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Malaria early warning in Uganda using ECMWF S2S and seasonal climate forecasts

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The ECMWF S2S (extended range ensemble prediction system, EPS) and seasonal forecast system are used in an integrated seamless prediction system to drive a dynamical malaria model in Africa, to produce malaria transmission anomaly predictions up to four months ahead. We show the potential skill of this system across Africa, and then evaluate the early warning system for malaria against district level and sentinel site health data for Uganda over the past 6 to 10 years and show that the system has skill in predicting transmission anomalies. This is the first ever demonstration of successful malaria health predictions on the sub-national scale using a fully dynamical prediction system. We show how a simple cost-loss economic analysis can help guide when to use an early warning system to guide health interventions, rather than simply always or never intervening.