This open-access article is distributed under Creative Commons licence CC-BY-NC 4.0.

Evaluation of paediatric platelet product use in South Africa, 2014 - 2021

L Bolton,[1,2] BSc, PhD; **R Swanevelder,**[3] BCom, MSc; **P-L Wessels,**[4] MB ChB, PG Dip Transfusion Med; **T N Glatt,**[3,5,6] MB BCh, MMed (Haematology), FCPath (Haematology); **C Barrett,**[7] MB ChB, MMed (Internal Medicine); **K van den Berg,**[3,8,9] MB ChB, PhD

[1] *South African Centre for Epidemiological Modelling and Analysis (SACEMA), Centre for Epidemic Response and Innovation (CERI), School for Data Science and Computational Thinking, Stellenbosch University, Cape Town, South Africa*
[2] *Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa*
[3] *Medical Division, South African National Blood Service, Roodepoort, South Africa*
[4] *Patient Blood Management and Transfusion Medicine, South African National Blood Service, Roodepoort, South Africa*
[5] *Department of Human Anatomy and Physiology, Faculty of Health Sciences, University of Johannesburg, South Africa*
[6] *Department of Molecular Medicine and Haematology, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa*
[7] *Research and Development Unit, School of Clinical Medicine, Faculty of Health Sciences, University of the Free State, Bloemfontein, South Africa*
[8] *Division of Clinical Haematology, Department of Internal Medicine, Faculty of Health Sciences, University of the Free State, Bloemfontein, South Africa*
[9] *Division of Clinical Haematology, Department of Medicine, Faculty of Health Sciences, University of Cape Town, South Africa*

Corresponding author: *L Bolton (lbolton@sun.ac.za)*

This in practice article aims to report on the evolution of paediatric platelet transfusions between the public and private healthcare sectors, highlighting challenges in practice standardisation, to stimulate discussion ahead of the potential restructuring of the healthcare system. Although platelet collection and transfusion practices are largely focused on adult patients, platelet transfusion remains a critical component of paediatric care. Despite the publication of numerous recommendations and guidelines for paediatric platelet transfusions, platelet thresholds for transfusion are largely lacking, leading to the implementation of adult guidelines. In resource-constrained settings, the use of standardised, evidence-based guidelines is essential to optimise patient outcomes and support equitable allocation of limited blood resources.

Keywords: paediatric platelets, blood component utilisation, healthcare systems, healthcare policy, transfusion guidelines

S Afr Med J 2026;116(8):e4310. https://doi.org/10.7196/SAMJ.2026.v116i8.4310

The South African National Blood Service (SANBS) is South Africa (SA)'s largest transfusion service, operating from 185 sites in eight provinces. SANBS collects, tests, processes and distributes quality-assured blood products and services equitably to ~53.4 million (or 88.1% of) South Africans across the public and private healthcare sectors.[1,2] In 2022, 28.6% of the population in the SANBS operational zones were children aged <15 years, with 0 - 4, 5 - 9 and 10 - 14-year-olds each contributing just over 9%.[2]

Platelet products used in clinical practice can be broadly classified into two categories: whole blood-derived pooled platelets (hereafter referred to as pooled platelets); and apheresis platelets. The indications for each are largely influenced by the patient's age, clinical indication and clinician preference. Compared with pooled platelets, produced from the buffy coats of five donors,[3] apheresis products are obtained from a single donor via plateletpheresis, increasing the cost of collection and production of these platelets.[4] Apheresis platelets are routinely leucodepleted and are available as adult and paediatric units. The SA guidelines for paediatric platelet transfusions recommend that paediatric platelet products should be produced from single-donor apheresis platelets.[3] In many clinical settings, paediatric platelet units are preferentially used in children to allow weight-based dosing and minimise volume overload; institutional practice often defaults to paediatric units for patients below ~30 - 40 kg, with adult units used for larger children and adolescents.

With a general viability of only 5 days,[5] platelet products must be carefully managed to ensure sufficient supply to patients with clinical indications for these products. More specialised products are largely provided as needed, allowing for the efficient allocation of resources.

