

**Appendix 4.** List of studies included in the systematic review

1. Aballea S, Cure S, Vogelmeier C, Wiren A. A retrospective database study comparing treatment outcomes and cost associated with choice of fixed-dose inhaled corticosteroid/long-acting  $\beta$ 2-agonists for asthma maintenance treatment in Germany. *International journal of clinical practice*. 2008;62(12):1870-9.
2. Accordini S, Bugiani M, Arossa W, Gerzeli S, Marinoni A, Olivieri M, et al. Poor control increases the economic cost of asthma. *International archives of allergy and immunology*. 2006;141(2):189-98.
3. Al Badaai Y, Valdés CJ, Samaha M. Outcomes and cost benefits of functional endoscopic sinus surgery in severely asthmatic patients with chronic rhinosinusitis. *The Journal of Laryngology & Otology*. 2014;128(6):512-7.
4. Andersson F, Ståhl E, Barnes PJ, Löfdahl CG, O'Byrne PM, Pauwels RA, et al. Adding formoterol to budesonide in moderate asthma—health economic results from the FACET study. *Respiratory medicine*. 2001;95(6):505-12.
5. Andersson F, Kjellman M, Forsberg G, Möller C, Arheden L. Comparison of the cost-effectiveness of budesonide and sodium cromoglycate in the management of childhood asthma in everyday clinical practice. *Annals of Allergy, Asthma & Immunology*. 2001;86(5):537-44.
6. Andrews AL, Teufel RJ II, Basco Jr WT, Simpson KN. A cost-effectiveness analysis of inhaled corticosteroid delivery for children with asthma in the emergency department. *The Journal of pediatrics*. 2012;161(5):903-7.
7. Andrews AL, Wong KA, Heine D, Scott Russell W. A Cost-effectiveness Analysis of Dexamethasone Versus Prednisone in Pediatric Acute Asthma Exacerbations. *Academic Emergency Medicine*. 2012;19(8):943-8.
8. Ariano R, Berto P, Incorvaia C, Di Cara G, Boccardo R, La Grutta S, et al. Economic evaluation of sublingual immunotherapy vs symptomatic treatment in allergic asthma. *Annals of Allergy, Asthma & Immunology*. 2009;103(3):254-9.
9. Atherly A, Nurmagambetov T, Williams S, Griffith M. An economic evaluation of the school-based “power breathing” asthma program. *Journal of Asthma*. 2009;46(6):596-9.
10. Ayres JG, Boyd R, Cowie H, Hurley JF. Costs of occupational asthma in the UK. *Thorax*. 2011;66(2):128-33.
11. Balkrishnan R, Norwood GJ, Anderson A. Outcomes and cost benefits associated with the introduction of inhaled corticosteroid therapy in a Medicaid population of asthmatic patients. *Clinical therapeutics*. 1998;20(3):567-80.
12. Barnes NC, Thwaites RMA, Price MJ. The cost-effectiveness of inhaled fluticasone propionate and budesonide in the treatment of asthma in adults and children. *Respiratory medicine*. 1999;93(6):402-7.
13. Barnes PJ, Jonsson B, Klim JB. The costs of asthma. *European Respiratory Journal*. 1996;9(4):636-42.
14. Bavbek S, Mungan D, Türktaş H, Mısırlıgil Z, Gemicioğlu B, Group AS. A cost-of-illness study estimating the direct cost per asthma exacerbation in Turkey. *Respiratory medicine*. 2011;105(4):541-8.
15. Beerhuizen T, Voorend-van Bergen S, van den Hout WB, Vaessen-Verberne AA, Brackel HJ, Landstra AM, et al. Cost-effectiveness of FENO-based and web-based monitoring in paediatric asthma management: a randomised controlled trial. *Thorax*. 2016;71(7):607-13.
16. Berg J, Lindgren P. Economic evaluation of FENO measurement in diagnosis and 1-year management of asthma in Germany. *Respiratory medicine*. 2008;102(2):219-31.
17. Berto P, Bassi M, Incorvaia C, Frati F, Puccinelli P, Giaquinto C, et al. Cost effectiveness of sublingual immunotherapy in children with allergic rhinitis and asthma. *European annals of allergy and clinical immunology*. 2005;37(8):303-8.
18. Berto P, Passalacqua G, Crimi N, Frati F, Ortolani C, Senna G, et al. Economic evaluation of sublingual immunotherapy vs symptomatic treatment in adults with pollen-induced respiratory allergy: the Sublingual Immunotherapy Pollen Allergy Italy (SPAI) study. *Annals of Allergy, Asthma & Immunology*. 2006;97(5):615-21.
19. Beyhun NE, Soyer ÖU, Kuyucu S, Sapan N, Altıntaş DU, Yüksel H, et al. A multi-center survey of childhood asthma in Turkey—I: The cost and its determinants. *Pediatric Allergy and Immunology*. 2009;20(1):72-80.

20. Bond K, Coyle D, O'Gorman K, Coyle K, Spooner C, Lemiere C, Vandermeer B, Tjosvold L, Rowe BH. Long-acting Beta2-agonist and inhaled corticosteroid combination therapy for adult persistent asthma: systematic review of clinical outcomes and economic evaluation. *CADTH Technology Overview*. 2010;1(3):e0120.
21. Boonsawat W. Cost-effectiveness of budesonide/formoterol maintenance and rescue therapy in Thailand. *Asian Biomedicine*. 2010;4(4):571-8.
22. Borker R, Emmett A, Jhingran P, Rickard K, Dorinsky P. Determining economic feasibility of fluticasone propionate-salmeterol vs montelukast in the treatment of persistent asthma using a net benefit approach and cost-effectiveness acceptability curves. *Annals of Allergy, Asthma & Immunology*. 2005;95(2):181-9.
23. Brandt S, Perez L, Künzli N, Lurmann F, Wilson J, Pastor M, et al. Cost of near-roadway and regional air pollution-attributable childhood asthma in Los Angeles County. *Journal of allergy and clinical immunology*. 2014;134(5):1028-35.
24. Briggs AH, Bousquet J, Wallace MV, Busse WW, Clark TJH, Pedersen SE, et al. Cost-effectiveness of asthma control: an economic appraisal of the GOAL study. *Allergy*. 2006;61(5):531-6.
25. Brixner DI, Lenhart G, Young DC, Samuelson WM. The effect of fixed combination of fluticasone and salmeterol on asthma drug utilization, asthma drug cost, and episodes of asthma exacerbations. *Current medical research and opinion*. 2007;23(11):2887-95.
26. Brodtkorb TH, Zetterström O, Tinghög G. Cost-effectiveness of clean air administered to the breathing zone in allergic asthma. *The clinical respiratory journal*. 2010;4(2):104-10.
27. Brown R, Turk F, Dale P, Bousquet J. Cost-effectiveness of omalizumab in patients with severe persistent allergic asthma. *Allergy*. 2007;62(2):149-53.
