

Feasibility of Automatic Telephone Monitoring and Education Delivery in Childhood Asthma



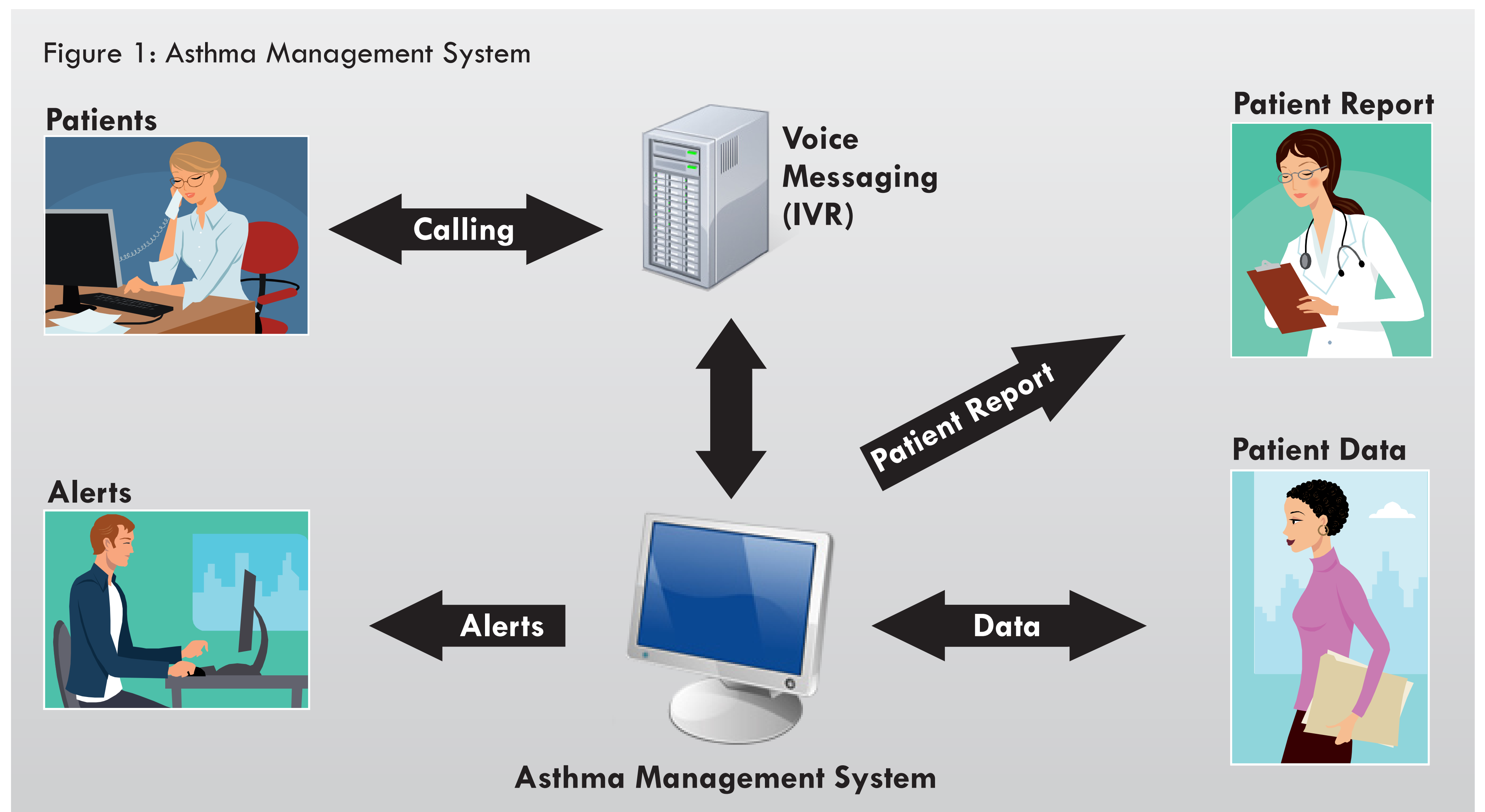
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Objective: To investigate the feasibility of using an automated interactive voice response (IVR) system and mobile short message service (SMS) for the collection of clinical information and the education of children with asthma.

Methods: We conducted pilot studies to investigate the feasibility of two different telephone-based telemedicine systems. Our paper presents a review of activity recorded from August 2006 to September 2007.

IVR Monitoring: Children and young people aged between 3 through to 16 years with asthma were eligible for the study. The participants received an automated telephone call made through the IVR system twice a week on their home phone or mobile phone. The IVR system asked questions about asthma symptoms and medication use. Children over 12 years old answered calls themselves. Parents answered calls for children younger than 12 years old. Participants were requested to enter clinical data using the keypad on the phone. Educational messages, appropriate information from the asthma management plan and medication reminders were given (Figure 1).

SMS Monitoring: Adolescents aged between 12 through to 16 years with asthma were eligible for the monitoring via mobile phone using SMS. Three messages were sent out each week. The first message included questions about their asthma symptoms and medication - in which participants were asked to reply. The other messages included asthma educational information.

Results: In the IVR study, 38 patients aged 3 to 14 years and/or their parents participated in the study. A total of 2026 calls were attempted by IVR system. There were 1278 successful calls with data collected and 579 calls (29%) with no answer due to variety of reasons. A total of 169 calls (8%) failed due to technical and operator errors. The overall response rate was 63% (Table 1).

Table 1. Interactive Voice Response calls and response rate

IVR asthma calls	Number of calls	Rate
Successful calls	1278	63%
Calls not answered	579	29%
Calls failed	169	8%
Total calls attempted	2026	100%

In the SMS study, 11 adolescents aged between 12 to 16 years participated in the study. There were total of 1151 SMS sent during the study period. These included a total of 312 asthma weekly questions, 547 asthma educational messages and 292 communication messages. There were 89 replies from nine participants. Two patients did not reply to the questions. The overall response rate was 29% (Table 2). From the messages received, the participants responded positively to the asthma education messages.

Table 2. SMS messages and response rate to asthma questions:

SMS messages	Number of messages	Rate
SMS questions	312	27%
Reply to questions	89	29%
Education	547	48%
Communication	292	25%
Total SMS sent	1151	100%

Conclusion: This study suggests that both IVR and SMS platforms are feasible for paediatric asthma data collection and patient education. Further research is required to determine the clinical outcomes and cost-effectiveness.



References:

- Wainwright C, Wootton R. A review of telemedicine and asthma. *Dis Manage Health Outcomes* 2003; 11(9):557-563.
- Anhøj J, Møldrup C. Feasibility of collecting diary data from asthma patients through mobile phone and SMS (short message service): response rate analysis and focus group evaluation from a pilot study. *Journal of Medical Internet Research* 2004 (Dec 2); 6(4):e42.
- Ostojic V, Cvoricsek B, Ostojic SB, Reznikoff D, Stipic-Markovic A, Tadjman Z. Improving asthma control through telemedicine: a study of short-message service. *Telemed J E Health*. 2005 Spring;11(1):28-35.