The Economic and Humanistic Burden of Food Allergies and Cost-Effectiveness of Treatment Options: A Systematic Review

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Supplementary Materials

Table S1. Sources searched for the SLR

Electronic databases
The following electronic databases were searched from their inception dates to July 21, 2023: • MEDLINE, including MEDLINE In-Process, MEDLINE Daily and MEDLINE Epub Ahead of Print, from 1946 to July 20, 2023 • Embase, from 1974 to July 20, 2023 • York Centre for Reviews and Dissemination (CRD) database: ○ NHS Economic Evaluation Database (EED), up to Issue 2 of 4, April 2015 [last database update] • International Health Technology Assessment (HTA) database, to July 21, 2023
Conference Proceedings
Manual searches of abstracts from 2021 to 2022 of the following conferences, were conducted between 28th and 31st August, 2023: • American College of Allergy, Asthma, and Immunology (ACAAI) 2021 (November 2021, New Orleans, LA, USA) and 2022 (November 2022, Louisville, KY, USA) • International Society for Pharmacoeconomics and Outcomes Research (ISPOR) European Annual Meeting 2021 (November 2021, Virtual) and 2022 (November 2022, Vienna, Austria) • ISPOR International Annual Meeting 2021 (May 2021, Virtual) and 2022 (May 2022, Washington DC, USA) • European Academy of Allergy & Clinical Immunology (EAACI) 2021 (July 2021, Krakov, Poland) and 2022 (July 2022, Prague, Czech Republic) • American Academy of Allergy, Asthma & Immunology (AAAAI) 2021 (February 2021, Virtual) and 2022 (February 2022, Phoenix, AZ, USA)
HTA Websites and Grey Literature Sources
The following HTA body websites were searched to identify relevant HTAs from the last ten years (2013–2023): • National Institute for Health and Care Excellence (NICE) – https://www.nice.org.uk/, searched on October 4, 2023 • Institute for Clinical and Economic Review (ICER) – https://icer.org/, searched on October 4, 2023 • Canadian Agency for Drugs and Technologies in Health (CADTH) – https://www.cadth.ca/, searched on October 4, 2023 • Haute Autorité de Santé (HAS) – https://www.has-sante.fr/portail/, searched on October 25, 2023 • Agenzia nazionale per i servizi sanitari regionali (AGENAS) – https://www.agenas.gov.it/, searched on October 25, 2023 • Agencia Española de Medicamentos y Productos Sanitarios (AEMPS) – https://www.aemps.gob.es/home.htm, searched on October 25, 2023 • Pharmaceutical Benefits Scheme (PBS) – https://www.pbs.gov.au/info/industry/listing/participants/pbac, searched on October 25, 2023 • Institut für Qualität und Wirtschaftlichkeit im Gesundheitswesen (IQWiG) – https://www.iqwig.de/, searched on October 25, 2023 A supplementary search of the following sources was also conducted for any additional relevant studies:

• The Cost-Effectiveness Analysis (CEA) Registry, managed by Tufts Medical Center – available at http://healtheconomics.tuftsmedicalcenter.org/cear2n/search/search.aspx, searched on October 4, 2023 • The EQ-5D Publications Database – https://euroqol.org/search-for-eq-5d-publications/, searched on October 4, 2023
Reference List Searching
The bibliographies of relevant SLRs, (N)MAs, economic evaluations and HTAs identified through the electronic database searches and grey literature searches were hand-searched to identify any additional studies of relevance.

Table S2. Eligibility criteria for the SLR

Category	Economic evaluations		Costs and HCRU studies		Utility and HRQoL studies	
	Inclusion criteria	Exclusion criteria	Inclusion criteria	Exclusion criteria	Inclusion criteria	Exclusion criteria
Population	• Patients with IgE-mediated food allergies[a] (including children, adolescents, and adults)	• Patients with non-IgE-mediated food allergies • Patients with eosinophil-associated gastrointestinal disorders or eosinophilic esophagitis • Patients with oral allergy syndrome/pollen allergy syndrome • Patients with food hypersensitivity, food intolerance, gluten	• Patients with IgE-mediated food allergies[a] (including children, adolescents, and adults) • ≥200 relevant people with food allergies	• Patients with non-IgE-mediated food allergies • Patients with eosinophil-associated gastrointestinal disorders or eosinophilic esophagitis • Patients with oral allergy syndrome/pollen allergy syndrome • Patients with food hypersensitivity, food intolerance, gluten intolerance, or celiac disease	• Patients with IgE-mediated food allergies[a] (including children, adolescents, and adults) • ≥220 relevant people with food allergies for HRQoL studies • ≥200 relevant people with food allergies for utility studies	• Patients with non-IgE-mediated food allergies • Patients with eosinophil-associated gastrointestinal disorders or eosinophilic esophagitis • Patients with oral allergy syndrome/pollen allergy syndrome • Patients with food hypersensitivity, food intolerance, gluten intolerance, or celiac disease

