SMARTSTARTALLERGY
a novel tool for monitoring parent-reported IgE food allergy in infants

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Introduction:

Infant food allergy is a major public health challenge. Australia is home to world-leading population-based cross-sectional studies that provide robust estimates of challenge-proven food allergy. However, these studies are time limited, geographically restricted and resource intensive, and there is currently no process for the continuous monitoring of food allergy incidence in infants.

SmartStartAllergy (SSA) is a novel SMS- and smartphone-based application that was developed with the support of SmartVax, an active national adverse event surveillance system for vaccines, and implemented in collaboration with general practices to monitor infant feeding and parent-reported food allergy in the first year of life(3). In this study, we aimed to describe the proportion of infants with parent-reported allergic reactions and likely IgE-mediated allergy to common food allergens in the first year of life.

Methods:

We conducted a prospective observational study across 28 WA general practices. Eligible participants were parents of 12-month-old infants who attended a participating practice between September 2018 and June 2022. An SMS was sent to parents when their child was 12 months old asking if their child has had an allergic reaction to any food. Parents who responded to the SMS (regardless of the answer provided) were sent a link to a web-based questionnaire to collect additional information about food introduction and allergic reactions (Figure 1). Parent-reported allergic reactions were defined as any food(s) that the parent selected in response to the question "Which food(s) have caused an allergic reaction?" A stricter definition was applied for likely IgE food allergy, requiring onset of symptoms of an allergic reaction within 2 hours of ingestion of the food, excluding isolated perioral rash. Proportions were calculated by dividing the number of infants with parent-reported IgE food allergy by the number who had introduced each food.

Results:

Parents of 7,085 infants were invited to participate by SMS, with 1,712 (24.2%) commencing the web-based questionnaire. The proportions of infants who had introduced each food, and of those the proportion with any parent-reported allergic reaction and likely IgE food allergy are presented in Table 1. As anticipated, a significant proportion of parent-reported allergic reactions were unlikely to be due to IgE food allergy (Figure 2). Foods with the highest proportions of parent-reported IgE food allergy at 12 months of age were egg (97/1641, 5.9%), dairy (98/1660, 5.9%) and peanut (29/1559, 1.8%), while other common allergens (soy, tree nuts, wheat, sesame and fish) were all <1%.

		Dairy	Egg	Fish	Peanut	Sesame	Soy	Treenut	Wheat
Introduction of foods	Total responded	1712	1712	1712	1712	1712	1712	1712	1712
	Yes (n)	1660	1641	1554	1559	1085	1230	1057	1657
	% introduced	97.0%	95.9%	90.8%	91.1%	63.4%	71.8%	61.7%	96.8%
Any parent-reported allergic reaction to food (if introduced)	Total responded	1653	1632	1547	1551	1082	1224	1054	1649
	Yes (n)	155	147	11	48	14	24	12	22
	% any allergy	9.4%	9.0%	0.7%	3.1%	1.3%	2.0%	1.1%	1.3%
Symptoms suggesting IgE food allergy	Yes (n)	98	97	5	29	7	10	8	12
	% likely IgE allergy	5.9%	5.9%	0.3%	1.9%	0.6%	0.8%	0.8%	0.7%

Table 1: Proportion of infants with introduction of common food allergens, any parent-reported reaction, and likely IgE food allergy
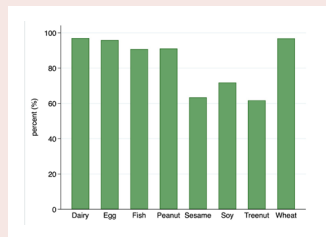
Graph 1: Introduction of foods.
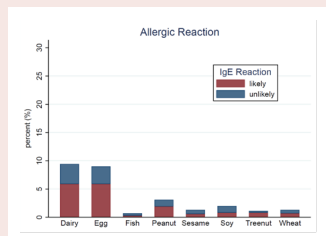
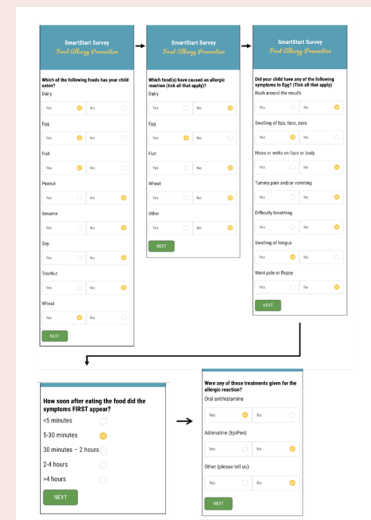**Graph 2:** Parent-reported allergic reaction to food if introduced.

Figure1: Representative screenshots from web-based SSA questionnaire.

Conclusion:

SmartStartAllergy is an effective tool for estimating the proportion of infants with parent-reported likely IgE food allergy in the first year of life. Applying criteria based on the timing and nature of symptoms may help to address the over-estimation of true food allergy prevalence that is known to occur when relying on self-reports(4); a study to investigate the agreement between parent-reported IgE food allergy via SSA and clinician-diagnosed food allergy is ongoing.
SmartStartAllergy has been implemented in general practices from all States and Territories in Australia, offering the unique potential to provide an efficient national monitoring system for incidence of parent-reported infant food allergy.

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