



ARTIGOS PRODUÇÃO CIENTÍFICA HEMOMINAS - 2026

15. Long-term temporal trends in hepatitis B and C among blood donors in Brazil: Prevalence, incidence, and demographic correlates from the REDS multicenter program

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Abstract: *Background:* Viral hepatitis remains a major public health challenge. We evaluated long-term trends in hepatitis B virus (HBV) and hepatitis C virus (HCV) prevalence, incidence, and force of infection (FOI) among blood donors from five Brazilian blood centers and investigated associated demographic factors.

Study design and methods: Data from the NHLBI Recipient Epidemiology and Donor Evaluation Study program were analyzed. Prevalence was estimated among 2,062,816 first-time donors for HBV (2008-2023) and 1,673,745 for HCV (2012-2023). Incidence was estimated among 1,346,256 repeat donors for HBV and 1,151,209 for HCV. Active HBV infection was defined by reactive HBsAg and anti-HBc or reactive HBV nucleic acid testing (NAT), and active HCV infection by reactive NAT. Historical FOI was estimated using a Bayesian serocatalytic model.

Results: Active infection prevalence was 136.2 per 100,000 donors (95% CI, 131.2-141.3) for HBV and 57.4 (95% CI, 53.8-61.1) for HCV. Incidence rates were 3.54 (95% CI, 3.01-4.11) and 3.99 (95% CI, 3.33-4.72) per 100,000 person-years, respectively. Prevalence decreased annually by 7.6% for HBV and 11.0% for HCV. Higher prevalence and incidence were associated with male sex, older age, lower educational attainment, and Black or mixed-race skin color. Regional differences persisted, and FOI declined markedly for both infections.

Discussion: HBV and HCV prevalence, incidence, and FOI declined substantially among Brazilian blood donors, suggesting reduced transmission, although improved donor selection and screening may also have contributed. Persistent demographic and regional disparities support continued surveillance and targeted prevention.

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14. Socio-Economic and Education Profile of Children With Haemophilia A Receiving Prophylaxis and Their Families: Results From a Brazilian Cohort

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13. Outcomes of hemophilia A in children under primary and secondary prophylaxis: results from the HEMFIL Cohort Study

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Abstract: *Background:* Early prophylaxis reduces the risk of joint damage in children with hemophilia A (CwHA). Long-term comparative data on bleeding outcomes and joint health in CwHA under primary prophylaxis (PP) and secondary prophylaxis (SP) remain limited. *Methods:* This prospective cohort study enrolled previously untreated or minimally treated

(<0.02 IU/mL). Patients were followed until 75 exposure days or inhibitor development. Annual bleeding rate (ABR) and annual joint bleeding rate (AjBR) were evaluated before and after prophylaxis initiation. Joint status was assessed once, at a median patient age of 8.4 years, using the Haemophilia Early Arthropathy Detection with Ultrasound and the Haemophilia Joint Health Score.

Results: A total of 43 children were included (PP, n = 23; SP, n = 20). Children receiving PP were younger at diagnosis and prophylaxis initiation. Before prophylaxis initiation, PP was associated with higher median ABR (8.5 vs 5.3; P = 0.014) and lower AjBR (0.6 vs 2.0; P=.006) vs SP, respectively. After prophylaxis initiation, ABR declined in both groups, with a greater reduction in SP (P=.016), while AjBR was comparable between the groups. Multivariable analysis showed that earlier diagnosis of hemophilia A and younger age at first joint bleeding were associated with a more severe bleeding phenotype. Ultrasound of 252 joints showed mild synovial hyper trophy in 35.7%; bone damage was uncommon and observed exclusively in SP.

Conclusion: In this study, CwHA receiving PP appeared to have a more severe bleeding phenotype compared with those on SP. However, this requires confirmation in future studies. Long-term joint outcomes were generally mild.

