. These include income levels, current status and rate of development of the health care system and accessibility of health care facilities to the public. The changing need for, demand for and use of blood in a country could be affected by many factors including geography, population migration and epidemiology of diseases for which blood is needed.

Fig. 6.1 Paradigm of need for, demand for and use of blood



Source: WHO experts' consultation on estimation of blood requirements, 3–5 February 2010. WHO; 2010 (*15*).

All transfusion services were challenged by the COVID-19 pandemic, and any report on blood usage and supply needs to recognize the major concerns about lack of availability of blood for transfusion during the early stages of the pandemic. Many of the factors underlying blood supply concerns have continued after the COVID-19 pandemic such as donor hesitancy and backlogs in elective surgery. Strategies and recommendations for responding to potential and real blood shortages should be incorporated into planning for blood supply by all countries (*16*).

Demographic change is likely to be one of the main drivers of long-term increases in blood requirements in many countries (*17, 18*). It can be modelled by describing current blood use by age, and by applying the results to the predictions of future population size and structure (*19*). The development of new medical interventions may also impact future blood requirements in developing countries, but these are harder to predict. It is important that future development planning for health services in a country takes into account the potential impact on blood usage and ensures this information is fed into blood service planning in a timely manner.

There are no simple formulae to provide reliable or useful estimates of the need and demand of blood in a national health system. Jacobs et al. (*20*) highlighted limitations of the WHO benchmark of 10 units per 1000 population per year, first introduced in a 1971 WHO document produced with International Society of Blood Transfusion and the League of Red Cross Societies (*21*). Although not a suitable measure of sufficiency for LMICs, the index remains a useful reference when local data or modelling are lacking. More accurate estimates require models that account for disease burden, health system capacity and transfusion practices.

A national assessment of blood requirements would usually be necessary for short-term or long-term national blood programme planning. For example, using a survey of a representative sample of hospitals, Drammeh et al. (2018) (*22*) estimated that approximately 6.2 blood donations per 1000 population are needed in the United Republic of Tanzania. This number is only slightly more than half of the 10 per 1000 population value used as a rough estimation for developing countries. Mammen et al. (2021) (*23*) estimated that to meet the patient transfusion need of the total population of India 26.2 million units (95% CI: 17.9–38.0) of whole blood collection would be required per annum (which would be equivalent to a donation rate of approximately 19.4 donations per 1000 population). A different approach was used for the study, which included the determination of diseases and conditions requiring transfusion, the population at risk through comprehensive literature review, and estimation of the percentage of people with the diseases and conditions requiring transfusion and transfusion needed through the Delphi method. The study also estimated a gap between need and demand of 13 million units per annum and highlighted the importance of addressing the multifactorial causes that lead to the existence of the gap (*23*).

6.2 Patients receiving blood transfusion

There is evidence of significant differences in patterns of blood use between high-, middle-, and low-income countries. In HICs, transfusion is most commonly used for supportive care in cardiovascular and transplant surgery, major bleeding and massive trauma, critical illness and for patients with solid and haematological malignancies (*12, 24, 25*). In LMICs, transfusion support is also more often used to treat pregnancy-related complications, including major bleeding and severe childhood anaemia (*26*). There are considerable data to suggest significant variation in rates of blood use within high-, middle- and low-income countries, which seems unlikely to be explained by case-mix alone (*27–31*).

6.3 Blood and blood components transfused

Not all countries responding to GDBS were able to provide information on the units of blood and blood components transfused, but important insights into patterns of variable transfusion practice are identified. Many countries provide the numbers of units that were issued to the hospitals or other transfusion-performing facilities.

A total of 136 countries (44 high income, 35 upper middle income, 42 lower middle income and 15 low income) provided data to GDBS 2023 on units of blood transfused, or when these figures are not available, units of blood components issued.[8] Fifteen countries, which provided partial data where the coverage percentage cannot be quantified, were not included in analysis. Additionally, data from previous surveys for 12 countries were excluded from the analysis to ensure an accurate representation of the situation in 2023. The coverage percentages of transfusion data for six countries (Albania, Canada, Central African Republic, Malaysia, Thailand and the United Kingdom) were used to adjust the corresponding population figures, ensuring that transfusion and population data are aligned. Table 6.1 listed the units of blood products transfused in 109 of the total 136 countries, together with the population size of these reporting countries. These data can be used to estimate the rate of blood and blood component transfusion in countries in different economic group. Annex 1 provides the list of the 109 countries whose data were included in the analysis. Detailed country data on the units of issued or transfused blood and blood components can be found in Annex 8.

Table 6.1 Populations, blood donations and transfusion of blood products in 109 countries by World Bank income group, 2023

World Bank income group	Blood products(thousands)							Population (millions)
	WB products	Red cells	WB-derived PLT[a]	AP-PLT	FFP	FP	Cryo	
High income (n = 40)	5	33 247	2 418	3 905	3 847	3 036	1 843	1 113
Upper middle income (n = 29)	162	10 737	831	542	3 776	123	438	485
Lower middle income(n = 30)	3 069	15 293	758	110	7 405	990	350	2 111
Low income (n = 10)	307	451	12	0.7	43	10	3.5	186
Total (n = 109)	**3 543**	**59 728**	**4 019**	**4 558**	**15 071**	**4 159**	**2 635**	**3 895**

Notes:
AP = apheresis; cryo = cryoprecipitate; FFP = fresh frozen plasma; FP = frozen plasma; PLT = platelets; WB = whole blood.
[a] All units were converted to units of the dosage equivalent to adult dose if reported in individual units (individual units divided by 5).

On average, 29.9 units of red cell products (including whole blood and red cells transfused) per 1000 population were transfused in HICs, 22.5 in upper-middle-income countries, 8.7 in lower-middle-income countries and 4.1 in low-income countries.

[8] For the purpose of simplicity, in the subsequent text, "units transfused" is used instead of "units transfused or issued". It is assumed that almost all blood products issued were transfused.

A median rate of 28.6 units of red cell products (including whole blood and red cells transfused) per 1000 population (IQR: 22.2–32.7) was reported by HICs, whereas the transfusion rate was 17.7 units (IQR: 12.8–29.0) in upper-middle-income countries, 7.7 units (IQR: 5.3–11.6) in lower-middle-income countries and 4.8 units (IQR: 3.6–5.9) in low-income countries (Table 6.2). Comparing the figures with the 2021 report shows some increased usage in upper middle- and lower-middle-income countries. However low-income countries have seen little change in transfusion rates, which is an ongoing cause for concern. The smaller number of countries in the low-income and upper-middle-income groups may lead to the exclusion of countries with low transfusion rates, potentially presenting a more favourable picture for these groups.

Table 6.2 Units of red cell products transfused per 1000 population by World Bank income group, 2023

World Bank income group	Mean	Median	IQR
Low income (n = 10)	4.1	4.8	3.6–5.9
Lower middle income (n = 30)	8.7	7.7	5.3–11.6
Upper middle income (n = 29)	22.5	17.7	12.8–29.0
High income (n = 40)	29.9	28.6	22.2–32.7
Total (n = 109)	**16.2**	**15.7**	**8.5.2–28.6**

Note: Five countries in the low-income and lower-middle-income groups reported red cell products units (whole blood plus red cells) higher than the number of whole blood collection reported. Based on communication with the programme managers in the countries, this is because paediatric units derived from an adult unit of whole blood were counted as multiple units when reported to WHO. Paediatric units in some countries in these income groups are frequently supplied and transfused. The transfusion rate estimated based on these data could thus be an over-estimate for countries belonging to the group.

A further measure of variation in clinical use is the proportion of blood that is transfused as whole blood rather than blood components, which can target specific deficiencies. GDBS data reveal great variations in the use of whole blood for transfusion among different country income groups. In HICs, whole blood is less commonly (0.01% as reported) used for transfusion (outside the setting of major traumatic haemorrhage), while in upper-middle-, lower-middle- and low-income countries, 1.5%, 16.7% and 40.5% of blood, respectively, was transfused as whole blood (Table 6.3). As health systems develop and become able to offer a wider range of diagnostic and treatment options, component therapy may have advantages for inventory management and the clinical management of all different patients.

Table 6.3 Proportion (median, %) of whole blood transfusions among all red cell transfusions by World Bank income group, 2023

World Bank income group	Mean (%)
Low income (n = 10)	40.5
Lower middle income (n = 30)	16.7
Upper middle income (n = 29)	1.5
High income (n = 40)	0.01

Transfusion rates of other blood components can be calculated in a similar way. On average, 5.7 units (in units of the dosage equivalent to adult dosage/apheresis platelet) of platelets per 1000 population were transfused in HICs, 2.8 in upper-middle-income countries, 0.4 in lower-middle-income countries and 0.07 in low-income countries. A median rate of 4.4 units of platelets transfused (in units of the dosage equivalent to adult dosage/apheresis platelet) per 1000 population (IQR: 3.3–5.5) was reported by HICs, whereas the transfusion rate was 1.8 units (IQR: 0.7–2.7) in upper-middle-income countries, 0.2 units (IQR: 0.05–0.4) in lower-middle-income countries and 0.03 units (IQR: 0.01–0.05) in low-income countries (Table 6.4). Comparing the figures with the 2021 report shows some increased usage in high-income and upper-middle-income countries.

Table 6.4 Platelet units (adult dose) transfused per 1000 population by World Bank income group

World Bank income group	Mean	Median (range)	IQR
Low income (n = 10)	0.07	0.03	0.01–0.05
Lower middle income (n = 30)	0.4	0.2	0.05–0.4
Upper middle income (n = 29)	2.8	1.8	0.7–2.7
High income (n = 40)	5.7	4.4	3.3–5.5
Total (n = 109)	**2.2**	**1.5**	**0.1–3.9**

Platelets can be prepared from whole blood (whole blood-derived platelets) or can be prepared through the apheresis procedure (apheresis platelets). Based on the data reported by countries globally, the ratio of whole blood-derived platelets (in units of the dosage equivalent to adult dosage/apheresis platelet) and apheresis platelets was 47:53. The ratios in high-income, upper-middle-income, lower-middle-income and low-income countries are 38:62, 60:40, 87:13 and 94:6, respectively. Different strategies for the supply of platelets for transfusion were adopted in countries. This is the case both across and within the economic groups.

Regarding plasma transfusions, on average, 5.4 units of plasma (including FFP) per 1000 population were transfused in HICs, 8.0 in upper-middle-income countries, 4.0 in lower-middle-income countries and 0.3 in low-income countries. A median rate of 4.0 units of plasma (i.e. frozen plasma and fresh frozen plasma) per 1000 population (IQR: 2.3–7.5) was reported by HICs, whereas the transfusion rate was 4.9 units (IQR: 3.4–12.7) in upper-middle-income countries, 0.7 units (IQR: 0.4–3.7) in lower-middle-income countries and 0.2 units (IQR: 0.03–0.4) in low-income countries (Table 6.5).

In lower-middle-income and upper-middle-income countries the mean rate is much higher than the median rate because the mean is disproportionately influenced by a few countries in this group which have very large populations and relatively higher plasma transfusion rates.

It was also observed that both the mean and median rates of plasma usage in upper-middle-income countries are higher than those in HICs in 2023.

Some HICs reported the use of pharmaceutical plasma products (such as solvent/detergent plasma) instead of FFP for clinical transfusion. Details can be found in the footnote of Annex 8.

Table 6.5 Units of plasma transfused per 1000 population by World Bank income group, 2023

World Bank income group	Mean	Median	IQR
Low income (n = 10)	0.3	0.2	0.03–0.4
Lower middle income (n = 39)	4.0	0.7	0.4–3.7
Upper middle income (n = 29)	8.0	4.9	3.4–12.7
High income (n = 40)	5.4	4.0	2.3–7.3
Total (n = 109)	**4.7**	**3.2**	**0.7–6.0**

Note: Countries that reported no plasma transfusion were excluded from the calculation of the median and IQR.

6.4 Changes in blood and blood components transfusion between 2018 and 2023

Of the total 136 countries that provided blood transfusion data in 2023, 96 countries (Africa 27, Americas 15, South-Eastern Asia six, Europe 28, Eastern Mediterranean six, Western Pacific 14) also provided comparable transfusion data in 2018. The analysis of the data for both years revealed the changes in blood components transfusion between 2018 and 2023.

Red cell products transfused (whole blood and red cells) in 96 countries increased by 8% between 2018 and 2023. By WHO region, the Americas, South-East Asia, Western Pacific, Africa, Eastern Mediterranean Region and Europe reported red cell products transfused between 2018 and 2023 increased (by ranking of the increasing rate) by 29%, 15%, 14%, 12%, 2% and 1% respectively (Table 6.6). The slight increase in red cell units transfused, compared to a slight decrease in whole blood collections in Europe, may be due to the use of different country sets in the two comparisons.

Table 6.6 Units (millions) of red cell products transfused by WHO region, 2018 and 2023

Region	Whole blood			Red cells			Whole blood + red cells		
	2018	2023	% diff[a]	2018	2023	% diff[a]	2018	2023	% diff[a]
Africa (n = 27)	0.69	0.83	20%	2.51	2.74	9%	3.20	3.57	12%
Americas (n = 14)	0.026	0.039	52%	4.31	3.46	29%	4.35	3.49	29%
South-East Asia (n = 6)[b]	0.25	0.23	-8%	1.59	1.88	18%	1.84	2.11	15%
Europe (n = 28)	0.08	0.03	-58%	16.95	17.10	1%	17.01	17.14	1%
Eastern Mediterranean (n = 6)	0.21	0.16	-25%	2.61	2.71	4%	2.82	2.87	2%
Western Pacific (n = 15)[c]	0.34	0.19	-45%	6.95	8.14	17%	7.29	8.33	14%
Total (n = 96)	**1.59**	**1.47**	**-8%**	**33.95**	**36.89**	**9%**	**35.54**	**38.36**	**8%**

Notes:
[a] % of the change (% diff) is calculated as (units in 2023 – units in 2018)/(units in 2018).
[b] 2023 Data from India for 2023 were not available and therefore excluded from the comparative analysis.
[c] Data from China for 2023 were not available and therefore excluded from the comparative analysis.

Overall, in 96 countries, platelets transfused (including both whole blood-derived platelet and apheresis platelets, both in units of the dosage equivalent to adult dosage/apheresis platelet) has reported an increase of 14% between 2018 and 2023. All WHO regions reported an increase, with increase rates ranging from 1% in the Western Pacific, 15% in Europe, 22% in the Eastern Mediterranean, 24% in South-East Asia, 30% in Africa and 49% in the Americas (Table 6.7). In Europe, it was observed that the whole blood-derived platelets increased at a faster rate than that of apheresis platelets. In the Americas and the Eastern Mediterranean, the apheresis platelets increased at a faster rate than that of whole blood-derived platelets. In South-East Asia, an increase in whole blood-derived platelet transfusions was observed, while apheresis platelet transfusions decreased, with an overall rise of 24% in in total platelet transfusions reported. In the Western Pacific, whole blood-derived platelet transfusions declined, whereas apheresis platelet transfusions increased, with a marginal overall increase in total platelet transfusions reported. In Africa, data collection did not differentiate between the two types of platelet products in 2023. The ratio between whole blood-derived platelets (in adult dosage) and the apheresis platelets was 2:1.

Table 6.7 Units (thousands) of platelets transfused by WHO region, 2018–2023

Region	Platelets (WB derived)			Apheresis platelets (apheresis)			Platelets (total)		
	2018	2023	% diff[a]	2018	2023	% diff[a]	2018	2023	% diff[a]
Africa (n = 27)	—	130	–	—	63	—	148	193	30%
Americas (n = 14)	240	295	23%	146	261	78%	373	556	49%
South-East Asia (n = 6)	123	178	45%	33	17	-50%	156	195	24%
Europe (n = 28)	1 297	1602	23%	870	895	3%	2 167	2 497	15%
Eastern Mediterranean (n = 6)	216	255	18%	103	135	31%	319	390	22%
Western Pacific (n = 15)	467	456	-2%	1 140	1 172	3%	1 607	1 628	1%
Total (n = 96)	**2 464**	**2 916**	**18%**	**2 321**	**2 543**	**10%**	**4 772**	**5 458**	**14%**

Notes: All units were converted to units of the dosage equivalent to adult dosage if reported in individual units. WB derived = whole blood-derived.
a % of the change (% diff) is calculated as (units in 2023 – units in 2018)/(units in 2018).

Overall, in 96 countries, the transfusion of plasma (including FFP and FP) increased by 8% between 2018 and 2023. The Western Pacific, Americas, African, Eastern Mediterranean and South-East Asia regions reported increases of 37%, 19%, 16%, 15% and 4%, respectively. The European Region reported a –9% decrease in plasma transfusions.

Cryoprecipitate transfusions increased by 10% across 96 countries between 2018 and 2023. The African, Western Pacific and European regions reported increases of 28%, 65% and 80%, respectively. The Eastern Mediterranean, Americas and South-East Asia regions reported decreases of –28%, –13% and –1%, respectively (Table 6.8).

Table 6.8 Units (in thousands) of fresh frozen plasma (FFP/FP) products transfused by WHO region, 2018–2023

Region	Plasma (FFP/FP)			Cryoprecipitate		
	2018	2023	% diff[a]	2018	2023	% diff
Africa (n = 27)	366	426	16%	54	69	28%
Americas (n = 14)	917	1 087	19%	224	194	–13%
South-East Asia (n = 6)	437	454	4%	287	283	–1%
Europe (n = 31)	4 313	3 917	–9%	119	213	80%
Eastern Mediterranean (n = 6)	1 107	1 274	15%	310	224	–28%
Western Pacific (n = 15)	1 874	2 560	37%	209	344	65%
Total (n = 96)	**9 014**	**9 719**	**8%**	**1 204**	**1 330**	**10%**

Note:
[a] % of the change (% diff) is calculated as (units in 2023 – units in 2018)/(units in 2018).

6.5 Strategies to improve evidence-based transfusion practice and monitor safe and appropriate blood transfusion

Many factors operate to explain the considerable variations in transfusion practices between countries (and within countries). One key consideration is variable uptake and implementation of best transfusion practice, informed by high-quality research.

There is an expanding body of literature, including that informed by randomized trials, to provide clearer recommendations on which patients may benefit from transfusions. Typical trial designs have compared outcomes between groups of patients allocated to receive fewer (restrictive) or greater (liberal) amounts of red cells or platelets. Thresholds for transfusion are usually defined by different levels of reduced haemoglobin concentration or low platelet count.

An update of earlier Cochrane systematic reviews (*32*) on the use of red blood cell transfusions has been updated in 2025. Whilst most trials were performed in resource-rich country settings, one large recent trial has evaluated both the timing of transfusion administration and transfusion volume in very young African children with severe anaemia (*33, 34*).

There is now strong evidence for avoiding unnecessary transfusions, with allogeneic red cells; in most patient groups (providing there is not significant active bleeding) haemoglobin thresholds for transfusion between 70 to 80 g/L can safely be used. Some patients such as children and younger fit adults, may be able to tolerate more severe anaemia safely particularly if the anaemia is chronic and/or has developed slowly and can be treated with alternate therapies. Strategies to implement this core message of restrictive transfusion practice would minimize risk of exposure to unnecessary blood for transfusion, which is particularly important given variability in comprehensive practices of microbiological screening for potential TTIs in many countries.

More recent randomized trial data suggest that in some populations of patients such as those with acute myocardial infarction and brain injury (e.g. traumatic brain injury or stroke), there may be small but important potential patient benefits with liberal strategies when compared with restrictive strategies. This reiterates the importance of clinical judgement in use of blood. Net benefits to these, and indeed all patients, needing blood will vary by region and country as well as individual patients. Therefore, clinical teams must consider risks of transfusing more blood, including those of TTI risks (Chapter 5), alongside wider availability of blood for patients including those most in need (e.g. major traumatic bleeding).

The use of anti-fibrinolytic agents is beyond the scope of this report and chapter on clinical use of blood, but the importance and well-established role of tranexamic acid (a very cheap drug) to safely reduce the risk of bleeding and the need for transfusion in multiple populations, must be noted.

The findings from 21 randomized trials of the use of platelets were reported in a recent systematic review. As for red cells transfusions, restrictive platelet transfusion strategies probably did not cause important increases in mortality or bleeding relative to liberal strategies across pre-defined clinical groups of patients who commonly might receive platelet transfusions.

Evidence-based guidelines are important tools in the education of those ordering blood components and are prerequisites for establishing systems for the appropriate clinical use of blood, such as clinical audit. In 2023, 129 countries reported the existence of national guidelines on the clinical use of blood. Across WHO regions, 34 (76%) countries in the African Region, 20 (65%) in the Region of the Americas, 9 (82%) in the South-East Asia Region, 34 (81%) in the European Region, 15 (88%) in the Eastern Mediterranean Region and 17 (77%) in the Western Pacific Region reported the existence of national guidelines on the clinical use of blood.

Box 4. Results of updated Cochrane review on RBC transfusion thresholds

Adult threshold comparison

The haemoglobin concentration used to define the restrictive transfusion group in most adult trials was between 7.0 g/dL and 8.0 g/dL – but triallists are increasingly experimenting with lower values (as low as 5.5 g/dL).

Study characteristics

61 trials (27 639 participants), drawn from contexts including orthopaedic, cardiac or vascular surgery; critical care; neurocritical care; gastrointestinal bleeding; trauma; acute myocardial infarction; haematological malignancies and postpartum heamorrhage.

Findings

Restrictive transfusion strategies reduced the risk of receiving at least one red blood cells transfusion by 42% when combining all clinical contexts (RR 0.58, 95% CI: 0.52–0.65; high-certainty evidence), with a large amount of heterogeneity between trials, reflecting diversity in the strength of estimates, not the efficacy of the policy.

When combining all clinical contexts, restrictive transfusion strategies did not modify the risk of 30-day mortality compared with liberal transfusion strategies (RR 1.01, 95% CI: 0.90–1.14; 44 studies, 22 575 participants; high-certainty evidence) or any of the other outcomes assessed including myocardial infarction, stroke, congestive heart failure, thromboembolism or infection (moderate to high-certainty evidence).

There were two exceptions in clinical populations:

In gastrointestinal bleeding, 30-day mortality was lower with a restrictive transfusion strategy (RR 0.63, 95% CI: 0.42–0.95; 4 studies, 1574 participants).

In critically ill patients with brain injury, unfavourable neurological outcome at 6 to 12 months was lower with a liberal transfusion strategy (RR 1.14, 95% CI: 1.05–1.22; 4 studies, 2297 participants) (moderate-certainty evidence).

Paediatric threshold comparison

The haemoglobin concentration used to define the restrictive group in paediatric critical care and haematological malignancies trials was between 6.5 g/dL and 8.0 g/dL, and between 7.0 g/dL and 9 g/dL in paediatric cardiac surgery trials, depending on the cardiac abnormality and stage of repair. For severe malarial anaemia, inclusion criteria required a haemoglobin concentration of < 6.0, but the decision that triggered an immediate vs a delayed transfusion could require a drop to < 4g/dL.

Study characteristics

8 trials (2 764 participants), from clinical contexts including: critical care, cardiac surgery, haematological malignancies and severe malarial anaemia.

6.5.1 Hospital transfusion committees

Governance of blood transfusion activities and the chain from donor to patient is vital, given all risks. One element is the role of hospital transfusion committees to provide oversight for all aspects of transfusion safety in transfusing facilities including appropriate usage, both to discourage use of inappropriate transfusions and to prevent underusage when transfusion is needed. GDBS data reported by 93 countries – including 29 high-income, 19 upper-middle-income, 32 lower-middle-income and 13 low-income countries – showed that hospital transfusion committees were present in 40% of hospitals performing transfusions. Across World Bank income groups, the average proportion of hospitals with a committee was 20% in low-income countries, 46% in lower-middle-income countries, 37% in upper-middle-income countries and 43% in HICs.

However, the percentages reported by countries within each income group vary substantially. The calculated group averages are heavily influenced by countries reporting a large number of hospitals where transfusions are performed. Table 6.9 presents the median and IQR percentages by World Bank income group.

Table 6.9 Percentage of transfusion-performing hospitals participating in hospital transfusion committee, 2023

World Bank income group	Median (IQR) (%)
Low income (n = 13)	9 (4–29)
Lower middle income (n = 32)	25 (2–87)
Upper middle income (n = 19)	28 (3–100)
High income (n = 29)	85 (18–100)
Global (n = 93)	**30 (4–100)**

6.5.2 Systems for reporting adverse transfusion events

Data from 95 countries (37 high income, 21 upper middle income, 26 lower middle income and 11 low income) indicate that systems for reporting adverse transfusion events were present in 68% of hospitals. By income group, the average proportion was 88% in HICs, 41% in upper-middle-income countries, 62% in lower-middle-income countries and 39% in low-income countries.

As with transfusion committees, the reported proportions vary considerably within income groups. Table 6.10 shows the median and IQR percentages by World Bank income group.

Table 6.10 Percentage of transfusion-performing hospitals participating in systems for reporting adverse transfusion events, 2023

World Bank income group	Median (IQR) (%)
Low income (n = 11)	0.4 (0–53)
Lower middle income (n = 26)	33(1–82)
Upper middle income (n = 21)	100 (22–100)
High income (n = 37)	100 (96–100)
Global (n = 95)	**84 (12–100)**

Compared with the GDBS survey data from 2018, the number of countries reporting these data has remained largely unchanged. Of the 168 countries surveyed, 63 (including 12 of 49 HICs, 22 of 45 upper-middle-income countries, 19 of 51 lower-middle-income countries and 10 of 23 low-income countries) did not respond to either of the two questions in this section. This limits the ability to report comprehensively on this measure. The lack of national data, both in developed and developing countries, highlights that this aspect of blood transfusion safety requires greater attention and potentially more targeted interventions.

It should be noted that the mere existence of national guidelines does not ensure their appropriate use. Similarly, the presence of a hospital transfusion committee does not guarantee that it functions effectively or influences transfusion practices. Countries reporting data noted that, in some cases, even established hospital transfusion committees do not meet regularly, and haemovigilance data are neither reported nor analysed, even when designated reporting forms exist.

Future efforts should focus on ensuring that these committees and systems are fully functional. In addition, operational studies on clinical use of blood and on implementing strategies to improve the blood transfusion practices are needed to generate more information and evidence to support policy and practice (*35, 36*).

6.6 Risks of undertransfusion: unmet demand for blood in resource-limited countries

The above discussion has focused on appropriate transfusions and the need to avoid unnecessary transfusions. It is important, however, to also recognize the potential risks of undertransfusion or delayed transfusion. A number of studies have highlighted the burden of severe anaemia in young children, often due to malaria. Mortality rates are significant, and deaths may occur within a few hours of arrival in hospital, indicating the importance of access to timely blood transfusion support, which is often not available (*37–39*). Failure to recognize the presence of severe anaemia resulted in lack of transfusion in some cases (*40*). The prevention and treatment of postpartum haemorrhage requires a multiplicity of interventions, including timely blood transfusion (*41*). The WOMAN trial report published by Picetti et al. (*42*) assessed the clinical and contextual factors surrounding the deaths of 483 women (of the 20 060 patients assessed in the trial) following postpartum haemorrhage in developing countries. It found that lack of timely transfusion or insufficient transfusion are still factors that lead to maternal deaths. An earlier review by Bates et al. (*43*) estimated that that overall 26% (range 16–71%) of maternal haemorrhage deaths were due to lack of blood for transfusion.

The WHO 14th General Programme of Work identifies promoting health equity and strengthening the resilience of health systems as key strategic objectives, with a particular emphasis on ensuring access to essential health services for all. It is important that countries and development partners agree to collect data on indicators to monitor progress towards achieving universal health coverage and to evaluate the quality and effectiveness of their care processes (*44, 45*). One of these monitoring systems is the WHO annual monitoring system for Service Availability and Readiness Assessment (SARA). The system has been implemented in many LMICs to regularly assess basic and comprehensive service availability and readiness, including uninterrupted safe blood supply, at the facility level (*46*).

Since the last global report, which emphasized the urgent need to document unmet demand in LMICs, a few studies have been published that highlight persistent inequities in access to safe blood transfusion, particularly in peripheral areas within national blood systems (*47–49*). Despite growing awareness, few countries have implemented routine data collection mechanisms at transfusion-performing hospitals or at the national level to systematically track unmet demand for blood transfusion, especially in LMICs (*50*). The absence of such systems creates significant challenges in identifying service gaps and designing targeted interventions to address disparities in access. To close this gap, it is essential to expand the scope of haemovigilance beyond its traditional focus on safety and adverse events by incorporating structured reporting on unmet demand for blood transfusion. This enhanced approach would provide a more comprehensive understanding of both the availability and accessibility of blood products, enabling health authorities and development partners to make evidence-based decisions, strengthen health system resilience and accelerate progress toward universal health coverage (*51*).

Chapter 7

Haemovigilance

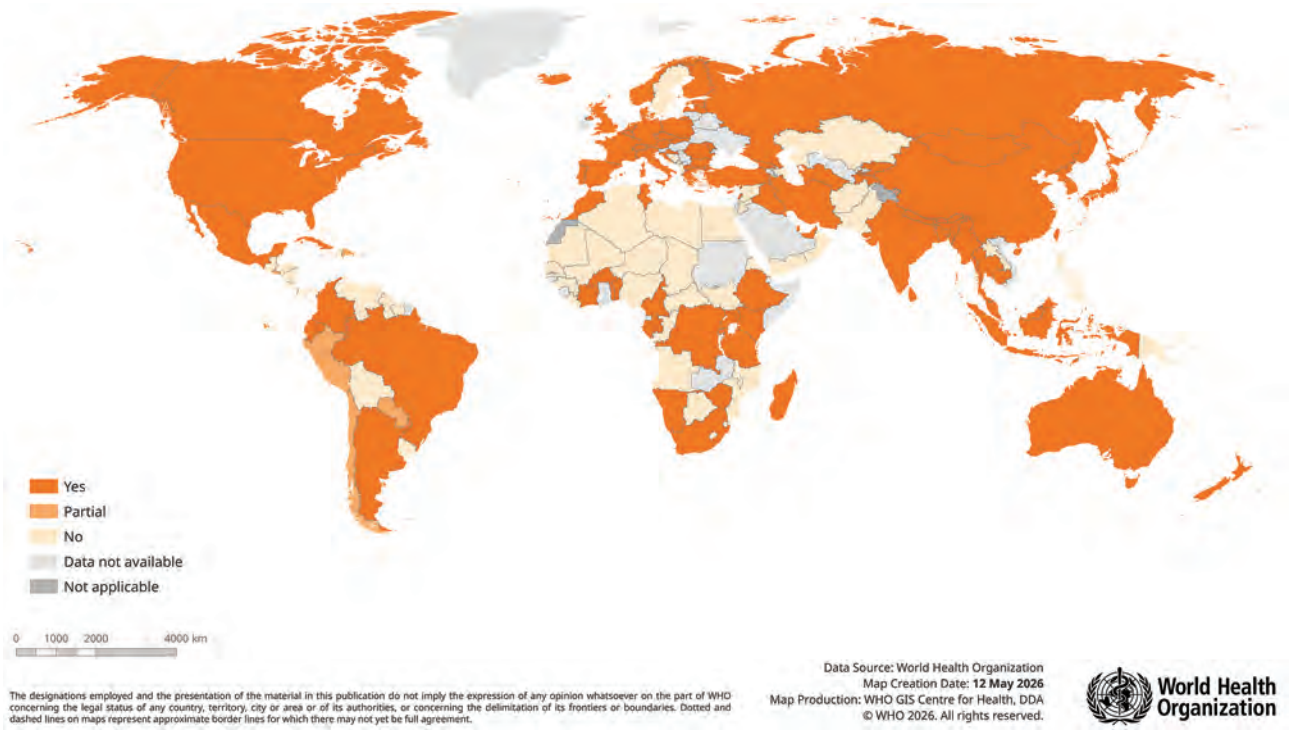
An important component of a blood safety system is the establishment of a haemovigilance system, which is a set of surveillance procedures covering the entire transfusion chain. It includes systematic data collection and analysis to monitor and evaluate adverse events associated with the blood supply and transfusion service, feedback to stakeholders and the implementation of corrective and preventive actions to improve blood safety and transfusion outcomes. Haemovigilance systems have drawn attention to the importance of many poorly documented and potentially preventable adverse events, including incorrect blood component transfused, transfusion-related acute lung injury and bacterial contamination of platelets.

Well-functioning haemovigilance systems indicate how safety should be improved and also document the success of the various measures put in place to improve transfusion safety. In many developed countries, such as in the European Union, there is a legal requirement to report serious adverse reactions and events to the regulatory agency. More recently, the scope of haemovigilance has been expanded to include adverse events in blood donors, thus helping to improve safety for the donor as well as the patient. In addition to serious adverse reactions, near-miss events are also recognized as an important component of haemovigilance system. These events, in which errors or deviations in the transfusion process are identified before reaching the patient and therefore provide valuable insight into underlying weaknesses in systems, communication and human factors. Systematic reporting and analysis of near-miss events form a part of preventive approach to transfusion safety and is a key feature of well-functioning and mature haemovigilance systems. There is also growing recognition of the need to identify and document adverse events associated with lack of availability of, or access to, blood transfusion to meet appropriate clinical need. Mechanisms need to be developed to facilitate the capture of information on such events, particularly as they are likely to have a disproportionate impact in low-income countries. Incorporating these considerations within haemovigilance frameworks can contribute to a more complete understanding of transfusion-related risks and support the development of strategies that improve both the safety and availability of blood.

GDBS 2023 indicates that 88 countries (representing 52% of the 168 responding countries) reported having a national haemovigilance system. Across WHO regions, 16 countries (36% of 45 surveyed) in Africa, 8 (26% of 31)[9] in the Americas, 9 (82% of 11) in South-East Asia, 34 (81% of 42) in Europe, 9 (53% of 17) in the Eastern Mediterranean and 12 (55% of 22) in the Western Pacific reported having such a system (Fig. 7.1).

[9] This does not include four countries in the Region of the Americas that answered the question as "partial".

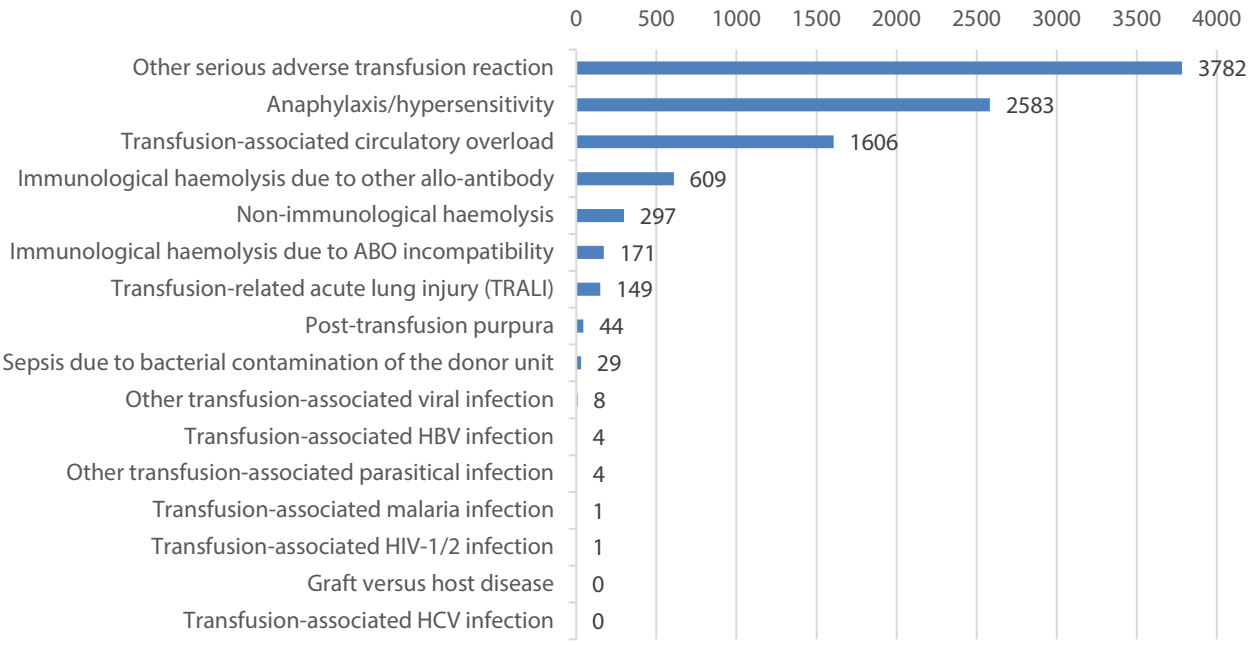
Fig. 7.1 Distribution of countries reporting the existence of national haemovigilance systems, 2023



A total of 60 countries (nine in Africa, five in the Americas, three in South-East Asia, 29 in Europe, five in the Eastern Mediterranean and 9 in the Western Pacific) reported haemovigilance data from clinical transfusion. Of those, 35 were HICs, 15 were upper middle income, seven were lower middle income and three were low income. Notably, the previous report included no low-income countries, highlighting progress in participation. A functioning haemovigilance system requires more than simply establishing a programme and requesting identification, reporting and follow-up of adverse events. Continuous improvement, guided by systematic analysis of collected data, is the core purpose of haemovigilance and reflects the maturity of the system. The availability and analysis of data are particularly important for low-income countries, as they inform the allocation of limited resources. However, reliable data are often lacking in these settings, making the development of robust haemovigilance systems essential.

The cases of serious adverse reaction reported are shown in Fig. 7.2, by category. Other serious adverse reaction (3 782), anaphylaxis and hypersensitivity (2 583 cases) and transfusion-associated circulatory overload (1606 cases) were the three main causes of serious adverse reaction, accounting for 41%, 28% and 17% of the total cases of serious adverse reaction reported, respectively. A total of 3 782 (in comparison with 1 491 as reported from 62 countries in GDBS 2018) cases were reported in the unclassified serious adverse reaction category "other". Many countries indicated that the main cases in this category were febrile non-haemolytic transfusion reactions. Since cases of febrile non-haemolytic transfusion reactions are not always serious, the "other" category may represent overreporting of serious adverse reaction cases. It would be useful to have clearer definition. A high percentage of reports in the "unclassified" or "other" category can limit the interpretation of haemovigilance data by obscuring the nature of adverse reactions, making it difficult to identify patterns, determine root causes and implement corrective actions. Excessive use of "other" also hampers cross-country comparisons. At the same time, their use may reflect incomplete clinical information and/or limited diagnostic capacity particularly in resource-constrained settings. To address this, national haemovigilance guidelines should provide clear definitions and examples for each category, and regular training should be conducted for blood establishments and clinicians on accurate reporting standards.

Fig. 7.2 Serious adverse transfusion reactions reported, 2023



Only 57 countries reporting haemovigilance data also provided the total number of blood components (including whole blood) transfused (16 countries)[10] or issued (the remaining 41 countries), allowing calculation of incidence rates for individual countries or groups of countries. Because the number of units transfused and issued within the same blood system can differ significantly, rates are expressed as cases per 100 000 units of blood components transfused or per 100 000 units distributed for individual countries, where possible. Regional or group averages are expressed as cases per 100 000 units distributed. Across these 57 countries, a total of 72 192 418 blood components were issued or transfused and 7683 cases of serious adverse reactions were reported. Based on these figures, the overall incidence of serious adverse reactions relative to the total number of blood components (including whole blood, red blood cells, plasma, platelets and cryoprecipitate) issued or transfused is estimated at 10.6 per 100 000 distributed blood components. The incidence of serious adverse reaction per 100 000 units of blood components transfused in the European Region, which reported both the largest number of case and denominator (components transfused or issued), was 13.5 per 100 000 units of distributed blood components. The incidence rates in the African Region, the Region of the Americas, the South-East Asia Region, the Eastern Mediterranean Region and the Western Pacific Region were 18.7, 34.8, 2.8, 10.2 and 10.3 per 100 000 units of distributed blood components, respectively (Table 7.1).

In the European Region, 27 of the 42 responding countries reported both haemovigilance data and the number of units of blood components transfused (or issued). The median incidence rate of serious adverse reactions in this region was 4.0 per 100 000 units distributed. Cyprus, Iceland and Latvia each reported zero cases, while other countries reported rates ranging from 0.8 to 104.6 (IQR: 3.3–11.0) per 100 000 units distributed.

In the African Region (reporting countries n = 9) the incidence rate was 18.7 per 100 000 units distributed. Eritrea and Mauritius each reported zero cases, while other countries reported rates ranging from Benin 9.7, Ghana 10.2, South Africa 15.8, Burkina Faso 23.6, Gabon 46.1 to Madagascar 50.2 per 100 000 units distributed.

[10] Austria, Belgium, Brunei Darussalam, Cook Islands, Cyprus, Denmark, Georgia, Iceland, Italy, Malta, New Zealand, Norway, Portugal, Qatar, Singapore, Spain.

In the Region of the Americas (n = 4) the incidence rates were Canada 2.5, Colombia 12.8, Chile 20.5, Ecuador 38.2 per 100 000 units distributed.

In the South-East Asia Region (n = 3) the incidence rates were India 0.6, Thailand 9.3 and Sri Lanka 34.2 per 100 000 units distributed. Bhutan provided a URL link to its hospital annual report, which includes adverse transfusion reactions.

In the Eastern Mediterranean Region (n = 5) the incidence rates were Kuwait 1.6, Morocco 2.0, Qatar 7.89 per 100 000 units transfused; and Iran (Islamic Republic) 11.2, Bahrain 50.2 per 100 000 units distributed.

In the Western Pacific Region (n = 9) the overall incidence rate was 10.6 per 100 000 units distributed. The country-specific rates were Republic of Korea 0.71, Malaysia 13.3, Japan 15.5, Australia 16.6 per 100 000 units distributed; and Singapore 13.6, New Zealand 20.35, Brunei Darussalam 90.6 per 100 000 units transfused. Cook Islands reported zero case. Tonga reported one case.

Table 7.1 Incidence of serious transfusion adverse reaction (per 100 000 units of components transfused) by WHO region, 2023

Region	Serious adverse reaction	Total number of components transfused/issued[a]	Incidence
Africa (n = 9)	409	2 181 555	18.7
Americas (n = 4)	1 240	3 561 048	34.8
South-East Asia (n = 3)	605	21 985 704	2.8
Europe (n = 27)	3 553	26 225 369	13.5
Eastern Mediterranean (n = 5)	599	5 845 776	10.2
Western Pacific (n = 9)	1274	12 392 966	10.3
Total (n = 57)	**7 683**	**72 192 418**	**10.6**

Note:
[a] When reported as an adult dosage, whole blood-derived platelet units were converted to individual units using the formula: units in adult dosage x 5.