Although platelet collection and transfusion practices are largely focused on adult patients, platelet transfusion remains a critical component of paediatric care. Platelet use in the paediatric population may be classified as 'therapeutic' to treat bleeding, or 'prophylactic' to prevent bleeding.[3] In general, the indications for paediatric platelet transfusions are similar to those for adults. However, specific indications in paediatric cases include intrauterine transfusions and neonatal thrombocytopenia.[6] Apheresis platelet transfusions in children are often indicated for patients with, among other conditions, aplastic anaemia and acute leukaemia, or those undergoing stem cell transplantation, and are preferred to minimise the risks associated with exposure to multiple donors and multiple transfusions.[3,7]

Specialised healthcare providers, such as the SANBS, are preparing for anticipated restructuring within the national healthcare system. In this context, a clear understanding of current trends in blood product utilisation among adult and paediatric populations is required.

This in practice article reports on trends in paediatric platelet transfusion practices across the public and private healthcare sectors over an 8-year period, highlighting challenges related to practice standardisation and identifying areas for discussion and future research within SA's evolving healthcare landscape.

Recent research

The results reported hereafter follow previous analyses of adult platelet product utilisation between 1 January 2014 and 31 December 2021.[8] Therefore, all data considerations outlined therein, as well as the references specified within, are applicable for this analysis.[8] Age was analysed in 1-year increments. Neonates were therefore included in the 0-year-old category, representing children between 0 and 1 year of age. Paediatric recipients were defined as individuals aged ≤15 years.

A distinction was made between adult and paediatric products within this investigation. Each requisition for blood products contained within the extract is uniquely identifiable. These requisitions contain patient (age, sex, indication, clinical domain, hospital, etc.) and platelet product (type of product, number of units, etc.) data.

Adult platelet product use in paediatric recipients

Of the 445 803 units of adult platelet products issued,[8] 64 824 (14.5%) were issued to recipients aged ≤15 years, comprising 47 400 units (73.1%) within the public sector and 17 424 units (26.9%) in the private sector (Table 1). The recipients were predominantly male in both sectors (52.0% in the public and 52.9% in the private sector), with median (interquartile range) ages of 7 (3 - 11) years in the public and 2 - 12 years in the private sector).

Apheresis platelets comprised the majority of the 64 824 platelet units issued (47653 units; 73.5%). However, 4 283 units of pooled platelets, or 6.6% of the total adult units issued to paediatric patients, were issued to 0 - 4-year-olds within the public sector. In the same age group, 812 units of pooled platelets (1.3%) were issued within the private sector (Table 1). Notably, 1 412 (33%) and 385 (47.4%) units

Table 1. Adult platelet units issued to recipients aged ≤15 years in the South African public and private healthcare sectors, 2014 - 2021, by age group and platelet product

		Platelet product units issued, *n* (%)		
Age group, years	**Sector**	**Apheresis***	**Pooled***	**Total†**
0 - 4	Public	10 438 (70.9)	4 283 (29.1)	14 721 (22.7)
	Private	4 940 (85.9)	812 (14.1)	5 752 (8.9)
5 - 9	Public	9 993 (70.9)	4 099 (29.1)	14 092 (21.7)
	Private	3 705 (87.6)	526 (12.4)	4 231 (6.5)
10 - 15	Public	12 659 (68.1)	5 928 (31.9)	18 587 (28.7)
	Private	5 918 (79.5)	1 523 (20.5)	7 441 (11.5)
Total		47 653 (73.5)	17 171 (26.5)	64 824

*Percentages indicate the platelet product units issued within each age group and healthcare sector. For example, apheresis (%) for 0 - 4-year-olds within the public sector = (number of apheresis units issued to the 0-4 years age group within the public sector/total units issued to the 0 - 4-year age group across both sectors) × 100.
†Percentages indicate the total platelet units issued within each age group and healthcare sector. For example, total *n* (%) for 0 - 4-year-olds within the public sector = (number of total units issued to the 0 - 4-year age group within the public sector/64 824) × 100.

