Supplementary File 1. Completed StaRI and iCHECK-DH reporting checklists

Manuscript: Design, rollout and early institutionalisation of a digital 360-degree performance management system in Cameroon's Expanded Programme on Immunization: an implementation study

Note: Page references are based on the submitted manuscript version provided for checklist completion and may shift after journal formatting. Where an item is marked "Partial" or "Not applicable", the explanation indicates why. Individual-level PMS data were not included because staff performance data are sensitive HR records.

Reporting standards used: StaRI Statement (Pinnock et al., 2017) and iCHECK-DH Guidelines and Checklist for Reporting Digital Health Implementations (Perrin Franck et al., 2023).

A. Completed StaRI checklist

Section	Item	Checklist focus	Manuscript location	How addressed in manuscript	Status
Title and abstract	1. Title	Identify the manuscript as an implementation study and describe the approach.	Title page, p. 1	Title includes "implementation study" and describes a digital 360-degree PMS in Cameroon EPI.	Complete
Title and abstract	2. Abstract	Summarise the implementation strategy, intervention, implementation outcomes and main findings.	Abstract, p. 2	Abstract describes CFIR-Proctor design, data sources, implementation outcomes, rollout and early PMS findings.	Complete
Introduction	3. Problem	Describe the health system or public health problem addressed by the intervention.	Background, pp. 3-4	Background explains weakly structured performance management, generic appraisal tools and limited use of appraisal data for decision-making.	Complete
Introduction	4. Rationale	Explain the rationale and theory/framework for both the implementation	Background, pp. 3-4; Methods, pp. 4-5	Rationale draws on HRH governance, 360-degree feedback, digital HRH	Complete

		approach and the intervention.		systems, CFIR and Proctor implementation outcomes.	
Introduction	5. Aims and objectives	State study aims, distinguishing implementation objectives from intervention/effectiveness objectives.	Background, p. 4; Methods, pp. 4-5	Study aims to generate implementation learning; it explicitly does not estimate causal effects on staff performance or immunization outcomes.	Complete
Methods: description	6. Design	Describe the study design and key features of the evaluation.	Methods: Study design, pp. 4-5	Descriptive implementation study informed by CFIR, Proctor outcomes, StaRI and iCHECK-DH.	Complete
Methods: description	7. Context	Describe the implementation context and barriers/facilitators that may influence transferability.	Setting, p. 5; Background, pp. 3-4	Describes Cameroon EPI, Ministry of Public Health, central and regional structure, Microsoft 365 environment and bilingual context.	Complete
Methods: description	8. Targeted sites/population	Describe targeted sites, personnel and eligibility criteria.	Setting, p. 5; Table 4, p. 13	Targeted central EPI and ten regions; staff groups include executive leadership, senior leadership, middle management and support staff.	Complete
Methods: description	9. Description	Describe the implementation strategy and the intervention being implemented.	Intervention and Implementation pathway, pp. 6-8; Figure 2, p. 10	Describes PowerApps/SharePoint/Power BI PMS and the iterative pathway from diagnostic to national rollout and institutionalisation.	Complete
Methods: description	10. Subgroups	Describe any subgroups recruited for	Data analysis, pp. 8-9; Tables 4-6, pp. 13-15	No nested subgroup recruitment. Descriptive disaggregation was	Not applicable / addressed descriptively

