# Supplementary Materials

**Supplementary Material S1. Qualitative Methods**

## Study design

As part of this mixed-methods proof-of-concept study we collected qualitative data through key-informant interviews (KIIs) and focus group discussions (FGDs). The aim of collecting this qualitative data was to assess the implementation outcomes of the CCDT+. These included the perceived acceptability, appropriateness, feasibility, and usability of the CCDT+. In designing this study, we followed the implementation outcomes as defined by Proctor et al. (2011). Qualitative and quantitative methods were integrated to strengthen the findings and develop practical and targeted recommendations for future versions of the CCDT+.

## Data collection

### Procedures

Qualitative data was collected post-implementation by a male project officer, using structured topic guides presented below. The project officer had been in regular contact with the participants, through organizing trainings and supervision sessions, and was supervised by the research coordinator (SA). None of the research team members (including the research coordinator/co-investigators or research team implementing the intervention) participated in FGDs or KIIs.

Interviews were audio recorded, and handwritten notes were made. The audio files were handed over to the research coordinator (SA), who then uploaded them to a secured online server. All participants in the FGDs and KII were assigned unique study IDs for confidentiality and anonymity. The interviews were conducted in English, Juba Arabic and Bari. Verbatim transcription of the audio recordings was done in the language with which the interview was conducted, and then translated into English. The notes which were taken during the FDG or KII were merged into the final transcript. 20% of the transcriptions were compared with the audio recordings to ensure their accuracy. All laptops involved in data management and analysis are encrypted and password protected.

### Topic guide – KII Supervisors

1. **Using the dashboard**

* General experience of using the dashboard.
* What worked/did not work well and why.
* Usefulness of information showed on the dashboard.
* Benefits of using the dashboard.
* Suitability for everyday use and motivation to continue using this dashboard.
* Recommendations for change.

1. **Supervising gatekeepers**

* General experience of participating in supervision meetings.
* What in the supervision meetings worked/did not work well and why.
* Experience in providing feedback about work.
  + Experience in providing updates about the cases identified
  + Experience in providing extra training during these sessions
* Usefulness of information shared during meetings.
* Recommendations for change.
* Feasibility/motivation to continue facilitating supervision meetings.

### Topic guide – KII and FGD Gatekeepers

1. **Participation in supervision meetings**

* General experience of participating in supervision meetings.
* What worked well in the supervision meetings.
  + Reasons why it did work well.
* What did not work well in the supervision meetings.
  + Reasons why it did not work well.
* Experience in participating in supervision meetings and receiving feedback about your work in identifying and referring children to TPO.
  + Experience in receiving updates about the cases you identified
  + Experience in receiving extra training during these sessions
* Usefulness of information shared during meetings.
* Recommendations for change / improvement.
* Feasibility/motivation to continue participating in the supervision meetings on top of your daily routine activities.

1. **Actively following up on identified cases, using the reminder techniques**

* General experience of actively following up on identified cases/families, using the reminder techniques.
* Feasibility of actively following up on identified cases, using the reminder techniques.
* Challenges encountered during active follow up and engaging with families.
* What worked well in following up with families, and why.
* What did not work well in following up with families, and why.
* Recommendations for change/improvement.
* What reasons did the parents/care givers tell you for not seeking help/support.

**Participants**

Gatekeepers were purposively selected based on their level of participation (active and less active). All invited gatekeepers received information about the study and provided consent. The interviews were conducted in a central community place, and participants received transportation refund and refreshments. KIIs were conducted with the clinical psychologist (n=1), social workers (n=2) and gatekeepers (n=8) and three FGDs with gatekeepers (n=27 in total).

