

CALL FOR EXPRESSION OF INTEREST

Technical Consultant for the Analysis of Neonatal Bloodstream Infection and Antimicrobial Resistance Data

Project	Africa PGI – CholGEN (Cholera Genomics Consortium II) Grant
Implementing Organization	Africa Public Health Foundation (APHF)
Duration / Duty Station	24 weeks / Remote, with authorised travel if required
Consultancy Value / Deadline	Up to USD 72,000, all-inclusive / Rolling basis until position is filled

1. BACKGROUND

The Africa Pathogen Genomics Initiative (Africa PGI) of Africa CDC supports African Union Member States to expand sequencing, bioinformatics and genomic epidemiology capacity and use genomic data for public health decision-making. Through the CholGen project, implemented by APHF, the associated KlebGEN project has generated clinical, microbiological, epidemiological and whole-genome sequencing data on neonatal bloodstream infections (BSI) from sentinel sites in nine Member States: **Zimbabwe, Morocco, Chad, Sierra Leone, Cameroon, Democratic Republic of the Congo, Mozambique and Uganda.**

APHF/Africa PGI seeks a highly qualified technical consultant to conduct a consolidated multi-country analysis of the KlebGEN datasets, characterise antimicrobial resistance (AMR) determinants and bacterial lineages, integrate genomic and epidemiological findings, and translate the evidence into recommendations relevant to empirical treatment, infection prevention and control (IPC), and AMR strategies.

2. OBJECTIVE

The consultant will undertake a rigorous, reproducible and policy-relevant analysis of the neonatal BSI datasets, including to:

- Clean, harmonise and quality-assure clinical, microbiological, epidemiological and genomic data.
- Characterise bacterial species, sequence types, AMR determinants, virulence factors and plasmid profiles.
- Conduct phylogenetic/genomic epidemiology analyses and assess genetic relatedness and potential transmission.
- Integrate genomic findings with clinical and epidemiological metadata and compare AMR patterns across countries.
- Generate evidence for empirical treatment guidance, IPC and AMR surveillance/response.
- Produce technical/scientific outputs and provide structured mentoring and knowledge transfer.

3. KEY SCOPE OF WORK

- Data review, inventory, quality assessment, gap identification and harmonisation across participating sites.
- Development of a standardised analytical dataset, data dictionary and documented cleaning/transformation procedures.
- Bacterial whole-genome analysis: read QC, assembly, species confirmation, MLST/cgMLST, AMR and virulence determinants, plasmid characterisation and phylogenetics.
- Clinical, epidemiological and statistical analysis, including relevant risk-factor modelling where supported by the data.
- Integrated genomic–epidemiological interpretation, including country and regional AMR patterns and public health implications.
- Preparation of technical reports, country/multi-country findings, manuscript(s), dissemination materials and presentations.

- Capacity transfer through practical training/mentoring on analytical methods, reproducible workflows and interpretation.

4. EXPECTED DELIVERABLES & PAYMENT

Deliverable	Timing	Payment
Inception report and analysis plan, including data inventory, QC criteria and workflow	Week 2	20%
Cleaned and quality-assured analytical dataset, scripts and data dictionary	Week 6	10%
Genomic analysis report: typing, AMR determinants, virulence and phylogenetics	Week 12	20%
Integrated epidemiological-genomic analysis across participating Member States	Week 16	20%
Draft manuscript and dissemination slide deck	Week 20	10%
Final close-out package, code/documentation handover and capacity-transfer session	Week 24	20%

All deliverables are subject to review and written acceptance by Africa PGI/APHF before payment.