		nested/additional research tasks.		conducted by location, gender and cadre.	
Methods: evaluation	11. Outcomes	Define primary and other implementation/intervention outcomes and how assessed.	Implementation outcome measures, p. 8; Table 1, pp. 6-8	Outcomes are defined using Proctor taxonomy: acceptability, appropriateness, feasibility, adoption, fidelity, penetration, implementation cost and sustainability.	Complete
Methods: evaluation	12. Process evaluation	Describe process evaluation objectives/outcomes related to how the implementation strategy worked.	Implementation pathway, pp. 6-8; Results, pp. 10-17	Process evidence includes diagnostic findings, alpha-test adaptations, backend training, rollout records and implementation outcome analysis.	Complete
Methods: evaluation	13. Economic evaluation	Describe methods for resource use, costs and economic analysis.	Methods, p. 8; Results, pp. 9-10 and p. 17; Limitations, p. 19	Implementation cost was assessed descriptively through avoided recurrent platform cost; full economic evaluation was not conducted.	Partial
Methods: evaluation	14. Sample size	Provide rationale for sample sizes.	Data analysis, pp. 8-9; Results, pp. 10-17	Samples were operational/routine implementation samples: alpha-test users, backend users, PMS rollout records and endline PMS respondents; no inferential sample size calculation was planned.	Partial / appropriate for descriptive design
Methods: evaluation	15. Analysis	Describe analytic methods and reasons for the chosen approach.	Data analysis, pp. 8-9	Uses descriptive statistics, percentage-point changes, Likert grouping and multiple-	Complete

				response analysis; inferential tests were not conducted due to study aims and sample size.	
Methods: evaluation	16. Subgroup analyses	Describe any a priori subgroup analyses.	Data analysis, pp. 8-9; Tables 4-6, pp. 13-15	Descriptive subgroup analyses were presented by location, gender and cadre; no inferential subgroup analysis was planned.	Complete
Results	17. Characteristics	Report participant/site characteristics.	Alpha testing, pp. 10-11; Adoption/penetration and Table 4, pp. 12-13	Reports alpha-test participant locations/departments and rollout distribution by location, gender and cadre.	Complete
Results	18. Outcomes	Report primary and other implementation/intervention outcomes.	Results and Tables 2-7, pp. 10-17	Reports alpha-test outcomes, backend training outcomes, national reach, PMS performance outputs and Proctor implementation outcomes.	Complete
Results	19. Process outcomes	Report process data and barriers/facilitators linked to the implementation mechanism.	Alpha testing, pp. 10-11; Backend capacity, pp. 11-12; Discussion, pp. 17-18	Reports practical adaptations, SharePoint migration, authentication fixes, bilingual navigation, reviewer-pairing updates and backend capacity-building.	Complete
Results	20. Economic evaluation	Report resource use, costs and economic outcomes.	Diagnostic findings, p. 10; Implementation outcomes, p. 17; Limitations, p. 19	Reports annual platform cost avoidance of US$1,380 and acknowledges incomplete implementation cost analysis.	Partial
Results	21. Subgroup analyses	Report subgroup representativeness and outcomes.	Tables 4-6, pp. 13-15	Reports distribution and performance patterns by location, gender and cadre;	Complete

				gender counts reflect dashboard records and driver exclusions are noted.	
Results	22. Fidelity/adaptation	Report fidelity to the implementation strategy and adaptations to context.	Alpha testing, pp. 10-11; Implementation outcome analysis, pp. 15-17	Reports intended 360-degree review components and adaptations to backend, authentication, bilingual interface, dashboard tracking and reviewer pairing.	Complete
Results	23. Contextual changes	Report contextual changes that may have affected outcomes.	Results, pp. 10-17; Discussion, pp. 17-18	No major external contextual changes were reported; relevant implementation context included bilingual operations, regional diversity and digital infrastructure constraints.	Partial
Results	24. Harms/unintended effects	Report important harms or unintended effects.	Ethics/data governance, p. 9; Discussion/limitations, pp. 18-19	No harms were reported. Potential risks include staff data sensitivity, rating leniency and hierarchical caution; mitigation included aggregation, role-based access and feedback-development framing.	Partial
Discussion	25. Structured discussion	Summarise findings, strengths, limitations, comparisons, conclusions and implications.	Discussion, strengths/limitations and conclusion, pp. 17-19	Discussion covers implementation learning, comparisons with HRH/digital health literature, limitations and future work.	Complete
Discussion	26. Implications	Discuss policy, practice and research implications,	Discussion and conclusion, pp. 17-19	Provides design principles for other programmes and future needs: repeated cycles,	Complete

		including scalability and sustainability.		calibration, metric validation, equity monitoring, cost analysis and linkage to outcomes.	
General	27. Statements	Include ethics, governance, registration/protocol, funding and conflicts statements.	Declarations, p. 22	Includes ethics approval, consent/publication, data availability, competing interests, funding, author contributions and acknowledgements.	Complete