*KII sample characteristics*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study ID** | **Participant Category** | **Gender** | **Age** | **Profession** |
| CK-02 | Gatekeeper | M | 24 | RWC1 |
| DDD-03 | Gatekeeper | M | 30 | Youth Leader |
| EL-03 | Gatekeeper | M | 33 | Facilitator |
| FLF-04 | Gatekeeper | M | 67 | Opinion Leader |
| LB-02 | Gatekeeper | M | 50 | RWC1 |
| KR-04 | Gatekeeper | M | 26 | Youth Leader |
| MKJ-01 | Gatekeeper | F | 47 | RWC1 |
| MMK-01 | Gatekeeper | F | 30 | VHT |
| CP | Clinical Psychologist | M | 40 | Clinical Psychologist |
| SW-01 | Supervisor | F | 28 | Social Worker |
| SW-02 | Supervisor | M | 24 | Social Worker |

*FGD sample characteristics*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study ID** | **Participant Category** | **Gender** | **Age** | **Profession** |
| **Focus Group Discussion 1** | | | | |
| KFF-01 | Gatekeeper | F | 27 | Facilitator |
| IA-04 | Gatekeeper | M | 37 | RWC1 |
| JAL-01 | Gatekeeper | M | 54 | VEC |
| JM-03 | Gatekeeper | F | 30 | RWC1 |
| WE-02 | Gatekeeper | M | 42 | RWC1 |
| KOW-04 | Gatekeeper | M | 33 | RWC1 |
| BS-01 | Gatekeeper | M | 30 | CPC |
| WE-03 | Gatekeeper | M | 42 | RCW1 |
| **Focus Group Discussion 2** | | | | |
| LF-02 | Gatekeeper | M | 26 | RWC1 |
| NK-01 | Gatekeeper | M | 24 | Community activist |
| WM-02 | Gatekeeper | M | 32 | VHT |
| ES-03 | Gatekeeper | F | 23 | RWC1 |
| MS-03 | Gatekeeper | M | 34 | RWC1 |
| JL-02 | Gatekeeper | F | 33 | VHT |
| FW-03 | Gatekeeper | M | 25 | Community activist |
| JMS-03 | Gatekeeper | F | 35 | CPC |
| OC-03 | Gatekeeper | M | 29 | RWC1 |
| CS-02 | Gatekeeper | M | 32 | VHT |
| **Focus Group Discussion 3** | | | | |
| TR-03 | Gatekeeper | M | 34 | RWC1 |
| DA-01 | Gatekeeper | M | 43 | RWC1 |
| CL-03 | Gatekeeper | M | 48 | RWC1 |
| SA-03 | Gatekeeper | F | 36 | RWC1 |
| GN-03 | Gatekeeper | M | 28 | Youth Leader |
| JK-03 | Gatekeeper | M | 42 | RWC1 |
| SH-01 | Gatekeeper | F | 30 | Community activist |
| JJ-03 | Gatekeeper | F | 42 | RWC1 |
| SB-03 | Gatekeeper | M | 32 | RWC1 |

**Data analysis**

A pragmatic approach to analysing the qualitative data was used in line with the applied nature and aim of this study to gather experiences and feedback about the CCDT+ as optimization strategy. This involved using a modified framework method (Ramanadhan *et al.* 2021; Ritchie and Spencer 2002), with a hybrid inductive and deductive approach to the analysis. The process started with familiarization with all transcripts, which was followed by a line-by-line review noting down key ideas and recurring themes related to the implementation outcomes. This was done by one member of the research team (MvdB). Following the open coding of all transcripts, the key research concepts which the topic guides were based on were compared and combined with the observed, emerging themes and key ideas and resulted in a working thematic framework. This included a draft definition of each overarching theme and underlying codes. The thematic framework was applied to the first FGD and two KII’s by two researchers (SA and MvdB) and refined based on a researcher triangulation with the wider team. All transcripts were indexed based on the framework, charted in NVivo version 12, and interpreted per theme.

