size <1,000 were excluded. A binomial normal (BN) random-effects model was applied to estimate prevalence and birth prevalence.

Results: Of 1,770 journal articles and 468 abstracts screened, 115 publications met the inclusion criteria for the SLR. Birth prevalence studies were mostly based on cases identified through newborn screening programs. The qualitative and quantitative data showed gaps in the published literature, with missing data on prevalence and/or birth prevalence from key countries and regions. Moreover, no accurate conclusions could be made for mortality/life expectancy, as the number of publications was sparse and the few identified studies were heterogeneous in terms of reporting of SCD genotypes, diagnosis criteria, and study settings. This lack of data requires more research to determine up-to-date and adequate prevention and screening strategies, targeting causes of SCD mortality.

Quantitative analyses on the global and regional prevalence and birth prevalence of SCD and SCT are shown in **Table 1**. If observing these parameters together in this SLR, to gain a comprehensive view, potential "hot spots" for SCD and SCT from high to low prevalence were Africa, Middle East, India, and South America/the Caribbean. Prevalence data for certain regions were inadequate to provide consistent results using the BN model in this SLR, demonstrating the need to scale up systematic data collection by registries, databases, and longitudinal studies.

Conclusion: This SLR provides more insight into the global epidemiology of SCD, confirming earlier studies of areas with a high prevalence. However, this SLR demonstrates that resources are needed for additional studies across regions to provide uniform data collection on prevalence and mortality, ensuring an increased SCD awareness among healthcare professionals and public health policy makers worldwide.

Prevalence

Region	No. of studies		Total studied population		Prevalence per 100,000 [95% CI]	
	SCD	SCT	SCD	SCT	SCD	SCT
Global	20	23	84,084,506	8,296,898	116 [55;246]	2,644 [1,308;5,274]
Africa	3	4	7,274	11,523	788 [316;1,951]	17,690 [14,149;21,891]
Europe	6	2	81,199,930	5,882,911	34 [10;116]	NA
India	6	9	430,952	472,154	128 [48;340]	2,193 [1,090;4,364]
Middle East	4	6	1,909,565	1,914,429	212 [64;698]	2,429 [934;6,167]
North America	–	–	–	–	NA	NA
South America/ the Caribbean	1	2	536,785	15,881	NA	NA

Birth prevalence

Region	No. of studies		Total studied population		Prevalence per 100,000 [95% CI]	
	SCD	SCT	SCD	SCT	SCD	SCT
Global	50	43	92,209,456	8,659,149	191 [120;303]	4,010 [2,686;5,946]
Africa	11	9	397,651	377,422	1,321 [1,041;1,674]	15,502 [12,618;18,901]
Europe	11	8	5,407,689	556,241	33 [20;54]	514 [336;787]
India	1	1	5,467	5,467	NA	NA
Middle East	5	4	598,718	559,778	218 [88;538]	2,429 [1,129;5,148]
North America	4	4	79,048,695	4,026,924	54 [25;117]	1,681 [923;3,043]
South America/ the Caribbean	18	17	6,751,236	3,133,317	201 [102;395]	4,344 [4,344;8,765]

Table 1. Global and regional prevalence and birth prevalence of sickle cell disease (SCD) and sickle cell trait (SCT). Within each region, the prevalence is estimated using a binomial normal model, which assumes a binomial distribution for the individual studies with a mean value drawn from a normal distribution for a regional/global value. A summary estimate is determined for each region with >2 studies. Regions with insufficient data to determine the (birth) prevalence are shown as not available (NA).

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5613401   SICKLE CELL DISEASE GENOMICS OF AFRICA (SICKLEGENAFRICA) NETWORK: QUALITATIVE INTERVIEW FINDINGS ON REASONS FOR REFUSAL OF BROAD CONSENT

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Background: Sickle Cell Disease Genomics of Africa (SickleGenAfrica) Network is a collaborative project to examine the overarching premise that genetic variation affects the body's defence against intravascular haemolysis and the development of organ damage in sickle cell disease. In addition, SickleGenAfrica employs community engagement to address fundamental ethical issues relating to genomics research, and this study focussed on broad consent incorporated in the process of informed consent.

Objectives: To identify the reasons why some SickleGenAfrica participants refused to provide broad consent for future use of their biological samples and information for other genomics research.

