# Appendix E: Economic evidence tables

| Study | Burri[10] | | | |
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| **Study details** | **Population & interventions** | **Costs** | **Health outcomes** | **Cost effectiveness** |
| **Economic analysis:** CCA (health outcome: Hospital admission) <br> **Study design:** RCT <br> **Approach to analysis:** Analysis of individual resource use, with unit costs applied. <br> **Perspective:** Switzerland and Germany primary care <br> **Follow-up:** 12 months <br> **Discounting:** Costs: n/a; Outcomes: n/a | **Population:** Patients presenting with new onset or clearly worsening dyspnoea as their primary symptom <br> **Cohort settings:** <br> Start age: 72 <br> Male: 13% <br> **Intervention 1: (n=160)** <br> Usual care (no BNP) <br> **Intervention 2: (n=163)** <br> Receiving point of care B-type natriuretic peptide (BNP) measurement | **Total costs (mean per patient):** <br> Intervention 1: £5,607 <br> Intervention 2: £5,924 <br> Incremental (2–1): £317 <br> (95% CI: NR; p=NR) <br> **Currency & cost year:** <br> 2007 US dollars (presented here as 2007 UK pounds35[(a)]) <br> **Cost components incorporated:** <br> Hospitalisations from dyspnoea, outpatient visits to a physician, medical treatment. | **Hospitalisations (per 100 patients):** <br> Intervention 1: 26.25 <br> Intervention 2: 30.67 <br> Incremental (2–1): 4.42 <br> (95% CI: NR; p=NR) <br><br> **Diagnostic certainty (% of patients receiving appropriate treatment):** <br> Intervention 1: 53% <br> Intervention 2: 66% <br> Incremental (2–1): 13% <br> (95% CI: NR; p=NR) | Intervention 1, usual care (no BNP), was seen to have lower costs and fewer hospitalizations per 100 patients. However, diagnostic certainty was greater for intervention 2 using BNP. |

**Data sources**

**Health outcomes:** Resource use from questionnaires from referring physicians and telephone interviews with patients at 3 and 12 months. **Quality-of-life weights:** NA <br> **Cost sources:** Participant's insurance company and hospital charges. Swiss health system.

**Comments**

**Source of funding:** NR **Applicability and limitations:** Intervention may not be relevant. Cost-consequence analysis only. Clinical outcomes may not be important. Unclear if hospital admissions through ED. Non-UK study. RCT-based analysis so from 1 study by definition therefore not reflecting all evidence in area. No sensitivity analysis reported.

**Overall applicability[(b)]:** Partially applicable    **Overall quality[(c)]:** Potentially serious limitations

*Abbreviations: 95% CI: 95% confidence interval; BNP: B-type natriuretic peptide; CCA: cost–consequence analysis; NR: not reported; for studies where the time horizon is longer than the treatment duration, an assumption needs to be made about the continuation of the study effect. For example, does a difference in utility between groups during treatment continue beyond the end of treatment and if so for how long.*
*(a) Converted using 2007 purchasing power parities.[59]*
*(b) Directly applicable/Partially applicable/Not applicable.*
*(c) Minor limitations/Potentially serious limitations/Very serious limitations.*

| Study | Hunter[32] | | | |
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| **Study details** | **Population & interventions** | **Costs** | **Health outcomes** | **Cost effectiveness** |
| **Economic analysis:** CUA (health outcome: QALY, antibiotic use) <br> **Study design:** Probabilistic decision analytic model <br> **Approach to analysis:** Decision tree and Markov model of progression based on 2 severity states (Healthy and respiratory tract infection). 28 day cycles. <br> **Perspective:** UK NHS <br> **Time horizon:** 3 years (40 cycles) <br> **Discounting:** Costs: 3.5% (0.26% per cycle); Outcomes: 3.5% (0.26% per cycle) | **Population:** <br> Patients with respiratory tract infection symptoms as defined by NICE <br> **Cohort settings:** <br> Start age: NR <br> Male: NR <br> **Intervention 1: (n=100)** <br> Usual care (no CRP) <br> **Intervention 2: (n=100)** <br> GP use of C-reactive protein (CRP) point of care test | **Total costs (mean per patient):** <br> Intervention 1: £180.81 <br> Intervention 2: £180.39 <br> Incremental (2–1): -£0.42 <br> (95% CI: NR; p=NR) <br> **Currency & cost year:** <br> 2013 UK pounds <br> **Cost components incorporated:** <br> Cost per CRP test, <br> cost per minute GP, <br> cost per antibiotic prescription | **QALYs (mean per patient):** <br> Intervention 1: 2.5563 <br> Intervention 2: 2.55761 <br> Incremental (2–1): 0.0013 <br> (95% CI: NR; p=NR) <br><br> **Antibiotics prescribed (mean per patient):** <br> Intervention 1: 1.84 <br> Intervention 2: 1.36 <br> Incremental (2–1): -0.48 <br> (95% CI: NR; p=NR) | Intervention 2 marginally dominates. Probability Intervention 2 cost-effective (£20K/30k threshold): 77%/80% <br><br> **Analysis of uncertainty:** <br> pa: 5,000 iterations of discounted costs and QALYs for sets of 100 patients presented in a cost-effectiveness plane. Results found intervention 2, GP use of CRP, to be dominant compared to intervention 1, usual care, in 50% of simulations. <br><br> One way sensitivity analysis, changing key parameters in the model, had little impact on the conclusions. |