5. REQUIRED QUALIFICATIONS & EXPERIENCE

- PhD, or MSc with at least seven (7) years of relevant post-qualification experience, in epidemiology, biostatistics, infectious disease epidemiology, microbiology, bioinformatics or a related discipline.
- Demonstrated expertise in clinical/surveillance data analysis, epidemiological methods, inferential statistics and risk-factor modelling.
- Strong bacterial whole-genome sequencing and bioinformatics skills, including QC, assembly, species confirmation, MLST/cgMLST, AMR/virulence detection, plasmid analysis, phylogenetics and genomic epidemiology.
- Proficiency in Linux command-line environments and R and/or Python, with experience in reproducible workflows such as Nextflow or Snakemake.
- Demonstrated AMR and bacterial genomic epidemiology experience involving *Klebsiella pneumoniae* and *Escherichia coli*, evidenced by publications, technical reports or comparable assignments.
- Prior neonatal BSI/sepsis experience is highly desirable.
- Ability to integrate genomic, microbiological, clinical and epidemiological data and translate results into policy-relevant recommendations.
- Experience in African/LMIC settings and multi-country or sentinel surveillance is highly desirable.
- Working knowledge of research ethics, data protection, de-identification, confidentiality and Material/Data Transfer Agreements.
- Demonstrated mentoring/training experience. Full professional English is mandatory; French is an advantage.
- Experience using advanced statistical methods, machine learning or AI with genomic/epidemiological data is an added advantage.

6. APPLICATION REQUIREMENTS

- Interested candidates should submit:
- Cover letter demonstrating interest and suitability.
- Detailed CV highlighting relevant qualifications, experience and publications.

- d. Technical proposal covering understanding, methodology, workplan, quality assurance/reproducibility and knowledge transfer.
- e. Financial proposal for the 24-week assignment.
- f. At least two representative analytical outputs from comparable assignments.
- g. At least two professional referees who can attest to relevant experience.
- h. Evidence of relevant qualifications, where requested.

7. EVALUATION & SELECTION

- a. Eligibility and mandatory requirements screening will be conducted first; candidates failing mandatory requirements may not proceed.
- b. Technical evaluation will consider qualifications, bacterial genomics/bioinformatics, AMR and genomic epidemiology, experience with *K. pneumoniae* and *E. coli*, neonatal BSI/sepsis, integrated analysis, publications/outputs, African/LMIC experience, proposed methodology and capacity-building experience.
- c. Financial proposals from technically responsive candidates will be evaluated in accordance with APHF procurement procedures.
- d. APHF may request clarification or additional information from applicants/shortlisted candidates.

8. FINANCIAL & CONTRACTUAL ARRANGEMENTS

The maximum available consultancy budget is USD 72,000. The fee is all-inclusive and covers professional fees, equipment, software, communication and other consultancy costs. Any required travel will be separately authorised and budgeted in advance. The successful consultant will enter into APHF's standard consultancy agreement.

9. DATA PROTECTION, CONFIDENTIALITY & INTELLECTUAL PROPERTY

- All work must comply with applicable APHF, Africa PGI and participating-site requirements on confidentiality, data protection, ethics, conflict of interest and intellectual property.
- No directly identifiable patient data will be transferred; datasets will be de-identified before release.
- Analytical outputs, scripts and documentation will be subject to the ownership and intellectual property provisions of the consultancy agreement and applicable project arrangements.

10. SUBMISSION

Email: tender@aphf.africa **Subject:** Expression of Interest – Technical Consultant for Neonatal BSI and AMR Data Analysis

Submission: One consolidated PDF document, where practicable. Applications are open for 14 days, with selection conducted on a rolling basis until the position is filled. Only shortlisted candidates will be contacted.

11. DISCLAIMER

APHF reserves the right to accept or reject applications, request clarification/additional information, amend the procurement process, or cancel/vary the process without liability to applicants. The successful consultant must comply with all applicable contractual, financial, safeguarding, confidentiality, data protection and ethical requirements.