28. Brüggjenjürgen B, Ezzat N, Kardos P, Buhl R. Economic evaluation of BDP/formoterol fixed vs two single inhalers in asthma treatment. *Allergy*. 2010;65(9):1108-15.
29. Brüggjenjürgen B, Reinhold T, Brehler R, Laake E, Wiese G, Machate U, et al. Cost-effectiveness of specific subcutaneous immunotherapy in patients with allergic rhinitis and allergic asthma. *Annals of Allergy, Asthma & Immunology*. 2008;101(3):316-24.
30. Brüggjenjürgen B, Selim D, Kardos P, Richter K, Vogelmeier C, Roll S, et al. Economic assessment of adjustable maintenance treatment with budesonide/formoterol in a single inhaler versus fixed treatment in asthma. *Pharmacoeconomics*. 2005;23(7):723-31.
31. Bunting BA, Cranor CW. The Asheville Project: long-term clinical, humanistic, and economic outcomes of a community-based medication therapy management program for asthma. *Journal of the American Pharmacists Association*. 2006;46(2):133-47.
32. Campbell JD, Spackman DE, Sullivan SD. The costs and consequences of omalizumab in uncontrolled asthma from a USA payer perspective. *Allergy*. 2010;65(9):1141-8.
33. Campbell LM, Berggren F, Emmas C. The cost effectiveness of eformoterol via Turbohaler and salmeterol via pressurized metered dose inhaler and metered dose powder inhaler in mild to moderate asthma. *J Med Econ*. 2000;3:49-60.
34. Canadian Agency for Drugs and Technologies in H. Long-acting beta2-agonist and inhaled corticosteroid combination therapy for adult persistent asthma: systematic review of clinical outcomes and economic evaluation. *CADTH technology overviews*. 2010;1(3).
35. Cangelosi MJ, Ortendahl JD, Meckley LM, Bentley TGK, Anene AM, Shriner KM, et al. Cost-effectiveness of bronchial thermoplasty in commercially-insured patients with poorly controlled, severe, persistent asthma. *Expert review of pharmacoeconomics & outcomes research*. 2015;15(2):357-64.
36. Canonica GW, Castellani P, Cazzola M, Fabbri LM, Fogliani V, Mangrella M, et al. Adjustable maintenance dosing with budesonide/formoterol in a single inhaler provides effective asthma symptom control at a lower dose than fixed maintenance dosing. *Pulmonary pharmacology & therapeutics*. 2004;17(4):239-47.
37. Çelik GE, Bavbek S, Paşaoğlu G, Mungan D, Abadoğlu Ö, Harmancı E, et al. Direct medical cost of asthma in Ankara, Turkey. *Respiration*. 2004;71(6):587-93.
38. Chang C, Lee S-M, Choi B-W, Song J-h, Song H, Jung S, et al. Costs attributable to overweight and obesity in working asthma patients in the United States. *Yonsei medical journal*. 2017;58(1):187-94.

39. Chew FT, Goh DYT, Lee BW. The economic cost of asthma in Singapore. *Australian and New Zealand journal of medicine*. 1999;29(2):228-33.
40. Chuesakoolvanich K. Cost of hospitalizing asthma patients in a regional hospital in Thailand. *Respirology*. 2007;12(3):433-8.
41. Colice GL, Yu AP, Ivanova JI, Hsieh M, Birnbaum HG, Lage MJ, et al. Costs and resource use of mild persistent asthma patients initiated on controller therapy. *Journal of Asthma*. 2008;45(4):293-9.
42. Dal Negro RW, Tognella S, Pradelli L. A 36-month study on the cost/utility of add-on omalizumab in persistent difficult-to-treat atopic asthma in Italy. *Journal of Asthma*. 2012;49(8):843-8.
43. Dal Negro RW, Turco P, Micheletto C, Tognella S, Bonadiman L, Guerriero M, et al. Cost analysis of GER-induced asthma: A controlled study vs. atopic asthma of comparable severity. *Respiratory medicine*. 2007;101(8):1814-20.
44. de Asis MLB, Greene R. A cost-effectiveness analysis of a peak flow-based asthma education and self-management plan in a high-cost population. *Journal of Asthma*. 2004;41(5):559-65.
45. Dewilde S, Turk F, Tambour M, Sandström T. The economic value of anti-IgE in severe persistent, IgE-mediated (allergic) asthma patients: adaptation of INNOVATE to Sweden. *Current medical research and opinion*. 2006;22(9):1765-76.
46. Doan T, Grammer LC, Yarnold PR, Greenberger PA, Patterson R. An intervention program to reduce the hospitalization cost of asthmatic patients requiring intubation. *Annals of Allergy, Asthma & Immunology*. 1996;76(6):513-8.
47. Donahue JG, Greineder DK, Connor-Lacke L, Canning CF, Platt R. Utilization and cost of immunotherapy for allergic asthma and rhinitis. *Annals of Allergy, Asthma & Immunology*. 1999;82(4):339-47.
48. Doull I, Price D, Thomas M, Hawkins N, Stamuli E, Tabberer M, et al. Cost-effectiveness of salmeterol xinafoate/fluticasone propionate combination inhaler in chronic asthma. *Current medical research and opinion*. 2007;23(5):1147-59.
49. Drummond N, Abdalla M, Beattie JAG, Buckingham JK, Lindsay T, Osman LM, et al. Effectiveness of routine self monitoring of peak flow in patients with asthma. *BMJ*. 1994;308(6928):564-7.
50. Ericsson K, Bantje TA, Huber RM, Borg S, Bateman ED. Cost-effectiveness analysis of budesonide/formoterol compared with fluticasone in moderate-persistent asthma. *Respiratory medicine*. 2006;100(4):586-94.
51. Everden P, Lloyd A, Hutchinson J, Plumb J. Cost-effectiveness of eformoterol Turbohaler® versus salmeterol Accuhaler® in children with symptomatic asthma. *Respiratory medicine*. 2002;96(4):250-8.
52. Faria R, McKenna C, Palmer S. Optimizing the position and use of omalizumab for severe persistent allergic asthma using cost-effectiveness analysis. *Value in Health*. 2014;17(8):772-82.
53. Franco R, Nascimento HFd, Cruz AA, Santos AC, Souza-Machado C, Ponte EV, et al. The economic impact of severe asthma to low-income families. *Allergy*. 2009;64(3):478-83.
54. Gallefoss F, Bakke PS. Cost-effectiveness of self-management in asthmatics: a 1-yr follow-up randomized, controlled trial. *European Respiratory Journal*. 2001;17(2):206-13.
55. Gerald JK, Grad R, Bailey WC, Gerald LB. Cost-effectiveness of school-based asthma screening in an urban setting. *Journal of Allergy and Clinical Immunology*. 2010;125(3):643-50.
56. Gerzeli S, Rognoni C, Quaglini S, Cavallo MC, Cremonesi G, Papi A. Cost-effectiveness and cost-utility of beclomethasone/formoterol versus fluticasone propionate/salmeterol in patients with moderate to severe asthma. *Clinical drug investigation*. 2012;32(4):253-65.