The reported incidence rates presented in this section and in Table 7.1 require careful contextual interpretation. Variability between the overall and country-specific incidence rates may reflect variation in haemovigilance system maturity, reporting practices, case definitions and data completeness, both across and within WHO regions rather than true differences in underlying risk. Some of the reported adverse transfusion reactions might include both serious and non-serious transfusion reactions, accounting for higher serious adverse reaction rates in some countries. It may also be possible that not all countries followed the internationally recognized definitions promoted by WHO (*52*). Conversely, relatively lower values in some countries may result from under reporting, incomplete surveillance or use of the partially reported haemovigilance data and national transfusion data when calculating rates for this report. Reporting zero incidents is also not unusual for countries with small populations.

Overall, reporting the global, regional and country-specific incidence rates represents an important step forward. Continued efforts to establish and strengthen national haemovigilance systems will support more complete and consistent reporting of adverse events so that targeted recommendations can be made to minimize transfusion-related risks at national level. At the international level, the availability of comparable haemovigilance data will facilitate benchmarking of transfusion safety and support continuous improvement worldwide. To achieve this objective, training and additional guidelines accompanying the GDBS questionnaire are needed to promote a common understanding of case definitions used in the GDBS survey.

chapter 8

Plasma used for fractionation and the provision of plasma-derived medicinal products

Plasma-derived medicinal products (PDMPs) are indispensable in the prevention and treatment of serious morbidities associated with a wide range of inherited and acquired medical conditions, including bleeding disorders, immune deficiencies and certain neurological diseases. Products such as clotting factors, immunoglobulins and albumin are often lifesaving and constitute an essential component of modern health care.

Despite their clinical importance, access to essential PDMPs remains globally inadequate and unevenly distributed. Many patients in LMICs with severe congenital or acquired disorders continue to lack access to appropriate treatment (*53*). These variations in availability across countries are closely associated with national income levels as well the differences in the strength and organization of national blood systems, regulatory oversight and health system capacity. As a result, substantial and preventable morbidity and mortality persists, contributing to widening health inequities.

Constraints in access are not confined to low-resource settings. Even in HICs, shortages of critical PDMPs such as intravenous immunoglobulin (IVIG) are experienced while demand is increasing (*54*). These shortages highlight vulnerabilities in the current global plasma supply chain, including dependence on limited supplies, imbalanced and regionally concentrated plasma collection, complex manufacturing processes and exposure to geopolitical tensions, posing challenges to ensuring sustainable access worldwide.

Ensuring sustainable and equitable access to PDMPs therefore requires more than increasing supply alone. Addressing these challenges requires coordinated national and global action including strengthening plasma collection, optimizing the use of available plasma, together with measures related to governance and regulatory capacity, clinical stewardship and diversification of manufacturing and supply arrangements to promote equitable distribution of PDMPs (*55, 56*).

A major factor limiting the global availability of PDMPs is the inadequate supply of plasma that meets internationally recognized standards for fractionation. The WHO *Guidance on increasing supplies of plasma-derived medicinal products in low- and middle-income countries through fractionation of domestic plasma* and *Implementing cross-border transfer of domestic plasma to obtain plasma-derived medicinal products* provide a strategic framework to assist Member States in increasing both the availability of quality-assured plasma for fractionation and access to PDMPs within their health systems (*57, 58*). WHO guidance is intended to strengthen national capacity for plasma collection, regulation and stewardship, while supporting a more resilient and diversified global supply of PDMPS, rather than promoting isolation or disengagement from international plasma and PDMP markets.

This global status report continues to provide information on status and progress in countries in making quality-assured plasma available for fractionation of PDMPs to meet the treatment need of the patients requiring PDMPs.

Of 168 responding countries, 49 countries reported various arrangements for utilizing plasma collected in the country for fractionation. Of those, 27 countries reported that the plasma was fractionated through domestic or contract fractionation, nine countries reported selling the plasma to the fractionator and purchasing PDMP from the market (not necessarily produced through manufacture of the plasma originating in the countries) and 13 countries reported using both of those options. A total of 119 countries reported that all PDMP are imported or no PDMPs were used during the reporting period.

Data on the volume of plasma sent for fractionation by the blood services in 2023 were obtained from 36 countries, which reported the collection of a total of around 21.5 million litres of plasma for fractionation. By comparison, the current volume fractionated globally is estimated to exceed 90 million litres. The lower volume captured through the WHO GDBS is likely to reflect underreporting of source plasma collections, particularly in settings where plasma collection and fractionation occur outside national blood services, most notably in the Regions of the Americas (*59*).

An analysis by collection method – whether plasma was recovered from whole blood or collected by apheresis, or collected as source plasma – showed that globally, 26% of the plasma sent for fractionation by blood establishments was recovered plasma. Recovered plasma represents an opportunity to increase PDMP supply through improved utilization of existing whole blood collections, particularly in countries where expansion of source plasma is not immediately feasible. In Europe, 2.7 million litres of recovered plasma were fractionated, accounting for 37% of the region's total fractionated plasma. In the Western Pacific Region, 1.9 million litres of recovered plasma were fractionated, representing 15% of the total volume reported in the region (see Table 8.1).

Several countries reported a high proportion of recovered plasma among their fractionated volumes:

- Eastern Mediterranean Region: Iran (Islamic Republic of) and Morocco – 99.8%
- South-East Asia Region: Thailand – 97%
- African Region: Namibia and South Africa – 88%
- Region of the Americas: Argentina, Canada, Chile and Paraguay – 83%.

Compared with the previous report based on 2018 data, notable changes were observed in several regions. In the Western Pacific Region, seven countries reported a total volume of 12 867 736 L, an increase from 10 868 412 L in 2018. In Europe, 20 countries reported a combined volume of 7 429 653 L, up from 6 629 997 L reported by 25 countries in 2018. In the South-East Asia Region, Thailand reported 224 242 L, a significant rise from 133 419 L in 2018. In contrast, countries in other regions – Africa, the Americas and Eastern Mediterranean – reported a slight decrease compared with the volumes reported in 2018.

Globally, efforts continue to increase the supply of plasma which can be manufactured into essential PDMPs. Campaigns to raise awareness of the need for and to promote plasma donation (*60–62*) underscore the importance of ensuring that sufficient plasma protein products are available to meet patients' needs, reflected also in the choice of "Give blood, give plasma, share life, share often," as the slogan for the World Blood Donor Day 2023 celebration and global campaign. Legislative changes also reflect these efforts, such as the Plasma Donation Awareness Acts in the United States and the Substances of Human Origin Regulation in the European Union, which also align with initiatives such as the International Coalition for Safe Plasma Proteins. The European Union also co-funded, through the EU4Health programme, the SUPPLY project – a collaborative initiative involving blood establishments, donor organizations, patient

advocates and medical societies which aims to increase the volume and resilience of voluntary and unpaid plasma collection and ensure equitable access to PDMPs across Europe.

Table 8.1 Volume (L) of plasma for fractionation by collection method and WHO region, 2023

Region	Recovered plasma	Apheresis plasma	Source plasma[a]	Total	% of recovered plasma	% source plasma
Africa (n = 2)	253 633	2 665	30 448	286 746	88	11
Americas (n = 4)	352 418	24 362	48 771	425 551	83	11
South-East Asia (n = 1)	217 890	2 322	4 030	224 242	97	2
Europe (n = 20)	2 718 068	3 551 237	1 160 349	7 429 654	37	16
Eastern Mediterranean (n = 2)	274 000	427	-	274 427	99.8	0
Western Pacific (n = 7)	1 896 951	902 413	10 068 372	12 867 736	15	78
Total (n = 36)	**5 712 960**	**4 483 426**	**11 311 970**	**21 508 356**	**27**	**53**

Note:
[a] Source plasma" was included in the GDBS questionnaire for the collection of 2023 data. Previous surveys only offered two options: "Recovered plasma" and "Apheresis plasma." In the GDBS 2023 questionnaire, "Source plasma" is defined as plasma obtained by plasmapheresis for further fractionation into plasma-derived medicinal products.

The volume of plasma for fractionation (and processing for PDMP) per 1000 population varied considerably between countries, ranging from 0.25–55.44 L, with a median of 5.37 L.

Forty-two countries responded that at least one of the four products – albumin, IVIG, Factor VIII product (excluding recombinant products), Factor IX – were manufactured by fractionation within the country or through contract fractionation: 23 countries reported all four, and seven countries reported three products (albumin, IVIG and Factor VIII) were manufactured by fractionation within the country or through contract fractionation. Four countries reported that only albumin and one country reported only IVIG were manufactured in such as way.

Twenty-two countries provided data on the proportion of three key PDMPs – albumin, IVIG and Factor VIII – supplied through fractionation (either domestic or contract fractionation) of plasma collected within their own country. This proportion is referred to as the "self-reliance rate", and acts as an indicator for the extent to which countries are able to meet national PDMP clinical needs through the fractionation of domestically collected plasma, while recognizing that imported products continue to play an important complementary role.

Among these 22 countries, 14 reported that 50% or more of at least two of the three products were obtained through fractionation of domestically collected plasma. Nine countries – Australia, Czechia, Italy, Japan, Namibia, New Zealand, Norway, Republic of Korea and South Africa – reported that 75% or more of at least two of these products were sourced from domestic plasma fractionation.

Some countries reported, or are known to have, large volumes of plasma for fractionation but did not report the percentage of the "self-reliance" rate requested in the GDBS questionnaire. This may be due to differences in the definition of self-reliance used nationally or the complexity of plasma sources and PDMP supply chains. This report monitors two of the three key PDMPs, as some countries may choose not to include all three (for example, excluding plasma-derived Factor VIII) in their national monitoring framework. Annex 9 provides detailed information on the supply of PDMPs in countries reporting to WHO. Box 5 details the National Bioproducts Institute (NBI) and Namibian Blood Transfusion Service (NAMBTS) Contract Fractionation Programme and its impact on PDMP availability in Namibia.

Box 5. NBI-NAMBTS Contract Fractionation Programme and its impact on PDMP availability in Namibia

The contract fractionation partnership, established in 2013 between the National Bioproducts Institute (NBI) of South Africa and the Namibian Blood Transfusion Service (NAMBTS) is vital for the two organizations. This collaboration has ensured the optimal use of Namibian surplus plasma, improved financial sustainability for NAMBTS and significantly enhanced patient access to lifesaving PDMPs. It also offers NBI strategic access to safe, high-quality plasma required for sustainable and scalable PDMP manufacturing. This example illustrates how contract fractionation can strengthen both national sustainability and regional supply when underpinned by strong quality systems, regulatory oversight and long-term partnership arrangements.

The whole blood donation rate in Namibia is 15 units per 1000 population. In 2023, NAMBTS collected 50 979 donations, consisting of 88% (45 096) whole blood units, 9% (4 640) apheresis plasma donations and 1% each apheresis double red cell and apheresis platelet donations. All whole blood units were processed into components at the centralized testing and processing facility in Windhoek. From these donations, NAMBTS produced 14 600 L of plasma of which 17% was issued for transfusion in Namibia while the remaining surplus was exported to NBI for fractionation, giving an export volume of 4.8 L per 1000 population.

NAMBTS maintains stringent quality and safety standards, performing ID-NAT testing for HIV-1/2, HBV and HCV, alongside syphilis screening. The total TTI prevalence among donations remains consistently low at approximately 1% per year, with 2023 recording 0.95%. Compared with background prevalence rates in the general population, these levels are significantly reduced, demonstrating effective donor selection and reliance on a 100% voluntary non-remunerated donor base, of which 72% are repeat donors.

To qualify as a plasma supplier, NBI requires plasma sourced from donor populations with documented, controlled, and significantly reduced rates of TTIs compared with the general population. Suppliers must provide comprehensive epidemiological evidence as part of the qualification process. To ensure safety and compliance, NBI relies on robust serological and NAT testing for HIV, HBV and HCV, supported by good manufacturing practice (GMP) and quality-system audits of the blood establishment. Supplier suitability is assessed on a case-by-case basis, and NBI may incorporate contractual trigger points into agreements (e.g. increasing NAT yields, shifts in immunoglobulin yields, or unacceptable trends in TTI prevalence). Crucially, NBI requires plasma suppliers to demonstrate that TTI prevalence among donations is substantially lower than background rates in the general population, reflecting strong donor selection practices and effective risk mitigation. This benchmark is fundamental for ensuring that the plasma pool remains safe, reliable and suitable for large-scale PDMP manufacturing.

The successful NBI-NAMBTS plasma fractionation partnership hinges on achieving and maintaining stringent quality and blood safety standards, which requires a staged, collaborative and externally validated approach. The initial and critical step for NAMBTS was leveraging significant President's Emergency Plan for AIDS Relief funding (contributing 6–44% of annual expenditure between 2005–2015) to implement and improve GMP) across its operations, including ID-NAT testing, component processing and cold chain management. This foundation led to successful attainment of AfSBT Stepwise Accreditation (Level 3) by 2013, which served as compelling, objective evidence of high-quality and blood safety standards – a key prompt for engaging NBI.

The collaboration with NBI followed a meticulous validation process: it started with a feasibility assessment, followed by a physical audit which, despite finding no major GMP deficiencies, identified areas for improvement. NAMBTS's prompt closure of all non-conformances led to a second successful audit, after which NBI championed the partnership by submitting a plasma master file to the South African regulatory body (South African Health Products Regulatory Authority). NBI's plasma master file is prepared in accordance with European Medicines Agency regulatory guidance and includes detailed donor-population epidemiology, such as prevalence, incidence, NAT yields, risk assessments and ongoing surveillance data, to demonstrate that the donor population is suitable for fractionation. Epidemiological data from NAMBTS confirmed a significantly reduced TTI prevalence among donors compared with the general population, reflecting the effectiveness of its GMP framework and rigorous ID-NAT and serology screening processes and was accepted as a plasma supplier on NBI's plasma master file by the South African Health Products Regulatory Authority.

For potential replicators, maintaining quality is a continuous commitment, achieved through an ongoing quality management system, regular re-accreditation audits by bodies like AfSBT (every 4 years) and recurring compliance audits by the plasma partner, NBI (every 3 years). Crucially, NAMBTS specifically focused on meeting NBI's strict quality requirements by implementing a targeted strategy to reduce TTIs, including discontinuing collections from high-risk clinics (those with TTI prevalence above 5%) and limiting new donor recruitment in high-endemic areas, successfully dropping the total TTI rate below the target 1% threshold from 1.49% in 2015 to 0.95% by 2023.

Historically, between 2009 and 2012, Namibia experienced severe shortages of PDMPs because the sole regional supplier, NBI, could only meet domestic South African demand, forcing Namibia to rely on costly and less reliable international suppliers. Simultaneously, NAMBTS faced a critical operational and ethical challenge. Of the 33 373 L of plasma produced over the 5 years preceding the collaboration, approximately 77% (25 798 L), were discarded as costly medical waste, despite being suitable for fractionation. At this pivotal time, the collaboration between NBI and NAMBTS was initiated to address Namibia's supply deficit and prevent the extensive, wasteful disposal of high-quality plasma, while strengthening NBI's production capacity and contributing to the regional supply of PDMPs.

Box 5. NBI-NAMBTS Contract Fractionation Programme and its impact on PDMP availability in Namibia (continued)

This partnership offers NAMBTS a sustainable way to utilize surplus plasma, generating income that covered 45% of ID-NAT costs and contributed 8% of total annual revenue in 2023. Crucially, it ensures the consistent availability of essential PDMPs in Namibia, including Factor VIII, albumin, immunoglobulins and vital fresh dried plasma distributed in remote areas where cold chain infrastructure is limited. For NBI, the collaboration strategically increases plasma volumes, enhancing its production capacity and supporting NBI's mandate to improve access to essential PDMPs across Southern Africa.

The NBI-NAMBTS Contract Fractionation Programme is a successful model of regional cooperation, improving PDMP availability, strengthening national blood system sustainability and ensuring that every donated unit contributes to improved patient outcomes.

Ensuring a safe, secure, sufficient and ethically obtained supply of PDMPs is a critical public health responsibility for national governments. The World Health Assembly resolution WHA63.12 urges Member States to establish, implement and support nationally coordinated, efficiently managed and sustainable blood and plasma programmes, tailored to available resources, with the ultimate goal of achieving self-sufficiency (*63*). Importantly, setting and monitoring a goal of self-sufficiency should not be interpreted as being for national or regional strategy and interest only. Rather, it represents a global approach to diversifying plasma collection and PDMP manufacturing and supply, thereby contributing to achieving a sustainable and secure global supply chain. In this context, self-sufficiency should be understood as a strategic public health objective that complements, rather than replaces, international cooperation and shared responsibility for global plasma and PDMP supply. Box 6 illustrates how the Italian Government has established a system to monitor both demand and self-sufficiency of PDMPs.

Analysis of the WHO GDBS data on plasma used for fractionation and the provision of PDMPs highlights substantial variation in plasma collection and volumes across countries, reflecting differences in national capacity and approaches to PDMP supply. These findings underscore the importance of strengthening domestic plasma collection and appropriate utilization as part of broader efforts to enhance national capacity and resilience, while recognizing continued interdependence in PDMP supply within regional and global arrangements. Within this context, quality considerations, regulatory systems and fractionation arrangements emerge as critical supply-side factors requiring attention. Improving access to PDMPs therefore depends on sustained investment in national blood system capacity, strong governance and regulatory oversight, and sound clinical stewardship to ensure that, as far as possible, available plasma is converted into PDMPs rather than being wasted.

Beyond the supply-side factors examined in this chapter, equitable and sustainable access to PDMPs is also shaped by wider health system functions, including financing, procurement, service delivery and prescribing practices. Although these aspects were not examined in detail here, strengthening these functions through appropriate national policies and collaboration at the global level is necessary to ensure that donated plasma is used responsibly and effectively, and that national blood systems are able to deliver PDMPs as part of a broader public health benefit, particularly for patients who depend on lifelong or critical PDMP therapy.

Box 6. System to monitor the demand and self-sufficiency of PDMPs in Italy

The plasma collected in Italy comes from voluntary, regular, responsible, anonymous and non-remunerated donations.

According to Italian legislation, the term PDMP self-sufficiency means "[. . .] to provide patients, in a systematic and sustainable way, with the prompt and continuous availability of a defined set of PDMPs with the highest level of quality and safety that meets appropriate clinical needs through the national collection of plasma [. . .] with the contribution of PDMPs shares acquired on the market".

Self-sufficiency in PDMPs and blood components is the first objective stated in Law No. 219/2005, recognizing this as a non-divisible national and supraregional interest, which regional and local health authorities have to contribute and accomplish. To this end, this Law also acknowledges the annual programme of national self-sufficiency as the instrument to determine all aspects of national self-sufficiency, covering historical consumptions/trends, real needs as well as required production levels, resources, prospective financing criteria and compensation methods among the regions.

The regions, individually or in association, send plasma collected by blood establishments to authorized, contracted companies to be industrially transformed into PDMPs.

In this framework and with this mandate, the National Blood Centre constantly and systematically monitors data relating to plasma donations, carrying out detailed analyses on a monthly basis, processing information communicated by the blood establishments regarding the volumes of plasma sent to fractionation companies. This process allows real-time monitoring of plasma collection trends, identifying any variation or critical issue in the supply.

Analysis of the demand for PDMPs is carried out on a 6-month basis for albumin and immunoglobulins and on annual basis for all PDMPs, integrating several data sources to obtain a complete and accurate picture of the need for and the use of these pharmaceutical products. The sources of information used include the Drug Traceability Flow, which allows the tracking of the entire distribution chain provided by the Ministry of Health and gives a detailed overview of the distribution to health facilities, including commercial transactions. In addition, the analysis considers the distribution of PDMPs to the regions through the toll-manufacturing system, supplied by the fractionation companies. Finally, the analysis also covers the flow of PDMPs dispensed nationwide through pharmacies and the supply supplied by the Italian Medicines Agency, which also provides data on imported medicinal products. Analysis of the demand for PDMPs is carried out every 6 months for products considered "drivers" and on an annual basis for all PDMPs, including recombinant products, monoclonal antibodies used in the replacement therapy of coagulation disorders and pharmaceutical products under importation procedures. This frequency allows the constant update of procurement strategies and ensures the availability of these essential and strategic products for the national health system, balancing supply and demand and optimizing available resources.

Sources: Candura F et al. *Demand for plasma-derived medicinal products in Italy*. National Blood Centre; 2023 (*64*); *Plasma and plasma-derived medicinal products national plan 2016–2020*. Official Journal of the Italian Republic; 2017 (*65*); *New regulations on transfusion activities and the national production of blood products*. Official Journal of the Italian Republic; 2005 (*66*).

chapter 9

Discussion and conclusions

This document is primarily based on data collected for 2023, as reported by 168 of 194 Member States of the WHO GDBS. This database provides information on the current global status of major aspects of blood banking and transfusion practices, namely organization governance of the blood system, blood availability, blood safety and, to a lesser extent, clinical transfusion practice. Data have been analysed according to reporting countries' geographical location (region) as well as the level of economic development as defined by the World Bank. Although encouraging progress has been seen compared with survey data from earlier time periods in some areas, significant challenges still remain, especially for resource-poor countries.

9.1 Governance, regulation and financing

A well-governed blood system with sustainable financing is essential for a safe, sufficient blood supply and universal access, as emphasized in WHO's blood safety strategy (*67, 68*) and World Health Assembly resolutions (*32, 69*). While approaches vary by country, effective governance typically involves a national blood policy backed by legislation, clear standards, enforcement mechanisms, sustainable financing and transparent public reporting to ensure accountability.

One area that deserves special attention is the persistent lack of specific legislation covering the safety and quality of blood and blood products for transfusion in many countries. While 100% of European countries reported having such legislation, the proportions were only 53% in Africa and 59% in the Western Pacific. The absence of such legislation in 29% of countries remains a significant concern. Governance through a system of regular inspection and licensing is important for national blood availability and safety. Only 64% of countries had a system of regular inspection and 62% licensing by the national regulatory agency or other entity, and only 40% of countries indicated that some of their blood transfusion services are accredited. Building up a system for inspection and licensing should be a priority for countries that do not currently have such programmes. Committed government support in funding, legislation and regulation of national blood services will be fundamental for achieving the progress needed to reach the goal of providing safe and sufficient blood to all patients who need blood transfusion. In this aspect, useful lessons could be learned from the experience in the European Union in ensuring sufficiency and access to safe blood products through implementing a harmonized legislative and regulatory framework across all Member States.

9.2 Blood availability

Accurately determining the true need for blood products is difficult to achieve directly as it is influenced by many factors. Using population blood donation rate as a proxy measure for blood availability, higher income countries clearly have more blood products available for transfusion. The blood donation rate per 1000 population varies from 0.4 to 53 but the optimal rate is not known. High-income countries collected 36% of global donations while their population made up 15% of the global population. Despite progress that has been made, the transfusion rates of blood components in developing countries are much lower than in developed countries. However, population-based rates do not fully capture the complexity of blood availability and accessibility within countries and significant disparities often exist between urban and rural settings, where infrastructure, transportation and health care resources differ markedly. Inadequate blood supply in many countries inevitably results in patient harm due to lack of essential transfusion support. It also seems likely that many patients in all countries continue to receive unnecessary transfusions.

The disparity in blood availability is closely linked to the level of funding allocated to blood centres. Generally, the cost per unit of blood collected tends to be higher in economically developed countries, reflecting stronger financial support and more advanced infrastructure. In contrast, less economically developed countries often face chronic shortages of blood supplies, which can be attributed to a combination of organizational inefficiencies, inadequate funding and broader socioeconomic challenges (*70*). These factors include limited health care budgets, insufficient donor recruitment systems and logistical barriers in storage and distribution.

To address these gaps, comprehensive strategies must be developed and effectively implemented to strengthen blood systems and improve blood collection and distribution in less economically developed regions. Ultimately, bridging the gap in blood availability requires a multifaceted approach combining financial investment, capacity building and innovative solutions tailored to the unique challenges of resource-poor settings.

9.3 Blood safety

The starting point of a safe blood supply is a stable population of regular voluntary non-remunerated blood donors. Globally, 85.4% of whole blood donations were collected from voluntary non-remunerated blood donors. This proportion was 98.4% for HICs and 63.4% for low-income countries.

Repeat donations carry the least risk of infection and are reliable especially in time of crisis. While the whole blood donation from repeat donors ranged from less than 0.1% to 100%, the median rate was 89% for high-income countries versus 36% to 56% for countries in the other World Bank income groups.

Although estimates of residual risk levels for TTIs are not readily available, prevalence rates of TTI markers are correlated with the level of residual risk. For HIV, HBV, HCV and syphilis markers, the prevalence rates for all four infections were lowest in HICs and highest in low-income countries.

The higher prevalence rates of TTI markers in low-income countries should be reduced through greater efforts to increase blood collections from more repeat voluntary non-remunerated donors in order to reduce the reliance on family or replacement and paid blood donations.

Systematic screening of all donations for TTI markers is an important step in reducing the risk of TTIs. The majority of countries have national policies for screening for major TTIs (HIV, HBV, HCV and syphilis), though there are variations in details of screening policy and screening for additional TTIs (such as Chagas disease, HTLV, malaria and West Nile fever), with a major reason being regional differences in infectious disease epidemiology. The effectiveness of TTI screening can only be guaranteed with well designed and implemented quality assurance systems.

Using participation in EQAS as an indicator of quality-assured testing, globally, 63% of blood screening laboratories take part in EQAS for testing TTIs. Participation rates vary by income level: 92% in HICs, 66% in upper-middle-income countries, 48% in lower-middle-income countries and 68% in low-income countries. As the only quantitative GDBS indicator on quality systems, EQAS participation serves as a proxy for overall system functionality. The observed disparity suggests gaps in comprehensive quality systems governing blood supply and transfusion services, in particular in LMICs. Investing in establishing effective and sustainable quality system across all areas of blood supply and transfusion will be key to improving blood safety globally.

9.4 Clinical transfusion practice

Marked differences in clinical transfusion patterns persist between high-resource and low-resource settings. Most blood transfusions in low-income countries are still used for life-threatening childbirth-related complications and severe childhood anaemia, while in HICs transfusions are mostly given to support patients for surgery, critical illness and cancer treatment. The use of FFP is significantly less common in low-income countries than in HICs; the same applies to the use of platelet transfusions. Comprehensive and granular data on patterns of blood demand and use in all countries, but specifically low-income countries, are needed to understand issues of demand and supply. One major setting of uncertainty is blood use in acute injury and trauma in LMICs, as highlighted in a recent systematic review (*71*). Multiple reports suggest that many patients continue to receive unnecessary transfusions, outside of evidence-based indications.

Safe and effective clinical transfusion practices can be improved by hospital transfusion committees, providing critical local oversight of the transfusion process and promotion of education. GDBS data reported by 93 countries indicated that 30% of hospitals where transfusion was performed reported having a transfusion committee (85% in HICs, 28% in upper-middle-income countries, 25% in lower-middle-income countries and 9% in low-income countries). The proportion of hospitals that have a reporting system for adverse transfusion reactions was higher for resource-rich countries and lower for resource-limited countries. National haemovigilance programmes have increasingly been implemented, first for systematically monitoring the safety of the entire transfusion process and more recently also for measuring transfusion outcome. In 2023, 52% reporting countries (88 of 168) had such systems, but only 36% (60 countries) reported haemovigilance data. In Europe, 69% (27 out of 42) countries reported the existence of both a haemovigilance system and related data, while rates were lower in other regions. Haemovigilance mechanisms need to be expanded to allow the capture of data associated with inability to provide blood due to inadequate supply or accessibility.

More research to improve the implementation of appropriate evidence-based utilization of blood and the use of alternatives to transfusion will benefit the entire global transfusion community. Even though many resource-limited countries are still focusing on fundamental challenges, including blood availability and safety, security of blood supply remains an important issue for all blood services and operators. Strengthening patient blood management, reducing unnecessary transfusions and improving clinical governance remain global priorities to decrease unnecessary blood transfusions and reduce transfusion risk and improve patient care and outcomes (*72*). Strategies must address fundamental concerns about lack of availability of blood, for example to treat severe life-threatening anaemia in children with malaria or to manage major blood loss in trauma and postpartum bleeding. This applies for all countries and especially low-resource country settings.

9.5 Access to plasma-derived medicinal products

Plasma-derived medicinal products are essential for treating serious conditions, yet many LMICs continue to face shortages. In some settings, certain PDMPs, such as IVIG and coagulation factor concentrates, are unavailable or prohibitively expensive. This report reviews progress in making quality-assured plasma available for PDMP production

– a critical step toward reducing disparities and ensuring sustainable supply. Of 168 responding countries, 49 reported arrangements for utilizing locally collected plasma for fractionation. Despite some progress in collecting plasma from whole blood, apheresis and source donations, insufficiency and inequality remain global challenges. Plasma volumes for fractionation per 1000 population vary widely, from 0.25 to 55.44 L, with a median of 5.37 L reflecting major inequities in both access and production capacity.

A major factor limiting the global availability of PDMPs is the inadequate supply of plasma meeting internationally recognized standards for fractionation. The WHO guidance on increasing supplies of PDMPs in LMICs provides a roadmap for strengthening national capacity, improving quality systems and expanding access to PDMPs. Strengthening GMP implementation, increasing the proportion of plasma that meets fractionation standards and diversifying source of global supply remain critical to addressing persistent shortages (*73*).

9.6 Data

The existence of a robust data collection and reporting system is a critical component of a well-managed, nationally coordinated blood transfusion programme. Comprehensive national data on blood availability and safety enable countries to set priorities and strengthen their blood systems.

- There is a need to establish systems of surveillance on the incidence and prevalence of HIV, HBV, HCV and other infections in blood donors and vigilance on the transfusion outcomes of recipients, including post-transfusion risk of infection.
- Information on clinical transfusion, including patterns of use by indication and department, forms the basis for monitoring clinical transfusion practice and provides critical performance measures to influence desirable changes in the prescription and administration of blood and to reduce variations in transfusion practice.
- Data on unmet clinical need – instances where blood is not available for clinically justified indications – are rarely collected but represent an important measure of service effectiveness. Countries providing limited or no data should consider establishing standardized national systems for data collection and management.
- National blood transfusion services require support to develop, maintain and optimize information management systems.
- Hospitals should strengthen data systems to ensure full traceability and accurate reporting on the utilization of blood, and to provide complete, high-quality data to national haemovigilance programmes.

9.7 Conclusions

The issue of adequate blood availability and accessibility lies at the centre of the various challenges faced by the global blood bank community. With economic development, LMICs are expected to experience growth of their national health care systems. Advances in health care – including increased accessibility to health care for the population and greater availability of treatment options – are likely to bring increased demand for blood transfusion support. An inadequate blood supply can impede the progress of national health care. Different factors will be relevant to explain potential or actual shortages of blood donations in countries, for example, due to lack of repeat donations from voluntary non-remunerated donors.

In many countries with limited resources, inadequacy of blood supply often coexists with inadequate funding and weaker legislation and regulation. Safe and effective blood systems rely on robust TTI screening, strong quality systems and comprehensive haemovigilance. Strengthening these foundations will be essential for achieving secure and sustainable blood supply chains. The goal of achieving an adequate and secure blood supply chain is of great significance, not only for the blood bank and transfusion medicine community but also for the overall public health of a nation.

In conclusion, the WHO survey continues to show significant variations in the availability, safety and use of blood and blood components between resource-rich and resource-poor countries. Despite progress in some areas there are still challenges, especially for resource-limited countries, in reaching the goal of providing sufficient, secure and safe blood for all people who need blood transfusion. The following measures will be vital to achieving that aim.

- Improving sustainable funding support for blood services, establishing specific legislation and developing national programmes for providing effective governance of blood collection services will be critical in order to continuously improve global blood availability and safety.

- Strengthening quality assurance programmes for TTI screening of blood donations and implement a comprehensive quality system covering all stages of the blood collection and transfusion chain. This will help reduce residual TTI risks and ultimately ensure blood safety.

- Improving the safety and efficacy of clinical transfusions through clinical governance, national haemovigilance systems and hospital transfusion committees should be a priority for all countries.

- Implement GMP and quality systems in blood and plasma in the whole chain of blood collection and transfusion and increase the collection and preparation of plasma that meets fractionation standards. These measures will contribute to universal access and a secure, sustainable global supply of essential PDMPs. A strengthened quality system will also improve the overall quality of blood components supplied.

- Robust data collection on blood service activities, clinical transfusion practice, transfusion safety, unmet need and blood utilization provide the foundation for an evidence-based approach to the provision safe blood products and transfusion medicine in the future.

chapter 10

Limitations

While best attempts have been made to obtain accurate data from countries, the data submitted by national health authorities have not been independently verified. Data accuracy therefore depends on the data collection systems in countries, and this report can only reflect the information provided by WHO Member States. While many countries report comprehensive national data on blood availability and safety, others provide limited information on the activities of a subset of blood centres in the country. Incomplete data and potentially different interpretations of some indicators affected our ability to analyse some of the information received from countries. These limitations are particularly the case for the clinical data.

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Annex 1. Explanatory note on country data and methodology

Country data sources

Data from the following countries were used as sources for this report.

WHO African Region (45/47)

Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, South Africa, South Sudan, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.

Data for Equatorial Guinea and Sierra Leone were not included.

WHO Region of the Americas (31/35)

Argentina, Bahamas, Belize, Bolivia (Plurinational State of), Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, United States of America, Uruguay, Venezuela (Bolivarian Republic of).

Data for Antigua and Barbuda, Barbados, Jamaica and Grenada were not included.

Data provided by the territories of Aruba, Bermuda, British Virgin Islands, Cayman Islands, Curaçao, French Territories, Montserrat, and Turks and Caicos Islands were not included in this report. The information can be found in the following WHO/PAHO report: *Regional report. Supply of blood for transfusions in Latin American and Caribbean countries: 2018–2020* (https://iris.paho.org/handle/10665.2/68251).

WHO South-East Asia Region (11/11)

Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste.

Note: In accordance with resolution WHA78.25 (2025), Indonesia was reassigned to the WHO Western Pacific Region as of 27 May 2025. In this instance, data analysis had already been completed with data pertaining to Indonesia included in the South-East Asia regional aggregates. WHO regional comparisons must be done with caution.

WHO European Region (42/53)

Albania, Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Luxembourg, Malta, Montenegro, Netherlands (Kingdom of the), North Macedonia, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, Serbia, Slovakia, Spain, Sweden, Switzerland, Tajikistan, Türkiye, Turkmenistan, United Kingdom.

Data for Andorra, Armenia, Belarus, Ireland, Israel, Lithuania, Monaco, San Marino, Slovenia, Ukraine and Uzbekistan were not included.

WHO Eastern Mediterranean Region (17/21)

Afghanistan, Bahrain, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Syrian Arab Republic, Qatar, Tunisia, United Arab Emirates, Yemen.

Data for Djibouti, Saudi Arabia, Somalia and Sudan were not included.

WHO Western Pacific Region (22/27)

Australia, Brunei Darussalam, Cambodia, China, Cook Islands, Fiji, Japan, Kiribati, Lao People's Democratic Republic, Malaysia, Micronesia (Federated States of), Mongolia, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Tonga, Viet Nam.

Data for Marshall Islands, Nauru, Solomon Islands, Tuvalu and Vanuatu were not included.

Population data and income group classifications

Data reported for population were extracted from *World population prospects: the 2024 revision*. New York: Population Division, Department of Economic and Social Affairs, United Nations Secretariat; 2024.

Income group classification is based on the *World Bank list of economies (2023)*. Washington, DC: World Bank; 2024.

Partial data

Partial data were supplied by 36 countries, with estimated percentages of the national number of donations covered by the report ranging from 27% to 99%. Of those 36 countries, 14 reported more than 90% of national collections. Four countries reported data less than 50%. In generating the global overview, the percentages were used to calculate adjusted numbers. The percentages were also used to calculate the donations per 1000 population. Some countries reported coverage percentage but did not provide any sampling frame or basis. Decisions had to be made as to whether to apply the estimated percentage to obtain an adjusted total collections and donations rate.

In some cases, in order to provide aggregate data, it has been necessary to assume that this partial information is representative of the whole country. It is recognized that this may present a more favourable picture than in reality, particularly for LMICs where, when partial data are provided, the data often relate to major cities; these tend to have better facilities, equipment and management, and have wider coverage, leaving other areas with a poorer situation unreported. Caution should be taken not to generalize these data.

Confirmatory testing

It should be noted that a higher proportion of LMICs only reported reactive results for testing of TTI. Countries that did not provide confirmatory test results may also have higher percentages of positive results among donations than those included. In addition, it should be noted that the strategies and protocols for conducting screening and confirmatory tests may differ between countries. In some countries, a sample was considered as positive when found twice repeatedly reactive. The samples were not confirmed with additional tests. The aggregated figure includes both initial reactive and confirmed reactive results due to the heterogeneity in confirmatory testing and so may overestimate the true reactive aggregated TTI reactivity rate in the responses.

Explanatory note for Tables 6.1, 6.2, 6.3, 6.4, 6.5

Data from the year 2023 for the following countries were used as sources for analysis and for generating the statistics presented in Tables 6.1, 6.2, 6.3, 6.4 and 6.5.

African Region (1 high income, 4 upper middle income, 11 lower middle income, 9 low income: 9; total: 25)

Benin, Burkina Faso, Burundi, Cabo Verde, Central African Republic, Congo, Côte d'Ivoire, Eritrea, Eswatini, Gabon, Ghana, Madagascar, Malawi, Mali, Mauritania, Mauritius, Namibia, Rwanda, Sao Tome and Principe, Seychelles, South Africa, Togo, United Republic of Tanzania, Zambia, Zimbabwe.

Region of the Americas (4 high income, 11 upper middle income, 3 lower middle income; total: 18)

Argentina, Bahamas, Belize, Bolivia (Plurinational State of), Canada, Chile, Colombia, Costa, Rica, Cuba, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Peru, Saint Lucia, United States of America, Venezuela (Bolivarian Republic of).

South-East Asia Region (1 upper middle income, 5 lower middle income; total: 6)

Bhutan, India, Nepal, Sri Lanka, Thailand, Timor-Leste.

European Region (25 high income, 9 upper middle income, 1 lower middle income; total: 35)

Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Italy, Kazakhstan , Latvia, Malta, Montenegro, Netherlands (Kingdom of the), North Macedonia, Norway, Poland, Portugal, Republic of Moldova, Romania, Slovak Republic, Spain, Sweden, Tajikistan, Türkiye, United Kingdom.

Eastern Mediterranean Region (3 high income, 1 upper middle income, 3 lower middle income, 1 low income; Total: 8)

Afghanistan, Bahrain, Iran (Islamic Republic of), Kuwait, Libya, Morocco, Qatar, Tunisia.

Western Pacific Region (7 high income, 3 upper middle income, 7 lower middle income; total: 17)

Australia, Brunei Darussalam, Cook Islands, Japan, Kiribati, Lao People's Democratic Republic, Malaysia, Mongolia, New Zealand, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Tonga, Viet Nam.

Note: Coverage data provided for Albania, Canada, Central African Republic, Malaysia, Thailand and the United Kingdom were used to adjust the corresponding population figures. All 2023 country data on the units of issued or transfused blood and blood components can be found in Annex 8.

Annex 2. Blood centres and data coverage 2018–2023[1]

… Not reported/not available.
— No response.
Blank cell in the last column: 100%.
Blank cell in other columns: not applicable.

Country	Data year	Number of blood establishments in the country			Number of blood establishments covered by this report			Estimated % of blood donations covered by reported data
		Stand-alone	Hospital-based	Total	Stand-alone	Hospital-based	Total	
Afghanistan	2018	1	288	289	1	101	102	
	2023			15			7	…
Albania	2018	1	31	32	1	31	32	
	2023			32			6	65
Algeria	2018			231			231	
	2023			255			255	
Andorra	2018	—	—	—	—	—	—	—
	2023			—			—	—
Angola	2018				0	164	164	
	2023	—	—	—	—	—	—	—
Antigua and Barbuda	2018	—	—	—	—	—	—	—
	2023			—			—	—
Argentina	2017	38	149	187	34	129	163	95
	2023			187			163	95
Armenia	2018	—	—	—	—	—	—	—
	2023			—			—	—
Australia	2018	—	—	—	—	—	—	—
	2023			1			1	
Austria	2018	23	8	31	23	8	31	
	2023			44			42	95
Azerbaijan	2018	—	—	—	—	—	—	—
	2023			15			15	
Bahamas	2017	0	3	3		0	3	3
	2023			3			3	
Bahrain	2018	0	3	3		1	1	90
	2023			3			1	1
Bangladesh	2018	54	288	342	3	87	90	90
	2023			402			223	82
Barbados	2017	0	1	1	0	1	1	
	2023			—			—	—
Belarus	2018	—	—	—	—	—	—	—
	2023			—			—	—
Belgium	2018	5	0	5	5	0	5	
	2023			4			4	
Belize	2017	1	6	7	1	6	7	
	2023			8			7	…
Benin	2018				6	34	40	
	2023			34			34	
Bhutan	2018	0	27	27	0	15	15	90
	2023			27			1	60
Bolivia (Plurinational State of)	2017	12	5	17	12	5	17	12
	2023			18			18	
Bosnia and Herzegovina	2018	1	17	18	1	17	18	
	2023			4			1	…

[1] From 2023, the GDBS questionnaire collected data on the total number of blood establishments in the country and those covered by the report. Before 2023, it included counts of stand-alone and hospital-based blood centres, as well as total centres. "Blood Centre" and "Blood Establishment" share the same definition across all years. Some countries reported large differences between 2018 and 2023 totals, likely due to varying interpretations of how to count establishments.

Country	Data year	Number of blood establishments in the country			Number of blood establishments covered by this report			Estimated % of blood donations covered by reported data
		Stand-alone	Hospital-based	Total	Stand-alone	Hospital-based	Total	
Botswana[2]	2018				2	0	2	
	2023			2			2	
Brazil	2017	…	…	3 071	…	…	…	...
	2023			443			443	
Brunei Darussalam[3]	2018	0	5	5	0	4	4	80
	2023			5			5	
Bulgaria	2018	6	23	29	6	23	29	
	2023			6			6	
Burkina Faso	2018				6	38	44	
	2023			23			23[4]	
Burundi	2018				5	3	8	
	2023			10			9	...
Cabo Verde	2018				0	6	6	
	2023			5			5	
Cambodia	2018	—	—	—	—	—	—	—
	2023			25			25	
Cameroon	2018				0	58	58	
	2023			…			…	…
Canada	2018	—	—	—	—	—	—	—
	2023			2			1	80
Central African Republic	2018				1	0	1	80
	2023			1			1	90
Chad	2018				1	76	77	
	2023			9			9	
Chile	2017	4	12	16	4	12	16	80
	2023			16			16	80
China	2018	452	0	452	452	0	452	
	2023			453			453	
Colombia	2017	23	58	81		23	58	81
	2023			83			83	
Comoros	2018				1	5	6	
	2023			…			…	…
Congo	2018				2	34	36	
	2023			38			51	
Cook Islands	2018	—	—	—	—	—	—	—
	2023			2			2	
Costa Rica	2017	2	33	35	2	33	35	
	2023			35			35	
Côte D'Ivoire	2018				27	24	51	
	2023			29			29	
Croatia	2018	1	6	7	1	6	7	
	2023			7			7	
Cuba	2017	…	…	…	…		…	...
	2022			46			45	...
Cyprus	2018	4	0	4	4	0	4	
	2023			1			1	
Czechia	2018	2	66	68	2	66	68	...[5]
	2023			74			74	
Democratic People's Republic of Korea	2018	—	—	—	—	—	—	—
	2023			188			188	
Democratic Republic of the Congo	2018				26	850	876	
	2023						…	

[2] There are two blood centres. Each of the two centres are linked to two collection sites (four blood collection sites in total).