Methods: Qualitative research using one-on-one telephone interviews

Setting: SickleGenAfrica study sites in Nigeria and Tanzania

Participants: SickleGenAfrica site investigators based in Abuja, Kano, Lagos and Dar es Salaam study sites

Analysis: Inductive thematic analysis

Results: Overall, findings from the SickleGenAfrica project revealed that broad consent for future genomics research was obtained from all participants at two study sites in Accra and Kumasi (Ghana). Nonetheless, a small number of participants at four study sites in Nigeria and Tanzania refused broad consent stating reasons including concerns about confidentiality, unavailable updated information for future research, and lack of immediate benefits from genomic research. In addition, psychosocial factors such as gender differences, family dynamics with autonomous decision-making, and beliefs about possible spiritual uses of blood samples. Furthermore, insufficient information and limited understanding about genomics research emerged as reasons for refusal of broad consent.

Conclusions: Continuous education to address ethical issues in genomics research, culturally sensitive psychosocial interventions for participants, and recommendations from beneficiaries of genomics research are required to help obtain broad consent in Africa.

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5609968   REAL-WORLD PATIENT-REPORTED OUTCOMES AND WEARABLE METRIC CORRELATIONS: REMOTE DAILY MONITORING FOR EXPLORATION OF QUALITY OF LIFE IN SICKLE CELL DISEASE

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Background/Aims: Sickle Cell Disease (SCD) is a debilitating condition that lacks data on its natural history and quality of life (QoL) beyond limited snapshots through infrequent healthcare contacts. This lack of longitudinal targeted QoL measurement and understanding of the physiological factors that may influence it sees a need for more detail on the impacts key metrics have on patient outcomes. The core objective of this study was to generate real-world evidence tracking changes in live wearable metrics and patient QoL, to better characterise a baseline of key correlations in SCD.

Methods: Data was collected from 238 patients over 16 months, using a CE and FDA-cleared wearable (Withings ScanWatch) to automatically record metrics including sleep quality, activity, and heart rate. EQ-5D-5L and pain scores (0-10) were manually entered by patients via a digital patient-reported outcomes (PRO) portal, and a daily cohort average across each metric was calculated. Statistically significant correlations were analysed both at an overall day-to-day level and split by weekday vs. weekend to explore the potential impacts of activities such as work on sleep patterns. Patients provided informed e-consent to participate and for analysis of their de-identified data.

Results: Increasing daily EQ-5D-5L scores were found to correlate with increasing numbers of sleep disturbances (p=0.024) and decreasing pain scores (p<0.001). In turn, lower pain scores were associated with lower sleep heart rates (p<0.001) and wake-up durations (p<0.001), as well as lower active heart rates (p<0.001) and higher activity levels (p<0.001).

1a. Pain Score vs. EQ-5D, Sleep Heart Rate and Wake-up Duration   1b. Pain Score vs. Daily Number of Steps and Active Heart Rate
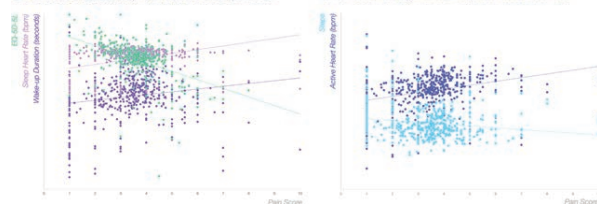
While sleep quality (sleep disturbances) appeared to show a contradictory increase with higher EQ-5D scores, the significance of this correlation was lost following a split by weekdays and weekends. Statistical significance was also lost for the link between pain scores and steps during the weekend, whereas an additional correlation between pain and total sleep duration (p=0.023) was found only during weekdays, and between pain and the number of sleep disturbances (p=0.033) during the weekend. Similarly, a correlation between EQ-5D and active heart rate (p=0.022), as well as duration to wakeup (p=0.017), was seen only during the weekend.