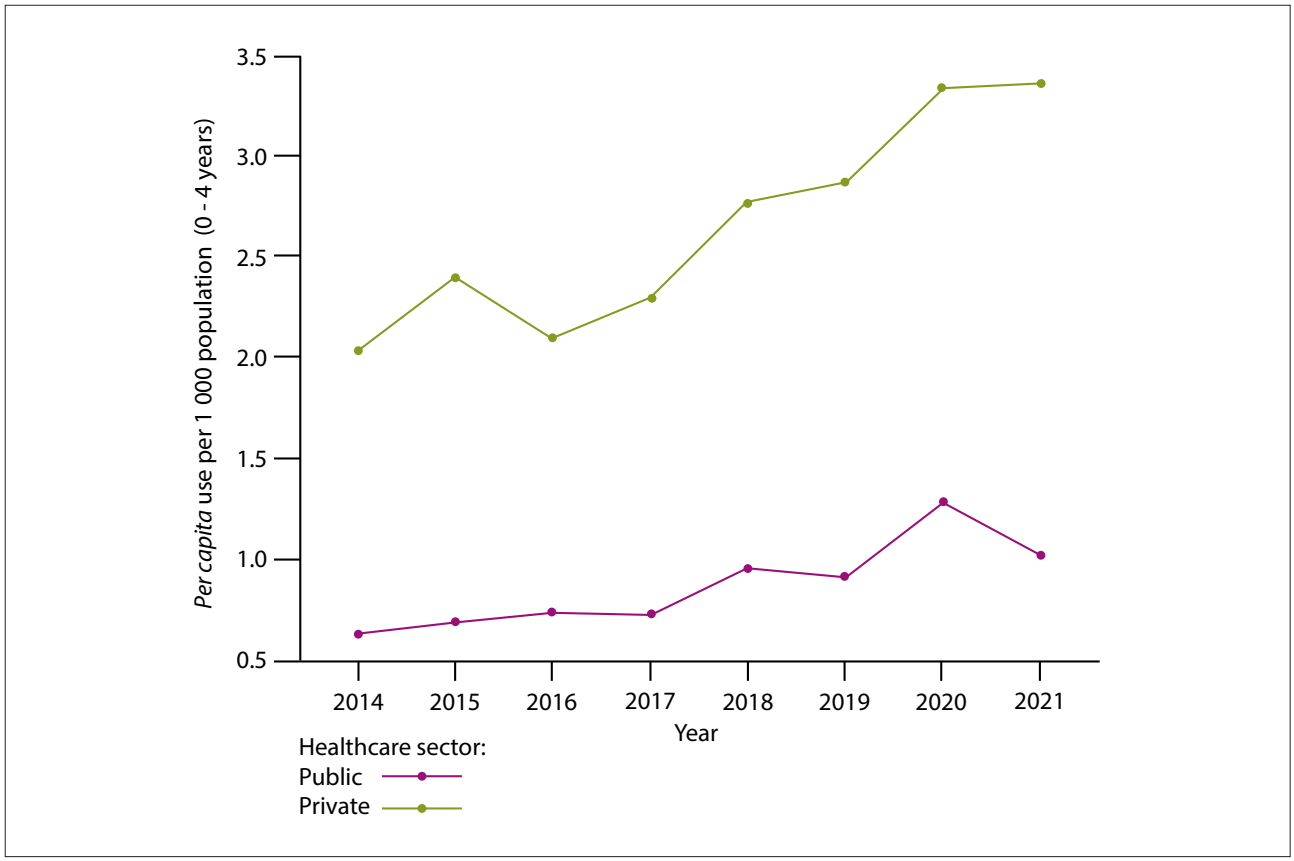


Fig. 1. Trend in per capita *paediatric platelet use in 0 - 4-year-olds in the South African public and private healthcare sectors between 2014 and 2021*

Table 2. *Per capita* paediatric platelet use in 0 - 4-year-olds in the South African public and private healthcare sectors, 2014 - 2021[9-16]*

	Public sector			Private sector		
Year	Platelet units issued, *n*	Estimated sector population (millions)	*Per capita* use per 1 000 population	Platelet units issued, *n*	Estimated sector population (millions)	*Per capita* use per 1 000 population
2014	2 812	4.48	0.63	1 408	0.69	2.03
2015	3 141	4.53	0.69	1 581	0.66	2.39
2016	3 311	4.50	0.74	1 436	0.69	2.09
2017	3 314	4.55	0.73	1 512	0.66	2.29
2018	4 102	4.33	0.95	1 734	0.63	2.76
2019	4 167	4.58	0.91	2 035	0.71	2.86
2020	6 005	4.70	1.28	1 874	0.56	3.33
2021	4 743	4.64	1.02	2 149	0.64	3.35
Average	3 949	4.54	0.87	1 716	0.66	2.62

*Utilisation figures and population estimates exclude the Western Cape Province.

of the latter pooled platelets were issued to patients <1 year old within the public and private sectors, respectively. This trend in pooled platelet use decreased over the 8-year period.

