severity. The main search was conducted, separately, by a MSc Student and a PhD student, both in Human Genetics and reviewed by a medical and human geneticist with expertise in SCD and a clinician-scientist with expertise in molecular pathology and microbiology. A total of 229 articles was compared and screened for duplications. The abstracts of the remaining articles were screened for suitability to the study. Articles were excluded based on its relevance to the scope of the review.

**Results:** This systematic review examines available data on the role of the microbiome in SCD clinical events. A total of 13 published articles were selected; most were observational human studies (n = 10), and five included SCD mouse models. Few studies performed microbiome 16S RNA analysis, to identify/classify uncultured microbes (n = 8/13). Results showed that the microbiome influences inflammation, and vaso-occlusive crises (VOC) in SCD, and is disrupted by medication and diet. This review was able to provide insight on how immunity can be maintained by the microbiome through TLRs and MyD88 mechanisms. The exploration of bacterial translocation may be regulated by an altering intestinal permeability and the microbial density, which is managed by the damage-associated molecular pattern (DAMPs). This may give insight into treating an altered intestinal microbiome in SCD patients. Whereas in SCD mouse models, neutrophil adhesion, Mac-1 activation, and heterotopic interaction in red blood cells were significantly influenced by the microbiota.

**Conclusion:** Data suggest that the microbiome can be disrupted by the SCD endophenotypes, specifically by triggering inflammation pathways, which could promote a cycle of VOC. This review emphasizes the need for investigating microbiome effects on SCD throughout the lifespan of patients.

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**Health services and outcomes research including psychology**

**S126 AN EU -- ARISE INITIATIVE GAP ANALYSIS APPROACH TO IMPROVING THE QUALITY OF LABORATORY SYSTEMS IN SUB-SAHARAN AFRICA.**

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**Background:** Accurate and reliable laboratory results are critical to diagnostics in sickle cell disease (SCD) newborn screening. In sub-Saharan Africa, due to neglect of some national health laboratories, there has been persistently high levels of laboratory error, lack of functioning quality management systems and laboratory accreditation.

ARISE (African Research and Innovative Initiative for Sickle Cell Education) is a research project funded by the EU. It involves a secondment program across 8 work packages between institutions in EU (Italy, France, UK and Cyprus) and non-EU (Nigeria, Lebanon, Kenya and USA) countries, creating an interagency and multidisciplinary staff exchange programme to share best practices in newborn screening, diagnosis and treatment of SCD, leading to improved disease outcomes.

Secondments include medical, nursing, laboratory, administrative, academic and research professionals.

Led by the RCPath and INSERM, WP3 is tasked with improving laboratory, immuno and genetic activities. Laboratory secondments are facilitated by baseline, interim and final gap assessments.

**Aims:**
1. To compare a baseline gap analysis at the commencement of the project in 2019 with an interim gap assessment 2 years into the project, following secondments to UK laboratories from Nigeria.
2. To identify areas of increased focus and support during planned secondments, workshops, and virtual lectures

**Methods:** 6 partner organisation laboratories participated in the baseline gap assessment in 2019, while 10 laboratories participated in the interim gap assessment in 2021, due to new institutions joining the ARISE initiative.

An electronic online questionnaire (40 questions) was sent to each laboratory lead.

**Results:** Survey results of the 6 laboratories that undertook both the baseline and interim gap assessment were analysed. A sample of comparative results between 2019 and 2021 include the following:

- Working towards accreditation - 2/6 versus 3/6: There is the need for each laboratory to progress towards an application for accreditation.
- SOP’s available for tests and processes - 38 versus 32: This might suggest standardisation and rebranding of documents previously labelled as SOP’s.
S127 CONSORTIUM ON NEWBORN SCREENING IN AFRICA FOR SICKLE CELL DISEASE

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Background: Sickle cell disease (SCD) is an inherited blood disorder that causes abnormalities in the oxygen-carrying protein hemoglobin found in red blood cells, leading to severe long-term health effects. According to the World Health Organization, more than 300,000 babies are born each year with SCD globally with majority in sub-Saharan Africa failing to reach the age of five. With early identification, low-cost treatments known to be effective in high-income settings for several years, can improve the health of children with SCD. Yet, SCD has not received the same level of attention as other conditions known to be effective in high-income settings for several years.

CONSA Program Goals and Objectives
- Demonstrate the effectiveness of early identification and clinical interventions for newborns with SCD
- Create sustainable, expanded networks for newborn screening and clinical interventions
- Foster collaboration between African hematologists and public health services to develop an organized network of researchers for conducting quality studies and publishing results
- Increase hematology capacity throughout sub-Saharan Africa

CONSA introduces standard-of-care practices for screening and early intervention therapies (including antibiotics and malaria prophylaxis, folic acid supplements, family education and counseling, and immunizations) at participating clinical institutions, screening 10,000 – 16,000 babies per year in each country, and providing clinical follow-up for babies diagnosed with SCD. A shared registry captures data from CONSA institution sites, which will be used to estimate the prevalence of SCD in member countries and evaluate the effectiveness of the interventional programs.

Currently, CONSA is working in seven countries, Ghana, Kenya, Liberia, Nigeria, Tanzania, Uganda, and Zambia. Hematologists and public health officials participating in the consortium have mobilized networks of screening laboratories, SCD or pediatric hematology clinics, teaching hospitals, regional referral hospitals, universities, and satellite clinics to screen newborns and provide clinical services protocol. Alongside the research showcasing the health outcomes of newborns screened and delivered early interventions, the consortium is working to ensure the long-term sustainability of programs through government, corporate, and other partner support.

All country sites launched screening in 2021. As of November 15, over 17,000 babies have been screened with over 150 found to be living with SCD. Despite challenges from the COVID-19 pandemic, including population concerns of going to health clinics, need to protect SCD patients from transmission, and supply chain breakdowns, CONSA looks forward to continuing to expand newborn screening efforts for the next several years.

Conclusion: The presentation will provide an overview of CONSA’s goals and current work to screen and provide care for newborns with SCD, despite challenges from the COVID-19 pandemic. The presentation will also include details from the Nigeria clinical sites, case studies of current babies with SCD, and recent work done to strengthen Nigeria’s national newborn screening and clinical efforts.

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