[3] Reported data did not include the data of one hospital-based blood centre (which is a private hospital).

[4] Including 10 regional blood transfusion centres and 13 hospital-based blood banks.

[5] Stand-alone blood centres that only collect plasma for fractionation are not included. There are 9 such centres.

Country	Data year	Number of blood establishments in the country			Number of blood establishments covered by this report			Estimated % of blood donations covered by reported data
		Stand-alone	Hospital-based	Total	Stand-alone	Hospital-based	Total	
Denmark	2018	0	5	5	0	5	5	
	2023			5			5	
Djibouti	2018	—	—	—	—	—	—	—
	2023			—			—	—
Dominica	2018			1			1	
	2023	—	—	—	—	—	—	—
Dominican Republic	2017	37	34	71	10	18	28	…
	2023	16	30	46	16	30	46	…
Ecuador	2017	8	12	20	8	12	20	
	2023			20			20	
Egypt	2018	28	…	…	28	0	28	33
	2023			413			413	70
El Salvador	2017	1	18	19	1	18	19	92.9
	2020			…			…	…
Equatorial Guinea	2018	—	—	—	—	—	—	—
	2023			—			—	—
Eritrea	2018				1	25	26	
	2023			1			1	
Estonia	2018	0	4	4	0	4	4	
	2023			13			13	
Eswatini	2018				1	0	1	
	2023			1			1	
Ethiopia	2018				42	0	42	
	2023			47			47	
Fiji	2018	0	3	3	0	3	3	
	2023			—			—	—
Finland	2018	1	0	1	1	0	1	
	2023			1			1	
France	2018	18	0	18	18	0	18	
	2023[6]			2			1	95
Gabon	2018				1	0	1	
	2023			13			10	76.9
Gambia	2018				0	10	10	
	2023			11			9	86.7
Georgia	2018	—	—	—	—	—	—	—
	2023			23			23	
Germany	2018	—	—	—	—	—	—	—
	2023			...			...	...
Ghana	2018				1	2	3	
	2023			165			163	98.8
Greece	2018	—	—	—	—	—	—	—
	2023			96			85	...
Grenada	2018	—	—	—	—	—	—	—
	2023			—			—	—
Guatemala	2017	16	58	74	16	48	64	97.9
	2023			90			90	
Guinea	2018	—	—	—	—	—	—	—
	2023			52			48	96
Guinea-Bissau	2018	—	—	—	—	—	—	—
	2023			14			1	...
Guyana	2017	1	0	1	1	0	1	
	2023			7			7	
Haiti	2017	1	0	1	1	0	1	95
	2023			1			1	

[6] The French Blood Establishment is composed of 13 regional facilities. There is also an army blood centre (CTSA).

Country	Data year	Number of blood establishments in the country			Number of blood establishments covered by this report			Estimated % of blood donations covered by reported data
		Stand-alone	Hospital-based	Total	Stand-alone	Hospital-based	Total	
Honduras	2017	2	16	18	2	16	18	—
	2023			33			33	
Hungary	2018	—	—	—	—	—	—	—
	2023			1			100	
Iceland	2018	0	1	1	0	1	1	
	2023			1			1	
India	2018	…	…	…	…	…	…	…
	2023			...			...	
Indonesia	2018	222	198	420	212	159	371	78.2
	2023			449			443	...
Iran (Islamic Republic of)	2018	91	0	91	91	0	91	
	2023			87			87	
Iraq	2018	—	—	—	—	—	—	—
	2023			38			38	
Ireland	2018	—	—	—	—	—	—	—
	2023			—			—	—
Israel	2018	—	—	—	—	—	—	—
	2023			—			—	—
Italy	2018		287	287	0	287	287	
	2023			276			276	
Jamaica	2017	1	15	16	1	15	16	
	2023			—			—	—
Japan	2017	54	0	54	54	0	54	
	2023			54			54	
Jordan	2018	4	37	41	1	0	1	…[7]
	2023			…			…	…
Kazakhstan	2018	18	0	18	18	0	18	
	2023			19			19	
Kenya	2018				27	0	27	
	2023			49			49	90
Kiribati	2018	0	3	3	0	1	1	75
	2023			3			1	95
Kuwait	2018	1	0	1	1	0	1	
	2023			2			2	
Kyrgyzstan	2018	6	39	45	6	39	45	
	2023			42			42	
Lao People's Democratic Republic	2018	18	0	18	18	0	18	
	2023			18			18	
Latvia	2018	1	6	7	1	6	7	
	2023			4			4	
Lebanon	2018	—	—	—	—	—	—	—
	2023			60			1	35
Lesotho	2018				2	2	4	
	2023			3			3	
Liberia	2018			40	2	38	40	
	2023			—			—	—
Libya	2018	10	48	58	10	48	58	92
	2023			17			17	80
Lithuania	2018	—	—	—	—	—	—	—
	2023			—			—	—
Luxembourg	2018	1	0	1	1	0	1	
	2023			1			1	
Madagascar	2018				5	70	75	
	2023			96			96	

[7] Data only covered the blood bank directorate.

Country	Data year	Number of blood establishments in the country			Number of blood establishments covered by this report			Estimated % of blood donations covered by reported data
		Stand-alone	Hospital-based	Total	Stand-alone	Hospital-based	Total	
Malawi	2018				4	67	71	
	2023			27			4	97.5
Malaysia	2018	—	—	—	—	—	—	—
	2023			98			98	
Maldives	2018	1	21	22	1	20	21	95
	2023			—			—	—
Mali	2018				1	13	14	
	2023			23			23	
Malta	2017	1	0	1	1	0	1	
	2023			1			1	
Marshall Islands	2018	0	2	2	0	1	1	80[8]
	2023			—			—	—
Mauritania	2018				1	13	14	
	2023			16			1	75
Mauritius	2018				1	0	1	
	2023			1			1	
Mexico	2017	163	353	516	163	353	516	
	2023			481			481	73
Micronesia (Federated States of)	2018	0	5	5	0	4	4	95
	2023	—	—	—	—	—	—	—
Monaco	2018	—	—	—	—	—	—	—
	2023			—			—	—
Mongolia	2018	1	26	27	1	26	27	
	2023			27			27	
Montenegro	2018	1	0	1	1	0	1	
	2023			1			1	
Morocco	2018	6	11	17	6	11	17	
	2023			36			36	
Mozambique	2018				1	162	163	
	2023			170			170	
Myanmar	2018	1	391	392	1	155	156	95
	2023			85			1	…
Namibia	2018				1	0	1	
	2023			1			1	
Nauru	2018	—	—	—	—	—	—	—
	2023			—			—	—
Nepal	2018	70	38	108	70	38	108	
	2023						121	90
Netherlands (Kingdom of the)	2018	—	—	—	—	—	—	—
	2023			1			1	
New Zealand	2018	6	0	6	6	0	6	
	2023			6			6	
Nicaragua	2017	2	0	2	2	0	2	
	2020			…			…	…
Niger	2018				1	5	6	
	2023			57			57	
Nigeria	2018	…	…	..	18	46	64	
	2023						17	
Niue	2018	0	1	1	0	1	1	
	2023			—			—	—
North Macedonia	2018			21			21	
	2023			19			19	
Norway	2018	0	22	22	0	22	22	
	2023			19			19	

[8] There are 2 hospital-based blood banks: 1 in Ebey and 1 in Majuro (capital). It is estimated that blood collections in Majuro account for 80% of the national collections.

Country	Data year	Number of blood establishments in the country			Number of blood establishments covered by this report			Estimated % of blood donations covered by reported data
		Stand-alone	Hospital-based	Total	Stand-alone	Hospital-based	Total	
Oman	2018	1	15	16	1	12	13	81.2
	2023			16			15	95
Pakistan	2018	…	…	…	120	486	606	95
	2023			320			272	84
Palau	2018	0	1	1	0	1	1	
	2023			1			1	
Panama	2017	0	30	30	0	28	28	94
	2023			—			—	—
Papua New Guinea	2018	—	—	—	—	—	—	—
	2023			32			32	71.9
Paraguay	2017	1	9	10	1	7	8	99
	2023			10			10	98
Peru	2017	2	93	95	2	93	95	
	2023			91			91	
Philippines	2018	—	—	—	—	—	—	—
	2023			225			225	
Poland	2018	23	0	23	23	0	23	
	2023	23	0	23	23	0	23	
Portugal	2018	4	29	33	4	29	33	
	2023			31			31	
Qatar	2018	1	0	1	1	0	1	
	2023			1			1	
Republic of Korea	2018	18	97	105	18	97	104	99
	2023			100			100	
Republic of Moldova	2018	1	16	17	1	16	17	
	2023			17			17	
Romania	2018	42	0	42	42	0	42	
	2023			42			41	97
Russian Federation	2018	101	231	332	101	231	332	99
	2023	—	—	—	—	—	—	—
Rwanda	2018				5	0	5	
	2023			5			5	
Saint Kitts and Nevis	2017	0	1	1	0	1	1	
	2020			1			1	
Saint Lucia	2017	0	2	2	0	2	2	
	2020			2			2	
Saint Vincent and the Grenadines	2018	0	1	1	0	1	1	
	2023	—	—	—	—	—	—	—
Samoa	2018	…	…	…	…	…	…	…
	2023			2			1	98
San Marino	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Sao Tome and Principe	2018				0	3	3	
	2023			1			1	
Saudi Arabia	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Senegal	2018				2	25	27	
	2023			28			...	...
Serbia	2018	—	—	—	—	—	—	—
	2023			7			7	
Seychelles	2018	—	—	—	—	—	—	—
	2023			1			1	
Sierra Leone	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Singapore	2018	1	0	1	1	0	1	
	2023			1			1	

Country	Data year	Number of blood establishments in the country			Number of blood establishments covered by this report			Estimated % of blood donations covered by reported data
		Stand-alone	Hospital-based	Total	Stand-alone	Hospital-based	Total	
Slovakia	2018	14	30	44	14	30	44	
	2023			45			45	
Slovenia	2018	—	—	—	—	—	—	—
	2023			—			—	—
Solomon Islands	2018	0	9	9	0	1	1	90[9]
	2023			—			—	
Somalia	2018	—	—	—	—	—	—	—
	2023			—			—	—
South Africa[10]	2018				0	11	11	
	2023			2			2	
South Sudan	2018				3	12	15	
	2023	—	—	—	—	—	—	—
Spain	2018			20			20	
	2023			20			20	
Sri Lanka	2018	2	101	103	2	101	103	
	2023			110			110	
Sudan	2018	—	—	—	—	—	—	—
	2023			—			—	—
Suriname	2017	1	0	1	1	0	1	
	2023			1			1	
Sweden	2018	0	26	26	0	26	26	
	2023			23			23	
Switzerland	2018	11	0	11	11	9	11	
	2023			11			11	
Syrian Arab Republic	2018	—	—	—	—	—	—	—
	2023			20			20	
Tajikistan	2018	4	0	4	4	0	4	
	2023			5			5	
Thailand	2018	13	160	173	13	0	13	41.9
	2023			173			161	89.3
Timor-Leste	2018	0	6	6	0	1	1	75[11]
	2023			1			1	
Togo	2018				2	0	2[12]	
	2023			8			8	
Tonga	2018	0	1	1	0	1	1	
	2023			4			1	75
Trinidad and Tobago	2017	0	7	7	0	7	7	
	2020			7			7	
Tunisia	2018	7	25	32	7	25	32	
	2023			32			32	
Türkiye	2018	—	—	—	—	—	—	—
	2023			18			18	
Turkmenistan	2018	—	—	—	—	—	—	—
	2023			67			67	
Tuvalu	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Uganda	2018				7	0	7	
	2023			8			8	
Ukraine	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—

[9] Stock of blood is only kept in the national referral hospital in Honiara. In other smaller hospitals, blood is collected from family replace blood donors only when there is a need.

[10] Blood services in South Africa are delivered by two independent blood services – SANBS (South African National Blood Service) and WPBTS (Western Province Blood Transfusion Service). This report is a national summary covering activities of both services.

[11] Data only cover the National Blood Bank.

[12] Blood system consists of 1 national centre (CNTS), 1 regional centre (CRTS) and 6 collection and distribution stations.

Country	Data year	Number of blood establishments in the country			Number of blood establishments covered by this report			Estimated % of blood donations covered by reported data
		Stand-alone	Hospital-based	Total	Stand-alone	Hospital-based	Total	
United Arab Emirates	2018	5	7	12	4	7	11	93[13]
	2023			6			6	97
United Kingdom	2018	—	—	—	—	—	—	—
	2023			4			1	...
United Republic of Tanzania	2018				7	0	7	
	2023			9			9	
United States of America	2018	65	0	65	5	0	5	62[14]
	2023			157			116	95
Uruguay	2017	3	71	74	3	71	74	96
	2020			…			…	…
Uzbekistan	2018	—	—	—	—	—	—	—
	2023			—			—	—
Vanuatu	2018	—	—	—	—	—	—	—
	2023			—			—	—
Venezuela (Bolivarian Republic of)	2017	—	—	—	—	—	—	—
	2023			...			...	....
Viet Nam	2018	—	—	—	—	—	—	—
	2023			51			25	90
Yemen	2018	8	271	279	3	0	3	…
	2023			9			4	44
Zambia	2018	—	—	—	—	—	—	—
	2023			10			10	
Zimbabwe	2018				5	0	5	
	2023			5			5	

[13] The stand-alone centre (Military Blood Bank) that was not included in the report is estimated to contribute approximately 7% of the national blood collection.

[14] This report includes data from 5 of the largest blood collection centres in the Unites States of America.

Annex 3. Blood donations 2018–2023

… Not reported/not available.
Blank cell: Not required/not applicable.
— No response.
VNRD: Voluntary non-remunerated donations.
Countries that reported in the GDBS 2017 but not in the 2018 survey are shown using 2017 data.

Country	Data year	No. whole blood donations collected (excluding autologous donations)						
		VNRD	VNRD from first time donors	VNRD from repeat donor	Family/ replacement donations	Paid donations	Others	Total
Afghanistan	2018	82 904	…	…	127 723	0	0	210 627
	2023	38 606	0	0	42 109	0	0	80 715
Albania	2018	9 282	…	…	23 144	650	11	33 087
	2023	5 786	3 903	1 883	18 412			24 198
Algeria	2018	397 821	…	…	194 859	0		592 680
	2023	372 557			304 323	0	0	676 880
Andorra	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Angola	2018	9 463	…	…	97 030	0	0	106 493
	2023	—	—	—	—	—	—	—
Antigua and Barbuda	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Argentina	2017	495 000	297 000	198 000	609 532	0		1 104 532
	2023	431 992			491 729			923 721
Armenia	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Australia	2018	690 759						690 759
	2023	749 305	80 989	668 316	0	0	0	749 305
Austria	2018	…	…	…	…	…	…	422 786
	2023	385 934						385 934
Azerbaijan	2018	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…
Bahamas	2017	1 293	341	919	4 303	0		5 596
	2023	752			3 177	0		3 929
Bahrain	2018	19 546	…	…	0	0		19 546
	2023	21 187			0	0	0	21 187
Bangladesh	2018	171 000	…	…	590 115	0		761 115
	2023	332 173			702 812	0	0	1 034 985
Barbados	2017	556	…	…	4 687	0		5 243
	2023	—	—	—	—	—	—	—
Belarus	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Belgium	2018	432 066	48 092	383 974	0	0	0	432 066
	2023	407 598	42 156	365 442	0	0	0	407 598
Belize	2017	680			5 412	0		6 092
	2023	430			6 329			6 759
Benin	2018	81 500	…	…	1 703	0	0	83 203
	2023	107 279	36 729	70 550	26	0	0	107 305
Bhutan	2018	5 496	…	…	2 274	0	0	7 770
	2023	3 847	2 509	1 538	334	0		4 181
Bolivia (Plurinational State of)	2017	42 698	31 353	11 345	76 965	0		119 663
	2023	61 863			75 492			137 339
Bosnia and Herzegovina	2018	—	—	—	—	—	—	—
	2023	15 998	3 001	12 997	35			16 033
Botswana	2018	24 088			0	0	0	24 088
	2023	27 897	10 180	17 717	1 080	0		28 977
Brazil	2017	2 395 417	1 447 387	948 030	1 465 433	0		3 860 850
	2023	1 872 321			925 385			2 797 706

Country	Data year	No. whole blood donations collected (excluding autologous donations)						
		VNRD	VNRD from first time donors	VNRD from repeat donor	Family/ replacement donations	Paid donations	Others	Total
Brunei Darussalam	2018	15 537	2 825	9 864	0	0		15 537
	2023	20 844	5 276	15 568	0	0	0	20 844
Bulgaria	2018	167 424	36 115	45 332	130 551	2 209		300 184
	2023	171 216	41 288	129 928	142 218	411	0	313 845
Burkina Faso	2018	94 839	69 467	37 464	12 096	0		106 935
	2023	140 318	85 547	56 016	1 245	0	0	141 563
Burundi	2018	82 524	…	…	0	0	0	82 524
	2023	93 929	39 701	54 228	0	0	0	93 929
Cabo Verde	2018	2 292			1 060	0		3 352
	2023	3 044	1 138	1 906	673	0	0	3 717
Cambodia	2018	—	—	—	—	—	—	—
	2023	27 838	24 856	2 982	115 305	0		143 143
Cameroon	2018	6 312	…	…	88 561	0	0	94 873
	2023	—	—	—	—	—	—	—
Canada[1]	2018	—	—	—	—	—	—	—
	2023	779 195	79 062	700 133	0	0	0	779 195
Central African Republic	2018	21 000	…	…	0	0	0	21 000
	2023	…	…	…	…	…	…	22 507
Chad	2018	831	…	…	73 637	0	0	74 468
	2023	4 792	…	…	105 320	…	…	110 112
Chile	2017	90 531	48 167	42 364	175 122	0		265 653
	2023	103 685			200 943			304 628
China	2018	13 661 423	…	…	39 196	0		13 700 619
	2023	16 990 000						16 990 000
Colombia	2017	782 964	599 611	183 353	47 327	0		830 291
	2023	816 118			52 141			868 253
Comoros	2018	168	…	…	1 512	0	0	1 680
	2023	—	—	—	—	—	—	—
Congo	2018	36 028	…	…	52 304	0	0	88 332
	2023	31 228	21 964	9 264	68 889			100 117
Cook Islands	2018	—	—	—	—	—	—	—
	2023	174	29	145				174
Costa Rica	2017	47 204	…	…	30 185	0		77 389
	2023	56 807			37 123			93 930
Côte d'Ivoire	2018	158 539	59 894	93 860	0	0	0	158 539
	2023	234 011	95 393	138 618	0	0		234 011
Croatia	2018	190 447	12 912	177 535	0	0		190 447
	2023	189 954	11 714	178 240	0	0	0	189 954
Cuba	2017	411 979	164 971	247 008	0	0		411 979
	2023	436 869	209 698	227 171				436 869
Cyprus	2018	63 008	0	63 008	0	0		63 008
	2023	71 243	6 140	65 103	0	0	39	71 282
Czechia	2018	417 251	27 262	389 989	0	0	0	417 251
	2023	444 429	29 773	414 656	0	0	0	444 429
Democratic People's Republic of Korea	2018	—	—	—	—	—	—	—
	2023	100 980						100 980
Democratic Republic of the Congo	2018	141 603	…	…	246 523	32 021	0	420 147
	2023	170 136			252 927	34 838	12 361	470 262
Denmark	2018	206 990	16 773	190 217	0	0	0	206 990
	2023	184 584						184 584
Djibouti	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Dominica	2018	171	17	77	790	0		961
	2023	—	—	—	—	—	—	—

[1] Subnational data provided by Canadian Blood Service.

Country	Data year	No. whole blood donations collected (excluding autologous donations)						
		VNRD	VNRD from first time donors	VNRD from repeat donor	Family/ replacement donations	Paid donations	Others	Total
Dominican Republic	2017	7 383	…	…	97 721	0		105 104
	2023	38 283			117 381			155 664
Ecuador	2017	179 823	…	…	69 530	0		249 353
	2023	270 207			57 489			327 696
Egypt	2018	305 718	300 000	5 718	121 142			426 860
	2023	739 900	393 024	346 876	251 462		2 000	993 362
El Salvador	2017	24 159	13 201	10 953	77 650	0		101 809
	2023	16 618	…	…	97 207			113 825
Equatorial Guinea	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Eritrea	2018	9 057	…	…	218	0	0	9 275
	2023	15 022	8 058	6 964	0	0	0	15 022
Estonia	2018	50 142	5 099	45 043	0	0	0	50 142
	2023	50 295	…	…	0	0	0	50 292
Eswatini	2018	15 203	…	…	0	0	0	15 203
	2023	12 978	0	0	0	0		12 978
Ethiopia	2018	182 767	…	…	3 730	0	0	186 497
	2023	307 786	187 575	120 211	1 671	0	0	309 457
Fiji	2018	17 814	6 923	10 891	443	0	0	18 257
	2023	—	—	—	—	—	—	—
Finland	2018	206 610	14 735	191 875	0	0	0	206 610
	2023	179 558	19 119	160 439	0	0	0	179 558
France	2018	2 512 870	387 109	2 125 761	0	0		2 512 870
	2023	2 268 672	337 790	1 930 882	0	0		2 268 672
Gabon	2018	6 900	…	…	16 100	0	0	23 000
	2023	16 647	6 183	10 464	7 657	0		24 304
Gambia	2018	1 330	…	…	10 659	0	0	11 989
	2023	1 503	…	…	13 975	0		15 478
Georgia	2018	—	—	—	—	—	—	—
	2023	37 651	16 002	21 649	18 876	34 321		90 848
Germany	2018	—	—	—	—	—	—	—
	2023	3 672 317	386 016	3 286 301				3 672 317
Ghana	2018	57 594	…	…	104 632	0		162 226
	2023	54 029	42 764	11 265	128 667			182 696
Greece	2018	—	—	—	—	—	—	—
	2023	379 964	49 595	330 369	170 709	0	0	550 673
Grenada	2017	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Guatemala	2017	6 888	…	…	129 930	0		136 818
	2023	6 089			174 683			180 772
Guinea	2018	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…
Guinea-Bissau	2018	—	—	—	—	—	—	—
	2023	6 520			5 346	0	0	11 668
Guyana	2017	9 755	3 013	6 712		0		9 755
	2023	11 225	…	…				11 225
Haiti	2017	11 571	…	…	16 447	0		28 018
	2023	3 151			16 485			19 636
Honduras	2017	13 959	…	…	66 861	24		80 844
	2023	12 746			80 465			93 211
Hungary	2018	—	—	—	—	—	—	—
	2023	356 745	36 623	320 122				356 745
Iceland	2018	—	—	—	—	—	—	—
	2023	10 841	0	10 841	0	0	0	10 841
India	2018	9 424 000	…	…	2 976 000	0		12 400 000
	2023	9 290 739			3 869 360			13 160 099

Country	Data year	No. whole blood donations collected (excluding autologous donations)						
		VNRD	VNRD from first time donors	VNRD from repeat donor	Family/ replacement donations	Paid donations	Others	Total
Indonesia	2018	3 480 051	989 612	2 490 439	327 097	14 567		3 821 715
	2023	…	…	…	…	…		…
Iran (Islamic Republic of)	2018	2 069 273	245 412	1 823 861	0	0	0	2 069 273
	2023	2 315 119	356 195	1 958 924	0	0	0	2 315 119
Iraq	2018	—	—	—	—	—	—	—
	2023	566 328	…	908	460 315			1 026 643
Ireland	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Israel	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Italy	2018	2 569 275	371 093	2 198 182	0	0	0	2 569 275
	2023	2 563 717	360 303	2 203 414	0	0	0	2 563 717
Jamaica	2017	5 612	…	…	26 417	0		32 029
	2023	—	—	—	—	—	—	—
Japan	2018	—	—	—	—	—	—	—
	2023	3 440 811	315 937	3 124 874				3 440 811
Jordan	2018	35 652	24 244	11 408	29 171	0	0	64 823
	2023	—	—	—	—	—	—	—
Kazakhstan	2018	147 092	55 340	91 752	39 209	2 419		190 782
	2023	194 333	…	…	46 842	7 475		248 650
Kenya	2018	164 275	…	…	0	0	0	164 275
	2023	180 725	144 580	36 145	120 484			301 209
Kiribati	2018	229	…	…	1 942	0		2 171
	2023	28	16	12	1 687	0	0	1 715
Kuwait	2018	43 467	14 278	29 189	34 564	0	0	78 031
	2023	30 013	8 824	21 189	54 959	0	0	84 972
Kyrgyzstan	2018	5 288	2 602	640	33 996	3 826		43 110
	2023	9 074	27 527	7 067	34 153	1 425	0	44 652
Lao People's Democratic Republic	2018	45 982	19 242	17 471	2 998	0		48 980
	2023	45 532	20 500	25 032	27 491	0	0	73 023
Latvia	2018	52 174	6 675	45 499	0	0		52 174
	2023	59 649	6 336	27 912	0	0		59 649
Lebanon	2018	—	—	—	—	—	—	—
	2023	14 169			31 061	0		45 230
Lesotho	2018	3 900	1 421	2 415	2 518	0	0	6 418
	2023	1 808	3 869	3 869	5 929	0	0	7 737
Liberia	2018	6 362	…	…	4 661	0	0	11 023
	2023	—	—	—	—	—	—	—
Libya	2018	17 057	1 405	15 652	131 273	0		148 330
	2023	57 081	36 760	20 320	228 327	0	0	285 408
Lithuania	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Luxembourg	2018	19 724	1 125	18 599	0	0		19 724
	2023	17 512	1 683	15 829	0	0	0	17 512
Madagascar	2018	9 821	…	…	39 102	0	0	48 923
	2023	17 978	7 249	10 729	53 615			71 593
Malawi	2018	52 494	…	…	10 506	0	0	63 000
	2023	112 768			2 933			115 701
Malaysia	2018	—	—	—	—	—	—	—
	2023	768 828	171 522	597 306	0	0	0	768 828
Maldives	2018	2 335	852	1 483	4 131	0		6 466
	2023	—	—	—	—	—	—	—
Mali	2018	15 025	…	…	40 981	0	0	56 006
	2023	16 869	5 215	11 654	52 295	0		69 614
Malta	2018	—	—	—	—	—	—	—
	2023	15 538	1 043	14 495				15 538

Country	Data year	No. whole blood donations collected (excluding autologous donations)						
		VNRD	VNRD from first time donors	VNRD from repeat donor	Family/ replacement donations	Paid donations	Others	Total
Marshall Islands	2018	…	…	…	…	…	…	288
	2023	—	—	—	—	—	—	—
Mauritania	2018	6 346	…	…	12 047	0	0	18 393
	2023	4 511			21 820	0	0	26 331
Mauritius	2018	41 063	…	…	3 508	0	160	44 731
	2023	44 736	9 468	29 354	7 504	0	0	52 240
Mexico	2017	124 325	…	…	2 270 511	0		2 394 836
	2023	132 717			1 468 720		0	1 601 437
Micronesia (Federated States of)	2018	302	157	145	1 434	0	0	1 736
	2023	—	—	—	—	—	—	—
Monaco	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Mongolia	2018	31 072	14 679	16 393	0	0	0	31 072
	2023	42 434	13 361	29 073	0	0	0	42 434
Montenegro	2018	7 608	1 663	5 945	11 045	0	0	18 653
	2023	8 647	1 313	7 334	11 697	0	0	20 344
Morocco	2018	298 842	…	…	22 494	0	0	321 336
	2023	382 234	…	…				382 234
Mozambique	2018	66 459	…	…	69 632	0	0	136 091
	2023	53 735			90 089			143 824
Myanmar	2018	96 018	41 305	54 713	921	0	0	96 939
	2023	39 491	9 625	29 866	0	0	0	39 491
Namibia	2018	37 672	…	…	0	0	0	37 672
	2023	45 096	8 847	36 249	0	0	0	45 096
Nauru	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Nepal	2018	225 696	67 708	157 988	46 226	0	0	271 922
	2023	165 700	…	…	110 467	0	0	276 167
Netherlands (Kingdom of the)	2018	—	—	—	—	—	—	—
	2023	384 998	32 731	352 267	0	0		384 998
New Zealand	2018	112 162	16 249	95 913	0	0	0	112 162
	2023	122 515	17 397	105 118	0	0	0	122 515
Nicaragua	2017	84 682	40 215	44,467	0	0		84 682
	2020	77 820	…	…	0	0	0	77 820
Niger	2018	38 625	…	…	99 090	0	0	137 715
	2023	73 929	…	…	115 381	0	0	189 310
Nigeria[2]	2018	30 229	…	…	84 800	53 432	240	168 701
	2023	14 443	8 112	6 191	62	0		14 505
Niue	2018	…	…	…	…	…	…	…
	2023	—	—	—	—	—	—	—
North Macedonia	2018	53 915	5 451	48 465	271	0	0	54 186
	2023	56 431	8 913	47 518				56 431
Norway	2018	174 454	10 000	164 454	0	0	0	174 454
	2023	164 470	15 355	149 115	0	0	0	164 470
Oman	2018	51 615	25 625	25 990	5 792	0		57 407
	2023	84 548	36 437	48 110	8 029	0		92 577
Pakistan	2018	410 599	…	…	1 903 709			2 314 308
	2023	126 172			878 189		590 887	1 595 248
Palau	2018	603			250	0		853
	2023	75	20	55	262	0	0	337
Panama	2018	2 801	—	—	48 822	2 443		54 066
	2023	—	—	—	—	—	—	—
Papua New Guinea	2018	—	—	—	—	—	—	—
	2023	11 246	4 431	6 815	30 790	0	0	42 036

[2] Partial data.

Country	Data year	No. whole blood donations collected (excluding autologous donations)						
		VNRD	VNRD from first time donors	VNRD from repeat donor	Family/ replacement donations	Paid donations	Others	Total
Paraguay	2017	12 673	…	…	76 061	0		88 734
	2023	14 536			109 687			142 237
Peru	2017	34 718	33 643	1 075	324 740	0		359 458
	2023	107 152			352 374			459 526
Philippines	2018	—	—	—	—	—	—	—
	2023	1 228 559	470 218	873 780	115 427	12		1 343 998
Poland	2018	1 172 572	181 913	986 166	50 180	367		1 223 119
	2023	1 308 952	176 279	1 132 673	34 339	330		1 343 621
Portugal	2018	309 231	24 645	284 586	0	0		309 231
	2023	299 713	32 665	267 048	0	0	0	299 713
Qatar	2018	30 209	12 952	17 257	26	0	0	30 235
	2023	41 132	20 188	20 944	0	0	0	41 132
Republic of Korea	2018	2 114 925	330 586	1 784 339	0	0	0	2 114 925
	2023	2 022 948	292 871	1 730 077	0	0	0	2 022 948
Republic of Moldova	2018	59 336	…	…	3 857			63 193
	2023	59 416			339			59 755
Romania	2018	416 769	122 348	294 421	0	0	0	416 769
	2023	411 171	112 096	299 075		0	0	411 171
Russian Federation	2018	2 203 748	…	…	0	20 463		2 224 211
	2023	—	—	—	—	—	—	—
Rwanda	2018	65 512	…	…	0	0	0	65 512
	2023	86 812	23 444	63 368	0	0		86 812
Saint Kitts and Nevis	2017	25	…	…	545	0		570
	2020	26			591			617
Saint Lucia	2017	1 561	587	974	1 215	0		2 776
	2023	222			2 194			2 416
Saint Vincent and the Grenadines	2018	110			1 197			1 307
	2023	—	—	—	—	—	—	—
Samoa	2018	—	—	—	—	—	—	—
	2023	50			2 847	0		2 897
San Marino	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Sao Tome and Principe	2018	853	…	…	341	0	0	1 194
	2023	642	401	241	634	0	0	1 276
Saudi Arabia	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Senegal	2018	87 183	…	…	10 775	0	0	97 958
	2023	30 900			12 042	0		42 942
Serbia	2018	—	—	—	—	—	—	—
	2023	211 361				0		211 361
Seychelles	2018	—	—	—	—	—	—	—
	2023	2 352			880	0		3 232
Sierra Leone	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Singapore	2018	115 826	24 349	91 477	0	0	0	11 5 826
	2023	122 668	21 195	101 473	0	0	0	122 668
Slovakia	2018	221 936	17 865	204 071	0	0		221 936
	2023	228 081	7 754	220 327	0	0	0	228 081
Slovenia	2018	50 142	5 099	81 413	0	0	0	50 142
	2023	—	—	—	—	—	—	—
Solomon Islands	2018	…	…	…	…	…	…	…
	2023	—	—	—	—	—	—	—
Somalia	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
South Africa	2018	982 010	…	…	0	0	0	982 010
	2023	1 077 544	148 838	928 706		0	0	1 077 544

Country	Data year	No. whole blood donations collected (excluding autologous donations)						
		VNRD	VNRD from first time donors	VNRD from repeat donor	Family/ replacement donations	Paid donations	Others	Total
South Sudan	2018	1 754	…	…	4 779	0	0	6 533
	2023	—	—	—	—	—	—	—
Spain	2018	1 065 752	…	…	0	0	0	1 065 752
	2023	1 564 886	…	…	0	0	0	1 564 886
Sri Lanka	2018	450 640	…	…	0	0	0	450 640
	2023	466 061	150 302	315 759	0	0	0	466 061
Sudan	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Suriname	2017	10 270	…	…	0	0		10 270
	2023	7 782	328	7 454				7 782
Sweden	2018	409 187	29 146	380 041	0	0		409 187
	2023	369 535	26 925	342 610	0	0	0	369 535
Switzerland	2018	260 011	…	…				260 011
	2023	246 034			8			246 042
Syrian Arab Republic	2018	—	—	—	—	—	—	—
	2023	71 400	55 500	15 900	166 600	0	14 200	252 200
Tajikistan	2018	31 326	9 789	15 662	6 574	7 935	0	45 835
	2023	48 976	25 751	23 225	8 142	22 452		79 570
Thailand	201811	1 112 497	152 536	959 961	0	0	0	1 112 497
	2023	2 500 504	413 460	2 087 044	257 532			2 758 036
Timor-Leste	2018	800	600	200	3 138	0	0	3 938
	2023	1 531	24	190	3 548			5 079
Togo	2018	50 023	10 106	32 800	0	0	0	50 023
	2023	65 008	16 274	48 734	0	0	0	65 008
Tonga	2018	...	...	...	...	...	...	3 322
	2023	1 104	803	301	1 272			2 376
Trinidad and Tobago	2017	4 737	1 180	3 557	16 746	0		21 483
	2023	…			…			19 188
Tunisia	2018	56 795	...	...	164 009	0	0	220 804
	2023	46 678	37 486	9 192	196 784	0		243 462
Türkiye	2018	—	—	—	—	—	—	—
	2023	2 614 375	657 271	1 957 104	0	0	0	2 614 375
Turkmenistan	2018	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…
Tuvalu	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Uganda	2018	254 750	...	...	0	0	0	254 750
	2023	356 035	138 853	217 182	0	0	0	356 035
Ukraine	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
United Arab Emirates	2018	120 320	73 070	47 250	2 565	4 361	0	127 246
	2023	150 051	86 661	63 390	46			150 097
United Kingdom	2018	—	—	—	—	—	—	—
	2023	1 430 613	121 857	1 308 756				1 430 613
United Republic of Tanzania	2018	173 922	…	…	133 913	0	0	307 835
	2023	241 605	192 926	48 679	289 395	0	0	531 000
United States of America	2018[3]	5 934 137	1 235 853	4 468 618	1 113	0	0	5 935 250
	2023	9 586 000	1 721 000	4 826 000	0	0	0	9 586 000
Uruguay	2017	40 118	…	…	51 263	0		91 381
	2023	57 575	…	…	36 112			93 722
Uzbekistan	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—
Vanuatu	2018	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—

[3] This report includes data from 5 of the largest blood collection centres in the United States of America. It was estimated that the number of blood donations reported covered 64% of the national data.

Country	Data year	No. whole blood donations collected (excluding autologous donations)						
		VNRD	VNRD from first time donors	VNRD from repeat donor	Family/ replacement donations	Paid donations	Others	Total
Venezuela (Bolivarian Republic of)	2018	—	—	—	—	—	—	—
	2023	…	…	…	…	…		1 110 420
Viet Nam	2018	—	—	—	—	—	—	—
	2023	1 500 000	550 000	950 000		100 000		1 600 000
Yemen	2018	…	…	…	…	…	…	17 913
	2023	314			7 116			7 430
Zambia	2018	—	—	—	—	—	—	—
	2023	130 166	71 591	58 575	0	0	0	130 166
Zimbabwe	2018	82 257	…	…	0	0		82 257
	2023	70 187	25 284	44 903	0	0	0	70 187

Annex 3. Blood donations 2018–2023 (continued)

… Not reported/not available.
Blank cell: Not required/not applicable.
— No response.
VNRD: Voluntary non-remunerated donors.
Countries that reported in the GDBS 2017 but not in the 2018 survey are shown using 2017 data.

Country	Data year	Blood donations collected through apheresis procedures	No. apheresis donations collected						
			VNRD	VNRD from first-time donors	VNRD from repeat donors	Family/ replacement donations	Paid donations	Others	Total no. of donations
Algeria	2018	Yes							11 458
	2023	Yes	4 105			9 557	0	0	13 662
Argentina	2017	Yes	64 250	12 850	51 400	0	0		64 250
	2023	Yes	…	…	…	…	…	…	53 918[1]
Australia	2018	Yes	639 090	…	—	0	0	0	639 090
	2023	Yes	883 293	23 087	860 206	0	0	0	883 293
Austria	2018	Yes	…	…	…	…	…	…	714 878
	2023	Yes	…	…	…	…	…	…	...
Azerbaijan	2018	—	—	—	—	—	—	—	—
	2023	Yes	…	…	…	…	…	…	…
Bangladesh	2018	Yes	20	20	0	0	0		20
	2023	Yes	12 635			0	0	0	12 635
Belgium	2018	Yes	165 469	9 130	156 339	0	0	0	165 469
	2023	Yes	212 637	10 633	202 004	0	0	0	212 637
Bhutan	2018	—	—	—	—	—	—	—	—
	2023	Yes	10	8	2				...
Bolivia (Plurinational State of)	2017	Yes	223	139	84	128			351
	2023	Yes	…	…	…	…	…	…	3 936
Bosnia and Herzegovina	2018	—	—	—	—	—	—	—	—
	2023	Yes	324	32	292				324
Botswana	2018	Yes	22	0	22	0	0		22
	2023	Yes	61	7	54				61
Brazil	2017	Yes	…	…	…	…	…	…	79 860
	2023	…	…	…	…	…	…	…	…
Brunei Darussalam	2018	Yes	451	…	…	0	0		451
	2023	Yes	714	74	640	0	0	0	714
Bulgaria	2018	Yes					1 082		1 082
	2023	Yes	0	0	0	0	1 435	0	1 435
Cambodia	2018	—	—	—	—	—	—	—	—
	2023	Yes				11			11
Canada	2018	—	—	—	—	—	—	—	—
	2023	Yes	121 336	13 688	107 648	0	0	0	121 336
Chile	2017	Yes	…	…	…	…	…	…	2 172
	2023	Yes	…	…	…	…	…	…	6 825[2]
China	2018	Yes	1 075 750	…	…	11 097			1 086 847
	2023	Yes	…	…	…	…	…	…	…
Colombia	2017	Yes	42 672	19 647	18 332	3 347	NA		46 019
	2023	Yes	66 605	48 273	18 332	4 176			70 781
Costa Rica	2017	Yes	130	32	98	8	NA		138
	2023	Yes	9 762	…	…	…	…	…	9 762
Croatia	2018	Yes	5 206	0	5 206	0	0		5 206
	2023	Yes	5 505	0	5 505	0	0	0	5 505
Cuba	2017	…	…	…	…	…	…	…	…
	2023	yes	…	…	…	…	…	…	6 776[3]

[1] There were 52 436 apheresis platelet donations and 1 482 apheresis red cell donations.
[2] There were 4 188 apheresis platelet donations, 2 109 apheresis red cell donations, and 528 apheresis plasma donations.
[3] Apheresis platelet donations.

Country	Data year	Blood donations collected through apheresis procedures	No. apheresis donations collected						
			VNRD	VNRD from first-time donors	VNRD from repeat donors	Family/ replacement donations	Paid donations	Others	Total no. of donations
Cyprus	2018	Yes	335	…	…	0	0		335
	2023	Yes	424	424	0	0	0	0	424
Czechia	2018	Yes	…	…	…	…	…	…	218 632
	2023	Yes	216 217			0	0		216 217
Denmark	2018	Yes	71 786			0	0	0	71 786
	2023	Yes	127 788						127 788
Dominique Republic	2018	—	—	—	—	—	—	—	—
	2023	Yes	3 810						3 810
Ecuador	2017	Yes	…	…	…	…	…	…	6 444
	2023	Yes	5 170	2 115	3 005	4 342	…	…	9 512
Egypt	2018	Yes	…	…	…	…	…	…	20 183
	2023	Yes	43 852	43 852					43 852
El Salvador	2017	Yes	1 231	…	…	0	0		1 231
	2023	Yes	…	…	…	…	…	…	11 931[4]
Estonia	2018	Yes	3 344	0	3 344	0	0	0	3 344
	2023	Yes	3 122	0	3 122	0	0	0	3 122
Eswatini	2018	—	—	—	—	—	—	—	—
	2023	Yes	421			0	0		421
Finland	2018	Yes	2 585	0	2 585	0	0	0	2 585
	2023	Yes	2 008	1	2 007	0	0	0	2 008
France	2018	Yes	453 392	87 498	365 894	0	0		453 392
	2023	Yes	409 223	12 712	396 511	0	0	0	409 223
Georgia	2018	—	—	—	—	—	—	—	—
	2023	Yes	536			52	2 444		3 032
Germany	2018	—	—	—	—	—	—	—	—
	2023	Yes	…	…	…	…	...	…	…
Greece	2018	—	—	—	—	—	—	—	—
	2023	Yes	11 250	240	11 010	6 529	0	0	17 779
Guatemala	2017	Yes	0			2 950	0		2 950
	2023	Yes	55			4 527			4 582
Guyana	2018	—	—	—	—	—	—	—	—
	2023	Yes	…	…	…	…	…	…	138[5]
Honduras	2017	…	…	…	…	…	...	…	…
	2023	Yes	130						130
Iceland	2018	—	—	—	—	—	—	—	—
	2023	Yes	1 004	0	1 004	0	0	0	1 004
India	2018	…	…	…	…	…	…	…	…
	2023	Yes	…	…	…	…	…	…	…
Indonesia	2018	Yes	14 093	10 933	3 160	2 555	185		16 833
	2023	Yes	…	…	…	…	…	…	…
Iran (Islamic Republic of)	2018	Yes	82 929	36 472	46 457	0	0	0	82 929
	2023	Yes	36 080	3 550	32 530	0	0	0	36 080
Iraq	2018	—	—	—	—	—	—	—	—
	2023	Yes		13 469					13 469
Italy	2018	Yes	421 807	…	…	0	0		421 807
	2023	Yes	455 754			0	0	0	455 754
Japan	2018	—	—	—	—	—	—	—	—
	2023	Yes	1 562 912	5 223	1 557 689				1 562 912
Jordan	2018	Yes	13	0	13	0	0	0	13
	2023	—	—	—	—	—	—	—	—
Kazakhstan	2018	Yes	16 329	2 699	13 630	2 594	5 990		24 913
	2023	Yes	19 275	3 027	16 248	2 014	4 387		25 676
Kenya	2018	—	—	—	—	—	—	—	—
	2023	Yes			247	805			1 052

[4] There were 11 300 apheresis platelet donations and 631 apheresis red cell donations.