**Data sources**

**Health outcomes:** Probabilities taken from Cals, Huang and Little [15,31,38] **Quality-of-life weights:** Health state utilities: utility scores from Kind, NICE and Oppong.[36,54,58] Duration of RTI from Cals [13] **Cost sources:** NHS reference costs and PSSRU.

**Comments**

**Source of funding:** NR **Limitations:** Reliant on small number of studies, mostly collection of studies by Cals et al.

**Overall applicability(a):** Directly applicable    **Overall quality(b):** Minor limitations

*Abbreviations: 95% CI: 95% confidence interval; CRP: C-reactive protein; CUA: cost–utility analysis; NR: not reported; pa: probabilistic analysis; PSSRU: personal social services research unit; QALYs: quality-adjusted life years.*
*(a) Directly applicable/Partially applicable/Not applicable.*
*(b) Minor limitations/Potentially serious limitations/Very serious limitations.*

| Study | Oppong[58] | | | |
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| **Study details** | **Population & interventions** | **Costs** | **Health outcomes** | **Cost effectiveness** |
| **Economic analysis:** CUA (health outcome: QALYs, antibiotic prescription) **Study design:** RCT **Approach to analysis:** Analysis of individual level resource use, with unit costs applied **Perspective:** Swedish and Norwegian health care systems. **Time horizon/Follow-up:** 28 days **Discounting:** Costs: n/a; Outcomes: n/a | **Population:** Patients presenting to their GP for the first time with an acute or worsened cough as the main or dominant symptom for up to 28 days **Cohort settings:** Start age: 52 Male: NR **Intervention 1: (n=89)** Usual care (no CRP) **Intervention 2: (n=281)** Patients receiving C-reactive protein (CRP) point of care test | **Total costs (mean per patient):** Intervention 1: NR Intervention 2: NR Incremental (2–1): £8.97 (95% CI: £1.48 to £19.43; p=0.09) **Currency & cost year:** 2007 Euro (presented here as 2007 UK pounds[(a)])] **Cost components incorporated:** Primary care clinic visits, nurse visits, hospital admissions, medical investigations, referrals, antibiotics and other drug prescriptions | **QALYs (mean per patient):** Intervention 1: NR Intervention 2: NR Incremental (2–1): 0.0012 (95% CI: -0.001 to 0.004; p=0.35) **Antibiotics prescribed (mean per patient):** Intervention 1: NR Intervention 2: NR Incremental (2–1): -0.1 (95% CI: -0.2 to 0.01; p=0.08) | **ICER (Intervention 2 versus Intervention 1):** £7,475 per QALY gained; under the £20,000 per QALY gained threshold. |

| **Data sources** |
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| **Health outcomes:** Patient provided resource use through weekly updated diary over the 28 days. Clinician completed case reports. **Quality-of-life weights:** EQ-5D European harmonised value set **Cost sources:** 1. national and international publications on costs; 2. collaborators from the GRACE network; 3. British health economists who had participated in studies in the countries; 4. health economists in the countries. |

| **Comments** |
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| **Source of funding:** Part of GRACE (Genomics to combat resistance against antibiotics in community-acquired LRTI in Europe) – European Commission funded project. **Limitations:** Swedish/Norwegian health care system may not be representative of UK NHS. Only reported incremental QALY difference, not incremental QALYs of each intervention. Observational study using regression analysis. 28 day follow-up may not be sufficient. Unit cost resources may not be reliable. No sensitivity analysis. |

| **Overall applicability[(b)]:** Partially applicable  **Overall quality[(c)]:** Potentially serious limitations |
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*Abbreviations: 95% CI: 95% confidence interval; CRP: C-reactive protein; CUA: cost–utility analysis; EQ-5D: Euroqol 5 dimensions (scale: 0.0 [death] to 1.0 [full health], negative values mean worse than death); ICER: incremental cost-effectiveness ratio; NR: not reported; QALYs: quality-adjusted life years.*
*(a) Converted using 2007 purchasing power parities.[59]*
*(b) Directly applicable/Partially applicable/Not applicable.*
*(c) Minor limitations/Potentially serious limitations/Very serious limitations.*