*Description of framework*

|  |  |  |
| --- | --- | --- |
| **Theme** | **Codes** | **Example related terms in transcripts** |
| Work effectiveness/efficiency | Insights in results and performance | Knowing how gatekeepers are performing  Real-time data benefits  Performance oriented |
| Planning purposes | Knowing where clients are waiting  Supports outreach communication  Supports outreach planning (service side)  Recommendations about outreach/service provision  Recommendations about planning  Recommendations about timekeeping |
| MI- and Reminder techniques | Reminder techniques  3C’s  Communication techniques |
| Technology challenges | Access to dashboard  License issues  Uploading delays  Data collection/processing issues |
| Communication and time management | Coordination  Time management and punctuality |
| Professional development | Learning and development | Insight in areas for learning  Supervision allow for ongoing learning  Receiving feedback boosts confidence  Allows continued learning from motivation point of view  Acquire new knowledge and skills |
| Peer support | Encouragement to work harder  Sharing challenges  Collaborative problem-solving  Wish for weekly supervision |
| Feedback on impact | Insight in results boosted motivation  Seeing the impact of work  Knowing where you can support |
| Work quality | Actionable insights | Providing feedback backed by data  Positive effects on performance  Precision feedback: group or individual |
| Training | Precision training based on data  Allows to correct and improve |
| Role and expectation | Integration into routine activities | Aligning the use of the tool with routine activities (challenges or fit)  Conflicting priorities |
| Limits to their role | Role limitation  Lack of information regarding service delivery  Perceptions community members |
| Compensation | Practical means  Individual rate for transportation  Recommendations for compensation  Certification |
| Community expectations | Refreshments  Expecting material goods  Mismatch in expectations |
| Meeting frequency and continuation | Recommendations for frequency of meetings  Recommendations for continuing the project |

**Supplementary Material S2**. **COREQ Checklist**

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from:

Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International Journal for Quality in Health Care. 2007. Volume 19, Number 6: pp. 349 – 357

| **Item No** | **Guide Questions/Description** | **Reported on Page #** |
| --- | --- | --- |
| **Domain 1: Research team and reflexivity** | | |
| **Personal Characteristics** | | |
| 1. Interviewer/ facilitator | Which author/s conducted the interview or focus group? | N/A |
| 2. Credentials | What were the researcher’s credentials? E.g., PhD, MD | N/A |
| 3. Occupation | What was their occupation at the time of the study? | 12 |
| 4. Gender | Was the researcher male or female? | Supplementary Material S1 |
| 5. Experience and training | What experience or training did the researcher have? | 12 |
| **Relationship with participants** | | |
| 6. Relationship established | Was a relationship established prior to study commencement? | Supplementary Material S1 |
| 7. Participant knowledge of the interviewer | What did the participants know about the researcher? e.g. personal goals, reasons for doing the research? | Supplementary Material S1 |
| 8. Interviewer characteristics | What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic | N/A |
| **Domain 2: study design** | | |
| **Theoretical framework** | | |
| 9. Methodological orientation and Theory | What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis | Supplementary Material S1 |
| **Participant selection** | | |
| 10. Sampling | How were participants selected? e.g., purposive, convenience, consecutive, snowball | Supplementary Material S1 |
| 11. Method of approach | How were participants approached? e.g., face-to-face, telephone, mail, email | 12 |
| 12. Sample size | How many participants were in the study? |  |
| 13. Non-participation Setting | How many people refused to participate or dropped out? Reasons? | Supplementary Material S1 |
| 14. Setting of data collection | Where was the data collected? e.g., home, clinic, workplace | 12 |
| 15. Presence of nonparticipants | Was anyone else present besides the participants and researchers? | Supplementary Material S1 |
| 16. Description of sample | What are the important characteristics of the sample? e.g. demographic data, date | Supplementary Material S1 |
| **Data collection** | | |
| 17. Interview guide | Were questions, prompts, and guides provided by the authors? Was it pilot tested? | Supplementary Material S1 |
| 18. Repeat interviews | Were repeat interviews carried out? If yes, how many? | N/A |
| 19. Audio/visual recording | Did the research use audio or visual recording to collect the data? | Supplementary Material S1 |
| 20. Field notes | Were field notes made during and/or after the interview or focus group? | Supplementary Material S1 |
| 21. Duration | What was the duration of the interviews or focus group? | Supplementary Material S1 |
| 22. Data saturation | Was data saturation discussed? |  |
| 23. Transcripts returned | Were transcripts returned to participants for comment and/or correction? | N/A |
| **Domain 3: analysis and findings** | | |
| **Data analysis** | | |
| 24. Number of data coders | How many data coders coded the data? | 14 |
| 25. Description of the coding tree | Did the authors provide a description of the coding tree? | Supplementary Material S1 |
| 26. Derivation of themes | Were themes identified in advance or derived from the data? | 14 |
| 27. Software | What software, if applicable, was used to manage the data? | 14 |
| 28. Participant checking | Did participants provide feedback on the findings? | N/A |
| **Reporting** | | |
| 29. Quotations presented | Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g., participant number | Table 2 |
| 30. Data and findings consistent | Was there consistency between the data presented and the findings? | Supplementary Material S1 |
| 31. Clarity of major themes | Were major themes clearly presented in the findings? | N/A |
| 32. Clarity of minor themes | Is there a description of diverse cases or a discussion of minor themes? | N/A |