[5] Apheresis platelet donations.

Country	Data year	Blood donations collected through apheresis procedures	No. apheresis donations collected						
			VNRD	VNRD from first-time donors	VNRD from repeat donors	Family/ replacement donations	Paid donations	Others	Total no. of donations
Kuwait	2018	Yes	7 285	174	7 111	473	0	0	7 758
	2023	Yes	53	9	44	819	7 231	0	8 103
Kyrgyzstan	2018	Yes	0			6 619	1 207		7 826
	2023	Yes	3 928	…	3 313	17 635	1 018	0	22 881
Latvia	2018	—	—	—	—	—	—	—	—
	2023	Yes	0			0	2 055	0	2 055
Libya	2018	Yes	3 760	1 217	2 543	29 008	0		32 768
	2023	Yes	15 918	5 969	9 949	50 407			66 325
Luxembourg	2018	Yes	2 757	0	2 757	0	0	0	2 757
	2023	Yes	3 083	0	3 083	0	0	0	3 083
Malaysia	2018	—	—	—	—	—	—	—	—
	2023	Yes	20 036			0	0	0	20 036
Maldives	2018	Yes	13	1	12	83	0		96
	2023	—	—	—	—	—	—	—	—
Malta	2018	—	—	—	—	—	—	—	—
	2023	Yes	291	0	291	0	0	0	291
Mauritius	2018	Yes	…						...
	2023	Yes	161	150	11	0	0	0	161
Mexico	2017	Yes	…	…	…	…	…	…	88 737
	2023	Yes	…	…	…	…	…	…	90 998
Mongolia	2018	Yes	3 224	22	3 202	0	0	0	3 224
	2023	Yes	2 013	0	2 013	0	0	0	2 013
Montenegro	2018	—	—	—	—	—	—	—	—
	2023	Yes	77	21	56	0	0	0	77
Morocco	2018	Yes	…	…	…	…	0	…	661
	2023	Yes	1 085						1 085
Myanmar[6]	2018	Yes	8	0	8	0	0	0	8
	2023	Yes	194	0	194	0	0	0	194
Namibia	2018	Yes	1 228	0	1 228	0	0	0	1 228
	2023	Yes	5 883	0	5 883	0	0	0	5 883
Nepal	2018	…	…	…	…	…	…	…	…
	2023	Yes	88			32			120
Netherlands (Kingdom of the)	2018	—	—	—	—	—	—	—	—
	2023	Yes	371 754			0	0		371 754
New Zealand	2018	Yes	62 543	1	62 542	0	0	0	62 543
	2023	Yes	101 612	893	0	0	0	0	101 612
Nicaragua	2018	—	—	—	—	—	—	—	—
	2023	Yes	…	…	…	…	…	…	…
North Macedonia	2018	Yes	…	…	…	…	…	…	…
	2023	Yes	510						510
Norway	2018	Yes	15 954	0	15 954	0	0	0	15 954
	2023	Yes	17 727	0	17 727	0	0	0	17 727
Oman	2018	Yes	919	3	916	16	0		935
	2023	Yes	27 29	12	27 17	13	0	0	27 42
Pakistan	2018	—	—	—	—	—	—	—	—
	2023	Yes	…	…	…	…	…	…	…
Panama	2018	Yes	…	…	…	…	…	…	3 935
	2023	—	—	—	—	—	—	—	—
Paraguay	2017	…	…	…	…	…	…	…	…
	2023	Yes	…	…	…	…	…	…	384[7]
Peru	2017	Yes	…	…	…	…	…	…	48 612
	2023	Yes	…	…	…	…	…	…	52 423[8]

[6] Data cover the National Blood Centre only.

[7] Apheresis platelet donations.

[8] There were 52 336 apheresis platelet donations and 87 apheresis red cell donations.

Country	Data year	Blood donations collected through apheresis procedures	No. apheresis donations collected						
			VNRD	VNRD from first-time donors	VNRD from repeat donors	Family/ replacement donations	Paid donations	Others	Total no. of donations
Philippines	2018	—	—	—	—	—	—	—	—
	2023	Yes	3 883			1 139		23	5 045
Poland	2018	Yes	62 987	…	…	906	706	846	65 495
	2023	Yes	138 565	0	138 565	1 328	658	788	141 339
Portugal	2018	Yes	4 860	1	4 859				4 860
	2023	Yes	6 320	74	6 246	0	0	0	6 320
Qatar	2018	Yes	973	7	966	0	0	0	973
	2023	Yes	2 219	268	1 951	0	0	0	2 219
Republic of Korea	2018	Yes	761 534	11 038	750 496	0	0	0	761 534
	2023	Yes	752 224	22 642	729 582	0	0	0	752 224
Republic of Moldova	2018	Yes	11 397	…	…	634	129		12 160
	2023	Yes	17 010			107			17 117
Romania	2018	Yes	6 718	0	6 718	1	0	0	6 719
	2023	Yes	6 582	0	6 582		0	0	6 582
Russian Federation	2018	Yes	463 800	…	…	0	75 206		539 006
	2023	—	—	—	—	—	—	—	—
Rwanda	2018	…	…	…	…	…	…	…	…
	2023	Yes	706	0	706	0	0		706
Serbia	2018	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…	…
Singapore	2018	Yes	8 382	20	8 362	0	0	0	8 382
	2023	Yes	8 378	51	8 327	0	0		8 378
Slovakia	2018	Yes	5 624	0	5 624	0	0	0	5 624
	2023	Yes	25 582	0	25 582	0	0	0	25 582
Slovenia	2018	Yes	3 344	0	3 344	0	0	0	3 344
	2023	—	—	—	—	—	—	—	—
South Africa	2018	…	…	…	…	…	…	…	…
	2023	Yes	66 135	296	65 839				66 135
Spain	2018	Yes	76 827	…	…	0	0	0	76 827
	2023	Yes	112 983	…	…	0	0	0	112 983
Sri Lanka	2018	Yes	1 598	0	1 598	0	0	0	1 598
	2023	Yes	464	0	464	0	0	0	464
Sweden	2018	Yes	37 882	0	37 882	0	0	0	37 882
	2023	Yes	29 598			0	0	0	29 598
Switzerland	2018	Yes	17 797	…	…	0	0		17 797
	2023	Yes	17 763						17 763
Syrian Arab Republic	2018	—	—	—	—	—	—	—	—
	2023	Yes							9
Tajikistan	2018	Yes	0	0	0	0	425	0	425
	2023	Yes					6 880		6 880
Thailand	2018	Yes	378 479	0	378 479	0	0	0	378 479
	2023	Yes	27 984	0	27 984				27 984
Tunisia	2018	Yes	59			963	0		1 022
	2023	Yes	487	187	17	300	0		787
Türkiye	2018	—	—	—	—	—	—	—	—
	2023	Yes	59 999	10 268	49 731	0	0	0	59 999
Turkmenistan	2018	—	—	—	—	—	—	—	—
	2023	Yes	…	…	…	…	…	…	…
United Arab Emirates	2018	Yes	4 863	491	4 231	251	2 144		7 258
	2023	Yes	15 793	4 349	11 444	68			15 861
United Kingdom	2018	—	—	—	—	—	—	—	—
	2023	Yes	89 512	7 758	81 754				89 512
United Republic of Tanzania	2018	—	—	—	—	—	—	—	—
	2023	Yes	45	0	45	0	0	0	45

Country	Data year	Blood donations collected through apheresis procedures	No. apheresis donations collected						
			VNRD	VNRD from first-time donors	VNRD from repeat donors	Family/ replacement donations	Paid donations	Others	Total no. of donations
United States of America	2018	Yes	1 353 287	72 136	414 095	384	0	0	1 353 671
	2023	Yes	1 437 000			0	0	0	1 437 000[9]
Uruguay	2017	Yes	2 118	…	…	…	…	…	2 118
	2020	Yes	…	…	…	…	…	…	2 422[10]
Venezuela (Bolivarian Republic of)	2018	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…	…
Viet Nam	2018	—	—	—	—	—	—	—	—
	2023	Yes	…	…	…	…	…	…	…
Zimbabwe	2018	…	…	…	…	…	…	…	…
	2023	Yes	64	0	64	0	0	0	64

[9] The reported figure is 11 023 000 with a note stating that whole blood and apheresis donations are not reported separately. The value of 1 437 000 is derived from the calculation of 11 023 000 – 9 586 000=1 437 000.

[10] Apheresis platelet donations.

Annex 4. Supplemental Data on Whole Blood Collections for Comparative Analysis (2013, 2018 and 2023)

[a] Upward trend with an average annual increase rate greater than 1% in both periods.
[b] Moderate upward trend with an average annual increase rate greater than 0%.
[c] Downward trend with an average annual decrease rate less than -1% in both periods.
[d] Moderate downward trend with an average annual decrease rate less than 0%.
[e] Data from different sections were submitted across three survey rounds. For comparison, only data from the same section (under the National Blood Centre) were included.

Country		2013	2018	2023	% Ann diff 13-18	% Ann diff 18-23	% VNRD 2013	% VNRD 2018	% VNRD 2023	Change types	Graph
Africa											
Algeria	VNRD	153 489	397 821	372 557	31.8%	-1.3%	31%	67%	55%		
	Total	490 633	592 680	676 880	4.2%	2.8%					
Benin	VNRD	74 016	81 500	107 279	2.0%	6.3%	95%	98%	100%	[a]	
	Total	77 510	83 203	107 279	1.5%	5.8%					
Botswana	VNRD	20 207	24 088	27 897	3.8%	3.2%	100%	100%	96%	[a]	
	Total	20 207	24 088	28 977	3.8%	4.1%					
Burkina Faso	VNRD	68 032	94 839	140 318	7.9%	9.6%	68%	89%	100%	[a]	
	Total	100 716	106 931	141 563	1.2%	6.5%					
Burundi	VNRD	55 650	82 524	93 929	9.7%	2.8%	100%	100%	100%	[a]	
	Total	55 666	82 524	93 929	9.6%	2.8%					
Cabo Verde	VNRD	2 762	2 292	3 044	-3.4%	6.6%	85%	68%	82%		
	Total	3 243	3 352	3 717	0.7%	2.2%					
Central African Republic	VNRD	11 300	21 000	22 507	17.2%	1.4%	99%	100%	100%	[a]	
	Total	11 423	21 000	22 507	16.8%	1.4%					
Chad	VNRD	4 310	831	4 792	-16.1%	95.3%	6%	1%	4%		
	Total	69 265	74 468	110 112	1.5%	9.6%					
Congo	VNRD	19 452	36 028	31 228	17.0%	-2.7%	39%	41%	31%		
	Total	50 472	88 332	100 117	15.0%	2.7%					
Côte d'Ivoire	VNRD	133 023	158 539	234 011	3.8%	9.5%	100%	100%	100%	[a]	
	Total	133 023	158 539	234 011	3.8%	9.5%					
Democratic Republic of Congo	VNRD	155 401	141 603	170 136	-1.8%	4.0%	36%	34%	36%		
	Total	435 275	420 147	470 062	-0.7%	2.4%					
Eritrea	VNRD	8 038	9 057	15 022	2.5%	13.2%	92%	98%	100%	[a]	
	Total	8 692	9 275	15 022	1.3%	12.4%					
Eswatini	VNRD	13 498	15 203	12 978	2.5%	-2.9%	100%	100%	100%		
	Total	13 498	15 203	12 978	2.5%	-2.9%					
Ethiopia	VNRD	53 686	182 767	307 786	48.1%	13.7%	68%	98%	99%	[a]	
	Total	79 274	186 497	309 457	27.1%	13.2%					
Gabon	VNRD	5 895	6 900	16 647	3.4%	28.3%	32%	30%	68%	[a]	
	Total	18 598	23 000	24 304	4.7%	1.1%					
Gambia	VNRD	2 162	1 330	1 503	-7.7%	2.6%	21%	11%	10%		
	Total	10 057	11 989	15 478	3.8%	5.8%					
Ghana	VNRD	52 897	57 594	54 029	1.8%	-1.2%	33%	36%	30%		
	Total	160 295	162 226	182 696	0.2%	2.5%					
Kenya	VNRD	158 742	164 275	180 725	0.7%	2.0%	100%	100%	60%	[b]	
	Total	158 742	164 275	301 209	0.7%	16.7%					
Lesotho	VNRD	7 718	3 900	1 808	-9.9%	-10.7%	97%	61%	23%	[c]	
	Total	7 988	6 418	7 737	-3.9%	4.1%					
Madagascar	VNRD	4 294	9 821	17 978	25.7%	16.6%	19%	20%	25%	[a]	
	Total	23 075	48 923	71 593	22.4%	9.3%					
Malawi	VNRD	48 579	52 494	112 768	1.6%	23.0%	82%	83%	97%	[a]	
	Total	58 924	63 000	115 701	1.4%	16.7%					
Mali	VNRD	14 056	15 025	16 869	1.4%	2.5%	31%	27%	24%	[a]	
	Total	45 932	56 006	69 614	4.4%	4.9%					
Mauritania	VNRD	2 744	6 346	4 511	26.3%	-5.8%	25%	35%	17%		
	Total	10 886	18 393	26 331	13.8%	8.6%					

Country		2013	2018	2023	% Ann diff 13-18	% Ann diff 18-23	% VNRD 2013	% VNRD 2018	% VNRD 2023	Change types	Graph
Mauritius	VNRD	41 629	41 063	44 736	-0.3%	1.8%	84%	92%	85%		
	Total	49 349	44 731	52 325	-1.9%	3.4%					
Mozambique	VNRD	52 209	66 459	53 735	5.5%	-3.8%	44%	49%	37%		
	Total	119 003	136 091	143 824	2.9%	1.1%					
Namibia	VNRD	28 143	37 672	45 096	6.8%	3.9%	100%	100%	100%	a	
	Total	28 143	37 672	45 096	6.8%	3.9%					
Niger	VNRD	25 765	38 625	73 929	10.0%	18.3%	34%	28%	39%	a	
	Total	75 977	137 715	189 310	16.3%	7.5%					
Rwanda	VNRD	43 074	65 512	86 812	10.4%	6.5%	100%	100%	100%	a	
	Total	43 074	65 512	86 812	10.4%	6.5%					
Sao Tome and Principe	VNRD	600	853	642	8.4%	-4.9%	65%	71%	50%		
	Total	919	1 194	1 276	6.0%	1.4%					
Senegal	VNRD	63 900	87 183	30 900	7.3%	-12.9%	94%	89%	72%		
	Total	67 815	97 958	42 974	8.9%	-11.2%					
Seychelles	VNRD	325	634	2 352	19.0%	54.2%	29%	34%	100%	a	
	Total	1 115	1 863	2 352	13.4%	5.2%					
South Africa	VNRD	947 485	982 010	1 077 544	0.7%	1.9%	100%	100%	107%	b	
	Total	947 485	982 010	1 011 544	0.7%	0.6%					
Togo	VNRD	39 558	50 023	65 008	5.3%	6.0%	95%	100%	100%	a	
	Total	41 488	50 023	65 008	4.1%	6.0%					
Uganda	VNRD	202 935	254 750	356 035	5.1%	8.0%	100%	100%	100%	a	
	Total	202 935	254 750	356 035	5.1%	8.0%					
United Republic of Tanzania	VNRD	138 425	173 922	241 605	5.1%	7.8%	85%	56%	46%	a	
	Total	163 645	307 835	531 000	17.6%	14.5%					
Zambia	VNRD	113 386	100 110	130 166	-2.3%	6.0%	100%	100%	100%		
	Total	113 386	100 110	130 166	-2.3%	6.0%					
Zimbabwe	VNRD	56 958	82 257	70 187	8.9%	-2.9%	100%	100%	100%		
	Total	56 958	82 257	70 187	8.9%	-2.9%					
The Americas											
Argentina	VNRD	362 750	495 000	434 636	7.3%	-2.4%	38%	45%	47%		
	Total	954 604	1104 532	926 444	3.1%	-3.2%					
Bahamas	VNRD	3 018	1 293	750.439	-11.4%	-8.4%	42%	23%	19%		
	Total	7 198	5 596	3 929	-4.5%	-6.0%					
Belize	VNRD	709	680	430	-0.8%	-7.4%	14%	11%	6%		
	Total	5 120	6 092	6 759	3.8%	2.2%					
Bolivia (Plurinational State of)	VNRD	46 171	42 698	61 863	-1.5%	9.0%	45%	36%	45%		
	Total	102 070	119 663	137 339	3.4%	3.0%					
Brazil	VNRD	1 984 384	2 216 016.296	1 872 321	2.3%	-3.1%	60%	65%	67%		
	Total	3 333 975	3398 798	2797 706	0.4%	-3.5%					
Canada	VNRD	872 000	794 471	779 195	-1.8%	-0.4%	100%	100%	100%		
	Total	872 000	794 471	779 195	-1.8%	-0.4%					
Chile	VNRD	54 068	90 531	103 573.52	13.5%	2.9%	24%	34%	34%	a	
	Total	229 911	265 653	304 628	3.1%	2.9%					
Columbia	VNRD	641 920	782 964	873 075.76	4.4%	2.3%	87%	94%	94%	a	
	Total	739 956	830 291	928 804	2.4%	2.4%					
Costa Rica	VNRD	46 465	47 204	56 807	0.3%	4.1%	68%	61%	60%	b	
	Total	68 209	77 389	93 931	2.7%	4.3%					
Cuba	VNRD	411 545	411 979	436 869	0.0%	1.2%	100%	100%	100%	b	
	Total	411 545	411 979	436 869	0.0%	1.2%					
Dominiqe Republic	VNRD	17 687	12 581	38 283	-5.8%	40.9%	16%	12%	25%		
	Total	110 734	106 803	155 664	-0.7%	9.1%					
Ecuador	VNRD	130 603	179 823	270 359.1	7.5%	10.1%	57%	72%	83%	a	
	Total	228 930	249 353	327 708	1.8%	6.3%					
El Savador	VNRD	14 022	24 159	16 618.45	14.5%	-6.2%	14%	24%	15%		
	Total	98 079	101 809	113 825	0.8%	2.4%					
Guatemala	VNRD	5 862	6 888	6 034	3.5%	-2.5%	5%	5%	3%		
	Total	121 907	139 768	180 782	2.9%	5.9%					

Country		2013	2018	2023	% Ann diff 13-18	% Ann diff 18-23	% VNRD 2013	% VNRD 2018	% VNRD 2023	Change types	Graph
Guyana	VNRD	10 679	9 755	11 225	-1.7%	3.0%	96%	100%	100%		
	Total	11 148	9 755	11 225	-2.5%	3.0%					
Haiti	VNRD	16 255	11 571	3 141.76	-5.8%	-14.6%	59%	41%	16%	c	
	Total	27 478	28 018	19 636	0.4%	-6.0%					
Honduras	VNRD	10 363	13 959	12 746	6.9%	-1.7%	15%	17%	14%		
	Total	69 076	80 844	93 211	3.4%	3.1%					
Paraguay	VNRD	7 904	12 673	14 536	12.1%	2.9%	9%	14%	12%	a	
	Total	85 940	88 734	124 237	0.7%	8.0%					
Peru	VNRD	9 340	34 718	107 152	54.3%	41.7%	5%	10%	23%	a	
	Total	204 743	359 458	459 526	15.1%	5.6%					
Saint Lucia	VNRD	1 344	1 561	222.272	3.2%	-17.2%	62%	56%	9%		
	Total	2 167	2 776	2 416	5.6%	-2.6%					
Suriname	VNRD	10 100	10 270	7 782	0.3%	-4.8%	100%	100%	100%		
	Total	10 100	10 270	7 782	0.3%	-4.8%					
Uruguay	VNRD	45 802	40 118	57 545.308	-2.5%	8.7%	46%	44%	61%		
	Total	98 547	91 381	93 722	-1.5%	0.5%					
Venezuela (Bolivarian Republic of)	VNRD	26 559	299 878	10 253	205.8%	-19.3%	6%	100%	...		
	Total	416 346	299 878	1110 420	-5.6%	54.1%					
South-East Asia											
Bangladesh	VNRD	175 984	171 000	332 173	-0.6%	18.9%	30%	22%	32%		
	Total	593 774	761 115	1034 985	5.6%	7.2%					
Bhutan	VNRD	5 589	5 496	3 847	-0.3%	-6.0%	63%	71%	92%		
	Total	8 849	7 770	4 181	-2.4%	-9.2%					
India	VNRD	8456 660	9424 000	9290 739	2.3%	-0.3%	85%	76%	71%		
	Total	9949 012	12400 000	13159 927	4.9%	1.2%					
Nepal	VNRD	188 048	225 696	165 700	4.0%	-5.3%	88%	83%	60%		
	Total	214 192	271 922	276 167	5.4%	0.3%					
Sri Lanka	VNRD	380 808	450 640	466 061	3.7%	0.7%	100%	100%	100%	b	
	Total	380 808	450 640	466 061	3.7%	0.7%					
Thailand	VNRD	559 620	632 975	668 937	2.6%	1.1%	100%	100%	100%	a,e	
	Total	559 620	632 975	668 937	2.6%	1.1%					
Timor-Leste	VNRD	739	800	1 531	1.7%	18.3%	37%	20%	30%	a	
	Total	2 007	3 938	5 079	19.2%	5.8%					
Europe											
Albania	VNRD	7 655	9 282	5 786	4.3%	-7.5%	26%	28%	24%		
	Total	29 216	33 087	24 198	2.6%	-5.4%					
Belgium	VNRD	496 288	432 066	407 598	-2.6%	-1.1%	100%	100%	100%	c	
	Total	496 288	432 066	407 598	-2.6%	-1.1%					
Bulgaria	VNRD	39 938	167 424	171 216	63.8%	0.5%	24%	56%	100%	b	
	Total	166 324	300 184	171 627	16.1%	-8.6%					
Croatia	VNRD	180 411	190 447	189 954	1.1%	-0.1%	100%	100%	100%		
	Total	180 411	190 447	189 954	1.1%	-0.1%					
Cyprus	VNRD	57 323	63 008	71 243	2.0%	2.6%	100%	100%	100%	a	
	Total	57 323	63 008	71 282	2.0%	2.6%					
Czechia	VNRD	402 100	417 251	444 429	0.8%	1.3%	100%	100%	100%	b	
	Total	402 100	417 251	444 429	0.8%	1.3%					
Denmark	VNRD	283 000	206 990	184 584	-5.4%	-2.2%	100%	100%	100%	c	
	Total	283 000	206 990	184 584	-5.4%	-2.2%					
Estonia	VNRD	60 929	50 142	50 295	-3.5%	0.1%	100%	100%	100%		
	Total	60 929	50 142	50 292	-3.5%	0.1%					
Finland	VNRD	208 619	206 610	179 558	-0.2%	-2.6%	100%	100%	100%	d	
	Total	208 619	206 610	179 558	-0.2%	-2.6%					
France	VNRD	2 608 622	2512 870	2 268 672	-0.7%	-1.9%	100%	100%	100%	d	
	Total	2 608 622	2512 870	2 268 672	-0.7%	-1.9%					
Germany	VNRD	4621 862	4193 478	3672 317	-1.9%	-2.5%	100%	100%	100%	c	
	Total	4621 862	4193 478	3672 317	-1.9%	-2.5%					
Greece	VNRD	273 484	276 248	379 964	0.2%	7.5%	50%	51%	69%	b	
	Total	546 968	541 662	550 673	-0.2%	0.3%					

Country		2013	2018	2023	% Ann diff 13-18	% Ann diff 18-23	% VNRD 2013	% VNRD 2018	% VNRD 2023	Change types	Graph
Hungary	VNRD	428 540	383 253	356 745	-2.1%	-1.4%	100%	100%	100%	c	
	Total	428 540	383 253	356 745	-2.1%	-1.4%					
Iceland	VNRD	12 363	10 734	10 841	-2.6%	0.2%	100%	100%	100%		
	Total	12 363	10 734	10 841	-2.6%	0.2%					
Italy	VNRD	2 633 175	2 569 275	2 563 717	-0.5%	-0.04%	100%	100%	100%	d	
	Total	2 633 175	2 569 275	2 563 717	-0.5%	0.0%					
Kazkhstan	VNRD	138 325	147 092	194 333	1.3%	6.4%	60%	77%	78%	a	
	Total	231 509	190 782	248 650	-3.5%	6.1%					
Kyrgyzstan	VNRD	7 380	5 288	9 074	-5.7%	14.3%	21%	12%	19%		
	Total	35 937	43 110	49 022	4.0%	2.7%					
Latvia	VNRD	52 015	52 174	59 649	0.1%	2.9%	100%	100%	100%	b	
	Total	52 015	52 174	59 649	0.1%	2.9%					
Luxembourg	VNRD	24 191	19 724	17 512	-3.7%	-2.2%	100%	100%	100%	c	
	Total	24 191	19 724	17 512	-3.7%	-2.2%					
Malta	VNRD	16 924	15 917	15 538	-1.2%	-0.5%	100%	100%	100%	d	
	Total	16 924	15 917	15 538	-1.2%	-0.5%					
Montenegro	VNRD	5 473	7 608	8 647	7.8%	2.7%	33%	41%	43%	a	
	Total	16 603	18 653	20 344	2.5%	1.8%					
Netherlands (Kingdom of the)	VNRD	459 844	417 194	384 998	-1.9%	-1.5%	100%	100%	100%	c	
	Total	459 844	417 194	384 998	-1.9%	-1.5%					
North Macedonia	VNRD	54 018	53 915	56 431	0.0%	0.9%	98%	100%	100%		
	Total	55 044	53 915	56 431	-0.4%	0.9%					
Norway	VNRD	213 031	174 454	164 470	-3.6%	-1.1%	100%	100%	100%	c	
	Total	213 031	174 454	164 470	-3.6%	-1.1%					
Poland	VNRD	1 158 628	1 172 572	1 308 952	0.2%	2.3%	99.9%	96%	97%	b	
	Total	1 159 579	1 223 209	1 343 621	1.1%	2.0%					
Portugal	VNRD	356 281	309 231	299 713	-2.6%	-0.5%	100%	100%	100%	d	
	Total	356 281	309 231	299 713	-2.6%	-0.5%					
Republic ofMoldova	VNRD	34 867	59 336	59 416	14.0%	0.0%	49%	94%	99%	b	
	Total	71 663	63 193	59 815	-2.4%	-1.1%					
Romania	VNRD	428 140	416 769	411 171	-0.5%	-0.3%	100%	100%	100%	d	
	Total	428 140	416 769	411 171	-0.5%	-0.3%					
Serbia	VNRD	212 374	243 473	211 361	2.9%	-2.6%	91%	100%	100%		
	Total	232 546	243 473	211 361	0.9%	-2.6%					
Slovak Republic	VNRD	210 845	221 936	228 081	1.1%	0.6%	100%	100%	100%	b	
	Total	210 845	221 936	228 081	1.1%	0.6%					
Slovenia	VNRD	92 479	90 927	81 976	-0.3%	-2.0%	100%	100%	100%	d	
	Total	92 479	90 927	81 976	-0.3%	-2.0%					
Spain	VNRD	1 647 420	1 605 752	1 564 886	-0.5%	-0.5%	100%	100%	100%		
	Total	1 647 420	1 605 752	1 564 886	-0.5%	-0.5%					
Sweden	VNRD	472 553	380 041	369 535	-3.9%	-0.6%	100%	93%	100%	d	
	Total	472 553	409 187	369 535	-2.7%	-1.9%					
Switzerland	VNRD	344 000	260 011	246 034	-4.9%	-1.1%	100%	100%	100%	c	
	Total	344 000	260 011	246 042	-4.9%	-1.1%					
Tajikistan	VNRD	14 701	31 326	23 225	22.6%	-5.2%	46%	64%	33%		
	Total	31 959	48 948	71 428	10.6%	9.2%					
Türkiye	VNRD	1 469 809	2 357 582	2 614 375	12.1%	2.2%	66%	100%	100%	a	
	Total	2 234 447	2 357 582	2 614 375	1.1%	2.2%					
The Eastern Mediterranean											
Afghanistan	VNRD	29 101	82 904	38 606	37.0%	-10.7%	41%	39%	48%		
	Total	71 828	210 627	80 715	38.6%	-12.3%					
Bahrain	VNRD	18 628	19 546	21 187	1.0%	1.7%	99%	100%	100%	b	
	Total	18 722	19 546	21 187	0.9%	1.7%					
Egypt	VNRD	272 829	425 384	739 900	11.2%	14.8%	64%	100%	75%	a,e	
	Total	423 023	426 860	988 186	0.2%	26.3%					
Iran (Islamic Republic of)	VNRD	2 001 791	2 069 273	2 315 119	0.7%	2.4%	100%	100%	100%	b	
	Total	2 001 791	2 069 273	2 315 119	0.7%	2.4%					

Country		2013	2018	2023	% Ann diff 13-18	% Ann diff 18-23	% VNRD 2013	% VNRD 2018	% VNRD 2023	Change types	Graph
Iraq	VNRD	186 978	376 653	566 328	20.3%	10.1%	37%	49%	55%	[a]	
	Total	500 821	763 732	1026 643	10.5%	6.9%					
Kuwait	VNRD	40 480	43 467	30 013	1.5%	-6.2%	70%	56%	35%		
	Total	57 833	78 031	84 972	7.0%	1.8%					
Libya	VNRD		17 057	57 081		46.9%	93%	11%	20%		
	Total		148 330	285 407		18.5%					
Morroco	VNRD	236 060	298 842	382 234	5.3%	5.6%	75%	93%	100%	[a]	
	Total	314 746	321 997	382 234	0.5%	3.7%					
Oman	VNRD	52 976	51 615	84 548	-0.5%	12.8%	100%	90%	48%		
	Total	52 976	57 407	177 124	1.7%	41.7%					
Qatar	VNRD	24 233	30 209	41 132	4.9%	7.2%	100%	100%	100%	[a]	
	Total	24 233	30 235	41 132	5.0%	7.2%					
Tunesia	VNRD	73 600	56 795	46 478	-4.6%	-3.6%	34%	26%	19%		
	Total	216 588	220 804	243 381	0.4%	2.0%					
United Arab Emirates	VNRD	109 374	125 183	150 051	2.9%	4.0%	96%	93%	100%	[a]	
	Total	113 765	134 504	150 097	3.6%	2.3%					
The Western Pacific											
Australia	VNRD	782 923	690 759	749 305	-2.4%	1.7%	100%	100%	100%		
	Total	782 926	690 759	749 305	-2.4%	1.7%					
Brunei Darussalam	VNRD	13 906	15 537	20 844	2.3%	6.8%	100%	100%	100%	[a]	
	Total	13 906	15 537	20 844	2.3%	6.8%					
Cambodia	VNRD	17 595	17 034	27 838	-0.6%	12.7%	35%	31%	19%		
	Total	50 353	54 829	143 143	1.8%	32.2%					
China	VNRD	11 575 406	13 661 423	16 990 000	3.6%	4.9%	96%	100%	100%	[a]	
	Total	12 017 518	13 700 619	16 990 000	2.8%	4.8%					
Cook Islands	VNRD	209	262	174	5.1%	-6.7%	100%	100%	100%		
	Total	209	262	174	5.1%	-6.7%					
Japan	VNRD	3 684 024	3 420 645	3 440 811	-1.4%	0.1%	100%	100%	100%		
	Total	3 684 024	3 420 645	3 440 811	-1.4%	0.1%					
Kiribati	VNRD	17	229	28	249.4%	-17.6%	2%	11%	2%		
	Total	1 075	2 171	1 715	20.4%	-4.2%					
Lao People's Democratic Republic	VNRD	32 603	45 982	45 532	8.2%	-0.2%	93%	94%	62%		
	Total	35 047	49 070	73 023	8.0%	9.8%					
Malaysia	VNRD	636 477	707 328	768 828	2.2%	1.7%	100%	100%	100%	[a]	
	Total	636 481	707 404	768 828	2.2%	1.7%					
Mongolia	VNRD	20 378	31 072	42 434	10.5%	7.3%	98%	100%	100%	[a]	
	Total	20 780	31 072	42 434	9.9%	7.3%					
New Zealand	VNRD	125 684	112 162	122 515	-2.2%	1.8%	100%	100%	100%		
	Total	125 684	112 162	122 515	-2.2%	1.8%					
Papua New Guinea	VNRD	15 847	20 847	11 246	6.3%	-9.2%	54%	54%	27%		
	Total	29 390	38 544	42 036	6.2%	1.8%					
Philippines	VNRD	357 524	713 366	1 228 559	19.9%	14.4%	71%	83%	91%	[a]	
	Total	506 762	861 979	1 343 998	14.0%	11.2%					
Republic of Korea	VNRD	2 206 245	2 114 925	2 022 948	-0.8%	-0.9%	100%	100%	100%		
	Total	2 206 245	2 114 925	2 022 948	-0.8%	-0.9%					
Samoa	VNRD	244	257	50	1.1%	-16.1%	12%	10%	2%	[a]	
	Total	2 015	2 479	2 897	4.6%	3.4%					
Singapore	VNRD	111 626	115 826	122 668	0.8%	1.2%	100%	100%	100%	[b]	
	Total	111 626	115 826	122 668	0.8%	1.2%					
Viet Nam	VNRD	877 127	963 358	1 500 000	2.0%	11.1%	94%	96%	94%	[a]	
	Total	930 468	1 001 013	1 600 000	1.5%	12.0%					

Annex 5. Blood component preparation 2018–2023

… Not reported/not available.
Blank cell: Not required/not applicable.
— No response.
FFP: Fresh Frozen Plasma
CRYO: Cryoprecipitate
AP: Apheresis
* Except stated/explained otherwise, 1 unit of blood component is defined as the preparation from whole blood donations of 450 ml.
** One unit of apheresis platelets usually contains 200–450 x 10^9 platelets.
Δ In adult therapeutic doses.

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
Afghanistan	2018	14 340	12 959	3 381	0	69			
	2023	18 059	16 123	10 187	10 187	83			
Albania	2018	26 379	4 217	14 507	11 872	636			
	2023	23 437	8 707	17 589	5 848	542			
Algeria	2018	532 729	176 911	170 823		0	0	13 411	0
	2023	609 438	247 589	253 097			0	15 557	0
Andorra	2018	—	—	—	—	—	—	—	—
	2012	—	—	—	—	—	—	—	—
Angola	2018	12 399	9 154	4 879		0			
	2023	—	—	—	—	—	—	—	—
Antigua and Barbuda	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Argentina	2017	1 036 348	712 777	767 605	288 974	56 333	1 750	62 500	2 700
	2023	871 783	597 834	643 878	242 357	47 248	1 482	52 436	700
Armenia	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Australia	2018	…							
	2023	740 545	109 695	76 286	663 500	77 798	0	59 842	978 356
Austria	2018	…	…	…	…	…	…	…	…
	2023	285 761	35 883	2 851			6	23 845	
Azerbaijan	2018	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	830	…
Bahamas	2017	5 545	1 341	1 435	2 658				
	2023	4 911	716	705					
Bahrain	2018	…	…	…	…	…		75	
	2023	…	…	…	…	…	…	…	…
Bangladesh	2018	84 465	34 495	59 481	10	113	0	20	0
	2023	…	…	…	…	…	…	…	…
Barbados	2017	790	376	790				152	
	2023	—	—	—	—	—	—	—	—
Belarus	2018	—	—	—	—	—	—	—	—
	2012	—	—	—	—	—	—	—	—
Belgium	2018	418 501	37 411	45 563	193 885[1]	0	3 058	33 693	7 917
	2023	394 346	37 485[Δ]	31 228	228 584[2]	0	651	32 645	6 268

[1] Plasma for fractionation, in litres.
[2] Plasma for fractionation, in litres.

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
Belize	2017	2 403	1 205	1 205	1 194	4			
	2023	784	1 691	1 993	859	34			
Benin	2017	56 140	925	5 291		0			
	2023	90 154	2 494	15 408	0	0			
Bhutan	2017	4 473	2 730	2 760	0	0			
	2023	4 224	2 524	2 206				10	
Bolivia (Plurinational State of)	2017	117 374	59 649	104 809	11 241	9 388	0	351	0
	2023	133 223	74 692	131 371	16 501	12 497	0	3 936	0
Bosnia and Herzegovina	2018	14 268	8 692	14 689				421	
	2023	15 305	8 676	15 167		119		324	
Botswana	2011	20 980	548	914		0	0	22	0
	2023	25 270	1 518	2 088			0	55	0
Brazil	2011	3 307 279	1 881 885	2 685 689	458 251	160 808	…	…	…
	2013	2 799 942	1 590 269	2 110 003	305 671	160 608	…	…	…
Brunei Darussalam	2018	14 588	5 010	5 199	0	166	0	451	0
	2023	19 409	10 205	10 649	8 760	864	0	714	0
Bulgaria	2018	164 087	26 963	117 005	100		…	2 145	
	2023	190 803	37 850	105 585	69 034	0	0	3 146	708
Burkina Faso	2018	85 234	2 854	4 730		0			
	2023	152 617	5 896	6 913		0			
Burundi	2018	1 902	0	0		0			
	2023	…	512	…					
Cambodia	2018	22 156	1 729	1 706	0	151			
	2023	136 652	11 947	4 843				8	3
Cameroon	2018	5 290	591	1 325		0			
	2023	—	—	—	—	—	—	—	—
Canada	2018	778 376	92 139	79 344	94 671	63 859	0	38 761	35 579
	2023	770 249	109 615	25 023	46 307	6 341	0	56 210	25 855
Cabo Verde	2018	3 255	1 029	2 437		71			
	2023	3 670	1 618	3 403	267	75			
Central African Republic	2018	0	0	0	0				
	2023	27		25					
Chad	2018	65	0	25		0			
	2023	…	…	…	…	…			
Chile	2018	263 736	1 001	219 800	39 260	20 525		2 172	
	2023	293 475	218 383	298 546		33 825	0	4 188	0
China	2018	23 235 952	523 970	23 235 952			…	1 777 451	…
	2023	…	…	…	…	…	…	1 158 622	…
Colombia	2018	821 244	229 781	483 556	165 041	58 389	24 828	140 029	2 555
	2023	907 098	245 442	766 518	101 264	106 742	19 039	89 925	…
Comoros	2018	0	0	0	0	0			
	2023	0	0	0	0	0			
Congo	2018	85 080	296	900		4			
	2013	51 546	1 440	437	0	2			
Cook Islands	2018	262		108					
	2013	253		79					

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
Costa Rica	2018	76 564	55 295	74 927		17 757		138	
	2023	82 827	58 675	20 982	60 464	7 700	2 817	6 945	
Cote D'Ivoire	2018	181 044	3 604	9 520		0			
	2023	298 235	3 168	3 965	0	0			
Croatia	2018	188 412	112 789	101 573	86 839	13 910	0	4 865	
	2023	187 721	119 898	187 721	0	18 550	0	5 334	5 506
Cuba	2018	332 635	66 452	68 385		16 700		1 762	
	2023	425 484	79 616	43 611	5 283	16 309	0	6 776	0
Cyprus	2018	61 359	6 872	12 562		113		335	
	2023	68 788	8 043 Δ	16 010	0	211	0	376	48
Czechia	2018	410 414	100 000[3]	158 150[4]	0		1 300	23 000	598 000
	2023	431 000	109 000	76 400	0	0	1 440	24 707	5 978
Democratic People's Republic of Korea	2018	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…			
Democratic Republic of Congo	2018	121 601	7 211	19 201		0			
	2023	…	…	…	…	…			
Denmark	2018	204 671	42 980Δ	198 855	494	1 129	0	2 526	75 547
	2023	180 767	36 073Δ	285 000	0	500	0	2 000	5 000
Djibouti	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Dominica	2017	909	336	420					
	2023	909	336	420	0	0			
Dominican Republic	2018	46 889	3 713	4 916	2 585	33			
	2023	83 101	1 411	11 185	5 354	176	252	3 558	
Ecuador	2018	239 785	119 613	196 010	33 424	12 264		6 444	
	2023	316 633	154 768	226 874	81 731	18 033	0	10 995	0
Egypt	2018	424 089	106 447	340 945	14 335	79 219		20 183	1 022
	2023	913 220	313 452	844 546	13 350	75 406	0	20 500	8
El Salvador	2018	…	…	…	…	…	…	1 231	…
	2013	113 793	69 207	83 050		9 655	631	11 300	
Equatorial Guinea	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Eritrea	2018	8 786	1 218	856		2			
	2023	13 943	900	673	0	0			
Estonia	2018	50 303	7 297	58 936	0	2 267	0	1 528	8 961
	2023	46 340	8 221Δ	54 954		652	0	1 618	5 731
Eswatini	2018	15 203	0	15 203		0			
	2023	11 698	0	1 108	0	0	0	421	0
Ethiopia	2018	36 654	36 649	36 637		70			
	2023	48 531	44 303	44 394		33			
Fiji	2018	13 432	53 73	6 044	1 343	671			
	2023	—	—	—	—	—	—	—	—
Finland	2018	208 808	37 060Δ	2	204 022		0	2 585	2
	2023	172 684	34 106Δ	0	172 684	0	0	3 837	2

[3] Recalculated from "therapeutical doses" (1 adult dose = 5 individual units).

[4] Recalculated from litres (1 unit = 0.26 litres).