57. Ghosh CS, Ravindran P, Joshi M, Stearns SC. Reductions in hospital use from self management training for chronic asthmatics. *Social science & medicine*. 1998;46(8):1087-93.
58. Goossens LMA, Riemersma RA, Postma DS, van der Molen T, Rutten-van Mölken MPMH. An economic evaluation of budesonide/formoterol for maintenance and reliever treatment in asthma in general practice. *Advances in therapy*. 2009;26(9):872.

59. Gordoys A, Armour C, Brillant M, Bosnic-Anticevich S, Burton D, Emmerton L, et al. Cost-effectiveness analysis of a pharmacy asthma care program in Australia. *Disease Management & Health Outcomes*. 2007;15(6):387-96.
60. Gruffydd-Jones K, Hollinghurst S, Ward S, Taylor G. Targeted routine asthma care in general practice using telephone triage. *Br J Gen Pract*. 2005;55(521):918-23.
61. Halpern MT, Khan ZM, Stanford RH, Spayde KM, Golubiewski M. Asthma: Resource use and costs for inhaled corticosteroid vs leukotriene modifier treatment-a meta-analysis. *Journal of family practice*. 2003;52(5):382.
62. Heaton PC, Guo JJ, Hornung RW, Johnston JA, Jang R, Moomaw CJ, et al. Analysis of the effectiveness and cost benefit of leukotriene modifiers in adults with asthma in the Ohio Medicaid population. *Journal of Managed Care Pharmacy*. 2006;12(1):33-42.
63. Honkoop PJ, Loijmans RJB, Termeer EH, Snoeck-Stroband JB, van den Hout WB, Bakker MJ, et al. Symptom-and fraction of exhaled nitric oxide-driven strategies for asthma control: a cluster-randomized trial in primary care. *Journal of Allergy and Clinical Immunology*. 2015;135(3):682-8.
64. Honkoop PJ, Loymans RJB, Termeer EH, Snoeck-Stroband JB, Bakker MJ, Assendelft WJJ, et al. Asthma control cost-utility randomized trial evaluation (ACCURATE): the goals of asthma treatment. *BMC pulmonary medicine*. 2011;11(1):53.
65. Horner SD, Brown A. Evaluating the effect of an asthma self-management intervention for rural families. *Journal of Asthma*. 2014;51(2):168-77.
66. Ismaila AS, Risebrough N, Li C, Corriveau D, Hawkins N, FitzGerald JM, et al. COST-effectiveness of salmeterol/fluticasone propionate combination (Advair®) in uncontrolled asthma in Canada. *Respiratory medicine*. 2014;108(9):1292-302.
67. Ismaila AS, Sayani AP, Marin M, Su Z. Clinical, economic, and humanistic burden of asthma in Canada: a systematic review. *BMC pulmonary medicine*. 2013;13(1):70.
68. Jansson S-A, Rönmark E, Forsberg B, Löfgren C, Lindberg A, Lundbäck B. The economic consequences of asthma among adults in Sweden. *Respiratory medicine*. 2007;101(11):2263-70.
69. Jassal MS, Diette GB, Dowdy DW. Cost-consequence analysis of multimodal interventions with environmental components for pediatric asthma in the state of Maryland. *Journal of Asthma*. 2013;50(6):672-80.
70. Johansson G, Andreasson EB, Larsson PE, Vogelmeier CF. Cost effectiveness of budesonide/formoterol for maintenance and reliever therapy versus salmeterol/fluticasone plus salbutamol in the treatment of asthma. *Pharmacoeconomics*. 2006;24(7):695-708.
71. Jönsson B, Berggren F, Svensson K, O'Byrne PM. An economic evaluation of combination treatment with budesonide and formoterol in patients with mild-to-moderate persistent asthma. *Respiratory medicine*. 2004;98(11):1146-54.
72. Karaca-Mandic P, Jena AB, Joyce GF, Goldman DP. Out-of-pocket medication costs and use of medications and health care services among children with asthma. *Jama*. 2012;307(12):1284-91.
73. Kattan M, Stearns SC, Crain EF, Stout JW, Gergen PJ, Evans Iii R, et al. Cost-effectiveness of a home-based environmental intervention for inner-city children with asthma. *Journal of Allergy and Clinical Immunology*. 2005;116(5):1058-63.
74. Kauppinen R, Sintonen H, Tukiainen H. One-year economic evaluation of intensive vs conventional patient education and supervision for self-management of new asthmatic patients. *Respiratory medicine*. 1998;92(2):300-7.
75. Kemp L, Haughney J, Barnes N, Sims E, von Ziegenweid J, Hillyer EV, et al. Cost-effectiveness analysis of corticosteroid inhaler devices in primary care asthma management: a real world observational study. *ClinicoEconomics and outcomes research: CEOR*. 2010;2:75.
76. Kennedy WA, Girard F, Chaboillez S, Cartier A, Côté J, Hargreave F, et al. Cost-effectiveness of various diagnostic approaches for occupational asthma. *Canadian respiratory journal*. 2007;14(5):276-80.
77. Khadadah M. The cost of asthma in Kuwait. *Medical Principles and Practice*. 2013;22(1):87-91.
78. Krahn MD, Berka C, Langlois P, Detsky AS. Direct and indirect costs of asthma in Canada, 1990. *CMAJ: Canadian Medical Association Journal*. 1996;154(6):821.

79. Krebs SE, Flood RG, Peter JR, Gerard JM. Evaluation of a high-dose continuous albuterol protocol for treatment of pediatric asthma in the emergency department. *Pediatric emergency care*. 2013;29(2):191-6.
80. Lage MJ, Gross GN, Brewster C, Spalitto A. Outcomes and costs of patients with persistent asthma treated with beclomethasone dipropionate hydrofluoroalkane or fluticasone propionate. *Advances in therapy*. 2009;26(8):762-75.
81. Lahdensuo A, Haahtela T, Herrala J, Kava T, Kiviranta K, Kuusisto P, et al. Randomised comparison of cost effectiveness of guided self management and traditional treatment of asthma in Finland. *Bmj*. 1998;316(7138):1138-9.
82. Lane S, Molina J, Plusa T. An international observational prospective study to determine the cost of asthma exacerbations (COAX). *Respiratory medicine*. 2006;100(3):434-50.
83. Lee TA, Chang C-L, Stephenson JJ, Sajjan SG, Maiese EM, Everett S, et al. Impact of asthma controller medications on medical and economic resource utilization in adult asthma patients. *Current medical research and opinion*. 2010;26(12):2851-60.
84. Lee TA, Fuhlbrigge AL, Sullivan SD, Finkelstein JA, Inui TS, Lozano P, et al. Agreement between caregiver reported healthcare utilization and administrative data for children with asthma. *Journal of asthma*. 2007;44(3):189-94.
85. Levy AN, García a Ruiz AJ, García-Agua Soler N, Sanjuan MVH. Cost-effectiveness of omalizumab in severe persistent asthma in Spain: a real-life perspective. *Journal of Asthma*. 2015;52(2):205-10.