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CiteScore: 4.7

12. Microbial diversity in leg ulcer and skin in Sickle Cell disease

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Abstract: *Introduction:* Leg ulcers are a common, painful, and difficult-to-treat complication of sickle cell disease due to their prolonged healing process. The microbial composition of these wounds remains poorly understood. This study investigated the microbiota diversity in sickle cell disease leg ulcers and associations with laboratory parameters.

Methods: Samples were collected from leg ulcers, intact skin adjacent to the ulcers, and intact skin from healthy controls. Microbiome profiling was performed by sequencing the V4 region of the 16S ribosomal RNA (rRNA) gene. The laboratory results of patients with sickle

cell disease leg ulcers were analyzed alongside the identified taxa using correlation-based analyses.

Results: Microbial diversity was significantly lower in sickle cell disease leg ulcers compared to intact skin. Additionally, leukocytes and mean corpuscular volume were statistically associated with the relative abundance of bacteria of the genera *Pseudomonas* and *Aeromonas*. *Staphylococcus* spp. was the predominant genus identified in leg ulcers and was negatively associated with *Pseudomonas* spp., reflecting a dysbiotic microbial profile characterized by taxa commonly associated with chronic wounds.

Conclusions: The observed associations between bacterial taxa and laboratory parameters are exploratory, do not imply causality, and contribute to the characterization of the microbial ecology of sickle cell disease leg ulcers.

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11. Human genetics implicates a BACH2–NRF2 axis in fetal haemoglobin activation

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Abstract: Human genetic studies have identified key regulators of fetal haemoglobin (HbF) expression, including BCL11A, resulting in therapeutic advances¹⁻⁸. Yet the mechanisms by which HbF expression is activated remain incompletely understood⁹. Here we conduct a large multi-ancestry genome-wide association study of HbF levels in 28,279 individuals that identifies 91 conditionally independent associations across 12 genomic regions. In one previously uncharacterized associated region, the high-HbF-linked causal variant rs1010474-C reduces BACH2 expression and elevates HbF levels. Direct perturbation or inhibition of BACH2 likewise increases HbF expression. Mechanistically, BACH2 restrains activation of the HbF-encoding γ -globin genes, while loss of BACH2 enhances NRF2 chromatin occupancy and promotes the formation of activation foci at the γ -globin genes. Although BACH2 and NRF2 binding motifs in the γ -globin promoters overlap, they can be selectively edited to activate or repress γ -globin, respectively, and do so independently of BCL11A. These findings illustrate how human genetic variation continues to advance our understanding of therapeutically relevant regulatory mechanisms underlying HbF expression.

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10. Perfil das agências transfusionais e assistências hemoterápicas no Norte de Minas Gerais

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Resumo: *Introdução:* No Norte de Minas Gerais, as transfusões de sangue são realizadas em 44 hospitais de 24 municípios conveniados ao Hemocentro Regional de Montes Claros/Fundação Hemominas. Apesar dos avanços na área da hemoterapia, as práticas transfusionais ainda apresentam riscos, o que evidencia a necessidade de hemovigilância constante. A segurança transfusional está diretamente ligada à existência de procedimentos padronizados, equipes treinadas, comitês transfusionais atuantes, rigoroso controle de qualidade, gestão adequada dos equipamentos e correção de não conformidades. O objetivo deste estudo foi avaliar o perfil das Agências Transfusionais e das Assistências Hemoterápicas vinculadas ao Hemocentro Regional de Montes Claros.

Método: Trata-se de um estudo transversal, descritivo e quantitativo que analisou os registros das inspeções hospitalares realizadas nos anos de 2019 e 2022. Os aspectos considerados incluíram a caracterização do serviço, informações gerais, captação de doadores, procedimentos transfusionais, atuação das Comissões Transfusionais e garantia de qualidade.