Per capita paediatric platelet product use

Per capita paediatric platelet use within the 0 - 4-year age group increased across healthcare sectors between 2014 and 2021 (Fig. 1). On average, the private healthcare sector *per capita* use was three times that of the public healthcare sector (2.62 units/1 000 in the private sector v. 0.87 units/1 000 in the public sector) (Table 2).

Discussion

Paediatric patient groups have varying platelet transfusion needs.[17] Several paediatric platelet transfusion guidelines have been published, but lack supporting evidence related to platelet thresholds for transfusion, often leading to default use of adult guidelines.[3] Any treatment decision should be evidence-based and clinically appropriate in terms of type, time and dose. It should ideally promote the best clinical outcome for the patient, without bringing harm or risk to the greater population. Use of adult platelet units in paediatric patients, where the required increment does not warrant it, raises ethical concerns regarding stewardship, equity and distributive justice – more so in a resource-constrained setting. Given that a single-donor apheresis platelet unit, when appropriately aliquoted at the time of processing, can meet the transfusion needs of multiple patients, careful consideration of adult unit use in smaller children is essential. While exact weight thresholds are not nationally defined, judicious use in children weighing <30 - 40 kg can help minimise avoidable wastage of scarce resources, promote cost-effective care and potentially reduce transfusion-related complications, such as volume overload. To enhance consistency and resource stewardship in paediatric transfusion practice, future SA transfusion guideline editions could be updated to explicitly recommend the use of paediatric platelet units for children weighing approximately <30 - 40 kg, in addition to the existing weight-based dosing guidance. Such a refinement would support standardisation across institutions, reduce avoidable wastage of scarce blood resources and mitigate transfusion-related volume complications.

Conclusion

Both the public and private sectors have shown an increase in *per capita* paediatric platelet usage during the study period. However, this increase was greater in the private sector than the public sector. This likely reflects linked contributors, such as differences in disease profiles, population characteristics and transfusion practices.[8] Potential mitigation measures that could contribute to more standardised approaches include providing more comprehensive transfusion training to clinical practitioners, and providing a deeper level of oversight through transfusion committees.[18] Additional contributors to the observed disparities could include differences in access to specialised services, including paediatric surgery, cardiothoracic surgery, paediatric oncology and haematology, haematopietic stem cell and solid organ transplants, all of which may require multiple platelet transfusions over the treatment period. In resource-constrained settings, following standardised, evidence-based guidelines is critical to ensure optimal patient outcomes while supporting the equitable use of limited and costly blood resources. Although we appreciate differences between sectors ranging from general to specialised access, further investigation into the role that these practices play in the disparities in utilisation may be of significant benefit to those central to the restructuring of the healthcare system. By highlighting the challenges in practice standardisation and the gains made over the last 8 years in paediatric platelet transfusion, this in practice article presents a platform to bring about timely discourse and discussion for equitable and sustainable paediatric transfusions in light of the planned restructure of the healthcare system.

Ethical approval. The human research ethics committees (HRECs) of SANBS (ref. no. 2017/7) and Stellenbosch University (ref. no. N18/10/128_RECIP_SANBS_2017/7) approved this study.

Data availability. Anonymised data and analysis code will only be made available once the data request and study protocol have been approved by the SANBS human research ethics committee (HREC) and all interested parties have concluded a non-disclosure agreement.

Acknowledgements. This work is based on research supported by the SA National Research Foundation (NRF). Any opinion, finding and conclusion or recommendation expressed in this material is that of the authors, and the NRF does not accept any liability in this regard.

Author contributions. LB: conceptualisation, data curation, formal analysis, investigation, methodology, software, validation, visualisation, writing – original, writing – review, and editing. RS: conceptualisation, supervision, methodology, writing – review, and editing. TG: specialist commentary, writing – review, and editing. PLW: clinical supervision, clinical analysis, and writing – review. KvdB: conceptualisation,

supervision, project administration, writing – review, and editing. CB: specialist commentary, writing – review, and editing.

Funding. The SACEMA was supported by the SA Department of Science and Innovation and the NRF for the duration of this research (LB). KvdB, RS, TG and PLW are employees of the SANBS, which also supported LB. KvdB is supported in part by the US National Institutes of Health, Fogarty International Center (grant D43-TW010345).