86. Liljas B, Ståhl E, Pauwels RA. Cost-effectiveness analysis of a dry powder inhaler (Turbuhaler) versus a pressurised metered dose inhaler in patients with asthma. *Pharmacoeconomics*. 1997;12(2 Pt 2):267-77.
87. Lindberg M, Ahlner J, Ekström T, Jonsson D, Möller M. Asthma nurse practice improves outcomes and reduces costs in primary health care. *Scandinavian Journal of Caring Sciences*. 2002;16(1):73-8.
88. Lundbäck B, Jenkins C, Price MJ, Thwaites RMA, an International Study G. Cost-effectiveness of salmeterol/fluticasone propionate combination product 50/250 µg twice daily and budesonide 800 µg twice daily in the treatment of adults and adolescents with asthma. *Respiratory medicine*. 2000;94(7):724-32.
89. Lundborg M, Wille S, Bjermer L, Tilling B, Lundgren M, Telg G, et al. Maintenance plus reliever budesonide/formoterol compared with a higher maintenance dose of budesonide/formoterol plus formoterol as reliever in asthma: an efficacy and cost-effectiveness study. *Current medical research and opinion*. 2006;22(5):809-21.
90. Luskin A, Bukstein D, Kocevar VS, Yin DD. Asthma rescue and allergy medication use among asthmatic children with prior allergy prescriptions who initiated asthma controller therapy. *Annals of Allergy, Asthma & Immunology*. 2005;95(2):129-36.
91. Malone DC, Luskin AT. Hydrofluoroalkane-134a beclomethasone as a dominant economic asthma therapy. *Respiratory medicine*. 2003;97(12):1269-76.
92. Marchetti M, Cavallo M, Annoni E, Gerzeli S. Cost-utility of inhaled corticosteroids in patients with moderate-to-severe asthma. *Expert review of pharmacoeconomics & outcomes research*. 2004;4(5):549-64.
93. Martin RJ, Price D, Roche N, Israel E, van Aalderen WMC, Grigg J, et al. Cost-effectiveness of initiating extrafine-or standard size-particle inhaled corticosteroid for asthma in two health-care systems: a retrospective matched cohort study. *NPJ primary care respiratory medicine*. 2014;24:14081.
94. Mattke S, Martorell F, Hong SY, Sharma P, Cuellar A, Lurie N. Anti-inflammatory medication adherence and cost and utilization of asthma care in a commercially insured population. *Journal of Asthma*. 2010;47(3):323-9.
95. McLean W, Gillis J, Waller R. The BC Community Pharmacy Asthma Study: a study of clinical, economic and holistic outcomes influenced by an asthma care protocol provided by specially trained community pharmacists in British Columbia. *Canadian respiratory journal*. 2003;10(4):195-202.
96. McQuaid EL, Garro A, Seifer R, Hammond SK, Borrelli B. Integrating asthma education and smoking cessation for parents: financial return on investment. *Pediatric pulmonology*. 2012;47(10):950-5.
97. Meijster T, van Duuren-Stuurman B, Heederik D, Houba R, Koningsveld E, Warren N, et al. Cost-benefit analysis in occupational health: a comparison of intervention scenarios for occupational asthma and rhinitis among bakery workers. *Occup Environ*

- Med. 2011;68(10):739-45.
98. Menendez R, Stanford RH, Edwards L, Kalberg C, Rickard K. Cost-efficacy analysis of fluticasone propionate versus zafirlukast in patients with persistent asthma. *Pharmacoeconomics*. 2001;19(8):865-74.
  99. Miller E, FitzGerald JM. Budesonide/formoterol as maintenance and reliever treatment compared to fixed dose combination strategies—a Canadian economic evaluation. *Can J Clin Pharmacol*. 2008;15(2):e165-e76.
  100. Miller E, Sears MR, McIvor A, Liovas A. Canadian economic evaluation of budesonide-formoterol as maintenance and reliever treatment in patients with moderate to severe asthma. *Canadian respiratory journal*. 2007;14(5):269-75.
  101. Miyagawa T, Arakawa I, Shiragami M, Nishimura S. Cost-effectiveness of including salmeterol in asthma therapy in a primary care setting in Japan. *Yakugaku zasshi*. 2006;126(1):51-9.
  102. Miyagawa T, Nishimura S. Economic Evaluation of an Asthma Therapy: Effect of Salmeterol on Loss of Labor Productivity in Japan. *Allergology International*. 2005;54(3):461-7.
  103. Mogasale V, Vos T. Cost-effectiveness of asthma clinic approach in the management of chronic asthma in Australia. *Australian and New Zealand journal of public health*. 2013;37(3):205-10.
  104. Moragón EM, Delgado J, Ojeda P, Del Llano LP, Collar JM, Antón-Rodríguez C, et al. Economic Evaluation of Fluticasone Propionate/Formoterol (Flutiform®) vs. Fluticasone/Salmeterol and Budesonide/Formoterol in Spain. *Pulmonary Therapy*. 2016;2(2):199-213.
  105. Mosen DM, Schatz M, Gold R, Mularski RA, Wong WF, Bellows J. Medication use, emergency hospital care utilization, and quality-of-life outcome disparities by race/ethnicity among adults with asthma. *The American journal of managed care*. 2010;16(11):821-8.
  106. Moullec G, FitzGerald JM, Rousseau R, Chen W, Sadatsafavi M. Interaction effect of psychological distress and asthma control on productivity loss? *European Respiratory Journal*. 2015:ERJ-01416.
  107. Mukherjee M, Stoddart A, Gupta RP, Nwaru BI, Farr A, Heaven M, et al. The epidemiology, healthcare and societal burden and costs of asthma in the UK and its member nations: analyses of standalone and linked national databases. *BMC medicine*. 2016;14(1):113.
  108. Naish J, Sturdy P, Toon P. Appropriate prescribing in asthma and its related cost in east London. *BMJ*. 1995;310(6972):97-100.
  109. Nash DR, Childs GE, Kelleher KJ. A cohort study of resource use by medicaid children with asthma. *Pediatrics*. 1999;104(2):310-2.
  110. Nasser S, Vestenbaek U, Beriot-Mathiot A, Poulsen PB. Cost-effectiveness of specific immunotherapy with Grazax in allergic rhinitis co-existing with asthma. *Allergy*. 2008;63(12):1624-9.
  111. Navaratnam P, Friedman HS, Urdaneta E. Mometasone furoate vs fluticasone propionate with salmeterol: multivariate analysis of resource use and asthma-related charges. *Current medical research and opinion*. 2009;25(12):2895-901.
  112. Neffen H, Gonzalez SN, Fritscher CC, Dovali C, Williams AE. 9 The Burden of Unscheduled Health Care for Asthma in Latin America. *Journal of investigational allergology & clinical immunology*. 2010;20(7):596.