Resultados: Em 2022, observou-se que 68,61% das transfusões ocorreram em Montes Claros. Concentrados de hemácias foram o hemocomponente mais utilizado (63%), seguidos por plaquetas (33%). As principais não conformidades incluíram falta de treinamento para a equipe hospitalar, preenchimento incompleto das solicitações de transfusão, protocolos desatualizados e ausência de validação dos equipamentos. A taxa de eventos adversos foi de 2,51 por 1.000 transfusões, sendo as reações febris não hemolíticas e alérgicas as mais frequentes.

Conclusão: Houve uma redução significativa nas não conformidades em 2022 em comparação a 2019, destacando a importância da educação continuada, da padronização de processos e de inspeções regulares para garantir a segurança transfusional e a qualidade dos serviços prestados.

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CiteScore: -----

9. Hematopoietic progenitor cell mobilization, collection, transportation, and infusion of fresh products

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Abstract: *Introduction:* The quality of the graft is a critical determinant of transplant success. *Methods:* Literature review and expert discussion. *Results:* In this review, we highlight the essential aspects of hematopoietic progenitor cell mobilization and collection, including apheresis and bone marrow harvest. We also discuss optimal cell dose and concentration, as well as key considerations for product labeling, transportation, and infusion of fresh cell therapy products. *Conclusion:* This document contains recommendations based on the best scientific evidence available at the time of its publication. We hope it proves useful in the daily operations of a bone marrow transplant unit.

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Impact Factor: -----

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8. HIV incidence and correlates of incident infection among Brazilian blood donors following adoption of individual donor assessment

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Abstract: *Background and objectives:* In 2020, Brazil implemented individual donor assessment (IDA), expanding eligibility to include individuals previously deferred, such as

men who have sex with men (MSM). We assessed human immunodeficiency virus (HIV) incidence and correlates of incident infection among blood donors following this policy change.

Materials and methods: We analysed donation data from five Brazilian blood centres from 2020 to 2024. Routine HIV screening included fourth-generation antigen/antibody (Ag/Ab) assays and nucleic acid testing (NAT). Additional testing (limiting antigen [LAg] avidity, viral load) was used to identify recent infections. Incidence was estimated separately for first-time donors (FTD) and repeat donors (RD), and multivariable Poisson regression was used to assess correlates of incident infection.

Results: Among 1.66 million screened donations, 2598 (0.16%) were HIV-reactive on routine screening. Residual serum was available for 74% (n = 1927), and following additional testing, 98 were classified as recent HIV infections. HIV incidence was higher among FTD (20.9/100,000 person-years) than RD (18.3/100,000). Higher incidence was observed among male and younger donors as well as those identifying as Black or multiracial (Pardo). Incidence varied between blood centres, with overall incidence stable across the study period. No increase in the residual risk (RR) of HIV transfusion-transmission was observed.

Conclusion: Our findings indicate that the adoption of IDA in Brazil did not change blood safety. HIV incidence remained stable, with varying HIV infection patterns reflecting known disparities in the epidemiology of HIV in Brazil.

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Impact Factor: 1.6

CiteScore: 3.2

7. Animated educational video for self-care in school-aged children with sickle cell anemia: Development and validation

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Abstract: This study was conducted to develop and validate an animated educational video focused on self-care for school-aged children with sickle cell anemia **METHODS:** This is a methodological study performed in a specialized hematology center in Brazil conducted in sequential stages: identification of informational needs through interviews with children; theoretical foundation; script and storyboard development; content validation by experts; video production; evaluation by the target audience; and final video adaptation. Content validity was analyzed using the content validity index (CVI) **RESULTS:** The video presented

high content validity indices, with an overall CVI of 0.99 in the expert evaluation and 1.00 in the target audience evaluation. The animation used accessible language and visual elements compatible with child development, favoring understanding of the disease and self-care practices CONCLUSION: The educational video proved to be a viable, methodologically rigorous, and appropriate educational technology to support health education and develop self-care in school-aged children with sickle cell anemia IMPLICATIONS FOR PRACTICE: Technology can be used by pediatric nurses and multidisciplinary teams to standardize guidelines, strengthen child-centered communication, and support management of sickle cell anemia in outpatient, hospital, and school settings.