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Technical Consultant for the Analysis of Neonatal Bloodstream Infection and Antimicrobial Resistance Data – 24 weeks under APHF – Africa PGI – CholGEN - Cholera Genomics Consortium II Grant

1. Background

The Africa Centres for Disease Control and Prevention (Africa CDC) is mandated to strengthen the capacity of African Union Member States to prevent, detect and respond to public health threats. Within this mandate, the Africa Pathogen Genomics Initiative (Africa PGI) leads the continental effort to expand sequencing, bioinformatics and genomic-epidemiology capacity across Member States and to ensure genomic data inform public health decisions.

The Cholera Genomics (CholGen) project is spearheaded by Africa PGI and implemented through the Africa Public Health Foundation (APHF). Under the associated KlebGEN project, clinical, microbiological and whole-genome sequencing data on neonatal bloodstream infection (BSI) have been generated at sentinel sites in nine AU Member States-Zimbabwe, Morocco, Chad, Sierra Leone, Ethiopia, Cameroon, the Democratic Republic of the Congo, Mozambique and Uganda.

Neonatal sepsis arising from bloodstream infection is among the leading causes of neonatal mortality in Africa. *Klebsiella pneumoniae* and *Escherichia coli* are the predominant Gram-negative causes, and resistance to the agents on which empirical neonatal treatment depends - third-generation cephalosporins, aminoglycosides and, increasingly, carbapenems - is widely reported yet poorly characterised at country level. Africa PGI therefore seeks a consultant to analyse the KlebGEN datasets, define the circulating resistance determinants and lineages, and translate them into evidence for empirical treatment guidance, infection prevention and control (IPC) and national antimicrobial resistance (AMR) strategy.

The collection has now reached a stage where a consolidated, multi-country analysis is both feasible and necessary. The datasets combine clinical, microbiological, epidemiological and whole-genome sequencing data from nine countries. There is added complexity in harmonising variable laboratory and clinical data quality across sites. Analysing them requires a specialised skill set — namely, expertise in bacterial genomics, AMR determinant characterisation, phylogenetics, and integrated epidemiological analysis — which is not available within the project team on a full-time basis. These consultancy services were included at the design stage precisely to secure this category of short-term specialised expertise.

3. Rationale

Engaging a consultant is the most appropriate mechanism for four reasons:

- **Capability.** The assignment demands advanced bioinformatics and genomic-epidemiology expertise for a defined, time-bound body of work rather than a continuing function.
- **Short-term consultancy** avoids the cost, lead time and recurrent liability of establishing a substantive post for a task of finite duration.
- **Timeliness.** Analysis must be completed in time to feed scheduled donor reporting, dissemination and close-out milestones, and to return actionable AMR findings to the nine participating Member States while those findings remain current. Delay compresses the remaining implementation window and places these commitments at risk.
- The provision is already ring-fenced. Leaving it unutilised would result in avoidable under-absorption and in multi-country data collected at substantial cost but never converted into usable evidence.

4. Proposed Scope of Work and Deliverables

The consultant will be engaged for an estimated [12 months] and will be accountable to Program Lead, Africa PGI. Deliverables and the associated payment schedule are proposed as follows:

#	Deliverable	Indicative timing	Payment tranche
1	Inception report and analysis plan — data inventory, quality-control criteria, analytical workflow and agreed timelines.	Week 2	20%
2	Cleaned, quality-assured and fully documented analytical dataset, with reproducible scripts and a data dictionary.	Week 6	10%
3	Genomic analysis report — species confirmation, sequence typing, antimicrobial resistance determinants, virulence markers, and phylogenetic relatedness.	Week 12	20%
4	Integrated epidemiological–genomic analysis across the nine participating Member States, linking sequencing outputs to clinical and surveillance metadata, with country-level and comparative interpretation of AMR patterns and their implications for empirical treatment guidance and IPC.	Week 16	20%
5	Draft manuscript and dissemination slide deck for the participating Member States, Africa PGI, project partners and the donor.	Week 20	10
6	Close-out package — handover of code and documentation, plus a capacity-transfer session for project and partner staff.	Week 24	20%

All deliverables will be subject to written acceptance by [Name, Title] before the corresponding payment tranche is released.

