



in collaboration with:



ADDENDUM TO

ImmunoCAP ISAC and Microtest for multiplex allergen testing in people with difficult to manage allergic disease: A systematic review and cost-effectiveness analysis

After submitting the final version of the report, further details were requested regarding the fourth scenario analysis presented in chapter 4 (assuming oral food challenge (OFC) costs of £256). Therefore, further details regarding the fourth scenario analysis is provided in this addendum. For completeness, further details regarding the other scenario analyses are provided as well. As noted in the report, all cost analyses consider the short-term test costs using two-way threshold analyses for the proportion sIgE tests and the proportion of OFC tests. Specifically, in pairwise comparisons of two test strategies, the minimal reduction (i.e. threshold) in proportions of sIgE and OFC tests is identified that was needed for the most expensive test strategy to just become cheaper than the alternative test strategy, assuming that everything else remains equal. Here, 100% for both tests was defined as all patients receive eight sIgE tests on average and all patients receiving on average one OFC test. Therefore, for example, if it was assumed that the use of multiplex allergen testing would result in no sIgE testing then this would imply a 100% reduction in sIgE testing compared to the standard diagnostic pathway.

Scenario analysis 1: assuming the LuxScan 10 000k reader would also be used for other purposes than ImmunoCAP ISAC testing

In the calculation of the base case costs it is assumed for ImmunoCAP ISAC, that the LuxScan 10 000k reader would only be used for ImmunoCAP ISAC testing (on average 386 tests per year). However, the LuxScan 10 000k reader might be used for other purposes. Therefore, in the first scenario analysis, it is assumed that the LuxScan 10 000k reader would be fully occupied for 253 days per year. This reduces the ImmunoCAP ISAC testing costs to £201.91 per patient tested as opposed to £219.51 in the base case i.e. the ImmunoCAP ISAC costs are reduced by £18.

This resulted in a decrease in the proportions of tests needed to be reduced in order for ImmunoCAP ISAC to be cost-saving compared with the standard diagnostic pathway and Microtest (Figure 1). More specifically, to be cost-saving compared with the standard diagnostic pathway, the proportion of OFC tests for ImmunoCAP ISAC should be reduced by at least 11% (e.g. from 50% to 39%) if there was a 100% reduction in sIgE tests. On the other hand, if there is no reduction in the proportion of sIgE tests, the reduction in OFC tests should be at least 35% for ImmunoCAP ISAC.

For ImmunoCAP ISAC compared with Microtest, the proportion of OFC tests for ImmunoCAP ISAC should be reduced by at least 8% if there is no reduction in the proportion of sIgE tests. When assuming no reduction in the proportion of OFC tests, the proportion of sIgE tests for ImmunoCAP ISAC should be reduced by at least 33% in order to be cost-saving.

Scenario analysis 2: assuming the Microtest test would be performed at the service provider laboratory

The second scenario analysis considered a scenario wherein the Microtest test would be performed at the service provider laboratory instead of at the Microtest Dx laboratory (as assumed in the base case analysis). This scenario reduces the costs of Microtest testing to £149.37 per patient tested as opposed to £156.85 in the base case (see Appendix 8 of the report) i.e. the Microtest costs are reduced by £7.

For Microtest, this resulted in a decrease in the proportions of tests needed to be reduced in order to be cost-saving compared with the standard diagnostic pathway (Figure 2). More specifically, to be cost-saving compared with the standard diagnostic pathway, the proportion of OFC tests for Microtest should be reduced by at least 2% if there was a 100% reduction in sIgE tests. On the other hand, if there is no reduction in the proportion of sIgE tests, the reduction in OFC tests should be at least 26% for Microtest. Moreover, for ImmunoCAP ISAC compared with Microtest, the proportion of OFC tests for ImmunoCAP ISAC should be reduced by at least 15% if there is no reduction in the proportion of sIgE tests. When assuming no reduction in the proportion of OFC tests, the proportion of sIgE tests for ImmunoCAP ISAC should be reduced by at least 39% in order to be cost-saving.

Scenario analysis 3: assuming different number of allergens tested using sIgE testing

The third scenario analysis considered the impact of the number of allergens tested using sIgE testing (base case value = 8 allergens tested per person). The number of allergens was set to 1 and 20 respectively.

