AuTOMATIC: Implementation of a highly automated response adaptive trial design

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Background
Response adaptive trial designs have the potential to identify an optimal intervention faster, with fewer participants and intervention failures compared to traditional parallel-group designs. Repeated sequential analyses on the accumulating data inform allocation ratios to each arm depending on performance relative to other interventions. Further gains are possible by automating the trial implementation.

Objectives
To present an automated response-adaptive trial solution for identifying the optimal reminder message framing and timing to improve the timeliness of routine vaccination in general practice.

Method
AuTOMATIC is a response-adaptive randomised trial of vaccine reminder text messages using four types of message framing (benefit, risk, neutral and social-norm) and three delivery times (2-weeks before, 1-week after and on the scheduled date) in a factorial design, compared to standard practice (13 arms). A modular trial system was built to enable interaction between the message delivery platform, randomisation, clinical trial database, data management and analysis, using authentication via API keys over a secure HTTPS connection.

Results
The trial system is in final testing and enrolment is planned to start late 2018. We anticipate that the investment in modular electronic solutions for implementing response-adaptive trial designs will be offset by the resources saved in data collection and statistical analysis. Automation may increase trial quality and integrity through real-time data management and standardised reports.

Conclusion
This trial expects to be the first fully automated adaptive trial in Australia. It will demonstrate how embedded adaptive trials can integrate with e-health to efficiently translate results into practice in real-time.