Category	Economic evaluations		Costs and HCRU studies		Utility and HRQoL studies	
	Inclusion criteria	Exclusion criteria	Inclusion criteria	Exclusion criteria	Inclusion criteria	Exclusion criteria
		intolerance, or celiac disease				
Interventions	• Omalizumab/Xolair® • Ligelizumab/QGE031 • Etokimab • Dupilumab/Dupixent® • Palforzia/Peanut (Arachis hypogea) allergen powder-dnfp • Epicutaneous immunotherapy/EPIT (such as Viaskin) • Aqueous food injections • Sublingual immunotherapy/SLIT • ADP101 • CA-002 • PRT-100/PRT-120 • INP20 • INT301 • Acalabutinib/ Calquence® • Abrocitinib/Cibinqo® • Talizumab/TNX-901	• Studies not investigating a relevant intervention	• Any or none	• NA	• Any or none	• NA
Comparators	• Any or none	• NA	• Any or none	• NA	• Any or none	• NA

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Category	Economic evaluations		Costs and HCRU studies		Utility and HRQoL studies	
	Inclusion criteria	**Exclusion criteria**	**Inclusion criteria**	**Exclusion criteria**	**Inclusion criteria**	**Exclusion criteria**

Outcomes	• ICERs
	• Cost per clinical outcome
	• Total QALYs
	• Total DALYs
	• Total LYGs
	• Total costs
	• Incremental costs and QALYs/DALYs
	• Net monetary benefit
		• Studies not reporting any outcomes listed of relevance for the population and/or intervention of interest	• Novel direct and indirect costs and HCRU, including:
			  • Drug cost
			  • Administration cost
			  • Monitoring costs
			  • Hospitalization costs
			  • Adverse events
			  • Miscellaneous costs
			  • Absenteeism
			  • Presenteeism
			  • Lost earnings
			  • Cost- and time-burden related to alternative allergen-free diet
				• Studies not reporting any relevant outcomes	• Any health state utility values measured using:
					  • EQ-5D
					  • SF-6D
					  • SF-36
					  • SF-12
					  • SF-16
					  • SF-20
					  • 15D
					• Food allergy specific measures such as FAQLQ (including the FAQLQ for children, teens, adults, caregivers, and FAQL-PB for parental burden), SOFAA, or FAIM
						• Studies not reporting any relevant outcomes

Study design	• Cost-utility • Cost-effectiveness • Cost-consequence • Cost-benefit • Cost-minimization	• Any other analysis	• Any original research study reporting novel cost and HCRU date, including budget impact models and cost-of-illness studies	• NA	• Any study design reporting novel health state utility/HRQoL data	• NA
Publication type	**Inclusion** • Journal articles presenting original research • Systematic reviews and/or meta-analyses of relevant primary publications (these will be considered relevant at the title/abstract stage but will be excluded during the full-text review stage) • HTAs					

Category	Economic evaluations		Costs and HCRU studies		Utility and HRQoL studies	
	Inclusion criteria	**Exclusion criteria**	**Inclusion criteria**	**Exclusion criteria**	**Inclusion criteria**	**Exclusion criteria**
	• Congress abstracts published in or since 2021 **Exclusion** • Case studies/reports • Non-primary research studies such as narrative reviews • Congress abstracts published before 2021					
Other considerat-ions	• Human subjects • Abstracts or full texts in the English language • Published within the past 10 years (2013 onwards)	• Studies without human participants i.e., in vitro/preclinical/animal studies • Studies with abstracts and full text not in English • Studies published prior to 2013	• Human subjects • Abstracts or full texts in the English language • Published within the past 10 years (2013 onwards)	• Studies without human participants i.e., in vitro/preclinical/ animal studies • Studies with abstracts and full text not in English • Studies published prior to 2013	• Human subjects • Abstracts or full texts in the English language	• Studies without human participants i.e., in vitro/preclinical/ animal studies • Studies with abstracts and full text not in English

Footnotes: [a]Due to there being limited information in the identified articles about whether or not the study populations had "IgE-related" food allergy, this review used a broad definition and included any study in patients with food allergy, unless clearly in a population with non-IgE-mediated disease**. Abbreviations:** 15-D: 15-Dimensions; DALY: disability-adjusted life year; EPIT: epicutaneous immunotherapy; FAIM: food allergy independence measure; FAQLQ(-PB): food allergy quality of life questionnaire (parental burden); HCRU: healthcare resource use; HRQoL: health-related quality of life; HTA: health technology assessment; ICER: incremental cost-effectiveness ratio; IgE: Immunoglobulin E; LYG: life-years gained; NA: not applicable; QALY: quality-adjusted life-years gained; SF-6D: Short Form-6 Dimensions; SF-36: 36-Item Short Form Health Survey; SF-12: 12-Item Short Form Health Survey; SF-16: 16-Item Short Form Health Survey; SF-20: 20-Item Short Form Health Survey; SLIT: sublingual immunotherapy; SLR: systematic literature review; SOFAA: scale of food allergy anxiety.