  113. Neri M, Migliori GB, Spanevello A, Berra D, Nicolini E, Landoni CV, et al. Economic analysis of two structured treatment and teaching programs on asthma. *Allergy*. 1996;51(5):313-9.
  114. Neville RG, Pearson MG, Richards N, Patience J, Sondhi S, Wagstaff B, et al. A cost analysis on the pattern of asthma prescribing in the UK. *European Respiratory Journal*. 1999;14(3):605-9.
  115. Nightingale CH. Cost comparison of  $\beta_2$ -agonist bronchodilators used in the treatment of asthma. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*. 1995;15(5):677-81.
  116. Norman G, Faria R, Paton F, Llewellyn A, Fox D, Palmer S, et al. Omalizumab for the treatment of severe persistent allergic asthma: a systematic review and economic evaluation. 2013.
  117. Noyes K, Bajorska A, Fisher S, Sauer J, Fagnano M, Halterman JS. Cost-

- effectiveness of the school-based asthma therapy (SBAT) program. *Pediatrics*. 2013:peds-2012.
118. Nurmagambetov TA, Barnett SBL, Jacob V, Chattopadhyay SK, Hopkins DP, Crocker DD, et al. Economic value of home-based, multi-trigger, multicomponent interventions with an environmental focus for reducing asthma morbidity: a Community Guide systematic review. *American Journal of Preventive Medicine*. 2011;41(2):S33-S47.
  119. O'Byrne P, Cuddy L, Taylor DW, Birch S, Morris J, Syrotuik J. Efficacy and cost benefit of inhaled corticosteroids in patients considered to have mild asthma in primary care practice. *Canadian Respiratory Journal*. 1996;3(3):169-75.
  120. O'Connor RD, O'Donnell JC, Pinto LA, Wiener DJ, Legorreta AP. Two-year retrospective economic evaluation of three dual-controller therapies used in the treatment of asthma. *Chest*. 2002;121(4):1028-35.
  121. O'Neill S, Sweeney J, Patterson CC, Menzies-Gow A, Niven R, Mansur AH, et al. The cost of treating severe refractory asthma in the UK: an economic analysis from the British Thoracic Society Difficult Asthma Registry. *Thorax*. 2015;70(4):376-8.
  122. Oba Y, Salzman GA. Cost-effectiveness analysis of omalizumab in adults and adolescents with moderate-to-severe allergic asthma. *Journal of allergy and clinical immunology*. 2004;114(2):265-9.
  123. Ozminkowski RJ, Wang S, Marder WD, Azzolini J, Schutt D. Cost implications for the use of inhaled anti-inflammatory medications in the treatment of asthma. *Pharmacoeconomics*. 2000;18(3):253-64.
  124. O'Connor RD, Nelson H, Borker R, Emmett A, Jhingran P, Rickard K, et al. Cost effectiveness of fluticasone propionate plus salmeterol versus fluticasone propionate plus montelukast in the treatment of persistent asthma. *Pharmacoeconomics*. 2004;22(12):815-25.
  125. Paggiaro P, Patel S, Nicolini G, Pradelli L, Zaniolo O, Papi A. Stepping down from high dose fluticasone/salmeterol to extrafine BDP/F in asthma is cost-effective. *Respiratory medicine*. 2013;107(10):1531-7.
  126. Pakhale S, Sumner A, Coyle D, Vandemheen K, Aaron S. (Correcting) misdiagnoses of asthma: a cost effectiveness analysis. *BMC pulmonary medicine*. 2011;11(1):27.
  127. Paltiel AD, Fuhlbrigge AL, Kitch BT, Lijias B, Weiss ST, Neumann PJ, et al. Cost-effectiveness of inhaled corticosteroids in adults with mild-to-moderate asthma: results from the asthma policy model. *Journal of Allergy and Clinical Immunology*. 2001;108(1):IN1-IN4.
  128. Patel MR, Brown RW, Clark NM. Perceived parent financial burden and asthma outcomes in low-income, urban children. *Journal of Urban Health*. 2013;90(2):329-42.
  129. Pathak DS, Davis EA, Stanford RH. Economic impact of asthma therapy with fluticasone propionate, montelukast, or zafirlukast in a managed care population. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*. 2002;22(2):166-74.
  130. Perera BJ. Efficacy and cost effectiveness of inhaled steroids in asthma in a developing country. *Archives of disease in childhood*. 1995;72(4):312-6.
  131. Phillips VL, Goodrich MA, Sullivan TJ. Health care worker disability due to latex allergy and asthma: a cost analysis. *American Journal of Public Health*. 1999;89(7):1024-8.
  132. Piecoro LT, Potoski M, Talbert JC, Doherty DE. Asthma prevalence, cost, and adherence with expert guidelines on the utilization of health care services and costs in a state Medicaid population. *Health services research*. 2001;36(2):357.
  133. Pieters WR, Wilson KK, Smith HCE, Tamminga JJ, Sondhi S. Salmeterol/Fluticasone Propionate versus Fluticasone Propionate Plus Montelukast. *Treatments in respiratory medicine*. 2005;4(2):129-38.
  134. Pinnock H, McKenzie L, Price D, Sheikh A. Cost-effectiveness of telephone or surgery asthma reviews: economic analysis of a randomised controlled trial. *Br J Gen Pract*. 2005;55(511):119-24.
  135. Polisena J, Tam S, Lodha A, Laporte A, Coyte PC, Ungar WJ. An economic evaluation of asthma action plans for children with asthma. *Journal of Asthma*. 2007;44(7):501-8.
  136. Price DB, Appleby JL. Fluticasone propionate: an audit of outcomes and cost-effectiveness in primary care. *Respiratory medicine*. 1998;92(2):351-3.
  137. Price D, Berg J, Lindgren P. An economic evaluation of NIOX MINO airway

- inflammation monitor in the United Kingdom. *Allergy*. 2009;64(3):431-8.
138. Price D, Musgrave S, Wilson E, Sims E, Shepstone L, Blyth A, et al. A pragmatic single-blind randomised controlled trial and economic evaluation of the use of leukotriene receptor antagonists in primary care at steps 2 and 3 of the national asthma guidelines (ELEVATE study). *Health Technology Assessment*. 2011;15(21):1-132.
  139. Price D, Haughney J, Duerden M, Nicholls C, Moseley C. The cost effectiveness of chlorofluorocarbon-free beclomethasone dipropionate in the treatment of chronic asthma: a cost model based on a 1-year pragmatic, randomised clinical study. *Pharmacoeconomics*. 2002;20(10):653-64.
  140. Price D, Haughney J, Lloyd A, Hutchinson J, Plumb J. An economic evaluation of adjustable and fixed dosing with budesonide/formoterol via a single inhaler in asthma patients: the ASSURE study. *Current medical research and opinion*. 2004;20(10):1671-9.
  141. Price D, Small I, Haughney J, Ryan D, Gruffydd-Jones K, Lavorini F, et al. Clinical and cost effectiveness of switching asthma patients from fluticasone-salmeterol to extra-fine particle beclometasone-formoterol: a retrospective matched observational study of real-world patients. *Primary Care Respiratory Journal*. 2013;22(4):439.
