

Publication

Effectiveness of an electronic clinical decision support system in improving the management of childhood illness in primary care in rural Nigeria: an observational study

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OBJECTIVES: To evaluate the impact of ALgorithm for the MANAgement of CHildhood illness ('AL-MANACH'), a digital clinical decision support system (CDSS) based on the Integrated Management of Childhood Illness, on health and quality of care outcomes for sick children attending primary health-care (PHC) facilities. **DESIGN:** Observational study, comparing outcomes of children attending facilities implementing ALMANACH with control facilities not yet implementing ALMANACH. **SETTING:** PHC facilities in Adamawa State, North-Eastern Nigeria. **PARTICIPANTS:** Children 2-59 months presenting with an acute illness. Children attending for routine care or nutrition visits (eg, immunisation, growth monitoring), physical trauma or mental health problems were excluded. **INTERVENTIONS:** The ALMANACH intervention package (CDSS implementation with training, mentorship and data feedback) was rolled out across Adamawa's PHC facilities by the Adamawa State Primary Health Care Development Agency, in partnership with the International Committee of the Red Cross and the Swiss Tropical and Public Health Institute. Tablets were donated, but no additional support or incentives were provided. Intervention and control facilities received supportive supervision based on the national supervision protocol. **PRIMARY AND SECONDARY OUTCOME MEASURES:** The primary outcome was caregiver-reported recovery at day 7, collected over the phone. Secondary outcomes were antibiotic and antimalarial prescription, referral, and communication of diagnosis and follow-up advice, assessed at day 0 exit interview. **RESULTS:** We recruited 1929 children, of which 1021 (53%) attended ALMANACH facilities, between March and September 2020. Caregiver-reported recovery was significantly higher among children attending ALMANACH facilities (adjusted OR=2.63, 95% CI 1.60 to 4.32). We observed higher parenteral and lower oral antimicrobial prescription rates (adjusted OR=2.42 (1.00 to 5.85) and adjusted OR=0.40 (0.22 to 0.73), respectively) in ALMANACH facilities as well as markedly higher rates for referral, communication of diagnosis, and follow-up advice. **CONCLUSION:** Implementation of digital CDSS with training, mentorship and feedback in primary care can improve quality of care and recovery of sick children in

resource-constrained settings, likely mediated by better guideline adherence. These findings support the use of CDSS for health systems strengthening to progress towards universal health coverage.

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