B. Completed iCHECK-DH checklist

iCHECK-DH section	Item	Checklist focus	Manuscript location	How addressed in manuscript	Status
Title	1. Title (mandatory)	Identify the report as an implementation report/study and describe the digital health implementation.	Title page, p. 1	Title identifies a digital 360-degree PMS and states that the manuscript is an implementation study.	Complete
Abstract	2. Abstract (mandatory)	Summarise context, intervention, implementation strategy, outputs/KPIs and conclusions.	Abstract, p. 2	Abstract summarises problem, digital PMS, CFIR/Proctor methods, metrics, testing, rollout, dashboards and calibration findings.	Complete
Introduction	3. Context (mandatory)	Describe geography, organisations, target population and implementation context/stage.	Background, pp. 3-4; Setting, p. 5	Describes Cameroon EPI, Ministry of Public Health, central and ten-region structure, bilingual programme environment and existing Microsoft ecosystem.	Complete
Introduction	4. Problem statement (mandatory)	Describe the public health or health system challenge the implementation addresses.	Background, pp. 3-4; Diagnostic results, p. 9	Describes generic survey-based PMS, missing technical metrics, limited structured feedback, weak tracking and weak decision-use of appraisal data.	Complete
Introduction	5. Similar interventions (mandatory)	State whether implementation was inspired by similar interventions and the added value/differentiation.	Background, p. 4	Discusses limited literature on digital PMS in LMIC public health programmes and contrasts the Cameroon EPI implementation with related digital HRH and Ethiopian community health work.	Complete
Methods	6. Aim and objectives (mandatory)	State implementation aims and how objectives/outcomes are measured.	Background, p. 4; Study design, p. 4; Implementation outcome measures, p. 8	Aims to describe design, rollout and institutionalisation and assess early implementation outcomes using Proctor taxonomy.	Complete
Methods	7. Blueprint summary (mandatory)	Summarise intervention design, key features, implementation strategy and roadmap.	Intervention, p. 6; Implementation pathway, pp. 6-8; Figure 2, p. 10	Describes 360-degree review model, PowerApps/SharePoint/Power	Complete

				BI architecture and nine-step implementation pathway.	
Methods	8. Technical design (mandatory)	Explain tool choice, functions, architecture, technology, licensing/ownership where relevant.	Intervention, p. 6; Diagnostic redesign, pp. 9-10; Figure 2, p. 10	Describes PowerApps as front end, SharePoint Lists as repository, Power BI dashboards, Microsoft 365 fit, role-based access and reduced vendor dependence.	Complete
Methods	9. Target (mandatory)	Describe target sites, users/resources and eligibility criteria.	Setting, p. 5; Table 4, p. 13	Targets Cameroon EPI central and regional staff across four cadres and all ten regions; rollout records describe staff distribution.	Complete
Methods	10. Data (mandatory)	Describe data governance, data lifecycle, ownership, protection, consent/ethics and hosting.	Ethics/data governance, p. 9; Data availability, p. 22	Data were aggregated/anonymised for reporting; role-based access, EPI Microsoft storage and restricted dashboards were used; underlying staff data are not public.	Complete
Methods	11. Interoperability (mandatory)	Describe interfaces with other systems and standards used.	Intervention, p. 6; Figure 2, p. 10	Technical integration was within Microsoft 365: PowerApps, SharePoint Lists and Power BI. Clinical interoperability standards were not applicable because the tool manages HR performance data rather than patient/clinical records.	Complete / not clinically applicable
Methods	12. Participating entities (mandatory)	Describe implementing organisations, government involvement, partners, funders and ownership/IP.	Title page, p. 1; Setting, p. 5; Declarations, p. 22	Entities include Cameroon EPI/Ministry of Public Health, SCIDaR/Solina consortium and AFENET partners; implementation project funded by Gavi; EPI ownership and HR administration structures are described.	Complete
Methods	13. Budget planning (mandatory)	Describe planned/actual implementation budget or costs, including technology and ownership costs.	Diagnostic redesign, p. 10; Implementation outcomes, p. 17; Limitations, p. 19	Reports US$1,380 recurring platform cost avoided. Full cost of design, staff time, IT support and maintenance was not fully measured and is identified for future cycles.	Partial
Methods	14. Sustainability (mandatory)	Describe business/sustainability	Backend capacity, pp. 11-12; Implementation	Describes backend-user training, SOPs, SharePoint	Complete