  142. Price MJ, Briggs AH. Development of an economic model to assess the cost effectiveness of asthma management strategies. *Pharmacoeconomics*. 2002;20(3):183-94.
  143. Puranitee PU, Kamchaisatian W, Manuyakorn W, Vilaiyuk S, Laecha O, Pattanaprateep O, et al. Direct medical cost of Thai pediatric asthma management: a pilot study. *Asian Pacific journal of allergy and immunology*. 2015;33(4).
  144. Ramos GFP, van Asselt ADI, Kuiper S, Severens JL, Maas T, Dompeling E, et al. Cost-effectiveness of primary prevention of paediatric asthma: a decision-analytic model. *The European Journal of Health Economics*. 2014;15(8):869-83.
  145. Reinhold T, Brinkhaus B, Willich SN, Witt C. Acupuncture in patients suffering from allergic asthma: is it worth additional costs? *The Journal of Alternative and Complementary Medicine*. 2014;20(3):169-77.
  146. Rhee H, Pesis-Katz I, Xing J. Cost benefits of a peer-led asthma self-management program for adolescents. *Journal of Asthma*. 2012;49(6):606-13.
  147. Roberts NJ, Boyd KA, Briggs AH, Caress AL, Partridge MR. Nurse led versus lay educators support for those with asthma in primary care: a costing study. *BMC pulmonary medicine*. 2012;12(1):52.
  148. Rodriguez E, Rivera DA, Perloth D, Becker E, Wang NE, Landau M. School nurses' role in asthma management, school absenteeism, and cost savings: A demonstration project. *Journal of School Health*. 2013;83(12):842-50.
  149. Rodriguez-Martinez CE, Sossa-Briceno MP, Castro-Rodriguez JA. Cost-utility analysis of the inhaled steroids available in a developing country for the management of pediatric patients with persistent asthma. *Journal of Asthma*. 2013;50(4):410-8.
  150. Rodriguez-Martinez CE, Nino G, Castro-Rodriguez JA. Cost-utility analysis of daily versus intermittent inhaled corticosteroids in mild-persistent asthma. *Pediatric pulmonology*. 2015;50(8):735-46.
  151. Rutten-van Mülken MP, Van Doorslaer EK, Jansen MC, Kerstjens HA, Rutten FF. Costs and effects of inhaled corticosteroids and bronchodilators in asthma and chronic obstructive pulmonary disease. *American journal of respiratory and critical care medicine*. 1995;151(4):975-82.
  152. Rutten-van Mülken MPMH, van Doorslaer EKA, Till MD. Cost-effectiveness analysis of formoterol versus salmeterol in patients with asthma. *Pharmacoeconomics*. 1998;14(6):671-84.
  153. Rutten-van Mülken M, Van Doorslaer EKA, Jansen MCC, Van Essen-Zandvliet EE, Rutten FFH. Cost effectiveness of inhaled corticosteroid plus bronchodilator therapy versus bronchodilator monotherapy in children with asthma. *Pharmacoeconomics*. 1993;4(4):257-70.
  154. Rydman RJ, Isola ML, Roberts RR, Zalenski RJ, McDermott MF, Murphy DG, et al. Emergency department observation unit versus hospital inpatient care for a chronic asthmatic population: a randomized trial of health status outcome and cost. *Medical care*. 1998;36(4):599-609.
  155. Sabatelli L, Seppälä U, Sastre J, Crater G. Cost-effectiveness and Budget Impact of

- Routine Use of Fractional Exhaled Nitric Oxide Monitoring for the Management of Adult Asthma Patients in Spain. *The Journal of Investigational Allergology and Clinical Immunology*. 2017;27(2):89-97.
156. Sadatsafavi M, FitzGerald M, Marra C, Lynd L. Costs and health outcomes associated with primary vs secondary care after an asthma-related hospitalization: a population-based study. *Chest*. 2013;144(2):428-35.
  157. Sadatsafavi M, Rousseau R, Chen W, Zhang W, Lynd L, FitzGerald JM. The preventable burden of productivity loss due to suboptimal asthma control: a population-based study. *Chest*. 2014;145(4):787-93.
  158. Salisbury C, Francis C, Rogers C, Parry K, Thomas H, Chadwick S, et al. A randomised controlled trial of clinics in secondary schools for adolescents with asthma. *Br J Gen Pract*. 2002;52(485):988-96.
  159. Sazonov-Kocevar V, Laforest L, Travier N, Yin DD, Ganse EV. Asthma and allergy medication use and costs among pediatric primary care patients on asthma controller therapy. *Pediatric allergy and immunology*. 2006;17(8):620-8.
  160. Schermer TR, Thoonen BP, van den Boom G, Akkermans RP, Grol RP, Folgering HT, et al. Randomized controlled economic evaluation of asthma self-management in primary health care. *American journal of respiratory and critical care medicine*. 2002;166(8):1062-72.
  161. Schramm B, Ehlken B, Smala A, Quednau K, Berger K, Nowak D. Cost of illness of atopic asthma and seasonal allergic rhinitis in Germany: 1-yr retrospective study. *European Respiratory Journal*. 2003;21(1):116-22.
  162. Sculpher MJ, Buxton MJ. The episode-free day as a composite measure of effectiveness. *Pharmacoeconomics*. 1993;4(5):345-52.
  163. Serra-Batlles J, Plaza V, Morejon E, Comella A, Bruges J. Costs of asthma according to the degree of severity. *European Respiratory Journal*. 1998;12(6):1322-6.
  164. Sheikh A, Hurwitz B, Sibbald B, Barnes G, Howe M, Durham S. House dust mite barrier bedding for childhood asthma: randomised placebo controlled trial in primary care [ISRCTN63308372]. *BMC family practice*. 2002;3(1):12.
  165. Shelledy DC, McCormick SR, LeGrand TS, Cardenas J, Peters JI. The effect of a pediatric asthma management program provided by respiratory therapists on patient outcomes and cost. *Heart & Lung: The Journal of Acute and Critical Care*. 2005;34(6):423-8.
  166. Sheth K, Borker R, Emmett A, Rickard K, Dorinsky P. Cost-effectiveness comparison of salmeterol/fluticasone propionate versus montelukast in the treatment of adults with persistent asthma. *Pharmacoeconomics*. 2002;20(13):909-18.
  167. Shih Y-CT, Mauskopf J, Borker R. A cost-effectiveness analysis of first-line controller therapies for persistent asthma. *Pharmacoeconomics*. 2007;25(7):577-90.
  168. Simonella L, Marks G, Sanderson K, Andrews G. Cost-effectiveness of current and optimal treatment for adult asthma. *Internal medicine journal*. 2006;36(4):244-50.
  169. Smith DH, Malone DC, Lawson KA, Okamoto LJ, Battista C, Saunders WB. A national estimate of the economic costs of asthma. *American journal of respiratory and critical care medicine*. 1997;156(3):787-93.