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
France	2018	…	…	…	…	…	…	…	…
	2023	2 133 880	2 040 202	151 803	1 703 016	0	1 518	94 105	318 027
Gabon	2018	20 480	2 180	2 119		0			
	2023	28 826	4 097	2 536	0	12			
Gambia	2018	0	0	0		0			
	2023	…	…	…	…	…			
Georgia	2018	—	—	—	—	—	—	—	—
	2023	109 065	4 765	86 525		61	812	12 741	823
Germany	2018	—	—	—	—	—	—	—	—
	2023	3 570 095	623 174[Δ]	757 007			104	321 315	616 002
Ghana	2018	24 044	7 322	21 063		367			
	2023	43 697	12 946	26 602	0	700			
Greece	2011	400 546	134 052	185 976		0	35	16 570	1 200
	2023	363 866	142 291	179 939	30 173		0	26 872	1 060
Grenada	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Guatemala	2017	123 098	49 618	73 240	2 865	3 281	109	2 515	
	2023	164 044	73 076	88 917	479	3 933	289	4 385	11
Guinea	2018	—	—	—	—	—	—	—	—
	2023	37 304	1 925	4 387	0	0			
Guinea-Bissau	2018	—	—	—	—	—	—	—	—
	2023	0	0	0	0	0			
Guyana	2017	9 734	2 177	3 789		384			
	2023	11 207	2 392	2 623		449		138	
Haiti	2017	27 550	784	255		73			
	2023	16 985	775	443					
Honduras	2017	69 647	33 284	50 901	1 143	2 081		750	
	2023	91 583	21 013	71 664	1 144	2 393		130	
Hungary	2018	—	—	—	—	—	—	—	—
	2023	354 984	213 963	354 943	0	0	0	15 910	
Iceland	2018	10 730	2 776[Δ]	2 230	0	0		1 360	91
	2023	10 819	1 098[Δ]	2 190	0	0	0	1 732	384
India	2018	…	…	…	…	…	…	…	…
	2023	9 802 272	2 339 065	8 614 687	196 307	237 053	…	…	…
Indonesia	2018	2 975 853	785 475	222 435	142 810	22 471	362	13 011	1 017
	2023	…	…	…	…	…	…	…	…
Iran (Islamic Republic of)	2011	2 032 011	1 081 780	1 874 376	157 340	156 998	0	20 958	36 748
	2023	2 269 521	1 209 182	2 147 250	152 248	140 022	0	47 542	0
Iraq	2011	…	…	…	…	…	…	…	…
	2023	941 429	443 620		524 121	102 220	978	30 984	
Ireland	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Israel	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Italy	2018	2 533 856	1 040 003	2 432 246	100 705	2 245	16 190	66 999	407 616
	2023	2 506 415	1 188 798	2 381 204	115 655	1 688	8 178	57 728	468 447

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
Jamaica	2018	28 714	8 897	20 261		1 292			
	2023	—	—	—	—	—	—	—	—
Japan	2018	3 305 960		756 591				864 222	186 005
	2023	3 336 529		691 751				851 550	178 962
Jordan	2018	64 823	45 376	57 044		13 680	0	13	0
	2023	—	—	—	—	—	—	—	—
Kazakhstan	2018	189 103	13 460	216 866		16 137		35 302	28 311
	2023	224 579	20 075	224 083		23 045	97	54 153	8 441
Kenya	2018	111 645	7 409	6 519		45			
	2023	210 847	18 976	14 759	4 218	211		1 052	
Kiribati	2018	730			8				
	3023	1 100	0	0	0	0			
Kuwait	2018	75 029	9 912	33 810	34 656	11 840	713	16 849	49 56
	2023	91 413	32 300	28 262	50 932	9 240	54	49 564	4 477
Kyrgyzstan	2018	40 182	6 619	40 244	42 530	1 819		6 619	1 207
	2023	8 909	3 563	9 034	11 803	756	0	7 509	167
Lao PDR	2018	18 354	542	1 435	0	1 019			
	2023	58 001	11 292	4 723	0	3 095			
Latvia	2018	52 464	5 791[Δ]	51 557		9 217	0	1 507	3 267
	2023	59 649	6 008[Δ]	63 010	0	13 236	0	4 049	3 372
Lebanon	2018	…	0	…	…	…	0	10 000	0
	2023	43 737	0	34 400	0	0	0	15 000	0
Lesotho	2018	5 988	49	211		0			
	2023	7 737	8	141	7 588	0			
Liberia	2018	0	0	0		0			
	2023	0	0	0		0			
Libya	2018	115 257	63 993	112 044	3 456	220	0	32 768	0
	2023	199 777	50 114	199 700	27 586	224		66 325	
Lithuania	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Luxembourg	2018	19 560	2 899		[5]			989	
	2023	17 042	2 315		15 714[6]		0	958	2 891
Madagascar	2018	27 926	2 850	9 184		0			
	2023	46 691	4 511	13 723					
Malawi	2018	12 286	2 515	1 560		83			
	2023	28 922	6 147	2 552	0	95			
Malaysia	2018	573 629	573 629	380 338		105 533	0	9 854	13 500
	2023	619 092	292 570	430 781	35 813	77 039		10 440	9 596
Maldives	2018	6 466	0	0	0	0		96	
	2023	—	—	—	—	—	—	—	—
Mali	2011	35 735	558	0		0			
	2023	11 951	634	2 140	0	0			
Malta	2011	15 676	3 661	14 253	0	0	0	1 049	0
	2023	15 279	1 642	14 004	0	0	0	291	0

[5] All plasma obtained from whole blood donations is intended for fractionation.

[6] Plasma from whole blood: intended exclusively for fractionation (production of immunoglobulins and albumin).

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
Marshall Islands	2011	…	…	…	…	…			
	2023	—	—	—	—	—	—	—	—
Mauritania	2011	183 93	3 140	10 916		0			
	2023	24 494	4 150	17 528	0	0			
Mauritius	2011	43 655	25 401	25 410		811			
	2023	51 602	32 387	32 333	0	867	0	173	0
Mexico	2011	1 792 305	857 150	1 349 225	359 796			86 728	
	2023	1 500 137	698 144	991 511	301 723	78 732	12 944	74 664	
Micronesia (Federated States of)	2018	362	146	0	0	0			
	2023	—	—	—	—	—	—	—	—
Monaco	2011	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Mongolia	2018	25 390	16 126	25 218	8 731	4 176	0	15	3 390
	2023	49 375	16 761	42 944	5 290	5 387	0	457	1 988
Montenegro	2018	18 646	8 110	14 889		2 530			
	2023	20 236	12 468	14 353	5 702	4 869	0	77	0
Morocco	2018	318 122	196 014	234 575	0	0	0	661	0
	2023	343 427	203 282	217 222				1 085	
Mozambique	2018	136 091	18 870	70 046		0			
	2023	…	…	…	…	…			
Myanmar	2018	56 786	36 290	42 922	5 082	5 082	0	8	0
	2023	39 294	33 427	24 919	2 678	2 678	0	51	143
Namibia	2018	36 937	2 009	32 435		25	0	1 413	0
	2023	44 955	8 140	34 473	10 337	145	1 118	1 299	4 640
Nauru	2018	…	…	…	…	…			
	2023	—	—	—	—	—	—	—	—
Nepal	2018	70 000	45 000	24 000	1 000	1 000			
	2023	77 548	41 176	16 470		2 059		120	
Netherlands (Kingdom of the)	2018	—	—	—	—	—	—	—	—
	2023	378 799	233 345	892	[7]			5 052	
New Zealand	2018	108 814	50 256	106 561[8]	1 336	0	0	2 646	73 202
	2023	122 361	63 931	0	118 076	0	0	2 805	112 250
Nicaragua	2017	83 833	48 117	76 950	5 969	5 931			
	2023	76 516	48 557	71 181	4 138	5 618		319	
Niger	2018	5 434	110	5 434		0			
	2023	16 113	595	2 049	0	0			
Nigeria	2018	1 875	397	1 875		0			
	2023	1 220	915	1 283	0	16			
Niue	2018								
	2023								
North Macedonia	2018	…	…	…	…	…	0	356	0
	2023	54 595	31 834	54 556		1 486[9]		1 778	
Norway	2018	170 363	95 844[Δ,10]	168 666			3 676	9 109	11 773
	2023	142 511	92 852 [Δ]	147 592	4 513		1 711	9 946	523

[7] 390 014 kg of plasma was delivered for the preparation of solvent-detergent plasma for transfusion and for fractionation.

[8] Fresh frozen plasma from whole blood is used exclusively for fractionation. Clinical FFP and cryoprecipitate are sourced entirely from apheresis plasma donations.

[9] Cryoprecipitate: 973 units prepared as 10-dose packs and 513 units prepared as 5-dose packs.

[10] One unit of platelet concentrate for therapeutic use is prepared from four buffy coats.

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
Oman	2018	21 639	37 202	34 787		2 589		1 026	
	2023	86 763	65 932	41 234	2 762	6 347	78	3 584	2 005
Pakistan	2018	805 569	375 080	636 640		49 979	…	…	…
	2023	839 354	237 500	388 864	8 428	92 122	500	7 670	1 000
Palau	2018	770	0	0	0	0			
	2023	304	0	0	0	0			
Panama	2017	49 811	35 844	27 133		4 518		3 935	
	2023	—	—	—	—	—	—	—	—
Papua New Guinea	2018	12 195	0	13	0	0			
	2023	17 221	412	173	0	7			
Paraguay	2017	82 894	53 691	65 496	11 743	4 685			
	2023	118 440	82 976	97 976	13 822	5 837		384	
Peru	2017	346 132	173 639	236 624		75 593		48 612	
	2023	429 112	289 973	330 959		41 061	87	52 336	
Philippines	2018	226 467	118 468	111 014	11 705	13 371	130	1 597	509
	2023	405 875	299 622	15 490	290 134	23 461	0	2 416	0
Poland	2018	1 201 027	428 848	1 185 886	26 887	36 834	31	50 360	143 258
	2023	1 327 466	99 290[&,11]	1 311 075	54 498	48 487	34	54 601	338 511
Portugal	2011	302 885	216 518			175	175	5 283	
	2023	294 088	190 576	155 630		42	259	6 373	206
Qatar	2018	27 047	22 360	9 019	3 035	2 565	0	852	0
	2023	40 272	38 398	1 224	10 586	1 130	0	2 219	0
Republic of Korea	2018	2 106 712	1 705 650	1 860 599	246 103	92 262	0	234 535	721 963
	2023	2 021 005[12]	1 717 590	1 839 759	169 468	114 541	0	301 602	697 540
Republic of Moldova	2018	63 176	769	63 477	11 161[13]	11 161		1 543	14 881
	2023	59 799	3 629	61 416	11 316	11 316		2 189	33 396
Romania	2018	404 031	105 819	291 857	12 493[14]	12 467	0	6 232	5
	2023	421 348	135 171	246 506	7 958	7 989	0	6 792	170
Russian Federation	2018	2 077 618	242 695	1 893 884	19 596	42 809	11 775	198 434	875 648
	2023	—	—	—	—	—	—	—	—
Rwanda	2018	62 477	24 678	6 168		804			
	2023	84 000	26 000	96 000		3 500		706	
Saint Kitts and Nevis	2017	…	…	…	…	…			
	2020	31	13	0	26	0			
Saint Lucia	2017	2 499	1 134	808		20			
	2023	2 416	1 091	966	505	0			
Saint Vincent and the Grenadines	2018	1 294	365	365					
	2023	1 145	251	257	0	0			
Samoa	2018	2 068	131	118	0	0			
	2023	2 766	137	2 629	0	0			
San Marino	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Sao Tome and Principe	2018	1 187	6	185		0			
	2023	1 154	8	76	17	0			

[11] Depending on the centre, 4–6 units are pooled to achieve a therapeutic dose.

[12] Red cell preparations include RBC (320 ml and 400 ml) and leukoreduced RBC (LR-RBC, 400 ml).

[13] Cryosupernatant.

[14] Cryosupernatant.

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
Saudi Arabia	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Senegal	2018	36 406	1 072	9 335		0			
	2023	37 304	1 925	4 387		0			
Serbia	2018	243 473	…	…	…	…	…	…	…
	2023	215 570	89 294	185 361	23 334	25 354	0	1 821	972
Seychelles	2018	113	72	42	0	0			
	2023	823	652	171	0	0			
Sierra Leone	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Singapore	2018	114 829[15]	60 085	26 345	72 497	20 270	18	8 847	612
	2023	121 329	62 944	20 389	84 202	19 876	26	8 869	8 365
Slovakia	2018	216 833	55 387	211 464			41	10 855	1 009
	2023	222 716	12 270 Δ	220 543	0	0	45	12 334	16 877
Slovenia	2017	85 631	8 913Δ	84 721	0	0	0	2 697	1 950
	2023	—	—	—	—	—	—	—	—
Solomon Islands	2018	…	…	…	…	…			
	2023	—	—	—	—	—			
Somalia	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
South Africa	2018	960 907	44 184	169 313		36 256	1 276	33 332	4 607
	2023	1 036 196	256 491	198 888[16]	261 215[17]	…	3 447	35 915	123 965
South Sudan	2018	…	0	0		0			
	2023	0	0	0	0	0			
Spain[18]	2018	1 559 773	221 434Δ	413 535		2 471	7 630	29 815	25 758
	2023	1 521 818	238 572 Δ	396 183	2 563	370	7 303	33 691	61 758
Sri Lanka	2018	446 098	264 798	390 940	6 211	60 324	0	18 577	0
	2023	466 061	278 865	384 027	9 382	56 319	0	5 808	0
Sudan	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Suriname	2018	104 323	2 779	1 984					
	2023	7 781	2 790	2 075					
Sweden	2018	399 719	38 314Δ	367 072			511	16 128	
	2023	684 803	46 516 Δ	356 600			475	13 699	28 703
Switzerland	2018	250 829	73 424	22 308			385	24 102	6 326
	2023	231 661	77 706	16 907	0		91	24 801	4 301
Syrian Arab Republic	2018	—	—	—	—	—	—	—	—
	2023	131 910	129 326	3 900	82 186	1 414			
Tajikistan	2018	42 140	1 501	52 930	7 206	7 206	0	0	4 150
	2023	69 060	3 860	81 822	0	8 830			
Thailand	2018	1 071 903	439 266	684 036	402 547	250 903	1 134	13 923	22 422
	2023[19]	1 210 813	594 408	796 928	314 272	281 443	1 084	11 989	14 911

[15] Red cell preparation units include paediatric packs derived from a single donation.

[16] All whole blood (WB)-derived plasma components are freshly frozen and quarantined. If the donor returns within 56 to 84 days and tests negative for all viral markers, the previously quarantined plasma is released for patient use. These released plasma components are also utilized for the production of cryoprecipitates for patient treatment.

[17] In litres.

[18] FFP, frozen plasma and apheresis plasma reported in litres.

[19] The number of units of blood components was reported from 13 centres, representing 43.46% of the country's total data.

Country	Data year	No. units of blood components prepared from whole blood donations*					No. units of blood components prepared through apheresis procedures		
		Red cells	Platelet	FFP	Plasma	CRYO	AP-Red cells	AP-Platelet**	AP-plasma
Timor-Leste	2018	459	66	459	0	0			
	2023	4 714	658	501	5	4 714			
Togo	2018	50 949	960	4 116		0			
	2023	75 398	2 580	7 283					
Tonga	2018	2 188	98	155	155	0			
	2023[20]	3 140	27	425					
Trinidad and Tobago	2017	…	…	…	…	…			
	2023	…	…	…	…	…	…	…	…
Tunisia	2018	86 880	153 111	0	0	196 551	0	1 029	0
	2023	217 800	152 017	184 591	14 000	1 200	0	487	0
Türkiye	2018	1 875 944	716 527	1 456 076	44 541	12 094	0	33 367	0
	2023	2 599 612	1 243 584	1 241 819	2 599 610	69 034	0	80 551	0
Turkmenistan	2018	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…	…
Tuvalu	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Uganda	2018	275 130	4 016	91 710		0			
	2023	207 663	12 586	13 851		190			
Ukraine	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
United Arab Emirates	2018	122 288	28 289	37 618	3 231	7 952	307	9 777	2 245
	2023	147 969	55 903	46 843	3 570	9 743	368	15 933	2 558
United Kingdom	2018	—	—	—	—	—	—	—	—
	2023	1 436 154	611 768	179 553	435 615	219 980	0	126 745	49 827
United Republic of Tanzania	2018	41 836	3 142	8 093		0			
	2023	76 995	8 225	24 738	0	0			
United States of America	2018[21]	5 904 105	188 446	501 953	1 246 810	1 275 515	1 256 256	1 591 635	334 012
	2013	…	61 000Δ		3 032 000	2 407 000	1 997 000	2 557 000	
Uruguay	2017	77 248	49 855	70 011	4 767	2 912		3 339	
	2023	76 901	41 617	67 411	4 670	3 059	3	2 422	
Uzbekistan	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Vanuatu	2018	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—
Venezuela (Bolivarian Republic of)	2017	—	—	—	—	—	—	—	—
	2023	1 096 903	727 197	7 217 197	369 076	369 076		2 422	
Viet Nam	2018	—	—	—	—	—	—	—	—
	2023	1 449 486	156 562		820 305	118 732	0	3 5 101	0
Yemen	2018	10 975	8 828	8 552	0	0			—
	2023	…	…	…	…	…			
Zambia	2018	30 000	12 000	30 000	0	450	30 000	12 000	30 000
	2023	116 915	15 548	45 508	0	5 500	0	200	0
Zimbabwe	2018	74 104	5 854	7 625		634	74 104	58 54	7 625
	2023	60 255	5 247	6 198	0	331	0	81	81

[20] The number provided is an estimate based on the units issued. Some duplication in this figure is possible.

[21] This report includes data from 5 of the largest blood collection centres in the Unites States of America.

Annex 6. Laboratory test requirements for screening donated blood for transfusion-transmissible infections, 2023

Y: Required for all donations.
S: Required for selected donations.
Blank cell: Not required.
… Not reported/not available.
— No response.
[a] Data of 2023 was not available. Data of earlier years were listed in the table.

Country	HIV1+2			Hepatitis B			Hepatitis C			Syphilis		Chagas disease		Malaria				HTLV 1/2	
	Ab	Combined Ag/Ab	NAT	HBsAg	Anti-HBc Ab	NAT	Anti-HCV Ab	Combined Ag/Ab	NAT	Serological testing	Others	Ab	Others	Smear microscopy	Ag	Ab	Others	Ab	Others
Afghanistan		Y		Y				Y		Y									
Albania		Y	Y	Y	S	Y	Y		Y	Y									
Algeria		Y		Y	Y		Y			Y									
Andorra	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Angola[a]		Y		Y			Y			Y				Y					
Antigua and Barbuda	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Argentina		Y	Y	Y	Y			Y		Y		Y						Y	
Armenia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Australia	Y		Y	Y	S	Y	Y		Y	S						S		S	
Austria	Y		Y	Y		Y	Y		Y	Y									
Azerbaijan		Y	Y	Y		Y	Y		Y	Y				S					
Bahamas	Y			Y	Y		Y			Y								Y	
Bahrain	Y			Y	Y		Y			Y				S					
Bangladesh	Y			Y	Y		Y			Y					Y				
Barbados	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Belarus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Belgium	Y		Y	Y		Y	Y		Y	Y		S				S		S	
Belize		Y		Y	Y		Y			Y		Y		Y					
Benin	Y	Y		Y			Y	Y		Y									
Bhutan	Y			Y			Y			Y									
Bolivia (Plurinational State of)[a]		Y		Y			Y			Y		Y							
Bosnia and Herzegovina		Y		Y			Y			Y									
Botswana		Y	Y	Y		Y	Y	Y	Y	Y									
Brazil	Y			Y	Y		Y			Y		Y						Y	
Brunei Darussalam		Y	Y	Y		Y	Y		Y	Y									
Bulgaria		Y	Y	Y		Y	Y		Y	Y	S								
Burkina Faso		Y		Y			Y			Y									
Burundi		Y		Y			Y	Y		Y									
Cabo Verde		Y		Y			Y	Y		Y									
Cambodia		Y		Y			Y			Y									
Cameroon[a]	Y			Y			Y			Y									
Canada	Y		Y	Y	Y	Y	Y		Y	Y		S						Y	
Central African Republic		Y		Y			Y			Y				Y					
Chad	Y			Y			Y			Y	S								
Chile		Y		Y				Y		Y		Y						Y	
China	Y	Y	Y	Y		Y	Y		Y	Y								S	
Colombia		Y	S	Y	Y	S	Y		S	Y		Y		S				Y	
Comoros[a]	Y			Y			Y			Y									
Congo	Y	Y		Y			Y			Y									
Cook Islands	Y			Y			Y			Y									
Costa Rica	Y	S		Y	Y		Y			Y		Y		S				Y	
Côte d'Ivoire		Y		Y			Y			Y									

Country	HIV1+2			Hepatitis B			Hepatitis C			Syphilis		Chagas disease		Malaria				HTLV 1/2	
	Ab	Combined Ag/Ab	NAT	HBsAg	Anti-HBc Ab	NAT	Anti-HCV Ab	Combined Ag/Ab	NAT	Serological testing	Others	Ab	Others	Smear microscopy	Ag	Ab	Others	Ab	Others
Croatia		Y	Y	Y	S	Y	Y		Y	Y						S			
Cuba		Y	Y	Y	Y	Y		Y	Y		Y								
Cyprus		Y	Y	Y		Y	Y		Y	Y									
Czechia[1]		Y	S	Y	S	S	Y	S	S	Y									
Democratic People's Republic of Korea	Y			Y	Y		Y	Y		Y				S					
Democratic Republic of the Congo	Y	Y		Y			Y	S		Y									
Denmark	Y		Y	Y		Y	Y		Y										
Djibouti	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Dominica[a]	Y			Y						Y								Y	
Dominican Republic	Y			Y	Y		Y			Y		Y						Y	
Ecuador		Y	Y	Y	[2]	Y	Y			Y		Y							
Egypt		Y	Y	Y		Y	Y		Y	Y									
El Salvador		Y		Y	Y		Y			Y		Y							
Equatorial Guinea	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Eritrea		Y		Y			Y			Y									
Estonia	Y		Y	Y		Y	Y			Y					S	S	[3]		
Eswatini		Y	Y	Y		Y	Y		Y	Y									
Ethiopia		Y		Y			Y			Y									
Fiji[a]		Y		Y	Y		Y			Y					S	S			
Finland		Y	Y	Y		Y	Y		Y	Y						S			
France		Y	Y	Y	Y	Y	Y		Y	Y		S				S		S	
Gabon		Y		Y			Y			Y					Y				
Gambia	Y			Y			Y			Y				S	S	S			
Georgia		Y	Y	Y		Y		Y	Y										
Germany[a]	Y		Y	Y	Y	Y	Y		Y	Y									
Ghana	Y	Y		Y			Y	Y		Y									
Greece		Y	Y	Y		Y	Y		Y	Y				S	S	S		Y	
Grenada	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Guatemala	Y			Y			Y			Y		Y							
Guinea		Y	Y	Y			Y			Y									
Guinea-Bissau		Y		Y				Y		Y									
Guyana	Y			Y			Y			Y		Y		Y				Y	
Haiti		Y		Y			Y			Y									
Honduras[4]		Y	Y	Y	Y	Y		Y	Y	Y		Y						Y	
Hungary	Y	Y	Y	Y	S	Y	Y		Y	Y						S			
Iceland	Y	Y		Y			Y			Y						S			
India	Y			Y			Y			Y				Y	Y				
Indonesia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				S	S	S			
Iran (Islamic Republic of)		Y	S	Y	S	S	Y		S	Y								S[5]	
Iraq		Y		Y	Y		Y			Y									
Ireland	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Israel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Italy	Y	Y	Y	Y		Y	Y		Y	Y		S				S			
Jamaica	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Japan	Y		Y	Y	Y	Y	Y		Y	Y		S						Y	
Jordan[a]	Y	Y		Y	Y		Y			Y	Y								
Kazakhstan		Y	Y	Y	Y	Y	Y		Y	Y									
Kenya	Y	Y		Y			Y			Y									
Kiribati	Y			Y			Y			Y									
Kuwait		Y	Y	Y	Y	Y	Y		Y	Y						S		Y	

[1] Anti-HBc testing performed for first time donors. NAT for HIV, HBV, HCV testing performed in approximate 40% donations.

[2] Anti-HBc testing is performed by five blood banks.

[3] Malaria markers (immunological or molecular) are performed only for selected donors to shorten deferral periods. Testing applies to individuals who have lived in a malaria-endemic area during the first five years of life, have a history of malaria infection, have stayed in a malaria-endemic area without symptoms, or have experienced fever during or after visiting such areas.

[4] NAT: Currently, only the Honduran Red Cross and the National Laboratory performed the testing.

[5] Testing is conducted in seven provinces and covers approximately 20% of the country's blood donations.

Country	HIV1+2			Hepatitis B			Hepatitis C			Syphilis		Chagas disease		Malaria				HTLV 1/2	
	Ab	Combined Ag/Ab	NAT	HBsAg	Anti-HBc Ab	NAT	Anti-HCV Ab	Combined Ag/Ab	NAT	Serological testing	Others	Ab	Others	Smear microscopy	Ag	Ab	Others	Ab	Others
Kyrgyzstan		Y	Y	Y		Y	Y		Y	Y				Y					
Lao People's Democratic Republic		Y		Y			Y			Y									
Latvia	Y		Y	Y		Y	Y		Y	Y									
Lebanon	Y	Y		Y	Y		Y			Y						S			
Lesotho		Y			Y		Y			Y									
Liberia*	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…		…	…
Libya	Y	Y		Y			Y	Y		Y									
Lithuania	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Luxembourg		Y	Y	Y	S	Y	Y		Y	Y		S				S		S	
Madagascar		Y		Y			Y			Y					Y				
Malawi	Y	Y		Y			Y			Y									
Malaysia		Y	S	Y		S	Y		S	Y				S[6]					
Maldives[a]	Y			Y			Y			Y									
Mali	Y	Y		Y			Y	Y		Y									
Malta		Y	Y	Y	Y	Y	Y		Y	Y									
Marshall Islands	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Mauritania		Y		Y			Y			Y									
Mauritius	Y	Y	Y	Y		Y	Y		Y	Y									
Mexico	Y			Y			Y			Y		Y			Y				
Micronesia (Federated States of)[a]	Y			Y			Y			Y									
Monaco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Mongolia		Y	Y	Y		Y	Y		Y	Y									
Montenegro		Y		Y			Y			Y									
Morocco		Y		Y				Y		Y									
Mozambique	Y	Y		Y			Y			Y									
Myanmar	Y		Y	Y		Y	Y		Y	Y									
Namibia		Y	Y	Y		Y	Y		Y	Y									
Nauru	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Nepal	Y		S	Y		S	Y		S	Y					S[7]				
Netherlands (Kingdom of the)	Y		Y	Y	Y	Y	Y		Y	S						S		S	
New Zealand		Y	Y	Y	S	Y	Y		Y	Y		S				S		S	
Nicaragua[a]		Y		Y	S			Y		Y		Y							
Niger		Y		Y			Y				Y								
Nigeria		Y		Y			Y			Y									
Niue*	Y			Y			Y			Y									
North Macedonia		Y	Y	Y		Y	Y		Y	Y									
Norway[8]	Y	Y		Y	S		Y			S		S				S		S	
Oman	Y	Y	Y	Y	Y	Y	Y	S	Y	Y						S		Y	
Pakistan	Y	Y		Y	Y	Y	Y		Y	Y				S	S				
Palau	Y			Y			Y			Y									
Panama[a]	Y	Y		Y	Y		Y			Y		Y						Y	
Papua New Guinea		Y		Y			Y				Y								
Paraguay		Y	S	Y	Y	S	Y		S	Y		Y						Y	
Peru	Y	S		Y	Y		Y			Y		Y		S	S	…		Y	
Philippines[9]	Y	Y	S	Y	Y	S	Y	Y	S	Y				Y	Y	Y			
Poland		Y	Y	Y		Y	Y	S	Y	Y									
Portugal	Y		Y	Y	Y	Y	Y		Y	Y		S				S		S	
Qatar		Y	Y	Y	Y	Y	Y		Y	Y						S[10]		Y	
Republic of Korea		Y	Y	Y		Y	Y		Y	Y						S		S	
Republic of Moldova		Y	Y	Y		Y	Y		Y	Y									
Romania		Y		Y				Y		Y								Y	

[6] Strategies to prevent transfusion-transmitted malaria include donor deferral and screening, blood film examination for malaria parasites, and prophylactic antimalarial treatment for potential donors in high-risk endemic areas.

[7] Only performed in endemic areas.

[8] Syphilis and anti-HBc testing are required for all new donors and for repeat donors whose previous donation was more than six months ago.

[9] NAT testing is conducted only in selected blood establishments due to limited funding and resources.

[10] NAT testing is performed only by blood establishments of the National Transfusion Service, covering about 70% of all donations in the country.

Country	HIV1+2			Hepatitis B			Hepatitis C			Syphilis		Chagas disease		Malaria				HTLV 1/2	
	Ab	Combined Ag/Ab	NAT	HBsAg	Anti-HBc Ab	NAT	Anti-HCV Ab	Combined Ag/Ab	NAT	Serological testing	Others	Ab	Others	Smear microscopy	Ag	Ab	Others	Ab	Others
Russian Federation[a]	Y	Y	Y	Y		Y	Y		Y	Y									
Rwanda	Y	Y		Y	Y		Y	Y		Y	Y								
Saint Kitts and Nevis[*]		Y		Y			Y			Y								Y	
Saint Lucia		Y		Y			Y			Y								Y	
Saint Vincent and the Grenadines[a]	Y	Y		Y			Y			Y								Y	
Samoa	Y			Y			Y			Y									
San Marino	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Sao Tome and Principe	Y	Y					Y	Y		Y	S				Y	Y			
Saudi Arabia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Senegal	Y			Y			Y			Y									
Serbia	Y	Y	Y	Y		Y	Y	Y	Y	Y									
Seychelles	Y	Y		Y	Y		Y			Y								Y	
Sierra Leone	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Singapore		Y	Y	Y		Y	Y		Y	Y						S	S[11]		
Slovakia	Y	Y	S	Y	Y	S	Y		S	Y						S			
Slovenia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Solomon Islands	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Somalia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
South Africa		Y	Y	Y	S	Y	Y		Y	Y									
South Sudan[a]	Y	Y		Y			Y			Y									
Spain	Y		Y	Y		Y	Y		Y	Y		S[12]				S		S	
Sri Lanka	Y	Y		Y			Y	Y		Y	Y			Y					
Sudan	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Suriname		Y		Y			Y			Y		Y						Y	
Sweden[13]	Y			Y	S		Y			Y		S				S		S	
Switzerland	Y		Y	Y		Y	Y		Y	Y		S				S			
Syrian Arab Republic		Y		Y			Y												
Tajikistan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y					
Thailand		Y	Y	Y	S	Y	Y		Y	Y									
Timor-Leste	Y	Y		Y			Y			Y									
Togo	Y	Y		Y			Y			Y									
Tonga	Y			Y			Y			Y									
Trinidad and Tobago	Y			Y			Y			Y		Y						Y	
Tunisia		Y		Y				Y		Y									
Türkiye		Y	Y	Y		Y	Y		Y	Y									
Turkmenistan	Y		Y	Y		Y	Y		Y	Y									
Tuvalu	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Uganda		Y	Y	Y		Y	Y		Y	Y									
Ukraine	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
United Arab Emirates		Y	Y	Y	Y	Y	Y		Y	Y							S[14]	Y	
United Kingdom		Y	Y[15]	Y	S[16]	Y	Y		Y	Y		S[17]				S[18]		S[19]	
United Republic of Tanzania		Y		Y				Y		Y									
United States of America	Y		Y	Y	Y	Y	Y		Y	Y		S						Y	
Uruguay[a]		Y		Y	Y			Y		Y		Y						Y	
Uzbekistan	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—

[11] Malaria PCR testing is performed for at-risk donors with a history of residence in a malaria-endemic country.

[12] For Chagas disease, malaria, HTLV, and West Nile virus, testing is done selectively based on interview and individual risk assessment.

[13] Blood donor screening is not performed by the blood establishments but by the contracted microbiology laboratory at the hospitals.

[14] Biosynex CellsCheck (automatic).

[15] HIV NAT and HBV NAT: While not mandatory for blood donations in most of the UK, HIV RNA and HBV DNA are included in nucleic acid screening as the commercial systems available are now triplex assays.

[16] Anti-HBc: All blood donors are to be screened for anti-HBc at their first donation or their first donation after the introduction of anti-HBc screening. Anti-HBc screening to be repeated if a donor lapses (over 2 years) or has a new HBV risk.

[17] Chagas: If at least four months following the date of last exposure to Chagas (or if transfused prior to 1980).

[18] Malaria: for donors who have had malaria diagnosed in the past, donors who have EVER had an undiagnosed fever that could have been malaria, donors who have EVER been resident in a malarial endemic area for 6 months or more or for other donors if at least four months and less than 12 months have passed since return from a malaria endemic area.

[19] HTLV: anti-HTLV screening is only required for blood donations from previously untested donors and for blood donations destined for use to prepare non-leucodepleted products.

Country	HIV1+2			Hepatitis B			Hepatitis C			Syphilis		Chagas disease		Malaria				HTLV 1/2	
	Ab	Combined Ag/Ab	NAT	HBsAg	Anti-HBc Ab	NAT	Anti-HCV Ab	Combined Ag/Ab	NAT	Serological testing	Others	Ab	Others	Smear microscopy	Ag	Ab	Others	Ab	Others
Vanuatu	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
Venezuela (Bolivarian Republic of)	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…		…	…
Viet Nam		Y	Y	Y		Y	Y		Y	Y					S	S			
Yemen		Y		Y	Y		Y	Y		Y					Y				
Zambia		Y		Y			Y			Y									
Zimbabwe		Y		Y	Y		Y			Y									

Annex 7. Number and proportion of donations tested positive/reactive for transfusion-transmissible infections markers, 2018–2023

… Not reported/not available.
Blank cell: Not required/not applicable.
— No response.
* Proportion expressed as positive/reactive per 100 donations tested.
Countries that reported in the GDBS 2017 but not in the 2018 survey are shown using 2017 data.

Country	Data year	HIV 1+2			HBV			HCV			Syphilis		
		Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*
Afghanistan	2018	88	230 777	0.04	5 657	247 608	2.28	2 058	247 608	0.83	1 486	247 608	0.60
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Albania	2018	5	23 312	0.02	1 060	23 312	4.54	132	23 312	0.57	18	23 312	0.08
	2023	10	37 022	0.03	1 395	37 022	3.77	235	37 022	0.63	73	37 022	0.19
Algeria	2018	237	592 680	0.04	1 007	592 680	0.17	534	592 680	0.09	1 067	592 680	0.18
	2023	1 312	676 800	0.19	2 679	676 800	0.39	1 085	676 800	0.16	2 122	676 800	0.31
Angola	2018	852	106 493	0.80	6 603	106 493	6.20	852	106 493	0.80	1 065	106 493	1.00
	2023	—	—	—	—	—	—	—	—	—	—	—	—
Argentina	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	1 389	726 444	0.19	1 852	726 444	0.25	2 964	726 444	0.41	11 580	726 444	1.59
Australia	2018	7	1 329 849	<0.001	79	1 329 849	0.006	53	1 329 849	0.004	…	…	…
	2023	6	1 632 581	<0.001	94	1 632 581	0.006	83	1 632 581	0.005	21	90 835	0.002
Austria	2018	…	…	…	…	…	…	…	…	…	…	…	…
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Azerbaijan	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	167	…	0.18	1 195	…	1.2	943	…	1.02	945	…	1.02
Bahamas	2017	8	5 619	0.14	30	5 619	0.53	15	5 619	0.27	45	5 619	0.80
	2023	25	4 989	0.50	27	4 989	0.54	19	4 989	0.38	56	4 989	0.11
Bahrain	2018	1	19 546	0.005	7	19 546	0.03	5	19 546	0.02	20	19 546	0.10
	2023	1	21 187	0.005	2	21 187	0.01	3	21 187	0.01	16	21 187	0.07
Bangladesh	2018	77	761 115	0.01	5 797	761 115	0.76	246	761 115	0.03	1 179	761 115	0.15
	2023	39	1 034 985	0.003	4 958	1 034 985	0.48	308	1 034 985	0.03	1 385	1 034 985	0.13
Barbados	2017	7	5 243	0.13	10	5 243	0.19	21	5 243	0.40	69	5 243	1.32
	2023	—	—	—	—	—	—	—	—	—	—	—	—
Belgium	2018	0	597 492	0	32	597 492	0.005	16	597 492	0.003	38	597 492	0.006
	2023	3	620 235	<0.001	26	620 235	0.004	15	620 235	0.003	29	620 235	0.004
Belize	2017	6	6 092	0.10	10	6 092	0.16	3	6 092	0.05	12	6 092	0.20
	2023	6	6 618	0.091	9	6 618	0.136	2	6 618	0.03	36	6 618	0.544
Benin	2018	1 523	83 203	1.83	5 009	83 203	6.02	1 290	83 203	1.55	1 257	83 203	1.51
	2023	1 368	107 296	1.27	4 184	107 296	3.90	998	107 296	0.93	1 026	107 296	0.96
Bhutan	2018	0	7 770	0	64	7 770	0.82	0	7 770	0	144	7 770	1.85
	2023	9	4 181	0.22	8	4 181	0.2	2	4 181	0.04	9	4 181	0.22
Bolivia (Plurinational State of)	2017	348	119 663	0.29	284	119 663	0.24	358	119 663	0.30	911	119 663	0.76
	2023	423	137 306	0.31	252	137 306	0.18	314	137 306	0.23	1 566	137 306	1.14
Bosnia and Herzegovina	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	2	16 033	0.01	5	16 033	0.03	1	16 033	0.006	3	16 033	0.02
Botswana	2018	352	24 088	1.46	289	24 088	1.20	108	24 088	0.45	368	24 088	1.53
	2023	289	27 605	1.05	182	27 605	0.66	118	27 605	0.43	302	27 605	1.09
Brazil	2017	8 636	3 143 417	0.28	7 179	3 143 417	0.23	10 289	3 143 417	0.33	33 738	3 143 417	1.07
	2023	5 299	2 979 411	0.18	4 800	2 984 895	0.16	7 002	2 987 704	0.23	34 321	3 056 435	1.12
Brunei Darussalam	2018	7	15 988	0.04	28	15 988	0.18	8	15 988	0.05	45	15 988	0.28
	2023	2	21 558	0.01	17	21 558	0.08	8	21 558	0.04	33	21 558	0.15
Bulgaria	2018	143	169 633	0.08	962	169 633	0.57	380	169 633	0.22	504	169 633	0.30
	2023	96	173 177	0.06	555	173 177	0.32	258	173 177	0.15	286	173 177	0.17

Country	Data year	HIV 1+2			HBV			HCV			Syphilis		
		Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*
Burkina Faso	2018	2 105	105 541	1.99	9 046	105 541	8.57	3 640	105 541	3.45	1 392	105 541	1.32
	2023	1 189	145 539	0.81	7 368	145 539	5.06	2 645	145 539	1.81	2 880	145 539	1.98
Burundi	2018	330	82 524	0.40	1 733	82 524	2.10	2 475	82 524	3.00	495	82 524	0.60
	2023	775	93 792	0.83	1 499	93 792	1.60	1 434	93 792	1.53	368	93 792	0.39
Cabo Verde	2018	1	3 352	0.03	53	3 352	1.58	2	3 352	0.06	6	3 352	0.18
	2023	3	3 717	0.08	22	3 717	0.59	7	3 717	0.19	18	3 717	0.48
Cambodia	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	663	143 143	0.46	1 824	143 143	1.27	475	143 143	0.33	3 414	143 143	2.39
Cameroon	2018	1 277	94 873	1.35	3 783	94 873	3.99	2 776	94 873	2.93	1 862	94 873	1.96
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Canada	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	4	792 260	0.005	57	792 260	0.007	70	792 260	0.009	82	792 260	0.01
Central African Republic	2018	868	21 000	4.13	2 132	21 000	10.15	341	21 000	1.62	418	21 000	1.99
	2023	1 001	22 507	4.45	1 822	22 507	8.10	379	22 507	1.68	931	22 507	4.14
Chad	2018	1 664	74 468	2.23	6 673	74 447	8.96	1 656	74 229	2.23	2 691	73 322	3.67
	2023	1 845	110 112	1.68	6 998	110 000	6.36	2 432	109 500	2.22	4 147	109 600	3.78
Chile	2017	110	265 653	0.04	37	265 653	0.01	70	265 653	0.03	…	…	…
	2023	50	295 489	0.02	9	295 489	0.003	17	295 489	0.006	1 905	295 489	0.645
China	2018	…	…	…	…	…	…	…	…	…	…	…	…
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Colombia	2017	1 746	830 291	0.21	994	830 291	0.12	3 058	830 291	0.37	9 870	830 291	1.19
	2023	1 514	999 584	0.15	1 143	999 584	0.11	2 865	999 584	0.29	13 052	999 584	1.31
Comoros	2018	0	1 680	0	53	1 680	3.15	15	1 512	0.99	27	1 370	1.97
	2023	—	—	—	—	—	—	—	—	—	—	—	—
Congo	2018	2 216	88 332	2.51	5 164	88 332	5.85	1 352	88 332	1.53	138	88 332	0.16
	2023	2 256	100 117	2.25	5 548	100 117	5.54	2 031	100 117	2.03	713	100 117	0.71
Cook Islands	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	0	264	0	0	264	0	0	264	0	0	264	0
Costa Rica	2017	60	77 389	0.08	204	77 389	0.26	138	77 389	0.18	372	77 389	0.48
	2023	65	93 931	0.07	100	93 931	0.11	106	93 931	0.11	427	93 931	0.46
Côte d'Ivoire	2018	…	158 539	…	11 010	158 539	6.94	3 473	158 539	2.19	312	158 539	0.20
	2023	1 252	234 011	0.54	13 183	234 011	5.65	2 458	234 011	1.05	89	234 011	0.04
Croatia	2018	2	195 563	0.001	7	195 563	0.004	1	195 563	<0.001	5	195 563	0.003
	2023	0	195 459	0	5	195 459	0.003	3	195 459	0.002	7	195 459	0.004
Cuba	2017	2 269	411 979	0.55	1 669	411 979	0.41	3 799	411 979	0.92	1 424	411 979	0.35
	2023	2 939	403 930	0.73	3 226	403 616	0.80	6 139	400 703	1.53	2 624	404 218	0.65
Cyprus	2018	2	63 008	0.003	24	63 008	0.04	5	63 008	0.008	19	63 008	0.03
	2023	3	71 706	0.004	8	71 706	0.01	5	71 706	0.007	36	71 706	0.05
Czechia	2018	0	635 883	0	10	635 883	0.002	15	635 883	0.002	9	635 883	0.001
	2023	0	660 645	0	7	660 645	0.001	17	660 645	0.003	17	660 645	0.003
Democratic People's Republic of Korea	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	0	100 980	0	606	100 980	0.6	101	100 980	0.1	0	100 980	0
Democratic Republic of the Congo	2018	8 403	397 530	2.11	10 924	388 735	2.81	9 663	373 277	2.59	6 722	370 670	1.81
	2023	7 078	470 062	1.51	8 738	454 559	1.92	5 061	450 561	1.12	5 907	441 920	1.34
Denmark	2018	0	278 975	0	4	278 975	0.001	2	278 975	<0.001			
	2023	0		0	0		0	0		0			
Dominica	2018	2	893	0.22	0	893	0				6	893	0.67
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Dominican Republic	2017	159	105 134	0.15	723	105 134	0.69	174	105 134	0.17	542	105 134	0.52
	2023	229	165 477	0.14	432	165 477	0.26	222	165 477	0.13	3 078	165 477	1.86
Ecuador	2017	783	249 363	0.31	377	249 363	0.15	643	249 363	0.26	3 010	249 363	1.21
	2023	720	327 415	0.22	238	327 415	0.07	373	327 415	0.11	3 005	327 415	0.92
Egypt	2018	985	428 759	0.23	3 269	428 759	0.76	9 978	428 759	2.33	1 038	428 759	0.24
	2023	95	988 186	0.009	282	988 186	0.028	470	988 186	0.047	100	988 186	0.01
El Salvador	2017	342	101 605	0.34	172	101 605	0.17	153	101 605	0.15	1 266	101 605	1.25
	2023	107	113 825	0.09	161	113 825	0.14	155	113 825	0.14	1 090	113 825	0.96