Conflicts of interest. None.

AI contribution. The authors confirm that no artificial intelligence-assisted technologies have been used in the production of this work.

1. South African National Blood Service. The South African National Blood Service integrated report 2023. Johannesburg: SANBS, 2023. https://sanbs.org.za/annual-reports/ (accessed 22 January 2024).
2. Statistics South Africa. Mid-year population estimates 2022. Pretoria: Stats SA, 2022. https://www.statssa.gov.za/?page_id=1854&PPN=P0302&SCH=73305 (accessed 15 March 2023).
3. Western Cape Blood Service, South African National Blood Service. Clinical Guidelines for the Use of Blood and Blood Products in South Africa. 6th ed. WCBS, SANBS, 2023. https://www.wcbs.org.za/2023/12/07/6th-edition-of-the-clinical-guidelines-for-the-use-of-blood-products-in-south-africa-released/ (accessed 14 April 2025).
4. South African National Blood Service. Change a Life. Johannesburg: SANBS, 2022. https://sanbs.org.za/change-a-life/ (accessed 24 January 2024).
5. Aubron C, Flint AWJ, Ozier Y, McQuilten Z. Platelet storage duration and its clinical and transfusion outcomes: A systematic review. Crit Care 2018;22(1):185. https://doi.org/10.1186/s13054-018-2114-x
6. Stanworth SJ, New HV, Apelseth TO, et al. Effects of the COVID-19 pandemic on supply and use of blood for transfusion. Lancet Haematol 2020;7(10):e756-e764. https://doi.org/10.1016/S2352-3026(20)30186-1
7. Hamid GA. Transfusion medicine. In: Hamid GA (ed.). Academia.edu: Clinical Hematolology. 2013:202-215. https://doi.org/10.13140/RG.2.1.1477.1683
8. Bolton L, Swanevelder R, Wessels PL, Pulliam JRC, van den Berg K. A critical analysis of adult platelet product utilisation in South Africa, 2014 - 2021. S Afr Med J 2025;115(3):e2467. https://doi.org/10.7196/SAMJ.2025.v115i3.2467
9. Statistics South Africa. General Household Survey 2014. Pretoria: Stats SA, 2014:1-173. https://www.statssa.gov.za/publications/P0318/P03182014.pdf (accessed 7 November 2022).
10. Statistics South Africa. General Household Survey 2015. Pretoria: Stats SA, 2015. https://www.statssa.gov.za/publications/P0318/P03182015.pdf (accessed 7 November 2022).
11. Statistics South Africa. General Household Survey 2016. Pretoria: Stats SA, 2016. https://www.statssa.gov.za/publications/P0318/P03182016.pdf (accessed 7 November 2022).
12. Statistics South Africa. General Household Survey 2017. Pretoria: Stats SA, 2017. https://www.statssa.gov.za/publications/P0318/P03182017.pdf (accessed 7 November 2022).
13. Statistics South Africa. General Household Survey 2018. Pretoria: Stats SA, 2018. https://www.statssa.gov.za/publications/P0318/P03182018.pdf (7 November 2022).
14. Statistics South Africa. General Household Survey 2019. Pretoria: Stats SA, 2019. https://www.statssa.gov.za/publications/P0318/P03182019.pdf (accessed 13 April 2023).
15. Statistics South Africa. General Household Survey 2020. Pretoria: Stats SA, 2021 https://www.statssa.gov.za/publications/P0318/P03182020.pdf (accessed 14 February 2023).
16. Statistics South Africa. General Household Survey 2021. Pretoria: Stats SA, 2022. https://www.statssa.gov.za/publications/P0318/P03182021.pdf (accessed 14 February 2023).
17. New HV, Berryman J, Bolton-Maggs PHB, et al. Guidelines on transfusion for fetuses, neonates and older children. Br J Haematol 2016;175(5):784-828. https://doi.org/10.1111/bjh.14233
18. Bolton L, van den Berg K, Swanevelder R, Pulliam JR. Characterizing differences in red blood cell usage patterns between healthcare sectors in South Africa, 2014 - 2019. Blood Transfus 2021;20(4):299-309. https://doi.org/10.245/20210209-21

Received 7 October 2025; accepted 12 January 2026.