  170. Smith JR, Mugford M, Holland R, Candy B, Noble MJ, Harrison BDW, et al. A systematic review to examine the impact of psycho-educational interventions on health outcomes and costs in adults and children with difficult asthma. 2005.
  171. Smith JR, Noble MJ, Musgrave S, Murdoch J, Price GM, Barton GR, et al. The at-risk registers in severe asthma (ARRISA) study: a cluster-randomised controlled trial examining effectiveness and costs in primary care. *Thorax*. 2012:thoraxjnl-2012.
  172. Ställberg B, Ekström T, Neij F, Olsson P, Skoogh BE, Wennergren G, et al. A real-life cost-effectiveness evaluation of budesonide/formoterol maintenance and reliever therapy in asthma. *Respiratory medicine*. 2008;102(10):1360-70.
  173. Stanford RH, Edwards LD, Rickard KA. Cost effectiveness of inhaled fluticasone propionate vs inhaled triamcinolone acetonide in the treatment of persistent asthma. *Clinical Drug Investigation*. 2000;20(4):237-44.
  174. Stanford RH, Riedel AA, Johnson JC, Astry CL. Comparative resource utilization in medicaid-eligible patients with asthma treated with fixed-dose fluticasone propionate/salmeterol or fluticasone propionate monotherapy. *Clinical therapeutics*. 2010;32(10):1782-93.

175. Stanford R, McLaughlin T, Okamoto LJ. The cost of asthma in the emergency department and hospital. *American journal of respiratory and critical care medicine*. 1999;160(1):211-5.
176. Stempel DA, Mauskopf J, McLaughlin T, Yazdani C, Stanford RH. Comparison of asthma costs in patients starting fluticasone propionate compared to patients starting montelukast. *Respiratory medicine*. 2001;95(3):227-34.
177. Stempel DA, McLaughlin T, Griffis DL, Stanford RH. Cost analysis of the use of inhaled corticosteroids in the treatment of asthma: a 1-year follow-up. *Respiratory medicine*. 2001;95(12):992-8.
178. Stempel DA, Altan Riedel A, Carranza Rosenzweig JR. Resource utilization with fluticasone propionate and salmeterol in a single inhaler compared with other controller therapies in children with asthma. *Current medical research and opinion*. 2006;22(3):463-70.
179. Stempel DA, Kruzikas DT, Manjunath R. Comparative efficacy and cost of asthma care in children with asthma treated with fluticasone propionate and montelukast. *The Journal of pediatrics*. 2007;150(2):162-7.
180. Stempel DA, Kruzikas DT, Manjunath R. Comparative efficacy and cost of asthma care in children with asthma treated with fluticasone propionate and montelukast. *The Journal of pediatrics*. 2007;150(2):162-7.
181. Stempel DA, O'donnell JC, Meyer JW. Inhaled corticosteroids plus salmeterol or montelukast: effects on resource utilization and costs. *Journal of allergy and clinical immunology*. 2002;109(3):433-9.
182. Stempel DA, Stanford RH, Thwaites RMA, Price MJ. Cost-efficacy comparison of inhaled fluticasone propionate and budesonide in the treatment of asthma. *Clinical therapeutics*. 2000;22(12):1562-74.
183. Steuten L, Palmer S, Vrijhoef B, Van Merode F, Spreeuwenberg C, Severens H. Cost-utility of a disease management program for patients with asthma. *International journal of technology assessment in health care*. 2007;23(2):184-91.
184. Stock S, Redaelli M, Luengen M, Wendland G, Civello D, Lauterbach KW. Asthma: prevalence and cost of illness. *European Respiratory Journal*. 2005;25(1):47-53.
185. Sullivan PW, Ghushchyan VH, Slejko JF, Belozeroff V, Globe DR, Lin S-L. The burden of adult asthma in the United States: evidence from the Medical Expenditure Panel Survey. *Journal of allergy and clinical immunology*. 2011;127(2):363-9.
186. Sullivan PW, Slejko JF, Ghushchyan VH, Sucher B, Globe DR, Lin S-L, et al. The relationship between asthma, asthma control and economic outcomes in the United States. *Journal of Asthma*. 2014;51(7):769-78.
187. Sullivan SD, Buxton M, Andersson LF, Lamm CJ, Liljas B, Chen YZ, et al. Cost-effectiveness analysis of early intervention with budesonide in mild persistent asthma. *Journal of Allergy and Clinical Immunology*. 2003;112(6):1229-36.
188. Sullivan SD, Lee TA, Blough DK, Finkelstein JA, Lozano P, Inui TS, et al. A multisite randomized trial of the effects of physician education and organizational change in chronic asthma care: cost-effectiveness analysis of the Pediatric Asthma Care Patient Outcomes Research Team II (PAC-PORT II). *Archives of pediatrics & adolescent medicine*. 2005;159(5):428-34.
189. Sullivan SD, Weiss KB, Lynn H, Mitchell H, Kattan M, Gergen PJ, et al. The cost-effectiveness of an inner-city asthma intervention for children. *Journal of Allergy and Clinical Immunology*. 2002;110(4):576-81.
190. Szucs TD, Anderhub H, Rutishauser M. The economic burden of asthma: direct and indirect costs in Switzerland. *European Respiratory Journal*. 1999;13(2):281-6.
191. Tai T, Bame SI. Cost-benefit analysis of childhood asthma management through school-based clinic programs. *Journal of community health*. 2011;36(2):253-60.
192. Tamminen K, Laine J, Soini E, Martikainen J, Kankaanranta H. Cost-effectiveness analysis of budesonide/formoterol maintenance and reliever therapy versus fixed combination treatments for asthma in Finland. *Current medical research and opinion*. 2008;24(12):3453-61.
193. Tan H, Sarawate C, Singer J, Elward K, Cohen RI, Smart BA, et al., editors. *Impact of asthma controller medications on clinical, economic, and patient-reported outcomes* 2009: Elsevier.
194. Teufel RJ, Basco Jr WT, Simpson KN. Cost effectiveness of an inpatient influenza immunization assessment and delivery program for children with asthma. *Journal of*

- Hospital Medicine: An Official Publication of the Society of Hospital Medicine. 2008;3(2):134-41.
195. Thomas M, Kocevar VS, Zhang Q, Yin DD, Price D. Asthma-related health care resource use among asthmatic children with and without concomitant allergic rhinitis. *Pediatrics*. 2005;115(1):129-34.
  196. Thomas P, Ross RN, Farrar JR. A retrospective assessment of cost avoidance associated with the use of nedocromil sodium metered-dose inhaler in the treatment of patients with asthma. *Clinical therapeutics*. 1996;18(5):939-52.
  197. Toelle BG, Peat JK, Mellis CM, Woolcock AJ. The cost of childhood asthma to Australian families. *Pediatric pulmonology*. 1995;19(6):330-5.