Country	Data year	HIV 1+2			HBV			HCV			Syphilis		
		Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*
Eritrea	2018	26	9 275	0.28	110	9 275	1.19	24	9 275	0.26	45	9 275	0.49
	2023	17	15 022	0.11	55	15 022	0.36	25	15 022	0.16	2	15 022	0.01
Estonia	2018	3	53 486	0.006	5	53 486	0.009	21	53 486	0.04	14	53 486	0.03
	2023	2	53 417	0.004	6	53 417	0.011	10	53 417	0.019	6	53 417	0.011
Eswatini	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	183	13 399	1.37	319	13 399	2.38	73	13 399	0.54	247	13 399	1.84
Ethiopia	2018	653	186 497	0.35	1 754	186 497	0.94	386	186 497	0.21	1 788	186 497	0.96
	2023	1 647	309 457	0.53	5 320	309 457	1.72	2 033	309 457	0.66	2 780	309 457	0.9
Finland	2018	2	206 610	0.001	0	206 610	0	1	206 610	<0.001	7	205 391	0.003
	2023	0	179 558	0	11	179 558	0.006	14	179 558	0.008	5	179 558	0.002
France	2018	25	2 926 942	<0.001	139	2 926 942	0.005	75	2 926 942	0.003	336	2 926 942	0.01
	2023	21	2 666 092	<0.001	221	2 666 092	0.008	57	2 666 092	0.002	378	2 666 092	0.014
Gabon	2018	303	23 000	1.32	762	23 000	3.31	155	23 000	0.67	388	23 000	1.69
	2023	526	26 475	1.98	1 159	26 475	4.37	659	26 475	2.48	568	26 475	2.15
Gambia	2018	15	11 989	0.13	423	11 378	3.71	13	11 161	0.12	5	6 641	0.08
	2023	68	15 476	0.44	530	15 476	3.43	17	15 476	0.11	61	15 476	0.39
Georgia	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	65	93 880	0.07	550	93 880	0.59	316	93 880	0.34	468	93 880	0.50
Germany	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Ghana	2018	479	55 315	0.87	1 537	55 315	2.78	768	55 315	1.39	1 897	55 315	3.43
	2023	5 980	182 696	3.27	9 326	182 696	5.10	6 062	182 696	3.32	10 471	182 696	5.73
Greece	2018	38	541 662	0.007	430	541 662	0.08	107	541 662	0.02	137	541 662	0.02
	2023	17	404 536	0.004	161	404 536	0.04	65	404 536	0.02	182	404 536	0.04
Guatemala	2017	234	136 241	0.17	500	136 241	0.37	768	136 241	0.56	1 560	136 241	1.15
	2023	280	180 302	0.16	585	180 302	0.32	769	180 302	0.43	1 723	180 302	0.96
Guinea	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Guinea-Bissau	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Guyana	2017	61	9 755	0.63	183	9 755	1.88	103	9 755	1.06	109	9 755	1.12
	2023	24	11 225	0.21	114	11 225	1.02	14	11 225	0.13	274	11 225	2.44
Haiti	2017	148	28 018	0.53	656	28 018	2.34	155	28 018	0.55	440	28 018	1.57
	2023	196	19 636	1.00	572	19 636	2.91	135	19 636	0.69	465	19 636	2.32
Honduras	2017	96	80 850	0.12	192	80 850	0.24	310	80 850	0.38	589	80 850	0.73
	2023	1 236	92 924	1.33	1 018	92 924	1.10	1 032	92 924	1.11		92 924	1.59
Hungary	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023			0			0			0			0
Iceland	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	0	11 845	0	1	11 845	0.008	0	11 845	0	3	11 845	0.025
India	2018	…	…	0.14	…	…	0.78	…	…	0.33	…	…	0.23
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Indonesia	2018	11 791	3 813 871	0.31	41 642	3 816 122	1.09	11 710	3 812 617	0.31	24 368	3 814 533	0.64
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Iran (Islamic Republic of)	2018	51	2 069 273	0.002	937	2 069 273	0.05	360	2 069 273	0.02	5	2 069 273	<0.001
	2023	116	2 351 199	0.005	1 095	2 351 199	0.05	464	2 351 199	0.02	...	2 351 199	...
Iraq	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	618	1 040 112	0.06	1 907	1 040 112	0.18	1 151	1 040 112	0.11	3 406	1 040 112	0.33
Italy	2018	83	2 991 082	0.003	521	2 991 082	0.02	163	2 991 082	0.005	548	2 991 082	0.02
	2023	74	3 019 471	0.002	437	3 019 471	0.015	185	3 019 471	0.006	632	3 019 471	0.02
Jamaica	2017	…	…	0.30	…	…	0.65	…	…	0.44	…	…	1.25
	2023	—	—	—	—	—	—	—	—	—	—	—	—
Japan	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	2 550	5 003 723	0.05	8 235	5 003 723	0.16	2 067	5 003 723	0.04	4 437	5 003 723	0.09
Jordan	2018	1	64 823	0.002	87	64 823	0.13	55	64 823	0.08	13	64 823	0.02
	2023	—	—	—	—	—	—	—	—	—	—	—	—

Country	Data year	HIV 1+2			HBV			HCV			Syphilis		
		Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*
Kazakhstan	2018	62	211 469	0.03	1 287	211 469	0.61	631	211 469	0.30	1 120	211 469	0.53
	2023	53	244 755	0.02	11 157	244 755	4.56	463	244 755	0.19	1 103	244 755	0.45
Kenya	2018	1 029	164 275	0.63	2 048	164 275	1.25	893	164 275	0.54	510	164 275	0.31
	2023	3 012	301 209	1.00	6 723	301 209	2.23	3 201	301 209	1.06	3 127	301 209	1.04
Kiribati	2018	0	2 171	0	146	2 171	6.73	0	2 171	0	50	2 171	2.30
	2023	6	1 909	0.31	113	1 924	5.87	0	418	0	31	1 715	1.81
Kuwait	2018	90	85 847	0.10	66	85 847	0.08	168	85 847	0.20	93	85 847	0.11
	2023	24	93 079	0.03	34	93 079	0.04	99	93 079	0.11	321	93 079	0.34
Kyrgyzstan	2018	152	41 946	0.36	1 860	41 946	4.43	825	41 946	1.97	691	41 946	1.65
	2023	77	50 457	0.15	933	50 457	1.84	243	50 457	0.48	397	50 457	0.79
Lao People's Democratic Republic	2018	129	49 070	0.26	1 855	49 070	3.78	61	49 070	0.12	40	49 070	0.08
	2023	181	73 023	0.24	1 350	73 023	1.84	104	73 023	0.14	265	73 023	0.36
Latvia	2018	9	56 960	0.02	16	56 960	0.28	28	56 960	0.05	17	56 960	0.03
	2023			0.03			0.09			0.17			0.09
Lebanon	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	2	45 230	0.004	28	45 230	0.062	6	45 230	0.013	15	45 230	0.033
Lesotho	2018	199	6 418	3.10	71	6 418	1.11	32	6 418	0.50	232	6 418	3.61
	2023	195	7 737	2.52	94	7 737	1.22	35	7 737	0.45	341	7 737	4.41
Liberia	2018	256	11 023	2.32	1 510	11 023	13.70	44	11 023	0.40	143	11 023	1.30
	2023	—	—	—	—	—	—	—	—	—	—	—	—
Libya	2018	75	148 330	0.05	281	148 330	0.19	200	148 330	0.13	31	148 330	0.02
	2023	200	285 407	0.07	579	285 407	0.20	314	285 407	0.11	31	285 407	0.01
Luxembourg	2018	0	22 603	0	0	22 603	0	1	22 603	0.004	6	22 603	0.03
	2023	1	10 007	0.01	2	10 007	0.02	0	10 007	0	3	10 007	0.03
Madagascar	2018	225	48 923	0.46	2 163	48 923	4.42	507	48 923	1.04	507	48 923	1.04
	2023	408	71 593	0.57	2 816	71 593	3.93	425	71 593	0.59	2 485	71 593	3.47
Malawi	2018	1 008	63 000	1.60	1 512	63 000	2.40	1 890	63 000	3.00	1 449	63 000	2.30
	2023	1 392	112 768	1.23	1 082	112 768	0.96	1 661	112 768	1.47	2 013	112 768	1.79
Malaysia	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	363	788 036	0.046	774	788 036	0.098	389	788 036	0.05	373	788 036	0.05
Maldives	2018	5	6 562	0.08	9	6 562	0.14	26	6 562	0.40	3	6 562	0.05
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Mali	2018	829	56 006	1.48	5 634	56 006	10.06	935	56 006	1.67	22	56 006	0.04
	2023	1 223	99 881	1.22	8 501	99 881	8.51	924	99 881	0.92	893	99 881	0.89
Malta	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	1	15 829	0.006	0	15 829	0	0	15 829	0	7	15 829	0.04
Mauritania	2018	34	18 393	0.18	2 301	18 393	12.51	1	18 393	0.005	79	18 393	0.43
	2023	80	26 331	0.30	2 879	32 109	8.96	28	26 331	0.11	132	32 109	0.41
Mauritius	2018	27	44 731	0.06	42	44 731	0.09	110	44 731	0.25	171	44 731	0.38
	2023	44	52 344	0.08	87	52 344	0.16	274	52 344	0.52	427	52 344	0.81
Mexico	2017	6 487	2 394 836	0.27	6 258	2 394 836	0.26	12 899	2 394 836	0.54	21 077	2 394 836	0.88
	2023	378	1 601 437	0.02	136	1 601 437	0.008	346	1 601 437	0.02	2 218	1 601 437	0.14
Micronesia (Federated States of)	2018	0	1 736	0	14	1 736	0.81	0	1 736	0	18	1 736	1.04
	2023	—	—	—	—	—	—	—	—	—	—	—	—
Mongolia	2018	0	34 296	0	230	34 296	0.67	170	34 296	0.50	363	34 296	1.06
	2023	0	41 842	0	223	41 842	0.53	304	41 842	0.73	353	41 842	0.85
Montenegro	2018	2	18 653	0.01	10	18 653	0.05	3	18 653	0.02	23	18 653	0.12
	2023	10	20 344	0.05	12	20 344	0.06	22	20 344	0.11	18	20 344	0.09
Morocco	2018	49	321 336	0.02	2 909	321 336	0.91	37	321 336	0.01	5 115	321 336	1.59
	2023	1 255	382 232	0.32	2 277	382 232	0.59	1 101	382 232	0.28	3 001	382 232	0.78
Mozambique	2018	5 171	136 091	3.80	5 022	136 091	3.69	1 606	136 091	1.18	4 260	136 091	3.13
	2023	2 987	143 824	2.08	3 217	143 824	2.24	789	143 824	0.55	2 215	143 824	1.54
Myanmar	2018	879	457 657	0.19	7 779	457 657	1.70	1 473	457 657	0.32	3 221	457 657	0.70
	2023	21	394 91	0.05	532	39 491	1.35	51	39 491	0.13	164	39 491	0.42
Namibia	2018	105	37 672	0.28	354	37 672	0.94	72	37 672	0.19	127	37 672	0.34
	2023	74	50 979	0.15	265	50 979	0.52	55	50 979	0.11	92	50 979	0.18

Country	Data year	HIV 1+2			HBV			HCV			Syphilis		
		Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*
Nepal	2018	113	271 922	0.04	700	271 922	0.26	424	271 922	0.16	1 229	271 922	0.45
	2023	111	276 167	0.04	442	276 167	0.16	194	276 167	0.07	1 850	276 167	0.67
Netherlands (Kingdom of the)	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	0	384 998	0	2	384 998	<0.001	0	384 998	0	13	384 998	0.003
New Zealand	2018	0	174 705	0	13	174 705	0.007	5	174 705	0.003	8	174 705	0.005
	2023	1	224 127	<0.001	10	224 127	0.004	10	224 127	0.004	17	224 127	0.008
Nicaragua	2017	49	84 682	0.06	164	84 682	0.19	225	84 682	0.27	251	84 682	0.30
	2020			0.06			0.14			0.04			0.83
Niger	2018	2 142	137 715	1.56	11 001	137 715	7.99	1 999	137 715	1.45	1 153	137 715	0.84
	2023	2 516	189 137	1.33	14 785	189 137	7.81	1 638	189 137	0.86	2 612	189 137	1.38
Nigeria	2018	1 972	165 605	1.19	6 102	165 605	3.68	3 689	165 605	2.23	1 522	165 605	0.92
	2023	188	14 507	1.29	870	14 507	6.00	337	14 507	2.32	113	14 507	0.78
Niue	2018	…	…	…	…	…	…	…	…	…	…	…	…
	2023	—	—	—	—	—	—	—	—	—	—	—	—
North Macedonia	2018	0	20 771	0	51	20 771	0.25	7	20 771	0.03	…	…	…
	2023	2	56 450	0.004	88	56 450	0.156	3	56 450	0.005	37	56 450	0.066
Norway	2018	0	190 408	0	0	190 408	0	1	190 408	<0.001	0	115 797	0
	2023	0	182 197	0	0	182 197	0	0	182 197	0	4	91 098	0.004
Oman	2018	8	58 342	0.01	326	58 342	0.56	213	58 342	0.37	91	58 342	0.16
	2023	59	91 632		258	91 632		78	91 632		107	91 632	
Pakistan	2018	1 999	2 004 007	0.10	39 800	2 031 244	1.96	50 478	2 030 079	2.49	12 872	1 872 687	0.69
	2023	2 423	1 555 462	0.16	20 668	1 555 462	1.33	31 325	1 555 462	2.01	18 514	1 555 462	1.19
Palau	2018	0	879	0	9	879	1.02	2	879	0.23	15	879	1.70
	2023	0	337	0	2	337	0.59	2	337	0.59	0	337	0
Panama	2017	84	54 066	0.16	125	54 066	0.23	176	54 066	0.33	460	54 066	0.85
	2023	—	—	—	—	—	—	—	—	—	—	—	—
Papua New Guinea	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Paraguay	2017	196	89 007	0.22	331	89 007	0.37	476	89 007	0.54	4 744	89 007	5.33
	2023	286	124 434	0.21	462	124 434	0.37	535	124 434	0.43	6 638	124 434	5.33
Peru	2017	794	359 458	0.22	1 478	359 458	0.41	2 162	359 458	0.60	3 536	359 458	0.98
	2023	933	459 687	0.20	308	459 687	0.07	786	459 687	0.17	529	459 687	0.12
Philippines	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	8 310	1 269 249	0.65	29 762	1 269 577	2.34	8 159	1 269 325	0.64	11 535	1 269 678	0.91
Poland	2018	34	1 293 424	0.003	204	1 293 424	0.02	187	1 293 424	0.01	134	1 293 424	0.01
	2023	42	1 496 828	0.003	167	1 496 828	0.01	149	1 496 828	0.010	212	1 496 828	0.014
Portugal	2018	10	314 091	0.003	16	314 091	0.005	9	314 091	0.003	90	314 091	0.03
	2023	19	306 033	0.006	24	306 033	0.008	16	306 033	0.005	90	306 033	0.03
Qatar	2018	4	30 125	0.01	38	30 125	0.13	59	30 125	0.20	62	30 125	0.21
	2023	5	43 351	0.01	48	43 351	0.11	10	43 351	0.02	163	43 351	0.38
Republic of Korea	2018	3 611	2 876 459	0.13	1 003	2 876 459	0.03	302	2 876 459	0.01	322	2 876 459	0.01
	2023	1 048	2 775 172	0.04	1 729	2 775 172	0.06	2 952	2 775 172	0.11	2 218	2 775 172	0.08
Republic of Moldova	2018	115	75 421	0.15	558	75 421	0.74	745	75 421	0.99	807	75 421	1.07
	2023	70	76 938	0.09	381	76 938	0.50	356	76 938	0.46	708	76 938	0.92
Romania	2018	41	423 487	0.01	1 651	423 487	0.39	262	423 487	0.06	1 043	423 487	0.25
	2023	617	425 013	0.14	1 183	427 586	0.27	431	424 836	0.10	1 098	424 952	0.25
Russian Federation	2018	1 209	2 763 217	0.04	2 334	2 763 217	0.08	5 049	2 763 217	0.18	3 907	2 763 217	0.14
	2023	—	—	—	—	—	—	—	—	—	—	—	—
Rwanda	2018	43	65 512	0.07	549	65 512	0.84	328	65 512	0.50	254	65 512	0.39
	2023	40	86 812	0.05	249	86 812	0.29	159	86 812	0.18	295	86 812	0.34
Saint Kitts and Nevis	2017	0	571	0	22	571	3.85	1	571	0.18	3	571	0.52
	2020			0.3			1.8						1
Saint Lucia	2017	4	2 773	0.14	12	2 773	0.43	2	2 773	0.07	26	2 773	0.94
	2023	12	2 416	0.50	11	2 416	0.46	5	2 416	0.21	88	2 416	3.64
Saint Vincent and the Grenadines	2018	2	1 295	0.15	11	1 295	0.85	2	1 295	0.15	12	1 295	0.93
	2023	—	—	—	—	—	—	—	—	—	—	—	—

Country	Data year	HIV 1+2			HBV			HCV			Syphilis		
		Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*
Samoa	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	6	2 897	0.21	47	2 897	1.62	2	2 897	0.07	29	2 897	1.04
Sao Tome and Principe	2018	5	1 194	0.42	93	1 194	7.79	6	1 194	0.50	18	1 194	1.50
	2023	2	1 276	0.16	56	1 276	4.39	0	1 276	0	3	1 276	0.24
Saudi Arabia	2018	…	…	…	…	…	…	…	…	…	…	…	…
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Senegal	2018	161	97 958	0.16	8 458	97 958	8.63	326	97 958	0.33	124	97 958	0.13
	2023	204	42 974	…	8 429	42 974	…	552	42 974	…	321	42 974	…
Serbia	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	8	211 361	0.004	43	211 361	0.02	20	211 361	0.009			
Seychelles	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	2	2 352	0.08	1	2 352	0.04	1	2 352	0.04	4	2 352	0.17
Singapore	2018	6	124 229	0.004	128	124 229	0.10	7	124 229	0.006	38	124 229	0.03
	2023	2	131 049	0.001	114	131 049	0.087	11	131 049	0.008	28	131 049	0.02
Slovakia	2018	4	227 560	0.002	24	227 560	0.01	9	227 560	0.004	23	227 560	0.01
	2023	0	253 663	0	11	253 663	0.004	9	253 663	0.004	54	253 663	0.02
Solomon Islands	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	—	—	—	—	—	—	—	—	—	—	—	—
South Africa	2018	1 536	982 010	0.16	729	982 010	0.07	112	982 010	0.01	2 846	982 010	0.29
	2023	2 406	1 141 096	0.21	783	1 141 096	0.07	229	1 141 096	0.02	4 520	1 141 096	0.40
South Sudan	2018	9	6 533	0.14	51	6 533	0.78	37	6 533	0.57	41	6 533	0.63
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Spain	2018	71	1 682 189	0.004	247	1 682 189	0.01	114	1 682 189	0.007	673	1 682 189	0.04
	2023	57	1 665 870	0.003	139	1 665 870	0.008	95	1 665 870	0.006	758	1 665 870	0.046
Sri Lanka	2018	29	450 640	0.006	513	450 640	0.11	898	450 640	0.20	107	450 640	0.02
	2023	71	466 061	0.015	208	466 061	0.044	449	466 061	0.096	211	466 061	0.045
Suriname	2017	…	…	0.07	…	…	0.05	…	…	0.07	…	…	0.24
	2023	5	7 782	0.06	3	7 782	0.04	2	7 782	0.03	6	7 782	0.08
Sweden	2018	0	491 036	0	0	491 036	0	2	491 036	<0.001	2	491 036	<0.001
	2023	0	394 018	0	0	394 018	0	0	394 018	0.002	0	394 018	0
Switzerland	2018	3	277 808	0.001	33	277 808	0.01	6	277 808	0.002	16	277 808	0.006
	2023	1	263 797	<0.001	25	263 797	0.009	3	263 797	0.001	17	263 797	0.006
Syrian Arab Republic	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	674	252 200	0.27	1 224	252 200	0.48	830	252 200	0.33			
Tajikistan	2018	…	…	…	…	…	…	…	…	…	…	…	…
	2023	32	71 428	0.04	723	71 428	1.01	392	71 428	0.55	632	71 428	0.88
Thailand	2018	821	1 122 497	0.07		1 122 497	0.32		1 122 497	0.12		1 122 497	0.09
	2023	1 435	2 500 504	0.06	7 953	2 500 504	0.32	4 156	2 500 504	0.17	6 990	2 500 504	0.28
Timor-Leste	2018	12	4 460	0.27	267	4 460	5.99	22	4 460	0.49	196	4 460	4.40
	2023	39	5 079	0.77	320	5 079	6.30	5	5 079	0.10	145	5 079	2.85
Togo	2018	251	50 023	0.50	1 385	50 023	2.77	285	50 023	0.57	149	50 023	0.30
	2023	910	65 008	1.40	1 850	65 008	2.85	659	65 008	1.01	92	65 008	0.14
Tonga	2018	…	…	…	…	…	…	…	…	…	…	…	…
	2023	0	2 504	0	55	2 507	2.19	1	2 504	0.04	1	2 504	0.04
Trinidad and Tobago	2017	49	21 645	0.23	199	21 645	0.92	91	21 645	0.42	243	21 645	1.12
	2023	19	19 269	0.10	54	19 269	0.28	28	19 269	0.15	184	19 269	0.95
Tunisia	2018	…	…	…	…	…	…	…	…	…	…	…	…
	2023	…	…	0.01	…	…	1	…	…	0.26	…	…	0.15
Türkiye	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	544	2 674 375	0.02	4 203	2 674 375	0.157	278	2 674 375	0.01	2 013	2 674 375	0.075
Turkmenistan	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	…	…	…	…	…	…	…	…	…	…	…	…
Uganda	2018	1 783	254 750	0.70	11 464	254 750	4.50	9 681	254 750	3.80	1 774	254 750	0.70
	2023	776	360 777	0.22	1 382	360 819	0.38	2 441	360 776	0.68	3 346	362 774	0.92
United Arab Emirates	2018	12	132 849	0.009	97	80 896	0.12	201	132 849	0.15	151	80 896	0.19
	2023	41	172 108	0.02	2 023	169 582	1.19	287	169 542	0.17	456	169 622	0.27

Country	Data year	HIV 1+2			HBV			HCV			Syphilis		
		Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*	Positive/ reactive, no.	No. donations tested	%*
United Kingdom	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	5	1 502 435	<0.001	71	1 502 435	0.005	25	1 502 435	0.002	140	1 502 435	0.009
United Republic of Tanzania	2018	3 227	307 835	1.05	13 613	307 835	4.42	1 092	307 835	0.35	6 801	307 835	2.21
	2023	10 089	531 000	1.90	23 364	531 000	4.40	12 213	531 000	2.30	16 461	531 000	3.10
United States of America	2018	855	6 951 668	0.01	1 950	6 951 952	0.03	3 184	6 951 892	0.05	3 032	6 949 911	0.04
	2023	7 839			32 944			10 562			15 968		
Uruguay	2017	90	92 674	0.10	145	92 674	0.16	314	92 674	0.34	451	92 674	0.49
	2023	71	84 947	0.08	97	84 947	0.11	145	84 947	0.17	581	84 947	0.68
Venezuela (Bolivarian Republic of)	2017	—	—	—	—	—	—	—	—	—	—	—	—
	2023	641	1 110 107	0.06	1 634	1 110 107	0.15	712	1 110 107	0.06	9 035	1 110 107	0.81
Viet Nam	2018	—	—	—	—	—	—	—	—	—	—	—	—
	2023	1 963	1 474 132	0.13	7 454	1 471 864	0.51	3 185	1 470 552	0.22	2 192	1 465 020	0.15
Yemen	2018	131	17 913	0.73	341	17 913	1.90	138	17 913	0.77	158	17 913	0.88
	2023	18	7 430	0.24	33	7 430	0.44	20	7 430	0.27	6	7 430	0.08
Zambia	2018	—	—	—	—	—	—	—	—	—	—	—	
	2023	3 384	130 166	2.60	8 070	130 166	6.20	885	130 166	0.68	911	130 166	0.70
Zimbabwe	2018	317	82 257	0.39	169	82 257	0.21	4	82 257	0.005	42	82 257	0.05
	2023	463	70 187	0.66	455	70 187	0.65	207	70 187	0.29	49	70 187	0.07

Annex 7. Number and proportion of donations tested positive/reactive for TTI markers 2018–2023 (continued)

… Not reported/not available.
Blank cell: Not required/not applicable.
— No response.
* Proportion, expressed as positive/reactive per 100 donations tested.

Country	Data year	Chagas disease			Malaria			HTLV I/II		
		Positive/ reactive, no.	No. donations screened	%*	Positive/ reactive, no.	No. screened	%*	Positive/ reactive, no.	No. screened	%*
Argentina	2017	16 653	1 102 875	1.51				2 426	1 102 875	0.22
	2023	13 989	726 444	1.51				2 023	726 444	0.22
Australia	2018	—	—	—	—	—	—	3	1 329 849	<0.001
	2023				1 325	78 638	1.68	9	111 403	0.008
Bahamas	2017							29	5 619	0.52
	2023							…	…	…
Bahrain	2018	…	…	…						
	2023	0	0	0						
Bangladesh	2018				120	761 115	0.015			
	2023				15	1 034 985	0.001			
Barbados	2017							17	5 243	0.32
	2023							—	—	—
Belgium	2018									
	2023				1					
Belize	2017	7	6 092	0.12						
	2023	7	6 618	0.11						
Bhutan	2018				0	7 770	0			
	2023									
Bolivia (Plurinational State of)	2017	2 462	119 663	2.06						
	2023	2 361	137 306	1.72						
Brazil	2017	8 088	3 143 417	0.26				9 631	3 143 417	0.31
	2023	4 576	2 994 525	0.15				5 594	2 971 969	0.19
Canada	2018	—	—	—				—	—	—
	2023	2	7 863	0.03				5	792 260	<0.001
Chile	2017	235	265 653	0.09				147	265 653	0.06
	20203	140	295 489	0.05				141	295 489	0.05
Colombia	2017	1 577	830 291	0.19				1 818	830 291	0.22
	2023	1 228	999 584	0.12				2 094	999 584	0.21
Costa Rica	2017	187	77 389	0.24				78	77 389	0.10
	2023	71	93 931	0.08				85	93 931	0.09
Croatia	2018									
	2023				13	3 784	0.34			
Dominica	2017							9	893	1.01
	2023									
Dominican Republic	2017							296	105 134	0.28
	2020							—	—	—
Ecuador	2017	1 333	249 363	0.53				157	23 883	0.66[1]
	2023			0.13				251	165 136	0.15
El Salvador	2017	2 104	101 605	2.07						
	2023	404	327 708	0.12				69	29 385	0.23
Finland	2018				38	694	5.48	0	5	0
	2023				67	1 285	5.21			
France	2018	1	68 805	0.001	1 332	229 662	0.58	23	2 926 942	<0.001
	2023	1	63 287	0.002	2 444	119 781	2.04	20	272 986	0.007
Greece	2018							—	—	—
	2023							4	404 536	0.001

[1] HTLV I-II screening was performed in 9.58% of the units.

Country	Data year	Chagas disease			Malaria			HTLV I/II		
		Positive/ reactive, no.	No. donations screened	%*	Positive/ reactive, no.	No. screened	%*	Positive/ reactive, no.	No. screened	%*
Guatemala	2017	985	136 241	0.72						
	2023	758	180 302	0.42				66	37 993	0.17
Guyana	2017	155	9 755	1.59				99	9 755	1.02
	2023	19	11 225	0.14				30	11 225	0.27
Haiti	2017							151	28 018	0.54
	2023							127	19 636	0.65
Honduras	2017	626	80 850	0.77				147	80 850	0.18
	2023	1 370	92 924	1.47				1 070	92 924	1.15
Iceland	2018									
	2023				1	12	8.33			
India	2018						0.05			
	2023				…	…	…			
Indonesia	2018				175	129 902	0.13			
	2023	…	…	…	…	…	…	…	…	…
Iran (Islamic Republic of)	2018							146	450 613	0.03
	2023							138	473 622	0.03
Jamaica	2017							455	32 092	1.42
	2023							—	—	—
Japan	2018							—	—	—
	2023	1	15 247	0.007				3 545	500 372	0.71
Kuwait	2018				1 218	11 442	10.65	38	85 847	0.04
	2023				1 092	14 543	7.51	4	93 079	0.004
Lebanon	2018									
	2023				148	1 819	8.14			
Luxembourg	2018				17	2 350	0.72	1	1 259	0.08
	2023	1	120		30	843		1	1 979	
Madagasgar	2018				28	39 210	0.07			
	2023				196	71 593	0.27			
Malawi	2018				…	…	0.54			
	2023									
Mexico	2018	8 767	2 394 836	0.37						
	2023	368	1 601 437	0.02						
New Zealand	2018	0	255	0	1	8 998	0.01	1	16 876	0.006
	2023	0	442	0	1	8 899	0.01	2	18 947	0.01
Nicaragua	2017	188	84 682	0.22						
	2020			0.16						
Norway	2018				12	3 655	0.33			
	2023	1	98	1.02	59	2 480	2.38	0	94	0
Oman	2018							69	58 342	0.12
	2023				647	9 312		35	91 632	
Pakistan	2018				14 800	1 751 296	0.85			
	2023				1 781	1 555 462	0.11			
Panama	2017	103	54 066	0.19				180	54 066	0.33
	2023									
Paraguay	2017	1 560	89 007	1.75				239	89 007	0.27
	2023	1 342	124 424	1.08				372	124 424	0.32
Peru	2017	1 627	359 458	0.45				2 809	359 458	0.78
	2023	491	459 687	0.11				511	459 687	0.11
Philippines	2018				—	—	—			
	2023				3 360	1 142 709	0.29			
Portugal	2018				8	4 835	0.17	4	40 315	0.01
	2023				45	13 119	0.34	3	45 886	0.007
Qatar	2018				0	17 457	0	4	30 125	0.01
	2023				1 630	29 604	5.51	3	43 351	0.007
Republic of Korea	2018				1 614	1 275 356	0.13	304	1 244 660	0.02
	2023				862	1 275 690	0.07	2 121	2 324 550	0.09

Country	Data year	Chagas disease			Malaria			HTLV I/II		
		Positive/ reactive, no.	No. donations screened	%*	Positive/ reactive, no.	No. screened	%*	Positive/ reactive, no.	No. screened	%*
Republic of Moldova	2018				115	58 821	0.20	558	58 821	0.95
	2023									
Romania	2018							15	423 487	0.004
	2023							91	423 405	0.02
Saint Kitts and Nevis	2017							5	571	0.88
	2020									0.8
Saint Lucia	2017							7	2 773	0.25
	2023							19	2 416	0.79
Saint Vincent and the Grenadines	2017							27	1 295	2.08
	2023							—	—	—
Sao Tome and Principe	2018									
	2023				0	1 276	0			
Seychelles	2018							—	—	—
	2023							6	2 352	0.26
Singapore	2018				135	9 916	1.36			
	2023				267	5 738	4.65			
Spain	2018	42	67 554	0.06	276	28 893	0.95	22	439 462	0.005
	2023	46	67 873	0.07	478	49 468	0.97	20	441 476	0.005
Sri Lanka	2018				0	450 640	0			
	2023				0	466 061	0			
Suriname	2017	…	…	0.01				…	…	0.08
	2023	1	7 782	0.01					7 782	
Sweden	2018							0	491 036	0
	2023							1	41 602	0.002
Trinidad and Tobago	2017	53	21 645	0.24				91	21 645	0.42
	2023	23	19 269	0.12				91	19 269	0.47
United Arab Emirates	2018							40	132 849	0.03
	2023							24	17 520	0.13
United Kingdom	2018	—	—	—	—	—	—	—	—	—
	2023	0	2 104	0	1 082	30 265	3.58	9	200 729	0.004
United States of America	2018	349	2 482 711	0.01				729	6 951 685	0.01
	2023	784						242		
Uruguay	2017	139	92 674	0.15				148	92 674	0.16
	2023	75	84 947	0.09				104	84 947	0.12
Venezuela (Bolivarian Republic of)	2017	—	—	—				—	—	—
	2023	3 115	1 110 107	0.28				289	1 110 107	0.03
Viet Nam	2018				—	—	—	—	—	—
	2023				2	229 233	<0.001			
Yemen	2018				554	17 913	3.09			
	2023				8	7 430	0.11			

Annex 8. Clinical use of blood and blood components, 2018–2023

… Not reported/not available.
Blank: Not required/not applicable.
— No response.
* Except stated/explained otherwise, 1 unit of blood component is defined as the preparation from whole blood donations of 450 ml.
** 1 unit of apheresis platelets usually contains 200–450 x 10^9 platelets.
Δ In adult therapeutic doses.
Countries that reported in the GDBS 2017 but not in the 2018 survey are shown using 2017 data.

Country	Data year	No. hospitals performing blood transfusion	No. units of blood components issued/transfused (excluding autologous blood units) in the country							
			Whole blood	Red cells	Whole blood-derived platelets	Apheresis platelets	Fresh frozen plasma	Plasma	Cryo-precipitate	
Afghanistan	2018	…	179 878	14 340	12 959	0	3 381	0	69	
	2023	16	65 846	18 059	16 123	0	10 187	10 187	83	Units transfused
Albania[1]	2018	32	391	22 452	4 217		14 508	7 643	466	Units issued
	2023	31	480	21 980	6 737			18 775	321	Units transfused
Algeria	2018		8 544	481 903	130 293	13 069	82 788		0	
	2023			249 658	159 437	15 557	104 782			Units issued
Angola	2018	159	97 568	12 399	9 154	0	4 879	0	18	
	2023	—	—	—	—	—	—	—	—	
Argentina	2017	1 135	7 335	1 016 808	491 700	59 197	291 240	12 281	23 000	
	2023	1 135	6 021	852 879[2]	244 116	52 155	244 116	10 190	19 269	
Australia	2018	—	—	—	—	—	—	—	—	
	2023	1 352[3]		704 542	106 429	49 191	86 887	5 060[4]	192 189	
Austria	2018	179	0	334 240	…	…	4 832		…	
	2023	180	0	274 404	14 418	21 309	1 732		31	Units transfused
Azerbaijan	2017	—	—	—	—	—	—	—	—	
	2023	…	…	…	…	…	…	…	…	
Bahamas	2017	3	…	…	…	…	…	…	…	
	2023	3	0	4 263	309	0	410	0	…	
Bahrain	2018	17	…	…	…	…	…	…	…	
	2023	22	10	17 497	8 226	43	9 066	0	3 019	Units issued
Bangladesh	2018	342	761 115	84 465	34 495	20	59 481	10	113	Units issued
	2023	…	…	…	…	…	…	…	…	
Barbados	2017	3	0	4 700	195	121	763			
	2023	—	—	—	—	—	—	—	—	
Belgium[5]	2018	105	0	410 615	67 395[Δ]		51 885			Units transfused
	2023	103	0	377 242	64 554[Δ]		37 858			Units transfused
Belize	2017	14	2 217	2 075	139	0	714	63	8	
	2023	1 783	3 078	265		1 271	111	10	1 783	
Benin	2018	40	25 012	100 083	21	0	3 416		0	Units issued
	2023[6]	59	12 508	143 795	1 644	0	16 626	0	0	Units issued
Bhutan	2018	27	1 446	5 019	2 208	0	1 528			Units issued
	2023	27	6	4 103	1 972	10	1 689	0	0	Units issued
Bolivia (Plurinational State of)	2018	95	495	78 100	28 409	265	44 573	490	5 628	
	2023	…	193	107 441	48 068	2 372	50 563	38	9 601	
Bosnia and Herzegovina	2018	—	—	—	—	—	—	—	—	
	2023	2			2	6 944	3 322	463	3 882	
Botswana	2018	27	…	…	…	…	…	…	…	
	2023	38	…	…	…	…	…	…	…	

[1] Tirana region: total transfusions from 6 blood establishments; 24 198 donations.
[2] In addition to the reported figure, 1 295 apheresis red cell units were transfused.
[3] In the Australian health system, hospitals also include Multi-Purpose Services and Day Care facilities.
[4] Cyro-depleted plasma.
[5] Platelet data include both whole blood–derived and apheresis units.
[6] Pediatric bags counted as single units.

Country	Data year	No. hospitals performing blood transfusion	No. units of blood components issued/transfused (excluding autologous blood units) in the country							
			Whole blood	Red cells	Whole blood-derived platelets	Apheresis platelets	Fresh frozen plasma	Plasma	Cryo-precipitate	
Brazil	2017	…	937	1 329 853	491 640		291 710	9 899	63 391	
	2023	…	…	…	…	…	…	…	…	
Brunei Darussalam	2018	4	0	15 995	2 080	563	2 555		86	Units transfused
	2023	7	4	19 239	3 195	579	4 227	23	805	Units transfused
Bulgaria	2018	172	92	155 525	26 712	2 145	100 310	100		Units issued
	2023	341	0	177 288	36 209	3 142	97 915	0	0	Units issued
Burkina Faso	2018	116	…	85 234	2 834	0	4 730	0	0	Units issued
	2023	141	0	131 245	4 027	0	4 768	0	0	Units issued
Burundi	2018	65	75 589	1 902	0	0	0		0	
	2023	83	86 790	0	512	0	0	0	0	Units issued
Cabo Verde	2018	6	32	3 093	165	0	403	0	87	Units transfused
	2023	6	2	3 678	472	0	367	0	2	Units transfused
Cambodia	2018	—	—	—	—	—	—	—	—	
	2023	24	...	...	...	...	...	...	...	
Cameroon	2018	58	73 113	5 290	591	0	1 325	0	0	Units transfused
	2023	…	…	…	…	…	…	…	…	…
Canada	2018	—	—	—	—	—	—	—	—	
	2023[7]	460	121	732 602	374 265	30 648	27 473	30 328	4 719	Units issued[8]
Central African Republic	2018	23	16 316	0	0		0		0	Units issued
	2023	50	16 524							Units issued
Chad	2018	77	44 220	65	0	0	25		0	Units issued
	2023	…	…	…	…	…	…	…	…	
Chile	2017	74		231 708	96 674	2 172	81 642		15 940	
	2023	75		271 584	124 353	7 688	79 000	0	24 326	
China[9]	2018	…	41 745	22 607 300	523 970	1 778 523	…	…	…	Units issued
	2023	…	…	…	…	…	…	…	…	Units issued
Colombia	2017	588	445	835 367	216 918	206 604	216 561		70 367	
	2023	641	330	871 414[10]	163 036	128 882	236 212		95 729	
Comoros	2018	8	1 525	0	0	0	0		0	Units issued
	2023	…	…	…	…	…	…	…	…	
Congo	2018	52	9 380	68 714	262	0	888	0	2	Units issued
	2023		29 169	46 121	993		334			Units issued
Cook Islands	2018	—	—	—	—	—	—	—	—	
	2023	2	11	210			2			Units transfused
Costa Rica	2017	33		64 044	32 048	111	17 436		11 552	
	2023	33	44	69 718[11]	28 639	6 725	18 916	178	9 390	
Côte d'Ivoire	2018	162	3 373	166 583	3 509	0	9 623	0	0	Units issued
	2023	165	466	294 549	3 077	0	3 451	0	0	Units issued
Croatia	2018[12]	35		188 184	30 281[Δ]	0	51 029	0	1 324	Units issued
	2023	35	0	186 953	106 780	26 025	39 504	0	17 350	Units issued
Cuba	2017			219 808	40 847	1 019	60 999	1 886	9 875	
	2023	138		344 774	49 473	1 156	41 799	2 942		
Cyprus	2018	65		61 574	5 208[Δ]	335	12 004		113	Units transfused
	2023	65	6	70 193	7 238[Δ]	376	16 164	0	217	Units transfused[13]
Czechia	2018	188	1 577	404 501	96 500	22 800	163 000	0		Units issued
	2023	188	977	427 430	109 000	24 500	78 949			Units issued
Democratic People's Republic of Korea	2018	—	—	—	—	—	—	—	—	
	2023	…	…	…	…	…	…	…	…	
Democratic Republic of the Congo	2018	…	0	195 049	36 128	1 948	40 438	1 441	956	Units transfused
	2023	29 028	253 729	167 537	2 018		1 518			Units transfused

[7] Units issued by Canadian Blood Service (CBS).

[8] Pathogen Inactivation Technology (PIT) implemented in 2023; pre-PIT: 1 unit = 4 concentrates; post-PIT: 1 unit = 3.5 concentrates; no pooling assumed for other products.

[9] 1 unit of red cell products: preparation from 200 ml whole blood donations.

[10] In addition to the reported figure, 3 503 apheresis red cell units were transfused.

[11] In addition to the reported figure, 2 817 apheresis red cell units were transfused.

[12] Platelets data provided are total of whole blood-derived and apheresis platelets in units equivalent to adult dosage.

[13] Reported transfused units; issued units: whole blood 0, red cells 70 658, whole blood derived platelet 9 118, platelets (apheresis) 376, FFP 16 472, Plasma 0, Cryoprecipitate 217.