DOI: [10.1016/j.pedn.2026.06.005](https://doi.org/10.1016/j.pedn.2026.06.005)

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6. Adherence to Clotting Factor Prophylaxis in Adolescent and Adult Males With Haemophilia

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Abstract: *Introduction:* Clotting factor prophylaxis remains the most prescribed standard-of-care treatment for people with haemophilia (PwH). Prophylaxis prevents bleeds, joint damage, and improves quality of life (QoL). Its success depends on treatment adherence, consisting of socioeconomic, behavioural, and disease- or therapy-related factors.

Aim: To identify determinants of clotting factor prophylaxis adherence among PwH followed at a Hemophilia Treatment Center (HTC) in Brazil.

Methods: A cross-sectional study was conducted at a Brazilian HTC in June-October/2022. Eligible participants were PwH A or B without inhibitors and on clotting factor prophylaxis, aged ≥ 14 years. Demographic, clinical, and therapeutic data were collected from records and interviews. Health-related QoL was assessed by the SF-36 questionnaire. Adherence was assessed using the Brazilian validated Validated Hemophilia Regimen Treatment Adherence Scale-Prophylaxis (VERITAS-Pro) questionnaire.

Results: Among 78 PwH (median age 30 years), 70 (90%) had severe haemophilia, 46 (59%) reported joint impairment, and 67 (86%) infused 3 times/week. Median SF-36 score was 70.3 (interquartile range [IQR] 57.3-83.3). Median VERITAS-Pro score was 44.0 (IQR 35.0-50.0), resulting in 70 (90%) adherent PwH. SF-36 score was not correlated with VERITAS-Pro. Clotting factor prophylaxis adherence was associated with having haemophilia A ($p = 0.012$) and infusing factor >2 times weekly ($p = 0.008$), and inversely correlated with prophylaxis

duration ($r = 0.317$ [weak clinical correlation]; $p = 0.005$), and directly correlated with SF-36 domain "Mental health" ($r = -0.304$ [weak clinical correlation]; $p = 0.007$).

Conclusion: The main factors determining adherence to clotting factor prophylaxis were having haemophilia A, receiving factor infusions more than twice weekly, having a shorter duration of prophylaxis, and good mental health.

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5. Corrigendum to 'Deleterious variants cluster in the A3 domain of factor VIII in people with severe hemophilia A and inhibitors': [Research and Practice in Thrombosis and Haemostasis Volume 9, Issue 6, August 2025, 103006]

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4. Laboratory and genetic characteristic associated with gallbladder-related outcomes in sickle cell disease in Brazil: results from the REDS-III multicenter cohort study

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Abstract: Sickle cell disease (SCD) is a hereditary disorder characterized by *HBB* variants, leading to chronic hemolytic anemia and vaso-occlusion. Hepatobiliary complications, including cholelithiasis, are common but underreported. This study investigated the rates and risk factors for cholelithiasis, cholecystitis, and cholecystectomy in a large Brazilian SCD cohort. Data from 2,778 individuals across six referral centers in the REDS-III Brazilian SCD cohort were analyzed. Clinical, laboratory, and genetic data were obtained retrospectively at enrollment and prospectively during follow-up. Gallbladder-related outcomes were assessed through medical records and imaging. Whole-genome sequencing was performed via the TOPMed program. Genome-wide association analyses used logistic mixed models adjusted for age, sex, genotype, and the first 10 principal components. Cholelithiasis, cholecystitis, and cholecystectomy occurred in 35.9%, 25.1%, and 10.6% of participants, respectively. Indirect bilirubin was consistently associated with all outcomes, while associations with other laboratory variables varied by genotype. Genetic analyses confirmed associations between UGT1A1 variants and bilirubin levels and identified genome-wide associations with cholecystectomy. Novel loci, including FER1L6, LRFN5, and SDK2, were also implicated. These findings indicate a high burden of gallbladder-related disease in Brazilian individuals with SCD and highlight both established and novel genetic pathways that may inform risk stratification and preventive strategies.