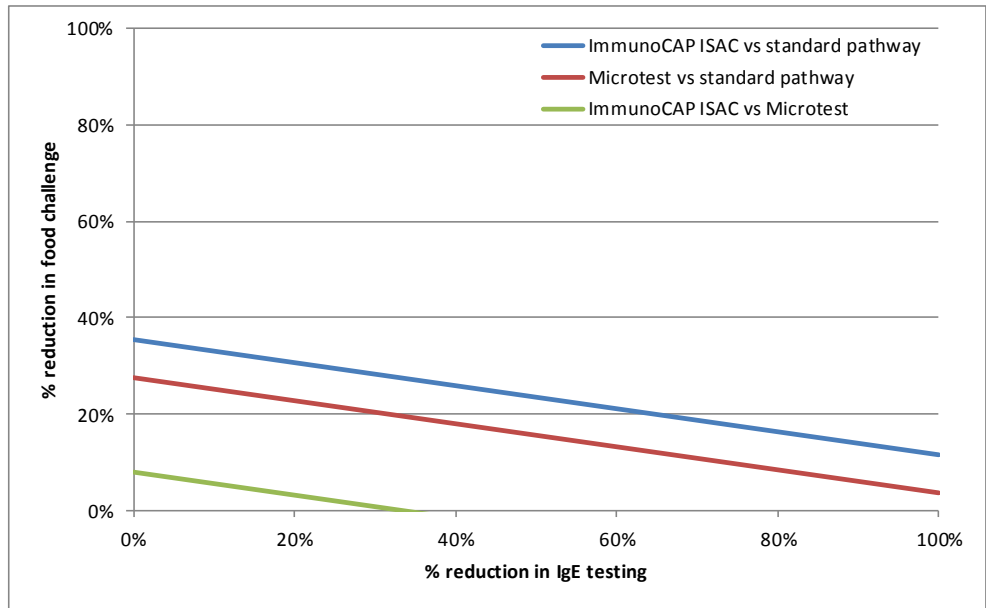
The results of this scenario analysis indicated that when assuming the number of allergens being tested is 1, decreases the costs of sIgE testing and hence the impact of reducing the proportion of patients with sIgE tests while assuming 20 allergens being tested increases the impact of reducing the proportion of patients with sIgE tests (Figures 3 and 4). More specifically when assuming 1 allergy being tested, for ImmunoCAP ISAC and Microtest to be cost-saving compared with the standard diagnostic pathway, the proportions of OFC tests should be reduced by at least 35% and 24% respectively if there was a 100% reduction in sIgE tests. Moreover, for ImmunoCAP ISAC compared with Microtest, the proportion of OFC tests for ImmunoCAP ISAC should be reduced by at least 8% if there is a 100% reduction in sIgE tests. On the other hand when assuming 20 allergies to be tested, for ImmunoCAP ISAC and Microtest to be cost-saving compared with the standard diagnostic pathway, assuming no reduction in OFC tests, the proportion of sIgE tests should be reduced by at least 64% and 46% respectively. Moreover, for ImmunoCAP ISAC compared with Microtest, the proportion of sIgE tests for ImmunoCAP ISAC should be reduced by at least 18% (assuming no reduction in OFC tests) in order to be cost-saving.

Scenario analysis 4: assuming OFC costs of £256

Based on the clinical expertise of a committee member, who mentioned that the costs of a hospital appointment to implement the food elimination diet (component of the OFC costs) are mostly not applicable, this final scenario analysis was added. The final scenario analysis considered a reduced OFC cost of £256.00 as opposed to £570.00 in the base case, excluding the hospital costs associated with implementing the food elimination diet.