Country	Data year	No. hospitals performing blood transfusion	No. units of blood components issued/transfused (excluding autologous blood units) in the country							
			Whole blood	Red cells	Whole blood-derived platelets	Apheresis platelets	Fresh frozen plasma	Plasma	Cryo-precipitate	
Denmark	2018	…	0	195 049	36 128[Δ]	1 948	40 438	1 441	956	Units transfused
	2023	…	0	175 021	29 922[Δ]		33 319			Units transfused
Dominica	2017	1	21	799	112	77				
	2023	—	—	—	—	—	—	—	—	
Dominican Republic	2018	…	13 360	36 049	358	1 591	882	126	9	
	2023	30	19 367	48 025[14]	421	3 389	2 415	1 309	106	
Ecuador	2017	353	110	107 445	39 437	444	41 807	2 708	4 346	
	2023	310	7 339	197 526[15]	59 680	10 483	66 772	766	13 258	
Egypt	2018	…	1 276	411 288	91 907	20 816	311 797	17 129	76 620	Units issued
	2023	…	7 880	979 794	253 312	42 238	791 748	102 454	104 512	Units issued
El Salvador	2017	…	1 123	78 198		7 078	26 832	26 848	7 416	
	2023	175		90 072[16]	46 671	7 106	29 569		9 564	
Eritrea	2018	25	21	8 483	528		615		0	Units issued
	2023	35	20	13 362	268	0	638	0	0	Units issued
Estonia	2018	23	17	48 682	5 115[Δ]	1 490	11 312	0	2 148	Units issued
	2023	24	91	43 855	5 866[Δ]	1 528	6 929		666	Units issued
Eswatini	2018	17	0	14 504	502	…	4 835		0	Units issued
	2023	21	0	51 36	0	60	123	0	0	Units transfused
Ethiopia	2018	429		36 654	36 649	0	36 637	0	70	
	2023	723	141 048	19 569	9 133	0	8 480	0	0	Units transfused[17]
Fiji	2018	3	1 050	11 915	4 834	0	4 533	1 275	671	Units issued
	2023	—	—	—	—	—	—	—	—	
Finland	2018	56	0	192 472	32 160[Δ]	5 500		192 000	0	Units issued
	2023	52	119	165 861	30 269[Δ]	3 833		176 946[18]	0	Units issued[19]
France	2018	…	0	2 295 441	208 585[Δ]	118 859	287 922	0	0	Units transfused
	2023	1 500	0	2 125 252	242 984[Δ]	90 547	210 097	0	0	Units issued
Gabon	2018	15	0	18 861	907	0	1 863	0	0	Units issued
	2023	74		34 743	1 842	0	2 492	0	0	Units issued
Gambia	2018	10	…	…	…	…	…	…	…	
	2023	16	…	…	…	…	…	…	…	
Georgia	2018	—	—	—	—	—	—	—	—	
	2023	164		101 842	9 601	12 997	48 361			Units transfused
Germany	2018	—	—	—	—	—	—	—	—	
	2023	…		3 343 673	557 801[Δ,20]		582 593			
Ghana	2018	319	18 459	23 933	5 899		36 256		590	Units issued
	2023[21]	…	182 552	27 342	7 713		16 181		656	Units issued
Greece	2018	—	—	—	—	—	—	—	—	
	2023	96		363 866	142 291	26 872	179 939	30 173		Units issued
Guatemala	2017	39	1 216	131 507	28 202	3 507	39 112	81	…	
	2023	61	1 082	165 731	40 915	5 194	47 782	127	3 769	
Guinea	2018	—	—	—	—	—	—	—	—	
	2023	72	…	…	…	…	…	…	…	Units issued
Guinea-Bissau	2018	—	—	—	—	—	—	—	—	
	2023	25	…	…	…	…	…	…	…	
Guyana	2017	11	…	…	…	…	…	…	…	
	2023	…	…	…	…	…	…	…	…	
Haiti	2017	12		16 985	295		550		…	
	2023	…	…	…	…	…	…	…	…	

[14] In addition to the reported figure, 322 apheresis red cell units were transfused.

[15] In addition to the reported figure, 11 apheresis red cell units were transfused.

[16] In addition to the reported figure, 565 apheresis red cell units were transfused.

[17] Transfused units based on partial data reported by facilities to blood bank; covers only a portion of total issued/transfused.

[18] No FFP is transfused; only Solvent/Detergent (SD)-treated plasma, produced by a company, is used in Finland.

[19] FRCBS lacks direct hospital transfusion data; estimated discard rates: RBC 0–5%, platelets 5–15% (varies by hospital type).

[20] 57 801 units in adult dosage, all types.

[21] Whole Blood and RBC issued exceed collections due to carryover from previous year and re-issues.

Country	Data year	No. hospitals performing blood transfusion	No. units of blood components issued/transfused (excluding autologous blood units) in the country							
			Whole blood	Red cells	Whole blood-derived platelets	Apheresis platelets	Fresh frozen plasma	Plasma	Cryo-precipitate	
Honduras	2017	33	1 464	71 056	22 238	265	20 694	1 090	1 799	
	2023	30	574	82 127	17 029	193	147 27	18	1 481	
Hungary	2018	—	—	—	—	—	—	—	—	
	2023	100		346 929	186 784	15 910	39 299	0	0	[22]
Iceland	2018	—	—	—	—	—	—	—	—	
	2023	7	0	9 795	987[Δ]	1 537	1 257	0	0	Units transfused
India	2018	…	…	…	…	…	…	…	…	
	2023	…	2 093 253	8 987 113	1 748 234		5 885 966	154 330		Units issued
Indonesia	2018	…	521 337	2 741 680	597 706	12 457	113 005	24 681	14 910	Units transfused
	2023	…	…	…	…	…	…	…	…	…
Iran (Islamic Republic of)	2018	929	3 779	1 962 214	906 420	20 958	661 378	11 756	128 337	Units issued
	2023	981	2 971	1 792 381	1 048 967	39 825	1 991 020	4 544	140 022	Units issued
Iraq	2018	—	—	—	—	—	—	—	—	
	2023	372	…	…	…	…	…	…	…	
Italy	2018	1 544	18	2 443 359	170 867	55 596	140 395		1 786	Units transfused
	2023	1 530	10	2 392 289	201 425	47 292	95 288		1 419	Units transfused
Jamaica	2017	15								
	2023	—	—	—	—	—	—	—	—	
Japan	2018	—	—	—	—	—	—	—	—	
	2023	9 277		3 328 843		845 574	884 478		9 926	Units issued
Jordan	2018	113	61 997	61 997	…	…	...	…	…	Units issued
	2023	—	—	—	—	—	—	—	—	
Kazakhstan	2018	459		175 482	13 245	34 918	135 936		14 685	Units issued
	2023	482		182 885		55 629[23]	130 464		19 915	Units transfused
Kenya	2018	530	59 931	99 852	7 280		6 409		34	Units issued
	2023[24]	732	48 314	131 662	4 732	900	8 850		320	
Kiribati	2018	3	888	730	…	…	…	8	…	Units transfused
	2023	4	583	1 095						Units issued
Kuwait	2018	43	0	91 455	0	…	…	…	101 320	Units issued
	2023	43	0	89 189	3 640	46 612	14 044	22 180	10 381	Units issued
Kyrgyzstan	2018	90		18 597	4 780	976	26 929		1 748	Units issued
	2023	193	92.2	192 78.7	3 074	7 509	8 131.6		6 96.9	Units issued
Lao People's Democratic Republic	2018	57	17 731	31 522	751		2 174		559	Units issued
	2023	24	11 588	58 001	11 292	0	4 723	0	3 095	Units issued
Latvia	2018	54	0	50 127	5 664[Δ]	2 874	24 637		8 288	Units issued
	2023	47	0	58 121	6 008[Δ]	4 049	20 282	0	12 832	Units issued
Lebanon	2018	—	—	—	—	—	—	—	—	
	2023	167		135 000	0	15 000				
Lesotho	2018	19	6	5 308	32	0	82	0	0	Units issued
	2023	23	…	…	…	…	…	…	…	…
Liberia	2018	38	15 034	…	…	…	…	…	…	
	2023	—	—	—	—	—	—	—	—	
Libya	2018	53	28 174	101 322	50 887	30 455	70 565	2 856	180	Units issued
	2023	190	87 123	190 000	49 424	20 665	32 339	10 983	20 000	Units issued
Luxembourg	2018[25]	4		19 243	2 079	907	3 348			Units issued
	2023	4	…	…	…	…	…	…	…	
Madagascar	2018	70	13 283	28 833	3 191	0	6 350	0	0	Units issued
	2023	296	16 426	45 292	3 710		8 543			Units issued
Malawi	2018	87	59 644	8 087	1 774	0	840	0	491	Units issued
	2023	99	93 448	27 977	5 707	0	474	0	28	Units issued

[22] Neutrophil granulocytes: 2 880 units.

[23] Total platelet transfusions reported without distinguishing between whole blood–derived and apheresis units.

[24] Covers only the 732 reporting facilities that perform transfusions.

[25] Fresh frozen plasma issued are Solvent/Detergent (SD)-treated FFP produced from plasma collected in Luxembourg.

Country	Data year	No. hospitals performing blood transfusion	No. units of blood components issued/transfused (excluding autologous blood units) in the country							
			Whole blood	Red cells	Whole blood-derived platelets	Apheresis platelets	Fresh frozen plasma	Plasma	Cryo-precipitate	
Malaysia[26]	2018	—	—	—	—	—	—	—	—	
	2023	146	17 472	774 517	232 309	11 354	177 293	842	64 416	Units issued
Maldives	2018[27]	91	…	6 390	0	0	…	0	0	Units issued
	2023	—	—	—	—	—	—	—	—	
Mali	2018	59	24 214	15 297	0	0	1 302		616	Units issued
	2023	14	27 695	57 133	1 025	0	1 551		14	Units issued[28]
Malta	2018	—	—	—	—	—	—	—	—	
	2023[29]	3	0	13 658	7 000	454	1 020	0	0	Units transfused
Marshall Islands	2018	…	…	…	…	…	…	…	…	
	2023	—	—	—	—	—	—	—	—	
Mauritania	2018	20		16 657	1 988		2 335		0	Units issued
	2023	22		24 494	2 970	0	2 450	0	0	Units issued
Mauritius	2018	23	…	40 546	16 148	…	17 950	0	316	
	2023	23	30	40 934	27 268	160	18 168		552	Units issued
Mexico	2017	5 010		807 125	370 934		301 864	6 204	55 200	
	2023	4 934	872	561 211	256 706		161 946	309	35 377	
Micronesia (Federated States of)	2018	5	565	681	45	0	0	0	0	Units issued
	2023	—	—	—	—	—	—	—	—	
Mongolia	2018	79	61	14 825	14 344	848	22 324	2 111	3 047	Units issued
	2023	77	22	40 175	3 469	0	32 549	1 472	4 080	Units issued
Montenegro	2018	11	30	16 162	3 256	0	10 479	0	2 427	Units transfused
	2023	18	5	17 594	6 853	77	8 729	1 190	4 089	Units transfused
Morocco	2018	633	…	…	…	…	…	…	…	
	2023	1 147		321 707	136 111	1 171	92 454			Units issued
Mozambique	2018	165	0	136 091	18 870	0	70 046	0	0	
	2023	191[30]	…	…	…	…	…	…	…	
Myanmar	2018[31]	391	36 470	56 212	10 098	8	38 506	2 137	2 564	Units issued
	2023[32]	248	86 803	145 730	72 475	46	31 060	2 697	3 539	Units issued
Namibia	2018	51	214	32 610	2 083	…	5 014		15	Units transfused
	2023	55	141	43 225	6 660	1 332	7 626	0	96	Units issued
Nepal	2018	…	205 000	68 000	42 000	…	20 000	1 000	1 000	Units issued
	2023	..	136 317	77 548	41 056	120	16 470		2 059	Units issued
Netherlands (Kingdom of the)	2018	—	—	—	—	—	—	—	—	
	2023	82		370 432	233 345	5 052	892	45 515		Units issued
New Zealand	2018	21	820	94 577	9 747[Δ]	9 747	13 355	175	5 281	Units transfused
	2023	21	906	105 647	41 120	5 104	12 264	0	6 908	Units transfused
Nicaragua	2017	43	0	70 969	36 052	0	18 004	0	3 980	
	2020	…	…	…	…	…	…	…	…	
Niger	2018	115	114 116	5 434	110		5 434		0	Units issued
	2023	165	…	…	…	…	…	…	…	Units issued
Nigeria[33]	2018[34]	46	156 540	…	…	…	…	…	…	
	2023	…[35]	…	10 838	…	…	…	…	…	
Niue	2018	…	…	…	…	…	…	…	…	Units transfused
	2023	—	—	—	—	—	—	—	—	
North Macedonia	2018	55	…	…	…	…	…	…	…	
	2023	45	1	53 190	26 745		48 093		1 611	Units issued

[26] Data on whole blood and components transfused are for Ministry of Health facilities only. About 20–30% of blood collected in Ministry of Health facilities was supplied to private health care facilities under an individual memorandum of understanding.

[27] Data given in this section are from Indira Gandhi Memorial Hospital and Maldivian blood services only.

[28] Platelets and cryoprecipitate produced exclusively in Bamako.

[29] Data from main Maltese hospital (~90% of national blood use).

[30] A total of 175 public hospitals and 16 private hospitals performed blood transfusions.

[31] Data cover National Blood Centre only.

[32] The number of blood components issued was reported by 51 hospital blood banks that submitted data to the blood establishment.

[33] Partial data.

[34] The data given in this section are from the Lagos State Blood Transfusion Service. Country data are not available.

[35] Most secondary and tertiary blood establishments conduct clinical transfusion, but data are unavailable. A national mapping of blood establishments is being developed, and tertiary hospitals have been advised to establish or reactivate transfusion committees.

Country	Data year	No. hospitals performing blood transfusion	No. units of blood components issued/transfused (excluding autologous blood units) in the country							
			Whole blood	Red cells	Whole blood-derived platelets	Apheresis platelets	Fresh frozen plasma	Plasma	Cryo-precipitate	
Norway	2018	28	315	158 922	16 645[Δ]	6 313		39 783[36]	0	Units transfused
	2023	40	760	132 395	16 657[Δ]	6 443	37[37]	39 972[38]		Units transfused
Oman	2018	18	…	…	…	…	…	…	…	
	2023	18		35 407	20 334	272	12 957		2 893	Units issued
Pakistan	2018	606	921 204	735 678	304 448			450 316	49 703	Units issued
	2023	196	39 4 317	19 3 747	40 112	6 821	93 578	7 428	1 531	Units issued
Palau	2018	…	…	…	…	…	…	…	…	
	2023	1	10	304						Units issued
Panama	2017	29	58	48 613	19 532	5 162	12 321	0	4 688	
	2023	—	—	—	—	—	—	—	—	
Papua New Guinea	2018	—	—	—	—	—	—	—	—	
	2023	32	15 201	22 994	1 235	0	1 009	0	275	Units issued
Paraguay	2017	…	76	72 404	29 581	48 612	25 458	83	2 981	
	2023	…	4	97 987	6 568	287	24 015	17	6 486	
Peru	2017	360	1 849	288 592	129 089	48 612	154 953		25 104	
	2023	…	2 214[39]	390 542	49 156[Δ]	98	129 908	35 780		
Philippines	2018	—	—	—	—	—	—	—	—	
	2023	815	139 168	865 687	199 307	5 651	81 168		11 815	Units transfused
Poland	2018	842	17	1 166 319	80 707[Δ]	45 648	285 594	1 569	34 936	Units issued
	2023	772	0	1 296 948	95 698[Δ]	55 067	247 125	1 005	46 275	Units issued
Portugal	2018	249	30	290 001	8 441[Δ]	5 665		0	273	Units transfused
	2023	186	9	284 975	162 037	6 703	6 858		264	Units transfused
Qatar	2018	28	27	25 373	20 012	843	6 120	3 072	3 300	Units transfused
	2023	31	0	33 493	3 704	2 036	10 091[40]		1 372	Units transfused
Republic of Korea	2018	1 013	764	1 904 380	1 545 917	204 442	529 388	588	88 564	Units issued
	2023	2 668	136	1 355 622	1 558 876	259 904	519 502	0	106 025	Units issued
Republic of Moldova	2018	68	70	42 027	770[Δ]	1 533	41 821	7 535	10 775	Units transfused
	2023	68	11	54 305	3 532	2 198	47 660	5 375	12 051	
Romania	2018	314	5 296	374 095	91 467	7 820	211 570[41]	….	10 791	Units transfused
	2023	315	1 066	453 596	154 415	8 785	242 508	7 862	10 497	
Russian Federation	2018		38	1 922 106	227 560	195 092	1 549 048	13 476	41 772	Units issued
	2023	—	—	—	—	—	—	—	—	
Rwanda	2018	69	0	74 044	15 256		5 898		608	Units issued
	2023	87	0	83 424	24 769	706	9 447		3 418	Units issued
Saint Kitts and Nevis	2017	1	…	…	…	…	…	…	…	
	2020	1	0	586	13	0	0	34	0	
Saint Lucia	2017	3	…	2 308	410	…	741	…	…	
	2020	3	0	2 212	326		475	0	0	
Saint Vincent and the Grenadines	2017	4	7	1 229	75	0	281	0	0	
	2023	—	—	—	—	—	—	—	—	
Samoa	2018	—	—	—	—	—	—	—	—	
	2023	2	47	2 904	137	0	228	0	0	Units issued
Sao Tome and Principe	2018	3	6	1 185	6		185		0	
	2023	1	55	1 154	8	0	76	17	0	Units transfused
Senegal	2018	60	223	29 176	602	0	3 057	0	0	
	2023	72	…	…	…	…	…	…	…	
Serbia	2018	—	—	—	—	—	—	—	—	
	2023	…	…	…	…	…	…	…	…	
Seychelles	2018	—	—	—	—	—	—	—	—	
	2023	4	417	1 645	237	0	142	0	0	Units issued

[36] Fresh frozen plasma (FFP) reported are Solvent/Detergent (SD)-treated FFP.

[37] 7 fresh frozen plasma (FFP) units were pathogen-reduced.

[38] Octaplasma was used as the main plasma product, with a total of 39 972 units transfused.

[39] Including 87 units of apheresis red cells.

[40] A total of 10 091 units were transfused, including both FFP and plasma.

[41] The total number of fresh frozen plasma (FFP) reported include cryosupernatant.

Country	Data year	No. hospitals performing blood transfusion	No. units of blood components issued/transfused (excluding autologous blood units) in the country							
			Whole blood	Red cells	Whole blood-derived platelets	Apheresis platelets	Fresh frozen plasma	Plasma	Cryo-precipitate	
Singapore	2018	21	0	111 070	58 240	9 614	23 908	42	18 986	Units transfused
	2023	18	0	114 986	59 440	9 001	198 00	248	18 313	Units transfused
Slovakia	2018	115	102	198 179	46 803	10 729	63 405			Units transfused
	2023	110	10	169 227	47 226	12 258	44 650	0	0	Units issued
Solomon Islands	2018	—	—	—	—	—	—	—	—	
	2023	—	—	—	—	—	—	—	—	
South Africa	2018	736	1 888	934 745	74 161[Δ]		147 195		50 933	Units issued
	2023	679	1 704	993 179	70 069[Δ]	44 451	152 323	35 146	62 098	Units issued[42]
South Sudan	2018	18	1 238	0	0	0	0	0	0	Units issued
	2023	—	—	—	—	—	—	—	—	
Spain	2018	465	33	1 477 105	226 376[Δ,43]		16 0 164	0	884	Units transfused
	2023	486	10	1 464 986	245 332[Δ,44]		118 339		393	Units transfused[45]
Sri Lanka	2018	103	0	412 154	134 059	17 682	156 512		48 622	
	2023	110	0	455 638	178 017	4 748	149 555	0	45 769	Units issued
Suriname	2017	5	0	11 166	1 947	0	2 127	0	0	
	2023	6	…	…	…	…	…	…	…	
Sweden	2018	…		390 404	33 608[Δ]	14 000	41 569[46]	7 202	0	Units transfused
	2023	81	250	350 677	39 000[Δ]	11 423	36 698	8 298[47]		Units transfused
Switzerland	2018	241	…	221 100	13 750[Δ]	25 197	23 568	0	0	Units issued
	2023	243	…	…	…	…	…	…	…	
Syrian Arab Republic	2015	—	—	—	—	—	—	—	—	
	2023	273	…	…	…	…	…	…	…	
Tajikistan	2018	124	…	…	…	…	…	…	…	
	2023	60	0	63 946	3 536	1 460	75 109	8 830	8 830	Units issued
Thailand	2018	1 332	0	1 049 777	428 189	13 448	215 837	562	235 027	Units issued
	2023[48]	907	0	1 192 701	594 408	11 763	252 035	151	232 023	Units issued
Timor-Leste	2018	6	2 954	459	66	0	459	0	0	Units issued
	2023	6	95	5 741	658		501			Units issued
Togo	2018	…	2 217	50 243	858		4 109	0	0	Units issued
	2023	…	0	74 550	2 538		7 304	0	0	Units issued
Tonga	2018	5	…	…	…	…	…	…	…	
	2023	4	63	3 140	27		425			Units issued
Trinidad and Tobago	2017	…	…	…	…	…	…	…	…	
	2020	…	…	…	…	…	…	…	…	
Tunisia	2018	…	…	…	…	…	…	…	…	
	2023	…	1 215	218 700	152 017	487	184 491	0	1 500	
Türkiye	2018	—	—	—	—	—	—	—	—	
	2023	1 127	29 861	2 777 294	1 246 872	166 408	1 306 468	0	78 322	Units transfused
Turkmenistan	2018	—	—	—	—	—	—	—	—	
	2023	…	…	…	…	…	…	…	…	
Uganda	2018	369	137 249	275 130	4 016	0	51 310	0	0	
	2023	549	…	…	…	…	…	…	…	Units issued
United Arab Emirates	2018	…	0	108 709	19 625	9 585	32 238	1 000	6 701	Units issued
	2023	…	…	…	…	…	…	…	…	
United Kingdom	2018	—	—	—	—	—	—	—	—	
	2023	241	0	1 342 828[49]	133 765[Δ]	115 907	143 973		203 585	Units issued
United Republic of Tanzania	2018	283	…	…	…	…	…	…	…	
	2023	1 217	367 878	69 990	6 109	45	4 684			Units issued

[42] The number of products refers to units issued to patients; some units were not transfused due to various reasons (e.g., patient death or change in clinical need).

[43] Including 210 973 adult therapeutic doses and 15 403 pediatric therapeutic doses.

[44] Including 230 095 adult therapeutic doses and 15 237 pediatric therapeutic doses.

[45] Data provided are total of whole blood-derived and apheresis platelets in units equivalent to adult dosage.

[46] Additional 7 202 units of Solvent/Detergent (SD)-treated FFP were transfused.

[47] Plasma refers to Octaplas, a pharmaceutical plasma product used in Sweden and elsewhere.

[48] Data on units issued were reported from 13 processing sites, representing 43.46% of the country's coverage. Information on actual transfused units was not available; figures reflect inventory issued, not confirmed transfusions.

[49] Figures represent adult red cell units and large volume transfusion (LVT) units only.

Country	Data year	No. hospitals performing blood transfusion	No. units of blood components issued/transfused (excluding autologous blood units) in the country							
			Whole blood	Red cells	Whole blood-derived platelets	Apheresis platelets	Fresh frozen plasma	Plasma	Cryo-precipitate	
United States of America	2018	…	…	…	…	…	…	…	…	
	2023	3 543	…[50]	10 327 000	55 000	2 160 000		1 882 000	1 171 000	Units transfused
Uruguay	2017	67	472	73 722	35 149	3 070	18 616	180	2 031	
	2023	…	…	…	…	…	…	…	…	
Venezuela (Bolivarian Republic of)	2017	—	—	—	—	—	—	—	—	
	2023	…	6 522	1 079 602	672 937		625 397		960	
Viet Nam	2018	—	—	—	—	—	—	—	—	
	2023	700		1 449 486	156 562	269 417		820 305	118 732	
Yemen	2018	271	3 041	10 975	8 828	0	8 552	0	0	Units issued
	2023	12	…	…	…	…	…	…	…	
Zambia	2018	—	—	—	—	—	—	—	—	
	2023	203	71 357	45 558	15 548	200	16 856		2 300	Units issued
Zimbabwe	2018	176	715	67 422	4 403		6 461		506	Units issued
	2023	219	1 003	57 534	3 631	75	6 027	0	177	Units issued

[50] Whole blood and red cell data were combined and reported as a single figure.

Annex 9. Provision of plasma-derived medicinal products through the fractionation of plasma collected in the country, 2014–2023

… Not reported/not available.
Blank cell: Not required/not applicable.
— No response.
* Arrangement for the fractionation of plasma collected in the country: A: fractionation through the public/not-for-profit sector in the country; B: fractionation through the for-profit sector in the country; C: contract fractionation in another country; D: plasma were sold to PDMP manufacturers.
IVIG: Intravenous immunoglobulin.
** % of PDMP supplied through the products manufactured by fractionation of plasma that were collected in the country.

Country	Data year	Fractionation arrangement*	Volume of plasma used for fractionation, or sold to the manufacturers of PMDP for fractionation						Products manufactured by fractionation of plasma collected in the country				% of self-reliance of PDMP supplies**		
			Recovered plasma (L)	Apheresis plasma (L)	Source plasma[1] (L)	Total (L)	L per 1000 population	% of recovered plasma	Albumin	IVIG	Factor VIII	Factor IX	Albumin	IVIG	Factor VIII
Argentina	2014	A	150 000	0		150 000	3.5	100	Yes	Yes	Yes	Yes	50	50	2
	2015	A, D	100 000	0		100 000	2.3	100	Yes	Yes	Yes	Yes	50	50	10
	2016	A, D	120 000	400		120 400	2.7	99	Yes	Yes	Yes	Yes	90	60	2
	2017	A, D	120 000	400		120 400	2.7	99	Yes	Yes	Yes	Yes	90	60	2
	2023	C	120 000	400		120 400	2.7	99	Yes	Yes	Yes	Yes	90	60	2
Armenia	2014	C	…	…		…	…	…	…	…	…	…	…	…	…
	2015	C	…	…		…	…	…	…	…	…	…	…	…	…
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	—	—	—		—	—	—	—	—	—	—	—	—	—
Australia	2014	B	171 981	360 000		531 981	22.8	32	Yes	Yes	Yes	Yes			
	2015	—	—	—		—	—	—	—	—	—	—	—	—	—
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	A	191 351	677 728	869 079		32.9	22	Yes	Yes	Yes	Yes	100	41	100
Austria[2]	2014	B, D				69 295	8.1		Yes	Yes	Yes	Yes			
	2015	B, D				105 827	12.3		Yes	Yes	Yes	Yes			
	2017	…	…	…		…	…	…	…	…	…	…	…	…	…
	2018	…	…	…		…	…	…	…	…	…	…	…	…	…
	2023	C	…	…		…	…	…	Yes	Yes	Yes	Yes	…	…	…
Belgium	2014	A	108 517	63 613		172 130	15.2	63	Yes	Yes	Yes	Yes	…	…	…
	2015	A	105 461	64 153		172 350	15.3	62	Yes	Yes	Yes	Yes	…	…	…
	2017	A	107 317	79 200		186 517	16.6	58	Yes	Yes	Yes	Yes	…	…	…
	2018	A, B	104 468	89 417		193 885	17.2	54	Yes	Yes	Yes	Yes	…	…	…
	2023	B	104 181	124 404		228 585	19.5	46	Yes	Yes	Yes	Yes	…	…	…
Brazil	2014	—	—	—		—	—	—	—	—	—	—	—	—	—
	2015	A	189 000	0		189 000	0.9	100	Yes	Yes	Yes	Yes	…	39	8
	2016	A, C[3]	81 857	0		81 857	0.4	100	Yes	Yes	No	No	…	40	…
	2017	A, C	81 857	0		81 857	0.4	100	Yes	Yes	Yes	Yes	…[4]	39	8
	2023	A	…	…		…	…	…	…	…	…	…	…	…	…
Bulgaria	2014	A	11 741	0		11 741	1.6	100	Yes	Yes	No	No	…	…	…
	2015	A	13 063	0		13 063	1.8	100	Yes	Yes	No	No	…	…	…
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	A	…	…		…	…	…	…	…	…	…	…	…	…
	2023	B	15 867	0	0	15 867	2.3	100	Yes	Yes	…	…	…	…	…

[1] "Source plasma" was included in the GDBS questionnaire for the collection of 2023 data. Previous surveys only offered two options: "Recovered plasma" and "Apheresis plasma." In the GDBS 2023 questionnaire, "Source plasma" is defined as: Plasma obtained by plasmapheresis for further fractionation into plasma-derived medicinal products.

[2] Data source for volume of plasma used for fractionation: The Collection, Testing and Use of Blood and Blood Components in Europe published by the European Directorate for the Quality of Medicines & HealthCare (EDQM) of the Council of Europe. Available at: https://www.edqm.eu/en/reports-blood.

[3] HEMOBRÁS has a Contract with LFB for technology transfer.

[4] All albumin from the fractionation of Brazilian plasma collected in Brazilian is donated to public hospitals.

Country	Data year	Fractionation arrangement*	Volume of plasma used for fractionation, or sold to the manufacturers of PMDP for fractionation						Products manufactured by fractionation of plasma collected in the country				% of self-reliance of PDMP supplies**		
			Recovered plasma (L)	Apheresis plasma (L)	Source plasma[1] (L)	Total (L)	L per 1000 population	% of recovered plasma	Albumin	IVIG	Factor VIII	Factor IX	Albumin	IVIG	Factor VIII
Canada	2014	A	212 757	6 159		218 916	6.1	97	Yes	Yes	No	Yes	59.3	22	0[5]
	2015	A	184 500	4 853		189 353	5.3	97	Yes	Yes	No	Yes	49.6	20.5	0
	2017	c	226 113	8 032		234 145	6.4	97	Yes	Yes	Yes	No	48.5	15.4	26.5
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	A	192 149	23 962	48 771	264 882	6.7	73	Yes	Yes	…	…	75	17	…
Chile[6]	2014	C	11 964[7]	0		11 964	0.67		Yes	Yes	Yes	No	17.5	3.6	…
	2015	C	17 8 877	0		17 887	0.99	100	Yes	Yes	Yes	No	17.5	3.6	…
	2016	…	…	…		…	…	…	…	…	…	…	…	…	…
	2017	C	17 658	0		17 658	0.94	100	Yes	Yes	Yes	No	17.5	3.6	…
	2023	C	28 520			28 520	1.5	…	Yes	Yes	No	No	20	5	…
China	2014	A	0	5 206 552		5 206 552	3.8	0	Yes	Yes	Yes	Yes	…	…	…
	2015	A	0	5 836 971		5 836 971	4.2	0	Yes	Yes	Yes	Yes	…	…	…
	2017	…	0	7 717 357		7 717 357	5.4	0	Yes	Yes	Yes	Yes	…	..	…
	2018	B	0	8 342 819		8 342 819	5.8	0	Yes	Yes	Yes	Yes			
	2023	A	…	..		…	…	..	Yes	Yes	Yes	Yes	…	..	…
Croatia	2014	…[8]	…	…		…	…	…	…	…	…	…	…	…	…
	2015	…	…	…		…	…	…	…	…	…	…	…	…	…
	2017	C, D							Yes	Yes	Yes	Yes			
	2018	C, D							Yes	Yes	Yes	Yes			
	2023	A	29 538	0	0	29 538	7.6	100	Yes	Yes	Yes	Yes	36	41	…
Cuba	2014	A	…	…		…	…	…	Yes	Yes	NO	NO	…	…	…
	2015	…	…	…		…	…	…	…	…	…	…	…	…	…
	2016	…	…	…		…	…	…	…	…	…	…	…	…	…
	2017	A							Yes	Yes	NO	NO			
	2023	A	…	…		…	…	…	Yes	Yes	…	…	…	…	…
Czechia	2014	D	67 032	501 131		568 163	53.9	11							
	2015	D	70 000	514 500		584 500	55.4	11							
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	C,D	65 000	496 000[9]		561 000	52.6	12					100	100	100
	2023	C	160 000		857 000	1 017 000	94.1	15.7	…	…	…	…	100	100	100
Denmark	2014	—	—	—		—	—	—	—	—	—	—	—	—	—
	2015	—	—	—		—	—	—	—	—	—	—	—	—	—
	2017	C	42 040	37 585		79 625	13.8	52.8	Yes	Yes	No	No	94	30	0[10]
	2018	C	42 461	42 994		85 455	14.9	49.7	Yes	Yes	No	No	100	34	0
	2023	A	134 151	118 581		252 732	42.5	53	Yes	Yes	…	…	100	45	…
Egypt	2014														
	2015														
	2017														
	2018														
	2023	A	…	…		…	…	…	Yes	Yes	Yes	…	…	…	…
Estonia	2014	C, D	10 470	0		10 470	8.0	100	Yes	Yes	Yes	No	100	100	100
	2015	C, D	11 076	0		11 076	8.4	100	Yes	Yes	Yes	No	100	100	50
	2017	C, D	11 685	0[11]		11 685	8.8	100	Yes	Yes	Yes	Yes	…	…	…
	2018	C, D	11 338	0		11 338	8.6	100	Yes	Yes	Yes	Yes	…	…	…
	2023	B	13 511			13 511	9.9	100	…	…	…	…	…	…	…

[5] All factor VIII supplied are recombinant.

[6] Agreement on exchange of plasma for PDMP with the National University of Cordoba, Argentina.

[7] In Kg.

[8] In 2013 Croatian fractionation plant was closed. Contract fractionation was considered during the year, but it was not approved then.

[9] Including 448 500 litres of apheresis plasma collected by stand-alone plasmapheresis centres.

[10] Only recombinant FVIII is used.

[11] Plasma obtained through plasmapheresis is used for transfusion.

Country	Data year	Fractionation arrangement*	Volume of plasma used for fractionation, or sold to the manufacturers of PMDP for fractionation						Products manufactured by fractionation of plasma collected in the country				% of self-reliance of PDMP supplies**		
			Recovered plasma (L)	Apheresis plasma (L)	Source plasma[1] (L)	Total (L)	L per 1000 population	% of recovered plasma	Albumin	IVIG	Factor VIII	Factor IX	Albumin	IVIG	Factor VIII
Finland	2014	…	…	…		…	…	…	…	…	…	…	…	…	…
	2015	C, D	55 000	0		55 000	10.0	100	No	No	No	No	…	…	…
	2017	C	55 000	0		55 000	10.0	100	No	No	No	No	…	…[12]	…
	2018	D	50 000	0		50 000	9.1	100	No	No	No	No	…	…	…
	2023	B	48 555	0	0	48 555	8.7	100	No	No	No	No	…	…	…
France	2014	A	675 769	93 946		769 715	12.0	88	Yes	Yes	Yes	Yes	…	…	…
	2015	A	594 437	200 265		794 703	12.3	75	Yes	Yes	Yes	Yes	…	…	…
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	B	…	…		…		…	…	…	…	…	…	…	…
	2023	B[13]	805 261	21 666		826 927	12.4	97	Yes	Yes	Yes	Yes	…	…	…
Germany	2014	D	1 205 680	2 021 831		3 227 511	40.0	37	Yes	Yes	Yes	Yes	…	…	…
	2015	D	1 009 803	1 900 278		2 910 081	36.1	34	Yes	Yes	Yes	Yes	…	…	…
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	C		3 349 417		…	…	…	…	…	…	…	…	…	…
Greece	2014	C	—	—		—	—	—	—	—	—	—	—	—	—
	2015	…	…	…		…	…	…	…	…	…	…	…	…	…
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	D													
Hungary	2014														
	2015														
	2017														
	2018														
	2023	B	85 201			…	…	…	…	…	…	…	…	…	…
India	2014	A, B, C	…	…		…	…	…	Yes	Yes	No	No	…	…	…
	2015	…	…	…		…	…	…	…	…	…	…	…	…	…
	2017	…	…	…		…	…	…	…	…	…	…	…	…	…
	2018	…	…	…		…	…	…	…	…	…	…	…	…	…
	2023	D													
Iran (Islamic Republic of)	2014	A, B, C	176 433	151 213		327 646	4.1	53	Yes	Yes	Yes	No	35	100	20
	2015	A, B, C	156 236	150 501		306 737	3.9	50	Yes	Yes	Yes	No	35	100	20
	2017	A, B, C	183 684	225 963		409 647	5.0	45	Yes	Yes	Yes	No	…	…	…
	2018	A, B, C	179 791	160 042		339 833	4.1	53	Yes	Yes	Yes	No	…	…	…
	2023	A	262 000	427		262 427	2.9	99	Yes	Yes	Yes	Yes	…	…	…
Israel	2014	A	43 314	0		43 314		100	No	Yes	No	No	0	45	0
	2015		—	—		—	—	—	—	—	—	—	—	—	—
	2017		—	—		—	—	—	—	—	—	—	—	—	—
	2018		—	—		—	—	—	—	—	—	—	—	—	—
	2023		—	—		—	—	—	—	—	—	—	—	—	—
Italy	2014	A	565 120	191 078		756 198	12.6	74	Yes	Yes	Yes	Yes	61	64	53
	2015	A	570 957	191 768		762 725	12.7	74	Yes	Yes	Yes	Yes	64	74	53
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	A, C[14]	586 999	211 251		798 250	13.1	67	Yes	Yes	Yes	Yes	72	76	59
	2023	A	601 814		256 074	857 888	14.4	70	Yes	Yes	Yes	Yes	72	79	98
Japan	2014	A, B, D	608 000	31 600		639 600	5.1	95	Yes	Yes	Yes	Yes	57.7	95.8	100
	2015	A, B, D	586 000	323 000		909 000	7.2	64	Yes	Yes	Yes	Yes	56.4	95.6	100
	2017	A, B, D[15]	582 225	352 775		935 000	7.4	62	Yes	Yes	Yes	Yes	62.9	94.8	100
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	C	629 082	147 283	466 074	1 242 439	10.0	51	Yes	Yes	Yes	Yes	67	83	100

[12] Domestically collected plasma does not cover the need for PDMPs, especially for IVIG.

[13] By law, the fractionation of plasma collected in France must be carried out in France by LFB, a company with public capital that operates on a for-profit basis.

[14] Around 20% – 25% is sent for contract fractionation in another country (Switzerland).

[15] Source plasma collected or separated by Japanese Red Cross Society are distributed to both not-for profit sector and commercial companies.

Country	Data year	Fractionation arrangement*	Volume of plasma used for fractionation, or sold to the manufacturers of PMDP for fractionation						Products manufactured by fractionation of plasma collected in the country				% of self-reliance of PDMP supplies**		
			Recovered plasma (L)	Apheresis plasma (L)	Source plasma[1] (L)	Total (L)	L per 1000 population	% of recovered plasma	Albumin	IVIG	Factor VIII	Factor IX	Albumin	IVIG	Factor VIII
Kazakhstan	2014	A	37 680	0		37 680	2.1	100	Yes	Yes			…	…	…
	2015	A	37 127	0		37 127	2.1	100	Yes	No	No	No	…	…	…
	2017		—	—		—	—	—	—	—	—	—	—	—	—
	2018	A	18 337	0		18 337	1.0	100	Yes	No	No	No	56	…	…
	2023	D	…	…	…	…	…	…	…	…	…	…	…	…	…
Kyrgyzstan	2014	A	…	…		…	…	…	…	…	…	…	…	…	…
	2015	A	1 506	0		1 506	0.3	100	Yes	…	…	…	…	…	…
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	A	…	…		…	…	…	Yes	…	…	…	…	…	…
	2023	A	3 878	167		4 045	0.2	96	Yes	No	No	No	1	0	0
Latvia	2014	—	—	—		—	—	—	—	—	—	—	—	—	—
	2015	—	—	—		—	—	—	—	—	—	—	—	—	—
	2017	A, C, D	6 857	2 921		9 778	5.1	70	Yes	Yes	No	No	100	100	0
	2018	A, C	4 287	1 444		5 731	3.0	75	Yes	Yes	No	No	100	100	100
	2023	A	7 200	0	800	8 000	4.2	90	Yes	Yes	No	No	80	50	…
Luxembourg	2014	A, B , C	5 654	2 218		7 872	13.9	71	Yes	Yes	No	No	100	35	0
	2015	A, B, C	5 446	1 132		6 578	11.6	82	Yes	Yes	No	No	90	50	0
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	C, D	0	762		762	1.3	0	Yes	Yes			47	28	0
	2023	C	4 177	276	1 082	5 535	8.3	75	Yes	Yes	No	No			
Malaysia	2014	C	33 110	0		33 110	1.1	100	Yes	Yes	Yes	…	…	…	…
	2015	C	31 680	0		31 680	1.0	100	Yes	Yes	Yes	No	…	…	…
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	A	32 369	3 142		35 511	1.0	91	Yes	Yes	Yes	No	36	55	56
Mexico	2014	C	…	…		…	…	…	…	…	…	…	…	…	…
	2015	C	…	…		…	…	…	Yes	Yes	Yes	Yes	…	…	…
	2016	C	10 770	0		10 770	0.1	100	Yes	Yes	Yes	Yes	85	…	…
	2017	C	…						Yes	Yes	Yes	Yes	…	…	…
	2023	D	…	…		…	…	…	…	…	…	…	…	…	…
Morocco	2014	C	12 000	0		12 000	0.4	100	Yes	Yes	Yes	Yes	…	…	…
	2015	C	9 652	0		9 652	0.3	100	Yes	Yes	Yes	Yes	50	85	50
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	C	6 486	0		6 486	0.2	100	Yes	Yes	Yes	Yes	50	100	50
	2023	A	12 000			12 000	0.3	100	Yes	Yes	Yes	Yes	…	…	…
Namibia	2014														
	2015														
	2017	D	6 483	0		6 483	2.6	100							
	2018														
	2023	A	11 625	0	1 294	12 919	4.4	90	Yes	Yes	Yes	Yes	100	100	100
Netherlands (Kingdom of the)	2014	—	—	—		—	—	—	—	—	—	—	—	—	—
	2015	A	…	…		277 437	16.4	…	Yes	Yes	Yes	Yes	…	…	…
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	A	…	…	…	…	…	…	Yes	Yes	Yes	Yes	…	…	…
New Zealand	2014	C	22 822	32 400		55 222	12.2	41	Yes	Yes	Yes	Yes	100	100	100
	2015	C	28 499	33 061		61 560	13.6	46	Yes	Yes	Yes	Yes	100	89	100
	2017	C	32 027	36 349		68 376	14.4	47	Yes	Yes	Yes	Yes	100	87.3	100
	2018	C	32 793	41 019		73 812	15.6	44	Yes	Yes	Yes	Yes	100	87.8	100
	2023	A	36 302	73 097		109 399	21.1	33	Yes	Yes	Yes	No	100	84	100

Country	Data year	Fractionation arrangement*	Volume of plasma used for fractionation, or sold to the manufacturers of PMDP for fractionation						Products manufactured by fractionation of plasma collected in the country				% of self-reliance of PDMP supplies**		
			Recovered plasma (L)	Apheresis plasma (L)	Source plasma[1] (L)	Total (L)	L per 1000 population	% of recovered plasma	Albumin	IVIG	Factor VIII	Factor IX	Albumin	IVIG	Factor VIII
Norway	2014	—	—	—		—	—	—	—	—	—	—	—	—	—
	2015	—	—	—		—	—	—	—	—	—	—	—	—	—
	2017	D	45 049	6 906		51 955	9.7	87	Yes	Yes	Yes	Yes	…	…	…
	2018	D	45 658	3 174		48 832	9.1	93	Yes	Yes	Yes	Yes	…	…	…
	2023	D[16]	45 044	3 972		49 016	8.8	100	Yes	Yes	Yes	Yes	100	16	100[17]
Paraguay	2014	C[18]													
	2015	C[19]	4 450[20]	0		4 450	0.7	100	Yes	Yes	No	No	…	…	
	2016	C	4 27 816	0		4 278	0.6	100	Yes	Yes	No	No	18.8	17.6	…
	2017	C	4 46 416	0		4 464	0.6	100	Yes	Yes	No	No	18.8	17.6	
	2023	C	11 74 916			11 749	1.7	100	Yes	Yes	No	No	18	20	
Poland	2014	B	171 729	28 739		200 468	5.2	85	…	…	…	…	…	…	…
	2015	B	249 170	74 503		323 673	8.4	76	…	…	…	…	…	…	…
	2017	C, D	193 206	21 404		214 610	5.7	90							
	2018	C	198 176	24 060		222 236	5.8	89	…	…	…	…	…	…	…
	2023	A	208 172	74 745		282 917	7.5	74	…	…	…	…	…	…	…
Portugal	2014														
	2015														
	2017														
	2018	C[21]	30 000	0		30 000	2.9	100	Yes	Yes	Yes	Yes	36	22	30
	2023	A	61 317	0	0	61 317	5.9	100	Yes	Yes	Yes	Yes	70	40	90
Republic of Korea	2014	A, B, D	367 993	732 650		1 100 643	21.9	33	Yes	Yes	Yes	Yes	79.9	100	100
	2015	A, B, D	296 167	596 345		892 512	17.7	33	Yes	Yes	Yes	Yes	95.4	100	100
	2017	A	322 134	462 965		785 099	15.3	41	Yes	Yes	Yes	Yes	71.3	100	100
	2018	A, B, D	445 995	492 044		938 039	18.33	48	Yes	Yes	Yes	Yes	68.7	100	100
	2023	C	991 953		390 234	1 382 187	26.7	72	Yes	Yes	Yes	Yes	40.4	100	100
Republic of Moldova	2014	—	—	—		—	—	—	—	—	—	—	—	—	—
	2015	—	—	—		—	—	—	—	—	—	—	—	—	—
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	A	86	6 858		6 942	1.7	1	Yes	No	No	No	100		
	2023	A	…	7 760		7 760	2.5	0	Yes	No	No	No	100	…	…
Russian Federation	2014	A	156 148	0		156 148	1.1	100	Yes	Yes	Yes	…	…	…	…
	2015	A	147 160	0		147 160	1.0	100	Yes	Yes	Yes	…	…	…	…
	2017	A	192 630	0		192 630	1.3	100	Yes	Yes	No	…	…	…	…
	2018	A	185 669	0		185 669	1.3	100	Yes	Yes	No	…	…	…	…
	2023	—	—	—		—	—	—	—	—	—	—	—	—	—
Serbia	2014	A	5 500	650		6 150	0.7	89	Yes	No	No	No	12	0	0
	2015	A	5 350	630		5 980	0.7	89	No	No	No	No	11	0	0
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023[22]														
Singapore	2014	C	15 074	3 861		18 936	3.4	79	Yes	Yes	Yes	No	64.7	24.3	11
	2015	C	13 407	671		14 078	2.5	95	Yes	Yes	Yes	No	45	47	9
	2017	C	14 879	226		15 105	2.6	99	Yes	Yes	Yes	No	60.7	100	38.6
	2018	C	14 879	203		15 082	2.6	99	Yes	Yes	Yes	No	73.8	100	41.5
	2023	C	15 894	1 163	146	17 203	3.0	92	Yes	Yes	No	No	59	65	0

[16] Since plasma were sold to and finished products were purchased from various companies, the exact level of self-reliance cannot be determined. However, the volume of plasma supplied is sufficient to produce the full national requirement for albumin and corresponds to the production of approximately 16% of the national IVIG requirement.

