The CHEERS way

A guide to planning linked climate and health research

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CHEERS connects population research with environmental and individual health observations. This guide helps research teams turn a locally defined question into a documented study workflow. The first release sets out the implementation sequence and develops sampling and visit planning as the first detailed module.

Use the sequence with the responsible local institution and community partners. Each study needs its own protocol, sampling design, ethics arrangements and operating procedures. Version 0.2 provides planning guidance; it does not establish an approved protocol for every CHEERS setting.

1 Define the local research question

Agree which climate exposure, population and health outcome the study will investigate. Record the setting, intended comparison, observation period and purpose of any adaptation evaluation. Involve local investigators and community representatives before choosing instruments.

Output A short study concept with objectives, population, outcomes and local responsibilities.

2 Agree responsibilities and governance

Identify who leads field implementation, maintains the population register, manages instruments, holds the linkage key and approves data access. Establish the applicable ethics and consent arrangements, local permissions, data agreements and routes for responding to participant concerns.

Output A responsibility record and the approvals and agreements needed for the proposed activities.

Study design and preparation

3 Build the sampling and visit plan

Reconcile the household register, define the sampling units and distinguish population surveillance from nested morbidity or sensor samples. Plan observations across seasons and locations. Record selection probabilities, visit allocation and how nonresponse, movement and field disruption will be handled.

Output A versioned sampling plan, reproducible selection record and field calendar.

4 Specify linked measurements

Choose health, survey and environmental measures that answer the research question. For every stream, record its unit, identifier, time zone, measurement frequency, instrument version and quality checks. Justify which participants or households receive each component and how observations will be linked.

Output A measurement specification and a data dictionary with linkage rules.

5 Train the team and test the workflow

Rehearse consent, household visits, instrument setup, synchronisation, data transfer and exception handling. Test translations and respondent understanding. Review the first linked records and document changes before extending fieldwork. Use the pilot to estimate practical workload and identify gaps in the proposed schedule.

Output Training records, a pilot review and a controlled set of field procedures.

Fieldwork analysis and learning

6 Collect observations and monitor coverage

Record planned and actual visit dates, consent and response outcomes, instrument assignments, transfer checks and maintenance events. Review coverage across weeks and geographic strata, alongside identifier consistency and missing data. Document field changes so that their consequences can be assessed in analysis.

Output Visit and instrument logs, coverage reports and a register of protocol deviations.

7 Prepare linked data and analysis

Retain source records and document transformations, units, clock corrections and quality exclusions. Specify the analysis population, exposure windows, confounders, repeated observations, sampling design and missing-data approach. Record software and model versions, and distinguish exploratory analyses from the planned analysis.

Output A traceable analysis dataset, quality report and analysis plan.

8 Share findings and plan the next study

Interpret the findings with local partners and report uncertainty, exclusions and limits to transferability. Agree authorship and data-access arrangements. Return useful results to participating communities and institutions. Plan adaptation evaluation or further measurement from the evidence, rather than assuming that a monitoring system has already improved health.

Output Research outputs, locally agreed feedback and a documented next research question.

Sources

1. Barteit S et al. Widening the lens of population-based health research to climate change impacts and adaptation: the climate change and health evaluation and response system (CHEERS). Frontiers in Public Health. 2023;11:1153559. https://doi.org/10.3389/fpubh.2023.1153559

2. CHEERS and HDSS workshop materials. Review of the Nouna HDSS 2.0 manual, 2024. Slides 4 to 12 cover sampling and time-space allocation; slides 13 to 16 cover field-quality lessons.

Guide updates and collaboration: barteit@uni-heidelberg.de. The online guide links each step to related methods and research settings: https://cheers-network.org/cheers-way.html