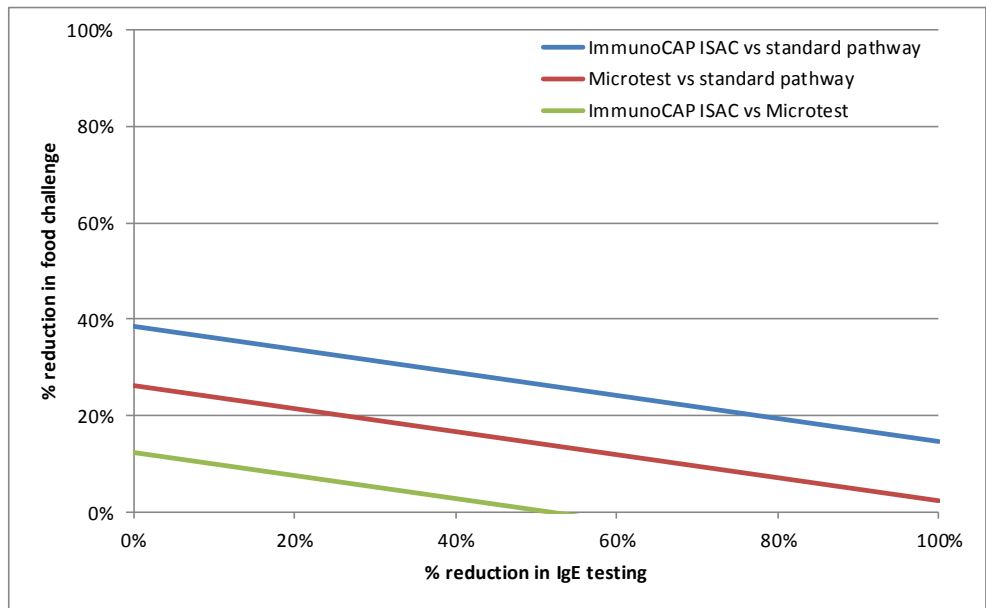
The results of this scenario analysis indicated that decreasing the OFC costs to £256.00 substantially increases the reduction in OFC needed in order for multiplex allergen testing to be cost-saving (Figure 5). More specifically, in order for ImmunoCAP ISAC and Microtest to be cost-saving compared with the standard diagnostic pathway, the proportion of OFC tests should be reduced by at least 32% and 8% respectively if there would be a 100% reduction in sIgE tests. On the other hand, if there is no reduction in the proportion of sIgE tests, the reduction in OFC tests should be at least 86% and 61% for ImmunoCAP ISAC and Microtest respectively. Moreover, for ImmunoCAP ISAC compared with Microtest, the proportion of OFC tests for ImmunoCAP ISAC should be reduced by at least 24% if there is no reduction in the proportion of sIgE tests. When assuming no reduction in the proportion of OFC tests, the proportion of sIgE tests for ImmunoCAP ISAC should be reduced by at least 46% in order to be cost-saving.

Figure 1: Results of two-way threshold analyses (assumed that the LuxScan 10 000k reader would be fully occupied)^a



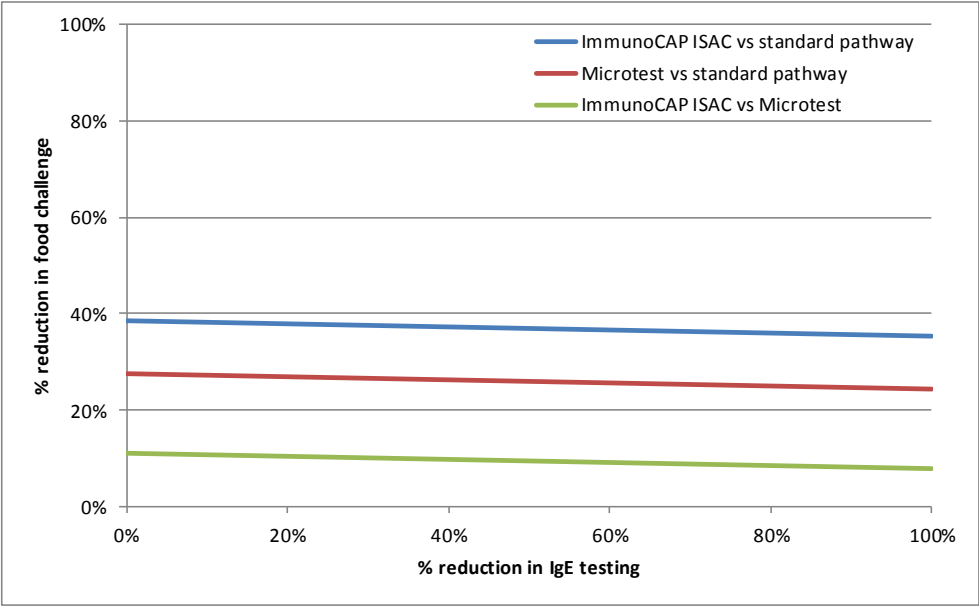
^aCombinations of percentage reductions in food challenge and IgE testing above a line lead to higher costs, and below a line lead to lower costs

Figure 2: Results of two-way threshold analyses (assumed that the Microtest test would be performed at the service provider lab)^a