[17] Recombinant Factor VIII is used. Although available information indicates that the volume of plasma supplied could be sufficient to cover the national Factor VIII requirement, it may be preferable to leave this field blank.

[18] In process.

[19] Through an agreement with the National University of Cordoba.

[20] In Kg.

[21] The contract fractionation started in 2018.

[22] No plasma collected in the country is used for fractionation.

Country	Data year	Fractionation arrangement*	Volume of plasma used for fractionation, or sold to the manufacturers of PMDP for fractionation						Products manufactured by fractionation of plasma collected in the country				% of self-reliance of PDMP supplies**		
			Recovered plasma (L)	Apheresis plasma (L)	Source plasma[1] (L)	Total (L)	L per 1000 population	% of recovered plasma	Albumin	IVIG	Factor VIII	Factor IX	Albumin	IVIG	Factor VIII
Slovakia	2014	C	26 077	0		26 077	4.8	100	Yes	Yes	Yes	No	58	45	31
	2015	C	34 801	0		34 801	6.4	100	Yes	Yes	Yes	No	58	45	31
	2017	C	39 105	0		39 105	7.2	100	Yes	Yes	Yes	No	54	41	29
	2018	C	28 669	0		28 669	5.3	100	Yes	Yes	Yes	No	54	41	29
	2023	C	10 347	10 126		20 473	3.7	51	Yes	Yes	Yes	No	…	…	…
Slovenia	2014	C	19 835	33		19 868	9.6	99	Yes	Yes	Yes	Yes			
	2015	C	15 000	170		15 170	7.3	99	Yes	Yes	Yes	Yes	70	60	100
	2017	C	16 964	975		17 939	8.6	95	Yes	Yes	Yes	Yes	56	54	100
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	—	—	—		—	—	—	—	—	—	—	—	—	—
South Africa	2014	A	161 588	0		161 588	3.0		Yes	Yes	Yes	Yes	90	100	100
	2015	A	185 097	1 896		186 993	3.4	98	Yes	Yes	Yes	Yes	80	100	100
	2017	A, D	299 703	5 760			5.2	98	Yes	Yes	Yes	Yes	80	80	100
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	A	242 008	2 665	29 154	273 827	4.3	88	Yes	Yes	Yes	Yes	100	100	100
Spain	2014	B	367 235	0		367 235	7.9	100	Yes	Yes	Yes	Yes	71	49	50
	2015	B	373 055	0		373 055	8.1	100	Yes	Yes	Yes	Yes	72	48	50
	2017	B	370 336	0		370 336	8.0	100	Yes	Yes	Yes	Yes	70	43	48
	2018	B	377 224	0		377 224	8.1	100	Yes	Yes	Yes	Yes	62	35	42
	2023	B	362 139	55 422		417 811	8.8	87	Yes	Yes	Yes	Yes	57	28	46
Sri Lanka	2014														
	2015														
	2017														
	2018	C	36 000	0		36 000	1.7	100	…	…	…	…	…	…	…
	2023	B	…	…		…	…	…	…	…	…	…	…	…	…
Sweden	2014	B, C	95 101	22 853		117 954	12.1	80	…	…	…	…	…	…	…
	2015	B, C	102 124	21 544		123 668	12.6	82	…	…	…	…	…	…	…
	2017	C, D	91 620	19 715		111 335	11.1	82							
	2018	C, D	89 263	18 605		107 868	10.8	83							
	2023	B, D	77 566		13 485	91 051	8.6	85	…	…	…	…	…	…	…
Switzerland	2014	A, B	66 598	0		66 598	8.0	100	Yes	Yes	Yes	…	…	…	…
	2015	A, B	67 874	1 108		68 982	8.3	98	Yes	Yes	Yes	…	…	…	…
	2017	B, D	63 063	925		63 988	7.5	99							
	2018	B, D	60 839	834		61 673	7.2	98							
	2023	C	57 644	1 114		58 758	6.6	98	Yes	Yes	Yes	Yes	…	…	…
Thailand	2014	A, C	30 000	0		30 000	0.4	100	Yes				25	0	0
	2015	A	32 375	2 022		34 397	0.5	94	Yes	Yes	Yes	No	25		
	2017	A	98 223	10 632		108 855	1.6	90	Yes	Yes	Yes	No	25	15	5
	2018	A	90 600	6 819		97 419	1.4	93	Yes	Yes	Yes	Yes	50	25	10
	2023	C	217 890	2 322	4 030	224 242	3.1	97	Yes	Yes	Yes	Yes	41.4	86	45.3
United States of America	2014	B, C	…	…		…	…	…	Yes	Yes	Yes	Yes	…	…	…
	2015	…	…	…		…	…	…	…	…	…	…	…	…	…
	2017	…	…	…		…	…	…	…	…	…	…	…	…	…
	2018	…	…	…		…	…	…	…	…	…	…	…	…	…
	2023	C	…	…		…	…	…	…	…	…	…	…	…	…
Uruguay	2014	C[23]	11 794	0		11 794	3.4	100	Yes	Yes	Yes	No	…	…	…
	2015	C	13 291	0		13 291	3.8	100	Yes	Yes	Yes	No	…	…	…
	2016	C	13 580	471		14 051	4.0	97	Yes	Yes	Yes	No	…	…	…
	2017	C	13 142	0		13 142	3.8	100	Yes	Yes	Yes	No	…	…	…
	2020	D	…	…		…	…	…	…	…	…	…	…	…	…

[23] Through a binational agreement for the interchange of plasma and PDMP with the fractionation plant of the National University of Cordoba.

Country	Data year	Fractionation arrangement*	Volume of plasma used for fractionation, or sold to the manufacturers of PMDP for fractionation						Products manufactured by fractionation of plasma collected in the country				% of self-reliance of PDMP supplies**		
			Recovered plasma (L)	Apheresis plasma (L)	Source plasma[1] (L)	Total (L)	L per 1000 population	% of recovered plasma	Albumin	IVIG	Factor VIII	Factor IX	Albumin	IVIG	Factor VIII
Uzbekistan	2014	A	3 122	936		4 058	0.1	77	Yes	No	No	No	26	0	0
	2015	A	3 528	1 058		4 586	0.1	77	Yes	No	No	No	31	0	0
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2018	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	—	—	—		—	—	—	—	—	—	—	—	—	—
Venezuela (Bolivarian Republic of)	2014	A, D	…	…		…	…	…	Yes	Yes	Yes	Yes	…	…	…
	2015	A, D	…	…		…	…	…	Yes	Yes	Yes	Yes	…	…	…
	2016	—	—	—		—	—	—	—	—	—	—	—	—	—
	2017	—	—	—		—	—	—	—	—	—	—	—	—	—
	2023	D	…	…		…	…	…	…	…	…	…	…	…	…

Annex 10. Governance, regulation and quality assurance programmes in the blood sector, 2023

… Not reported/not available.
Blank cell: Not required/not applicable/indicator was not included in the survey.
— No response.
Part: Partial or in process.
[a] Data for 2023 were not available. Data for earlier years were listed in the table.

Country	Unit within ministry of health with responsibility for governing blood provision and transfusion activities	National blood policy	Multiyear national strategic plan for blood safety or equivalent	Specific legislation covering the safety and quality of blood and blood products for transfusion	National blood committee (or equivalent)	Specific government budgetary line item for blood establishments	System of cost recovery for blood establishments	National standards for the collection, testing, processing, storage and distribution of blood and blood components	National guidelines on the appropriate clinical use of blood	National haemovigilance system
Afghanistan	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Albania	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Algeria	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
Andorra	—	—	—	—	—	—	—	—	—	—
Angola[a]	Yes	No	Yes	Yes	Yes	Yes	No	…	Yes	No
Antigua and Barbuda	—	—	—	—	—	—	—	—	—	—
Argentina	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Armenia	—	—	—	—	—	—	—	—	—	—
Australia	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Austria	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Azerbaijan	Yes	Yes	Yes	Yes	Yes	Yes	…	Yes	Yes	No
Bahamas	No	No	No	No	No	No	Yes	No	No	No
Bahrain	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bangladesh	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Barbados	—	—	—	—	—	—	—	—	—	—
Belarus	—	—	—	—	—	—	—	—	—	—
Belgium	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Belize	Yes	Yes	No	No	No	No	No	Yes	No	No
Benin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bhutan	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Bolivia (Plurinational State of)	Yes	No	Yes	Yes	No	Yes	…	Yes	Yes	No
Bosnia and Herzegovina	Yes	No	No	Yes	No	No	Yes	Yes	No	No
Botswana	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No
Brazil	Yes	Yes	No	Yes	Yes	Yes	…	Yes	Yes	Yes
Brunei Darussalam	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Bulgaria	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Burkina Faso	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Burundi	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No
Cabo Verde	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	No
Cambodia	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Cameroon[a]	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Canada	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Central African Republic	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No
Chad	No	No	No	No	No	Yes	No	No	No	No
Chile	Yes	Yes	Yes	Part	Yes	Yes	No	Yes	Yes	Part
China	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Colombia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Comoros[a]	Yes	Yes	No	Yes	No	No	Yes	No	No	No
Congo	No	Yes	Yes	No	No	Yes	Yes	No	Yes	No
Cook Islands	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes
Costa Rica	No	No	Part	Part	No	No	Yes	No	No	No
Côte d'Ivoire	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Croatia	Yes	No	No	Yes	Yes	Yes	Yes	No[1]	Yes	Yes
Cuba	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Cyprus	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes

[1] Standards for collection, testing, processing, storage and distribution of blood and components are defined by the Law on Blood and Blood Components and by an ordinance on special technical requirements.

Country	Unit within ministry of health with responsibility for governing blood provision and transfusion activities	National blood policy	Multiyear national strategic plan for blood safety or equivalent	Specific legislation covering the safety and quality of blood and blood products for transfusion	National blood committee (or equivalent)	Specific government budgetary line item for blood establishments	System of cost recovery for blood establishments	National standards for the collection, testing, processing, storage and distribution of blood and blood components	National guidelines on the appropriate clinical use of blood	National haemovigilance system
Czechia	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Democratic People's Republic of Korea	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Democratic Republic of the Congo	Yes	Yes	…	Yes	Yes	Yes	No	Yes	Yes	Yes
Denmark	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes
Djibouti	—	—	—	—	—	—	—	—	—	—
Dominica[a]	…	…	…	…	…	…	Yes	…	…	…
Dominican Republic	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Part
Ecuador	Yes	Yes	Yes	Part	No	Yes	No	Yes	Yes	Yes
Egypt	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
El Salvador	Yes	Yes	Yes	Part	Part	No	Yes	Yes	Yes	Part
Equatorial Guinea	—	—	—	—	—	—	—	—	—	—
Eritrea	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No
Estonia	Yes	No	No	Yes	No	…	Yes	Yes	Yes	Yes
Eswatini	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No
Ethiopia	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Fiji[a]	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Finland	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes
France	Yes	Yes	Yes	Yes	Yes	No[2]	Yes	Yes	Yes	Yes
Gabon	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Gambia	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No
Georgia	Yes	Yes	Yes	Yes[3]	Yes	Yes	Yes	Yes	No	Yes
Germany	Yes	Yes	No	Yes	Yes	…	Yes	Yes	Yes	Yes
Ghana	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	…
Greece	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Grenada	—	—	—	—	—	—	—	—	—	—
Guatemala	Yes	Yes	Yes	Yes	Part	Yes	…	Yes	Yes	No
Guinea	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No
Guinea-Bissau	No	No	No	No	No	…	No	…	…	…
Guyana	Yes	Yes	…	Yes	Yes	Yes	No	Yes	Yes	No
Haiti	Yes	Yes	…	Yes	Yes	Yes	…	…	…	No
Honduras	No	No	No	Yes	No	Yes	Yes	Yes	No	No
Hungary	Yes	Yes	Yes	Yes	Yes	Yes	…	Yes	Yes	…
Iceland	Yes	…	…	Yes	Yes	No	No	Yes	Yes	Yes
India	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indonesia	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Iran (Islamic Republic of)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Iraq	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ireland	—	—	—	—	—	—	—	—	—	—
Israel	—	—	—	—	—	—	—	—	—	—
Italy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Jamaica	—	—	—	—	—	—	—	—	—	—
Japan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Jordan[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Kazakhstan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Kenya	Yes	No	No	Yes	No	Yes	No	Yes	Yes	Yes
Kiribati	Yes	Yes	Yes[4]	Yes	Yes	Yes	No	Yes	Yes	Yes
Kuwait	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kyrgyzstan	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Lao People's Democratic Republic	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No
Latvia	No	Yes	Yes	Yes	Yes	Yes	…	Yes	Yes	Yes
LebaNon	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes

[2] EFS is funded primarily through a cost-recovery system (about 90%). Since 2024 it has also received direct financing through the healthcare system.

[3] In line with Georgia's commitment under the European Union Association Agreement to harmonize national legislation with European Union laws, the Parliament of Georgia approved the Law on the Quality and Safety of Blood and Blood Components in 2022. Work is currently underway to develop the necessary bylaws – covering, among other areas, the appropriate clinical use of blood and GMP standards – to ensure effective implementation of the new law.

[4] A 5-year strategic plan was recently developed and began implementation in 2023.

Country	Unit within ministry of health with responsibility for governing blood provision and transfusion activities	National blood policy	Multiyear national strategic plan for blood safety or equivalent	Specific legislation covering the safety and quality of blood and blood products for transfusion	National blood committee (or equivalent)	Specific government budgetary line item for blood establishments	System of cost recovery for blood establishments	National standards for the collection, testing, processing, storage and distribution of blood and blood components	National guidelines on the appropriate clinical use of blood	National haemovigilance system
Lesotho	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No
Liberia[a]	Yes	Yes	No	No	No	Yes	No	…	No	No
Libya	Yes	No	Yes	Yes	No	Yes	No	No	Yes	No
Lithuania	—	—	—	—	—	—	—	—	—	—
Luxembourg	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Madagascar	Yes	Yes	…	…	No	Yes	No	Yes	Yes	Yes
Malawi	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No
Malaysia	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Maldives[a]	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Mali	Yes	Yes	No	Yes	No	Yes	No	…	No	No
Malta	Yes	No	No	Yes	No	Yes	No	Yes	No[5]	Yes
Marshall Islands	—	—	—	—	—	—	—	—	—	—
Mauritania	No	Yes	Yes	No	No	Yes	No	No	Yes	No
Mauritius	…	Yes	Yes	…	Yes	No	No	Yes	Yes	No
Mexico	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Micronesia (Federated States of)[a]	No	No	No	No	No	No[6]	No	Yes	No	No
Monaco	—	—	—	—	—	—	—	—	—	—
Mongolia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Montenegro	Yes	Yes	Yes	Yes	No[7]	Yes	Yes	Yes	…	No
Morocco	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mozambique	Yes	No	No	Yes	No	Yes	No	Yes	…	No
Myanmar	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Namibia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nauru	—	—	—	—	—	—	—	—	—	—
Nepal	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Netherlands (Kingdom of the)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
New Zealand	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Nicaragua[a]	Yes	Yes	Yes	Yes	Part	No	…	Yes	Yes	No
Niger	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No
Nigeria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Niue[a]	No	…	No	No	No	No	No	Yes	Yes	No
North Macedonia	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes
Norway	Yes	Yes	No	Yes	Yes	No[8]	…	Yes	Yes	Yes
Oman	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	No
Pakistan	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Palau	No	No	No	No	No	No	Yes	Yes	No	No
Panama[a]	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No
Papua New Guinea	Yes	Yes	Yes	No	No	Yes	No	Yes	No	No
Paraguay	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Part
Peru	Yes	Yes	Yes	Yes	Part	Yes	…	Yes	Yes	Part
Philippines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Poland	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Portugal	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Qatar	No	No	No	No	No	Yes	No	Yes	Yes	Yes
Republic of Korea	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Republic of Moldova	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Romania	Yes	Yes	No[9]	Yes	Yes	Yes	…	Yes	Yes	Yes
Russian Federation[a]	Yes	Yes	Yes	Yes	Yes	Yes	…	Yes	Yes	Yes
Rwanda	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Saint Kitts and Nevis[a]	Yes	…	…	Yes	No	No	…	…	…	…
Saint Lucia	No	No	No	No	No	No	No	Yes	No	No
Saint Vincent and the Grenadines[a]	No	No	No	No	No	No	No	No	No	No

[5] The United Kingdom guidelines for appropriate blood use are followed.

[6] No dedicated funds for blood services. All funding for blood services is derived from hospital laboratory funding.

[7] The National Committee for Blood has functioned for several years. However, assistance in formulating policies and plans, establishing standards and providing advice on key matters is currently managed by NBTS management.

[8] All blood establishments are hospital departments in government-funded hospitals. They are fully funded. The exact amount in US$ is difficult to ascertain.

[9] The national blood transfusion strategy is not a standalone document; it is included within the Ministry of Health's National Public Health Strategy.

Country	Unit within ministry of health with responsibility for governing blood provision and transfusion activities	National blood policy	Multiyear national strategic plan for blood safety or equivalent	Specific legislation covering the safety and quality of blood and blood products for transfusion	National blood committee (or equivalent)	Specific government budgetary line item for blood establishments	System of cost recovery for blood establishments	National standards for the collection, testing, processing, storage and distribution of blood and blood components	National guidelines on the appropriate clinical use of blood	National haemovigilance system
Samoa	Yes	No	No	No	Yes	Yes	No	Yes	Yes	…
San Marino	—	—	—	—	—	—	—	—	—	—
Sao Tome and Principe	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No
Saudi Arabia	—	—	—	—	—	—	—	—	—	—
Senegal	…	Yes	Yes	Yes	…	Yes	Yes[10]	Yes	Yes	No
Serbia	Yes	Yes	…	Yes	Yes	…	Yes	No	No	…
Seychelles	No	Yes	No	No	No	No	No	No	No	No
Sierra Leone	—	—	—	—	—	—	—	—	—	—
Singapore	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Slovakia	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Slovenia	—	—	—	—	—	—	—	—	—	—
Solomon Islands	—	—	—	—	—	—	—	—	—	—
Somalia	—	—	—	—	—	—	—	—	—	—
South Africa	No	Yes	Yes	Yes	No	Yes[11]	Yes	Yes	Yes	Yes
South Sudan[a]	…	Yes	Yes	No	…	Yes	No	…	Yes	No
Spain	Yes	Yes	Yes	Yes	Yes	No[12]	No	Yes	Yes	Yes
Sri Lanka	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Sudan	—	—	—	—	—	—	—	—	—	—
Suriname	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Sweden	Yes	No	No	Yes	Yes	No	Yes	No	Yes	No
Switzerland	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Syrian Arab Republic	Yes	Yes	Yes	Yes	Yes	Yes	Yes[13]	Yes	Yes	No
Tajikistan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thailand	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Timor-Leste	No	No	No	No	Yes	…	No	No	No	No
Togo	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tonga	No	No	No	No	No[14]	No	No	Yes	Yes	No
Trinidad and Tobago	Yes	Yes	…	No	Yes	No	No	…	Yes	No
Tunisia	Yes	Yes	…	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Türkiye	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Turkmenistan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tuvalu	—	—	—	—	—	—	—	—	—	—
Uganda	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Ukraine	—	—	—	—	—	—	—	—	—	—
United Arab Emirates	Yes	Yes	No	…	Yes	Yes	Yes	Yes	…	Yes
United Kingdom	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
United Republic of Tanzania	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes
United States of America	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Uruguay	No	Yes	No	Yes	…	No	…	Yes	No	No
Uzbekistan	—	—	—	—	—	—	—	—	—	—
Vanuatu	—	—	—	—	—	—	—	—	—	—
Venezuela (Bolivarian Republic of)	Yes	Yes	No	Yes	No	…	…	Yes	No	No
Viet Nam	Yes	Yes	…	Yes	Yes	Yes	Yes	Yes	Yes	…
Yemen	No	No	No	No	No	No	No	Yes	Yes	No
Zambia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	…
Zimbabwe	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

[10] Only in private facilities supplied by the National Blood Transfusion Centre.

[11] The budget for blood services varies by province. For provinces serviced by the South African National Blood Service the budget is included under Goods and Services and for the Western Cape there is a separate line item for blood products and PDMPs.

[12] All blood establishments are public and financed through regional health budgets.

[13] The blood establishment operates as a self-financing entity.

[14] The Blood Bank Committee was established in 2000; however, it is currently inactive.

Annex 10. Governance, regulation and quality assurance programmes in the blood sector, 2023 (continued)

… Not reported/not available.
Blank cell: Not required/not applicable/indicator was not included in the survey.
— No response.
Part: Partial or in process.
[a] Data for 2023 were not available. Data for earlier years were listed in the table.

Country	Existence of national regulatory authority for blood establishments	Name of national regulatory authority	Regular inspection of blood establishments	Licensing of blood establishments	Blood establishment accreditation	Accreditation programmes
Afghanistan	…		No	Yes	No	
Albania	No		Yes	Yes	Yes[15]	
Algeria	Yes	Ministry of Health	Yes	…	No	
Andorra	—	—	—	—	—	—
Angola[a]			Yes	Yes	No	
Antigua and Barbuda	—	—	—	—	—	—
Argentina			Yes	Yes	Yes	
Armenia	—	—	—	—	—	—
Australia	Yes	Therapeutic Goods Administration	Yes	Yes	Yes[16]	
Austria	Yes	BASG/AGES MEA[17]	Yes	Yes	Yes	ISO 9001
Azerbaijan	…		…	…	…	
Bahamas			Part	No	Part	
Bahrain	Yes	National Health Regulatory Authority	Yes	Yes	Yes	ISO 15189
Bangladesh	Yes	Directorate General of Health Services	Yes	Yes	No	
Barbados	—	—	—	—	—	—
Belarus	—	—	—	—	—	—
Belgium	Yes	Federal Agency for Medicines and Health Products	Yes	Yes	…	
Belize			Yes	No	No	
Benin	Yes	Agency for Medicines and Other Health Products	Yes	Yes	No	
Bhutan	Yes	Bhutan Food and Drug Authority	Yes	Yes	No	
Bolivia (Plurinational State of)			Yes	Yes	…	
Bosnia and Herzegovina	No		Yes	Yes	Yes	
Botswana	Yes	Ministry of Health	No	Yes	No	
Brazil			Yes	…	Yes	
Brunei Darussalam	No		No	No	Yes	ISO 15189, Joint Commission International
Bulgaria	Yes	Bulgarian Drug Agency	Yes	Yes	Yes	
Burkina Faso	Yes	National Agency for Pharmaceutical Regulation	No	No	No	
Burundi	Yes	National Blood Transfusion Centre	No	No	No	
Cabo Verde	No		Yes	Yes	No	
Cambodia	Yes	National Blood Transfusion Centre	Yes	Yes	Yes	AfSBT
Cameroon[a]			No	No	No	
Canada	Yes	Health Canada	Yes	Yes	Yes[18]	
Central African Republic	No		No	No	No	
Chad	No		No	No	No	
Chile			Yes	Yes	Yes	

[15] The National Centre for Quality, Safety and Accreditation of Public Health Institutions is the competent authority for accreditation. All transfusion structures that are part of hospitals have been accredited as part of the hospital. The National Blood Transfusion Centre as an institution is in the process of being accredited.

[16] Lifeblood has a combination of collection, processing and testing sites. Sites are accredited by the Therapeutics Goods Administration and hold its licences to manufacture. Sites also hold National Association of Testing Authorities certification to perform testing.

[17] BASG/AGES MEA (Federal Office for Safety in Health Care).

[18] For more information, please refer to the Canadian Blood Services webpage on Laboratory Services Licenses and Accreditation: https://www.blood.ca/en/hospital-services/laboratory-services/licenses-and-accreditations. In addition, Canadian Blood Services' Cord Blood Bank is a member of the Cord Blood Association and is accredited by the: AABB (Association for the Advancement of Blood & Biotherapies), Foundation for Accreditation of Cellular Therapy NetCord (NetCord-FACT) and World Marrow Donor Association (WMDA).

Country	Existence of national regulatory authority for blood establishments	Name of national regulatory authority	Regular inspection of blood establishments	Licensing of blood establishments	Blood establishment accreditation	Accreditation programmes
China	Yes		Yes	Yes	Yes	
Colombia			Yes	Yes	No	
Comoros[a]			Yes	Yes	No	
Congo	No		No	No	No	
Cook Islands	No		No	No	No	
Costa Rica			Part	Yes	Yes	
Côte d'Ivoire	Yes	Authority for the Regulation of Pharmaceutical Products	Yes	Yes	No	ISO 15189
Croatia	Yes	Ministry of Health	Yes	Yes	No	
Cuba	Yes		Yes	Yes	Yes	
Cyprus	Yes	Ministry of Health	Yes	Yes	Yes	ISO 9001, ISO 15189[19]
Czechia	Yes	State Institute for Drug Control	Yes	Yes	Yes	
Democratic People's Republic of Korea	Yes		Yes	Yes	Yes	
Democratic Republic of the Congo	Yes		Yes	Yes	Yes	
Denmark	Yes	Danish Patient Safety Authority, Danish Medicines Agency[20]	Yes	Yes	Yes	ISO 15189
Djibouti	—	—	—	—	—	—
Dominica[a]			…	…	…	
Dominican Republic			Yes	Yes	No	
Ecuador			Yes	Yes	No	
Egypt	Yes	Blood Operations Regulatory Council	Yes	Yes	Yes	ISO 15189, AABB international accreditation
El Salvador			Yes	Yes	No	
Equatorial Guinea	—	—	—	—	—	—
Eritrea	Yes	National Medicine and Food Administration	No	No	No	
Estonia	Yes	State Agency of Medicines	Yes	Yes	No	
Eswatini	No		Yes	No	No	
Ethiopia	Yes	Ethiopian Food and Drug Authority	No	No	Yes	AfSBT Level 2[21]
Fiji[a]	…	…	Yes	No	No	
Finland	Yes	Finnish Medicines Agency	Yes	Yes	Yes	ISO 17025, ISO 15189, European Federation for ImmuNogenetics (EFI)[22]
France	Yes	National Agency for the Safety of Medicines and Health Products	Yes	Yes	Yes[23]	
Gabon	Yes	National Agency for Medicines and Other Health Products	No	No	No	
Gambia	No		No	No	No	
Georgia	Yes	Regulation Agency of Medical and Pharmaceutical Activities	No	Yes	Yes	State "Safe Blood" Programme
Germany	Yes	Ministry of Health	Yes	Yes	Yes	
Ghana	Yes	Food and Drugs Authority	Yes	Yes	No	
Greece	Yes	National Blood Centre	Yes	Yes	Yes	ISO 17020
Grenada	—	—	—	—	—	—
Guatemala			Yes	Yes	No	
Guinea	No		No	Yes	…	
Guinea-Bissau	…		…	…	…	
Guyana			Yes	Yes	No	
Haiti			No	…	No	
Honduras			No	Yes	No	

[19] The blood establishment has ISO 9001:2015 certification. Blood establishment laboratories are in the process of obtaining ISO 15189:2022 certification.

[20] Danish Patient Safety Authority (blood establishments and blood components), Danish Medicines Agency (medicines, including PDMPs).

[21] The national centre in Addis Ababa was certified at Level 2 by AfSBT in 2019.

[22] Testing according to EN ISO 17025 and ISO 15189 by national accreditation body FINAS. European Federation for Immunogenetics (EFI) accreditation for HLA testing.

[23] The blood establishment sites are authorized for their activities by the National Agency for the Safety of Medicines and Health Products and are regularly inspected. Laboratories for immunohaematology testing are accredited by the French Accreditation Committee (Cofrac) and authorized by the competent regional health agency.

Country	Existence of national regulatory authority for blood establishments	Name of national regulatory authority	Regular inspection of blood establishments	Licensing of blood establishments	Blood establishment accreditation	Accreditation programmes
Hungary	Yes	National Centre for Public Health and Pharmacy	Yes	Yes	No	
Iceland	Yes	Icelandic Medicines Agency	Yes	Yes	No	
India	Yes		Yes	Yes	Yes	
Indonesia	Yes	Indonesian Food and Drug Authority	Yes	Yes	Yes	GMP[24]
Iran (Islamic Republic of)	Yes		Yes	Yes	Yes	
Iraq	Yes	Ministry of Health	Yes	Yes	Yes	Ministry of Health
Ireland	—	—	—	—	—	—
Israel	—	—	—	—	—	—
Italy	Yes	Italian National Blood Centre	…	Yes	Yes	
Jamaica	—	—	—	—	—	—
Japan	Yes	Pharmaceuticals and Medical Devices Agency[25]	Yes	Yes	Yes[26]	
Jordan[a]			Yes	Yes	No	
Kazakhstan	Yes	Ministry of Health	Yes	Yes	Yes	National accreditation for health care institutions[27]
Kenya	Yes	Pharmacy and Poisons Board	No	No	Yes	ISO 15189
Kiribati	No		Yes	No	No	
Kuwait	Yes	Central Medical Stores	Yes	No	Yes[28]	
Kyrgyzstan	Yes	Republican Blood Centre[29]	Yes	No	No	
Lao People's Democratic Republic	Yes	National Blood Transfusion Committee	Yes	No	No	
Latvia	Yes	State Agency of Medicines	Yes	Yes	Yes	
Lebanon	No		Yes	Yes	No	
Lesotho	No		No	No	No	
Liberia[a]			No	No	No	
Libya	Yes	National Blood Transfusion Authority	No	Yes	No	
Lithuania	—	—	—	—	—	—
Luxembourg	Yes	Health Directorate	Yes	Yes	Yes	ISO 15189, Good practice guidelines for blood establishments
Madagascar	No		No	Yes	No	
Malawi	No		No	No	Yes	AfSBT[30]
Malaysia	No		Yes	No	Yes	ISO 15189, GMP[31]
Maldives[a]			No	No	No	
Mali	No		No	No	No	
Malta	Yes	Department of Health Regulation of Malta	Yes	Yes	Yes	
Marshall Islands	—	—	—	—	—	—
Mauritania	No		No	Yes	Yes	ISO 9001:2015[32]
Mauritius	No		No	No	No	
Mexico			Yes	Yes	No	
Micronesia (Federated States of)[a]			No	No	No	
Monaco	—	—	—	—	—	—
Mongolia	Yes	National Centre of Transfusion Medicine, Ministry of Health	Yes	Yes	Yes	ISO 9001, ISO 15189, ISO 45001
Montenegro	Yes	Institute for Medicines and Medical Devices of Montenegro	Yes	…	No	

[24] GMP certification of blood establishments.

[25] Pharmaceuticals and Medical Devices Agency, Ministry of Health, Labour and Welfare.

[26] The Japanese Red Cross Society is the marketing authorization holder of blood components for transfusion and is also licensed by the government to collect blood and is the only entity in Japan that collects donated blood. Regional blood centres have permission to collect blood and to distribute blood components to medical institutions. "Block" blood centres have permission to manufacture blood components for transfusion and distribute them to regional blood centres.

[27] National accreditation for health care institutions providing blood services (Национальная аккредитация для организаций здравоохранения, осуществляющих деятельность в сфере службы крови).

[28] AABB accredited and College of American Pathologists proficiency.

[29] The Republican Blood Centre serves as the regulatory authority.

[30] Level 1 under AfSBT stepwise accreditation. Level 2 baseline assessment completed by AfSBT experts in December 2023.

[31] Malaysian Standard International Organization for Standardization (MS ISO 15189:2014) and GMP.

[32] National blood transfusion service is certified to ISO 9001: 2015 standards.

Country	Existence of national regulatory authority for blood establishments	Name of national regulatory authority	Regular inspection of blood establishments	Licensing of blood establishments	Blood establishment accreditation	Accreditation programmes
Morocco	Yes	Agency for Medicines and Health Products	No	No	No	
Mozambique	No		No	No	No	
Myanmar	No		No	No	No	
Namibia	No		Yes	Yes	Yes	AfSBT[33]
Nauru	—	—	—	—	—	—
Nepal	No		Yes	Yes	No	
Netherlands (Kingdom of the)	Yes	Health and Youth Care Inspectorate[34]	Yes	Yes	Yes[35]	
New Zealand	Yes	Medsafe[36]	Yes	Yes	Yes[37]	
Nicaragua[a]			No	…	Part	
Niger	Yes	Agency for Regulation of the Pharmaceutical Sector of Niger	Yes	Yes	No	
Nigeria	Yes	National Blood Service Agency, National Agency for Food and Drug Administration and Control	No	Yes	Yes	
Niue[a]			No	No	No	
North Macedonia	No		Yes	No	Yes	ISO 9001
Norway	Yes	Norwegian Medical Products Agency[38]	Yes	Yes	Yes	Norwegian Accreditation[39]
Oman	No		No	Yes	No	
Pakistan	No		Yes	Yes	No	
Palau	No		No	No	No	
Panama[a]			Yes	Yes	No	
Papua New Guinea	Yes[40]		Yes	Yes	No	
Paraguay			Yes	Yes	No	
Peru			Yes	…	No	
Philippines	Yes	Health Facilities and Services Regulatory Bureau	Yes	Yes	No	
Poland	Yes[41]		Yes	Yes	Yes	
Portugal	Yes	General Directorate of Health	Yes	Yes	No	
Qatar	No		Yes	Yes	Yes	Joint Commission International, College of American Pathologists, AABB international accreditation and Ministry of Public Health
Republic of Korea	Yes[42]		Yes	Yes	Yes[43]	
Republic of Moldova	Yes	The Ministry of Health	Yes	Yes	Yes	
Romania	Yes	Ministry of Health	Yes	Yes	No	
Russian Federation[a]			Yes	Yes	…	
Rwanda	Yes	Rwanda Foods and Drugs Authority	Yes	Yes	Yes	AfSBT[44]
Saint Kitts and Nevis[a]			…	…	No	
Saint Lucia			No	…	No	
Saint Vincent and the Grenadines[a]			No	No	No	
Samoa	No		No	No	No	
San MariNo	—	—	—	—	—	—
Sao Tome and Principe	No		No	No	No	
Saudi Arabia	—	—	—	—	—	—

[33] AfSBT stepwise accreditation at Level 3 since 2013.

[34] Health and Youth Care Inspectorate, Ministry of Health, Welfare and Sport.

[35] GxP, ISO norms (15189, 9001, 13485), Joint Accreditation Committee of the International Society for Cellular Therapy and European Society for Blood and Marrow Transplantation and others.

[36] Accredited by Medsafe, the New Zealand medicines regulatory authority.

[37] Accredited by Medsafe, the New Zealand medicines regulatory authority.

[38] https://www.dmp.no/en.

[39] https://www.akkreditert.no/.

[40] The Health Department through the National Health Services Standards under the Health Compliance Standards Wing.

[41] Ministry of Health, Institute of Haematology and Transfusion Medicine, National Blood Centre.

[42] Ministry of Health and Welfare, Ministry of Food and Drug Safety and others.

[43] Ministry of Food and Drug Safety, ISO, Korean Association of Quality Assurance for Clinical Laboratory, Korean Laboratory Accreditation Programme, College of American Pathologists, National Serology Refenrece Laboratory (NRL) and others.

[44] AfSBT stepwise accreditation at Level 3.

Country	Existence of national regulatory authority for blood establishments	Name of national regulatory authority	Regular inspection of blood establishments	Licensing of blood establishments	Blood establishment accreditation	Accreditation programmes
Senegal	…	…	…	…	…	
Serbia	…		Yes	Yes	…	
Seychelles	No		No	No	No	
Sierra Leone	—	—	—	—	—	—
Singapore	Yes	Ministry of Health	Yes	Yes	Yes	AABB international accreditation
Slovakia	Yes	Ministry of Health	Yes	Yes	Yes[45]	
Slovenia	—	—	—	—	—	—
Solomon Islands	—		—	—	—	
Somalia	—	—	—	—	—	—
South Africa	No		Yes	Yes	Yes[46]	
South Sudan[a]			No	No	No	
Spain	Yes	Division for Blood, Blood Components, Reproductive Cells and Tissues, Directorate General for Public Health and Health Equity, Ministry of Health	Yes	Yes	Yes	ISO 9001: 2005, ISO 15189: 2013, ISO 14001
Sri Lanka	Yes[47]		Yes	No	Yes	ISO 15189
Sudan	—	—	—	—	—	—
Suriname			No	Yes	No	
Sweden	Yes	National Board of Social Affairs and Health[48]	Yes	Yes	Yes[49]	
Switzerland	Yes	Swissmedic	Yes	Yes	Yes	ISO 17025, ISO 9001
Syrian Arab Republic	No		Yes	Yes	No	
Tajikistan	Yes	Ministry of Health	Yes	Yes	No	
Thailand	No		Yes	Yes	Yes[50]	
Timor-Leste	No		No	No	No	
Togo	Yes		No	No	No	
Tonga	No		Yes	No	No	
Trinidad and Tobago			No	No	No	
Tunisia	Yes	Central Unit for Blood Transfusion and Blood Banks[51]	…	Yes	…	
Türkiye	Yes	Department of Blood and Blood Products, Ministry of Health	Yes	Yes	No	
Turkmenistan	Yes	Ministry of Health	Yes	No	No	
Tuvalu	—	—	—	—	—	—
Uganda	Yes	National Drug Authority	Yes	Yes	Yes	AfSBT[52]
Ukraine	—	—	—	—	—	—
United Arab Emirates	Yes[53]		Yes	Yes	Yes	AABB international accreditation
United Kingdom	Yes	Medicines and Healthcare products Regulatory Agency (MHRA)	Yes	Yes	Yes	
United Republic of Tanzania	No		No	No	Yes	AfSBT
United States of America	Yes	U.S. Food and Drug Administration	Yes	Yes	Yes[54]	
Uruguay			…	Yes	…	
Uzbekistan	—	—	—	—	—	—
Vanuatu	—	—	—	—	—	—
Venezuela (Bolivarian Republic of)			Yes	…	No	
Viet Nam	…		Yes	…	…	

[45] The State Institute for Drug Control performs audits and delivers a certificate of good practice of preparation of transfusion medicines.

[46] Accreditation is carried out by the South African National Accreditation System on an operational unit basis and includes donor clinics, blood banks, donation testing laboratories, processing centres and all other relevant laboratories.

[47] National Medicinal Regulatory Authority, Private Health Sector Regulatory Council.

[48] National Board of Social Affairs and Health and Swedish Medicines Agency.

[49] SWEDAC ISO 15189 for clinical laboratories (blood grouping and screening tests).

[50] In Thailand, hospital blood centres are required to be certified under the Hospital Accreditation programme by the Healthcare Accreditation Institute. The Hospital Accreditation programme also mandates laboratory accreditation from either the Royal College of Pathologists or the Medical Technology Council. The National Blood Centre holds ISO 9001, ISO 15189, ISO 15190, Hospital Accreditation laboratory accreditation and GMP certification.

[51] Central Unit for Blood Transfusion and Blood Banks (Unité centrale de transfusion sanguine et des banques de sang).

[52] Uganda adheres to AfSBT standards, is currently certified at Level 2 and is working toward achieving full accreditation at Step 3.

[53] Emirates Drugs Establishment and Ministry of Health and Prevention.

[54] Some transfusion services are accredited by the Joint Commission, AABB or the College of American Pathologists.

Country	Existence of national regulatory authority for blood establishments	Name of national regulatory authority	Regular inspection of blood establishments	Licensing of blood establishments	Blood establishment accreditation	Accreditation programmes
Yemen	No		No	Yes	No	
Zambia	Yes	Zambia Medicines Regulatory Authority	Yes	No	Yes	AfSBT Level 2
Zimbabwe	No		Yes	No	No	

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