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3. Functional capacity in sickle cell disease: A pilot study with 1-minute sit-to-stand test

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Abstract: *Background:* Sickle cell disease, the most prevalent monogenic recessive genetic disorder in the world, is characterized by two main pathogenic mechanisms: vaso-occlusion and hemolysis. These characteristics lead to reduced tolerance to physical exertion and, consequently, a reduced functional capacity which can be assessed using the one-minute sit-to-stand test. Complications from sickle cell disease result in poor quality of life, increased absenteeism from school and work, and impaired social interaction.

Method: Between January 2023 and April 2024, a pilot cross-sectional study was conducted with sickle cell disease patients aged from 18 to 60 years. The one-minute sit-to-stand test, Borg's perceived exertion scale, and the SF-36 quality of life questionnaire were utilized. Patients were monitored during the test. The sample was dichotomized based on test performance and SF-36 scores. Furthermore, clinical and demographic variables were analyzed.

Main results: Fifty-eight individuals participated in the final analysis. The mean age was 29.84 ± 11.20 years; 55.1 % were men, and 79.3 % identified themselves as Black or mixed race. The most prevalent genotype was hemoglobin SS (67.2 %), and 77.5 % were taking Hydroxyurea. The group with a better performance in the one-minute sit-to-stand test showed better quality of life as assessed using the SF-36 questionnaire.

Conclusion: Functional capacity is a significant factor in the autonomy and quality of life of patients with sickle cell disease. The one-minute sit-to-stand test is a low-cost and easily applicable test, which can contribute to the assessment of functional capacity in the routine follow-up of these patients.

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2. Dengue, chikungunya and Zika virus surveillance in blood donors in Brazil, 2019-2021

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Abstract: *Background and objectives:* Arbovirus infections are a major public health concern in Brazil and an ongoing blood safety concern. Periodic outbreaks of such infections are common in the general population. This study aimed to establish the rates of dengue, chikungunya and Zika virus (DENV, CHIKV, ZIKV) RNAemia among blood donors at six public blood centres during the 2019-2020 and 2020-2021 outbreak seasons.

Materials and methods: Residual minipool samples from nucleic acid testing (NAT) screening for human immunodeficiency virus, hepatitis B virus and hepatitis C virus were further pooled to form pools of 18 donation samples and tested using a Grifols research-use-only triplex transcription-mediated amplification assay for DENV, CHIKV and ZIKV RNA to establish the rates of RNAemia and infection incidence. We used these rates and estimated the durations of RNAemia, juxtaposed with public health reporting of cases.

Results: A total of 5,616 minipools representing 101,088 donations were tested. During both outbreak seasons, the highest rates of DENV RNAemia were observed in Ribeirão Preto, at 122/100,000 donations (95% confidence interval [CI]: 66-224) and 100/100,000 (95% CI: 52-189), respectively, with DENV RNAemia also detected in São Paulo, Recife and Manaus in the 2019/2020 season and in the latter two during the 2020/2021 season. CHIKV RNAemia was detected in Recife and ZIKV RNAemia in Manaus during the 2020/2021 season. The estimated numbers of DENV, CHIKV and ZIKV RNAemic components released for transfusion over the study period were 338, 22 and 6, respectively.

Conclusion: Surveillance for arbovirus RNAemia in blood donors is a useful adjunct to public health surveillance, particularly when surveillance systems are under strain, and has implications for transfusion safety.

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1. Genomic ancestry, F8 variants, and immune tolerance in hemophilia A patients with inhibitors: exome sequencing insights

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