**Supplementary Table S1. Description of the utilization rates and characteristics of zones across the study period**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Detection** | **Absolute utilization** | **Utilization rate per 100,000 persons** | **Population size** |
| Overall (n=6 settlements; 32 zones) |  |  |  |  |
| *Mean (SD)* | 106.00 (87.59) | 66.41 (70.27) | 365.41 (239.53) | 18,993.22 (13,523.61) |
| *Median (IQR)* | 71 (47, 125) | 41.5 (32, 60.5) | 338.67 (205.80, 415.28) | 13,724.00  (9,086.00, 26,489.50) |
| **Settlements** | **Detection**  **Mean (SD)** | **Absolute utilization**  **Mean (SD)** | **Utilization rate per 100,000 persons,**  **Mean (SD)** | **Population Size,**  **Mean (SD)** |
| Bidi Bidi (n=3 zones) | 195.33 (52.37) | 126.67 (41.40) | 288.15 (111.18) | 46,266.67 (11,955.59) |
| Rhino (n=5 zones) | 39.60 (9.32) | 47.80 (13.55) | 315.07 (210.23) | 21,015.60 (12,101.38) |
| Omugo (n=1) | 129.00 (0.00) | 98.00 (0.00) | 721.17 (0.00) | 13,589.00 (0.00) |
| Palorinya (n=4 zones) | 256.50 (122.79) | 200.25 (111.96) | 690.50 (384.75) | 31,750.00 (10,815.64) |
| Kyaka II (n=9 zones) | 79.11 (54.84) | 29.89 (17.94) | 231.80 (138.62) | 13,799.78 (6,840.82) |
| Kyangwali (n=10 zones) | 74.10 (31.41) | 33.80 (9.60) | 368.38 (162.84) | 9,911.80 (2,847.72) |

**Supplementary Table S2. Acceptability, appropriateness, feasibility, and usability of the CCDT+**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Acceptability** | **Appropriateness** | **Feasibility** | **Usability** |
| Overall | 4.41 (0.39) | 4.29 (0.41) | 4.28 (0.48) | 67.66 (13.03) |
| Gatekeeper type |  |  |  |  |
| Facilitator | 4.50 (0.71) | 4.50 (0.71) | 4.38 (0.88) | 75.00 (21.21) |
| VHT/CHW | 4.30 (0.33) | 4.45 (0.45) | 4.45 (0.27) | 71.00 (11.26) |
| Other Community-Based Structures | 4.32 (0.37) | 4.14 (0.40) | 4.15 (0.51) | 63.89 (12.27) |
| Other | 4.55 (0.39) | 4.48 (0.32) | 4.48 (0.48) | 69.50 (11.41) |
| Supervisor | 4.69 (0.47) | 4.56 (0.24) | 4.31 (0.13) | 80.63 (15.05) |
| *Kruskal-Wallis Chi-Squared (p)* | *4.26 (0.372)* | *9.04 (0.060)* | *3.78 (0.437)* | *6.01 (0.198)* |

\*Note: Scores for acceptability, appropriateness and feasibility range from 1 to 5. Usability scores range from 1-100. Higher scores indicate higher levels of the outcome.