Summary-Conclusion: Analysis of putative associations between PROs and real-time metrics, as well as the potential influences of activities such as work, were shown by changes in significance both before and after

split by weekdays/weekends. Notably, lower EQ-5D scores were found to correlate with higher levels of pain, in turn linking to lower daily steps. With a correlating increase in both active and sleep heart rates despite these lower activity levels, this may indicate higher detectable stress correlating with increased pain, with paralleled impacts on QoL. As such, these metrics may form points of monitoring when identifying or predicting risks of pain and related complications in SCD patients. Future work will explore potential causality, differences across patient groups, and more granular detail of the impact of specific treatments or healthcare events. Additional investigation into changes at an individual patient level will be conducted to better characterise deviations from patients' own baselines. This will support ongoing work to improve the understanding of baselines in SCD, and what the key factors in pain and quality of life may be in order to support patient outcomes improvement.

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006 Ageing and End Organ Damage Abstracts

5554869 ASSOCIATION BETWEEN HEMOGLOBIN LEVELS AND END-ORGAN DAMAGE IN SICKLE CELL DISEASE: A RETROSPECTIVE LINKED PRIMARY AND SECONDARY CARE DATABASE ANALYSIS IN ENGLAND

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Background: Sickle cell disease (SCD) is a chronic, multifaceted blood disorder that affects the oxygen-carrying protein hemoglobin (Hb). Along with chronic hemolysis and vaso-occlusion that often accompanies SCD, low Hb levels may contribute to downstream end-organ damage (EOD). Emerging evidence suggests an association between chronic hemolytic anemia in SCD and both short-term and long-term adverse outcomes, including EOD. Therefore, treatments that directly increase Hb may improve patients' acute symptoms while reducing the risk for long-term disease-related effects known to contribute to morbidity and mortality.

Aims: This study aims to ascertain the association between Hb level variation and EOD and clinical conditions typically associated with SCD (stroke, pulmonary hypertension, chronic kidney disease [CKD], end-stage renal disease [ESRD], leg ulcers, and pneumonia) in a real-world data set.

Methods: The Clinical Practice Research Datalink (CPRD) and the Hospital Episode Statistics (HES) databases in England were used to retrospectively identify linked Hb data among patients with SCD (April 1, 2007, to March 31, 2019). Recurring results in any 90-day period were averaged. Logistic regression adjusted with demographic and clinical variables was used to determine odds ratios (ORs) of developing each EOD outcome or clinical complication. ORs, P values, 95% confidence intervals (CIs), and areas under the receiver operating curve (AUC-ROCs) and corresponding 95% CIs were reported.

Results: Of 11,936 patients identified, 5379 (45%) had Hb results recorded in the CPRD. The logistic model for risk assessment of all outcomes studied indicated that an increase in Hb among patients with SCD was associated with a statistically significant ($P<0.001$) decrease in adjusted ORs per 1 g/dL increase in Hb (Table). Except for ESRD, leg ulcers, and pneumonia, the adjusted models showed statistically significant increases in AUC-ROC compared with the unadjusted models, signifying that the adjusted models were more robust and further verified a statistical OR after adjustment.

Increased Hb was associated with decreased risk of respiratory-related events. Pulmonary hypertension had the strongest effect with the most robust model (ORadjusted of 0.66). For pneumonia, ORadjusted was 0.77. For renal insufficiency, ORs for developing CKD or ESRD were significantly lower than 1 (ORadjusted=0.73 and ORadjusted=0.75, respectively). After adjusting for clinical and demographic factors, the model predicted a lower risk for stroke (ORadjusted=0.89). The estimated AUC-ROCs suggest that the adjusted model is more robust in stroke, hypertension, and CKD. These findings did not change when testing for other covariates such as deep vein thrombosis.

Summary-Conclusion: Among patients with SCD, an increase in Hb of 1 g/dL was associated with a statistically significant reduction in risk for 6 common EOD outcomes and clinical conditions. The results were more pronounced after adjusting for demographic and clinical covariates (based on clinical opinion and literature review) and further assessed with a bivariate analysis. The results were obtained from a representative real-world evidence dataset analyzed over a 12-year period, which was sufficient to observe EOD events, and are generalizable to the UK and similar populations. Our findings support the use of therapeutics that increase Hb in patients with SCD to protect against deleterious organ damage.

Table. ORs for Risk Assessment of Clinical Conditions Based on a 1 g/dL Increase of Hb in Patients With SCD.