5. Required Consultant Profile

Given the technical demands of the assignment, the following criteria are proposed as the mandatory basis for shortlisting and technical evaluation. The combination of epidemiological, bioinformatic and analytical competence, together with direct prior experience of neonatal bloodstream infection and AMR, is essential; candidates strong in only one of these domains would not be able to deliver the assignment.

Domain	Requirement
Qualifications	A PhD, or an MSc with a minimum of seven years' relevant post-qualification experience, in epidemiology, biostatistics, infectious disease epidemiology, microbiology, bioinformatics or a closely related discipline.
Epidemiology	Demonstrated expertise in the analysis of clinical and surveillance datasets, including study design, case definition, descriptive and inferential analysis, risk-factor modelling and the interpretation of findings for public health decision-making.

Domain	Requirement
Bioinformatics	Demonstrated proficiency in bacterial whole-genome sequencing analysis: read quality control, assembly, species confirmation, MLST and cgMLST typing, detection of antimicrobial resistance determinants and virulence genes, plasmid characterisation, phylogenetic reconstruction and transmission inference. Fluency in Linux command-line environments, R and/or Python, and reproducible workflow management (for example Nextflow or Snakemake).
Analytical integration	Proven ability to integrate genomic outputs with clinical, microbiological and epidemiological metadata, and to translate combined analyses into policy-relevant interpretation rather than descriptive reporting alone. Experience applying advanced statistical approaches, machine learning or AI methods to genomic and epidemiological datasets will be considered an added advantage.
Subject-matter experience (mandatory)	Demonstrated experience in AMR and bacterial genomic epidemiology, including work involving <i>Klebsiella pneumoniae</i> , <i>Escherichia coli</i> evidenced by peer-reviewed publications, technical reports or completed assignments. Prior experience in neonatal bloodstream infection or sepsis is highly desirable.
Publication record	A track record of first- or senior-authored peer-reviewed publications in genomic epidemiology, AMR, infectious disease epidemiology, bacterial genomics, microbial risk assessment or related fields..
Contextual experience	Prior experience in African or other low- and middle-income settings, including familiarity with sentinel surveillance systems, laboratory data quality constraints and the harmonisation of data across many sites and countries.
Governance and ethics	Working knowledge of research ethics requirements, data protection obligations, de-identification practice and material and data transfer agreements.
Capacity transfer	Demonstrated experience in mentoring or training scientific staff, and a willingness to deliver structured knowledge transfer as part of the assignment.
Language	Full professional proficiency in written and spoken English. Working knowledge of French is an advantage.

Shortlisted candidates will be required to submit a detailed curriculum vitae, at least two representative analytical outputs from comparable assignments, and two professional referees who can attest to work of this type.

6. Financial Implications

Activity	Budget (USD)
Consultancy services	72,000

- The fee is all-inclusive of the consultant's own equipment, software and communication costs. Any travel required in support of the assignment will be authorised and budgeted separately in advance.

- Expenditure will be charged solely to the CholGen consultancy services line and reported through routine project financial reporting to the donor.

7. Procurement, Compliance and Data Governance

- The consultant will be identified through APHF's standard competitive procurement procedure, including a published call for expressions of interest and technical and financial evaluation of a shortlist by a constituted panel. The criteria at Section 5 will form the technical scoring framework, with the mandatory subject-matter experience applied as a pass or fail screen at shortlisting.
- Engagement will be under APHF's standard consultancy agreement, incorporating clauses on confidentiality, data protection, conflict of interest, intellectual property and ownership of outputs, which will vest in APHF and the participating sites.
- All data handling will comply with the ethics approvals, material and data transfer agreements, and national data protection requirements in force at each participating site. No directly identifiable patient data will be transferred to the consultant; datasets will be de-identified prior to release.