		model, exit strategy, ownership and institutionalisation.	outcomes, pp. 15-17; Discussion, pp. 18-19	repository, maintenance calendar, EPI HR ownership and sustainability risks.	
Implementation/Results	15. Coverage (mandatory)	Describe implementation coverage and relative reach.	Adoption/penetration and Table 4, pp. 12-13	Reports central level plus all ten regions, 181 captured in rollout records and distribution by location, gender and cadre.	Complete
Implementation/Results	16. Outcomes (mandatory)	Report primary and other implementation outcomes using predefined measures.	Results and Tables 2-7, pp. 10-17	Reports acceptability, appropriateness, feasibility, adoption, fidelity, penetration, implementation cost, sustainability and first-cycle PMS outputs.	Complete
Implementation/Results	17. Lessons learned (mandatory)	Describe success factors, challenges, budget considerations and recommendations.	Results, pp. 10-17; Discussion, pp. 17-19	Lessons include starting with management problem, role-specific metrics, alpha testing, backend capacity before scale-up, dashboards for learning and cautious interpretation of scores.	Complete
Implementation/Results	18. Unintended consequences (nonmandatory)	Describe unintended consequences, harms or negative side effects.	Ethics/data governance, p. 9; Discussion/limitations, pp. 18-19	No direct harms were reported; potential risks include sensitive HR data exposure, rater leniency and hierarchical caution. Mitigations included aggregation, role-based access and development-oriented dashboards.	Partial
Discussion	19. Discussion (mandatory)	Summarise conclusions and future implications.	Discussion and conclusion, pp. 17-19	Discusses implications for digital HRH systems, feedback culture, equity, cost, sustainability and future review cycles.	Complete
General	20. General (nonmandatory)	Include regulatory/ethics approvals, registration/protocol and conflicts of interest.	Declarations, p. 22	Includes ethics approval number, programme authorisation, data availability, competing interests, funding and author contributions. No trial registration was applicable.	Complete

References for reporting standards

Pinnock, H., Barwick, M., Carpenter, C. R., Eldridge, S., Grandes, G., Griffiths, C. J., Rycroft-Malone, J., Meissner, P., Murray, E., Patel, A., Sheikh, A., & Taylor, S. J. C. (2017). Standards for Reporting Implementation Studies (StaRI) statement. BMJ, 356, i6795. https://doi.org/10.1136/bmj.i6795

Perrin Franck, C., Babington-Ashaye, A., Dietrich, D., Bediang, G., Veltsos, P., Gupta, P. P., Juech, C., Kadam, R., Collin, M., Setian, L., Serrano Pons, J., Kwankam, S. Y., Garrette, B., Barbe, S., Bagayoko, C. O., Mehl, G., Lovis, C., & Geissbuhler, A. (2023). iCHECK-DH: Guidelines and checklist for the reporting on digital health implementations. Journal of Medical Internet Research, 25, e46694. https://doi.org/10.2196/46694