Conditions	Unadjusted					Adjusted				
	OR	95% CI (OR)	P value	AUC-ROC	95% CI (AUC-ROC)[a]	OR[b]	95% CI (OR)	P value	AUC-ROC	95% CI (AUC-ROC)
Stroke	0.99	0.95-1.05	0.949	0.54	0.53-0.55	0.89	0.84-0.95	<0.001	0.77	0.76-0.78
Pulmonary hypertension	0.74	0.72-0.77	<0.001	0.74	0.73-0.76	0.66	0.63-0.68	<0.001	0.84	0.82-0.85
CKD	0.96	0.94-0.98	<0.001	0.63	0.62-0.63	0.73	0.71-0.75	<0.001	0.79	0.78-0.80
ESRD	0.83	0.80-0.87	<0.001	0.77	0.76-0.78	0.75	0.70-0.79	<0.001	0.64	0.62-0.66
Leg ulcer	0.69	0.66-0.73	<0.001	0.69	0.68-0.71	0.60	0.56-0.63	<0.001	0.57	0.56-0.58
Pneumonia	0.79	0.77-0.81	<0.001	0.63	0.62-0.64	0.77	0.74-0.79	<0.001	0.64	0.63-0.65

[a]95% CI of the AUC-ROC was calculated following a bootstrap approach with 1000 repetitions.
[b]ORs were adjusted for demographic and clinical variables, for which association to the outcome was assessed in a collinearity test. Adjusted ORs were reported following a statistical significance on bivariate analysis, further extended with a pairwise Pearson correlation. **Demographic variables** included age at first Hb reading, gender, ethnic group, index of multiple deprivation, body mass index, current alcohol and smoking status, and region of England. Note: Those without smoking or alcohol status records were assumed to currently be non-smokers or non-alcohol drinkers; age at first Hb reading and sex were included in the model regardless of the statistical significance of the collinearity test. Each condition was further adjusted for **clinical priors**, including hypertension, erythropoiesis-stimulating agent use, valve disorders (specifically aortic stenosis and mitral regurgitation), oral contraceptive pill use, atrial fibrillation, iron deficiency, pulmonary embolism, deep vein thrombosis, splenectomy, diabetes, and CKD.
[c]For the hypothesis that the AUC-ROC of the unadjusted fitting was smaller than the adjusted one, a comparison of the two paired AUC-ROCs, between unadjusted and adjusted fitting, was performed using the Delong method.
AUC-ROC, area under the receiver operating curve; CI, confidence interval; CKD, chronic kidney disease; ESRD, end-stage renal disease; Hb, hemoglobin; OR, odds ratio.

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007 Health Services and Outcomes Research including Psychology Abstracts

5606726 IMPACT OF ALLOGENEIC STEM CELL TRANSPLANTATION ON PHYSICAL, MENTAL, AND SOCIAL HEALTH OF ADULT SICKLE CELL DISEASE PATIENTS: A MIXED-METHODS STUDY

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Background: Sickle cell disease (SCD) is characterized by chronic hemolytic anemia and recurrent painful vaso-occlusive crises, resulting in considerable physical and psychosocial disease burden and early mortality. In recent years, the application of allogeneic hematopoietic stem cell transplantation (HSCT) as a curative treatment for adult SCD patients has increased. As a result, a deeper understanding of the complex relationship between physical, mental, and social health before and after curation is needed.

Aim: To explore the experiences and perspectives of adult SCD patients on the impact of HSCT on their physical, mental, and social health.

Methods: A mixed methods study design, consisting of a semi-structured interview and completion of 9 Patient Reported Outcomes Measurement Information System (PROMIS®) item banks per participant was used. Adult SCD patients who underwent HSCT ≥ 1 year ago at the Amsterdam University Medical Center were eligible to take part in this study. Interviews were recorded, transcribed verbatim, and thematically analyzed using MAXQDA® software. Standardized T-scores of PROMIS® measures were evaluated and compared to reference scores of the Dutch general population.

Results: Ten SCD patients with a median age of 29,5 years (range 19-49) were included in the study and interviewed between October 2021 and May 2022. Median time since HSCT was 2.7 years (range 1 - 3.5). All patients had successful engraftment. Relevant themes were (1) pain/living pain free, (2) physical wellbeing, (3) mental wellbeing, (4) perspective/outlook, (5) education and work, (6) family and friends and (7) activities and participation. Living pain free and the emergence of a future perspective were major improvements for most participants which