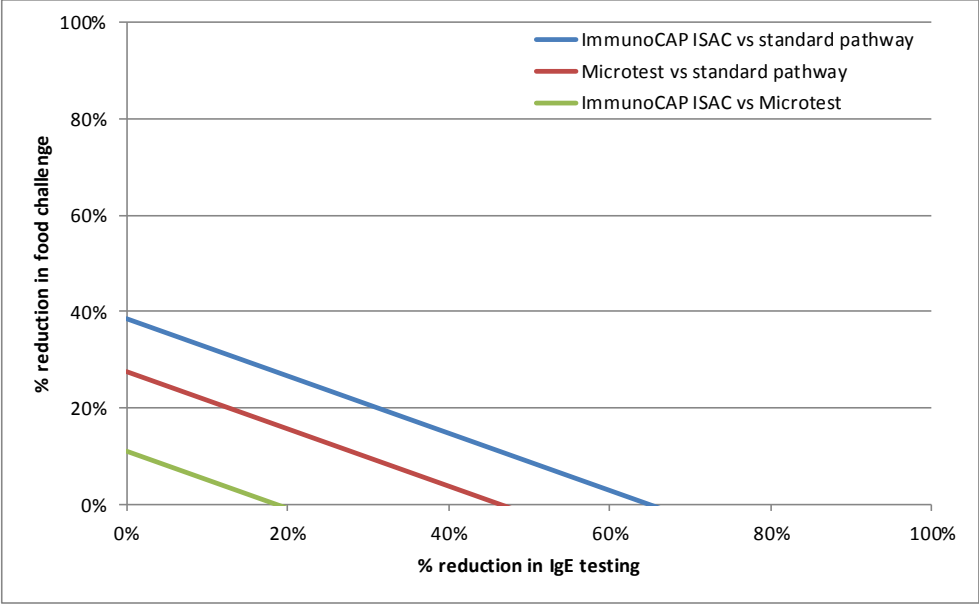
^aCombinations of percentage reductions in food challenge and IgE testing above a line lead to higher costs, and below a line lead to lower costs

Figure 3: Results of two-way threshold analyses (assumed one allergy tested during sIgE test)^a



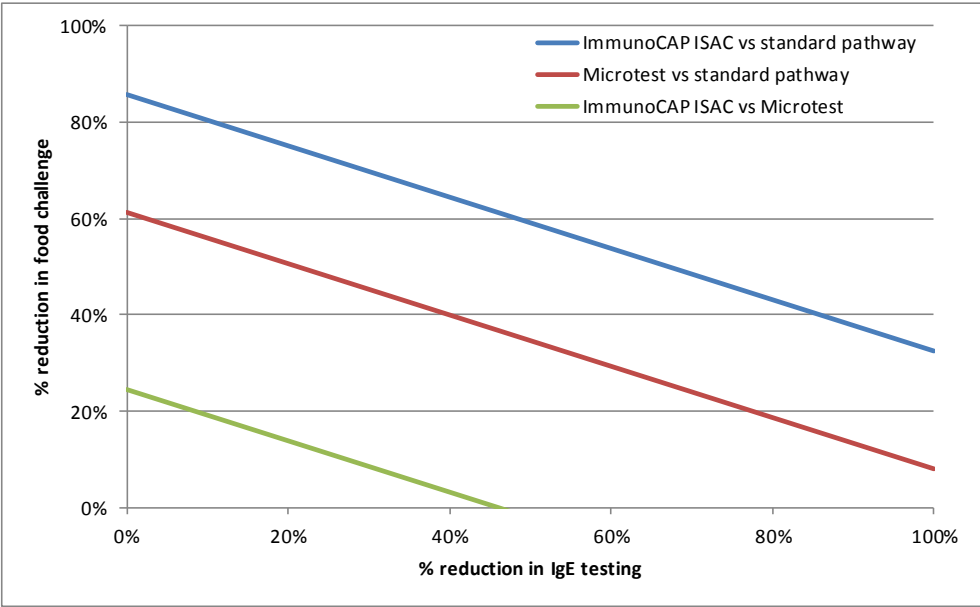
^aCombinations of percentage reductions in food challenge and IgE testing above a line lead to higher costs, and below a line lead to lower costs

Figure 4: Results of two-way threshold analyses (assumed 20 allergens tested during sIgE test)^a



^aCombinations of percentage reductions in food challenge and IgE testing above a line lead to higher costs, and below a line lead to lower costs

Figure 5: Results of two-way threshold analyses (assuming OFC costs of £256.00)^a



^aCombinations of percentage reductions in food challenge and IgE testing above a line lead to higher costs, and below a line lead to lower costs