  198. Trautner C, Richter B, Berger M. Cost-effectiveness of a structured treatment and teaching programme on asthma. *European Respiratory Journal*. 1993;6(10):1485-91.
  199. Ungar WJ, Coyte PC. Prospective study of the patient-level cost of asthma care in children. *Pediatric pulmonology*. 2001;32(2):101-8.
  200. Ungar WJ, Coyte PC, Pharmacy Medication Monitoring Program Advisory B. Measuring productivity loss days in asthma patients. *Health economics*. 2000;9(1):37-46.
  201. van der Meer V, van den Hout WB, Bakker MJ, Rabe KF, Sterk PJ, Assendelft WJ, et al. SMASHING (Self-Management in Asthma Supported by Hospitals ICT Nurses and General Practitioners) Study Group. Cost-effectiveness of internet-based self-management compared with usual care in Asthma. *PLoS One*. 2011;6(11):e27108.
  202. Van Ganse E, Antonicelli L, Zhang Q, Laforest L, Yin DD, Nocea G, et al. Asthma-related resource use and cost by GINA classification of severity in three European countries. *Respiratory medicine*. 2006;100(1):140-7.
  203. Van Ganse E, Laforest L, Pietri G, Boissel JP, Gormand F, Ben-Joseph R, et al. Persistent asthma: disease control, resource utilisation and direct costs. *European Respiratory Journal*. 2002;20(2):260-7.
  204. van Nooten F, Stern S, Braunstahl G-J, Thompson C, Groot M, Brown RE. Cost-effectiveness of omalizumab for uncontrolled allergic asthma in the Netherlands. *Journal of medical economics*. 2013;16(3):342-8.
  205. Volmer T, Kielhorn A, Weber HH, Wiessmann KJ. Cost effectiveness of fluticasone propionate and flunisolide in the treatment of corticosteroid-naïve patients with moderate asthma. *Pharmacoeconomics*. 1999;16(5):525-31.
  206. Wang L, Hollenbeak CS, Mauger DT, Zeiger RS, Paul IM, Sorkness CA, et al. Cost-effectiveness analysis of fluticasone versus montelukast in children with mild-to-moderate persistent asthma in the Pediatric Asthma Controller Trial. *Journal of Allergy and Clinical Immunology*. 2011;127(1):161-6.
  207. Wang SW, Liu X, Wiener DJ, Sennett C, Bowers BW, Legorreta AP. Comparison of prevalence, cost, and outcomes of a combination of salmeterol and fluticasone therapy to common asthma treatments. *The American journal of managed care*. 2001;7(9):913-22.
  208. Weinstein AG, McKee L, Stapleford J, Faust D. An economic evaluation of short-term inpatient rehabilitation for children with severe asthma. *Journal of allergy and clinical immunology*. 1996;98(2):264-73.
  209. Weiss KB, Gergen PJ, Hodgson TA. An economic evaluation of asthma in the United States. *New England Journal of Medicine*. 1992;326(13):862-6.
  210. Weiss KB, Sullivan SD. The health economics of asthma and rhinitis. I. Assessing the economic impact. *Journal of Allergy and Clinical Immunology*. 2001;107(1):3-8.
  211. Wickstrøm J, Dam N, Malmberg I, Hansen BB, Lange P. Cost-effectiveness of budesonide/formoterol for maintenance and reliever asthma therapy in Denmark—Cost-effectiveness analysis based on five randomised controlled trials. *The clinical respiratory journal*. 2009;3(3):169-80.
  212. Wild DM, Redlich CA, Paltiel AD. Surveillance for isocyanate asthma: a model based cost effectiveness analysis. *Occupational and Environmental Medicine*. 2005;62(11):743-9.
  213. Williams SA, Wagner S, Kannan H, Bolge SC. The association between asthma control and health care utilization, work productivity loss and health-related quality of life. *Journal of occupational and environmental medicine*. 2009;51(7):780-5.
  214. Willson J, Bateman ED, Pavord I, Lloyd A, Krivasi T, Esser D. Cost effectiveness of tiotropium in patients with asthma poorly controlled on inhaled glucocorticosteroids

- and long-acting  $\beta$ -agonists. *Applied health economics and health policy*. 2014;12(4):447-59.
215. Wilson ECF, Price D, Musgrave SD, Sims EJ, Shepstone L, Murdoch J, et al. Cost effectiveness of leukotriene receptor antagonists versus long-acting beta-2 agonists as add-on therapy to inhaled corticosteroids for asthma. *Pharmacoeconomics*. 2010;28(7):597-608.
  216. Wilson ECF, Price D, Musgrave SD, Sims EJ, Shepstone L, Murdoch J, et al. Cost effectiveness of leukotriene receptor antagonists versus long-acting beta-2 agonists as add-on therapy to inhaled corticosteroids for asthma. *Pharmacoeconomics*. 2010;28(7):597-608.
  217. Windsor RA, Bailey WC, Richards Jr JM, Manzella B, Soong S-J, Brooks M. Evaluation of the efficacy and cost effectiveness of health education methods to increase medication adherence among adults with asthma. *American Journal of Public Health*. 1990;80(12):1519-21.
  218. Wu AC, Paltiel AD, Kuntz KM, Weiss ST, Fuhlbrigge AL. Cost-effectiveness of omalizumab in adults with severe asthma: results from the Asthma Policy Model. *Journal of Allergy and Clinical Immunology*. 2007;120(5):1146-52.
  219. Wu AC, Gay C, Rett MD, Stout N, Weiss ST, Fuhlbrigge AL. Pharmacogenomic test that predicts response to inhaled corticosteroids in adults with asthma likely to be cost-saving. *Pharmacogenomics*. 2015;16(6):591-600.
  220. Xu C, Jackson M, Scuffham PA, Wootton R, Simpson P, Whitty J, et al. A randomized controlled trial of an interactive voice response telephone system and specialist nurse support for childhood asthma management. *Journal of Asthma*. 2010;47(7):768-73.
  221. Yawn BP, Yunginger JW, Wollan PC, Reed CE, Silverstein MD, Harris AG. Allergic rhinitis in Rochester, Minnesota residents with asthma: frequency and impact on health care charges. *Journal of Allergy and Clinical Immunology*. 1999;103(1):54-9.
  222. Zafari Z, Lynd LD, FitzGerald JM, Sadatsafavi M. Economic and health effect of full adherence to controller therapy in adults with uncontrolled asthma: a simulation study. *Journal of allergy and clinical immunology*. 2014;134(4):908-15.
  223. Zafari Z, Sadatsafavi M, Marra CA, Chen W, FitzGerald JM. Cost-effectiveness of bronchial thermoplasty, omalizumab, and standard therapy for moderate-to-severe allergic asthma. *PLoS One*. 2016;11(1):e0146003.
  224. Zein JG, Menegay MC, Singer ME, Erzurum SC, Gildea TR, Cicenia JC, et al. Cost effectiveness of bronchial thermoplasty in patients with severe uncontrolled asthma. *Journal of Asthma*. 2016;53(2):194-200.