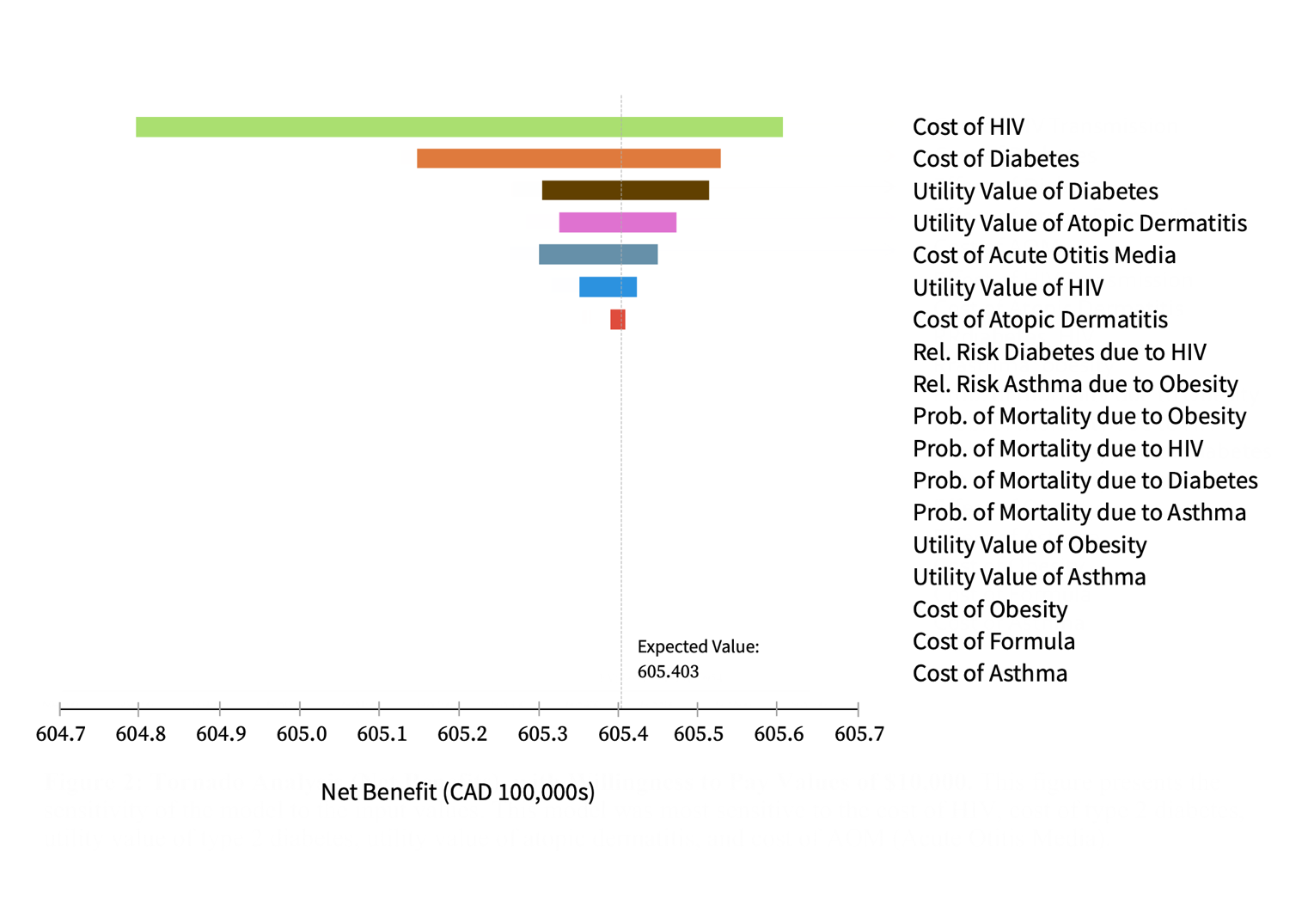
SUPPLEMENTAL

**Figure 1:** Flow diagram showing the inclusion and exclusion of studies used to obtain mutually exclusive health states and their associated probabilities.



**Figure 2: Tornado Analysis (Net Benefits), with Willingness to Pay Values of $10,000.** This figure presents the sensitivity of the model to the input values. This model was most sensitive to the cost of HIV, cost of type 2 diabetes, utility value of type 2 diabetes, utility value of atopic dermatitis, and cost of AOM (Acute Otitis Media).

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| **Table 1:** Studies from the United States Agency for Healthcare Research and Quality | | |
| **Health Condition** | **Study Type** | |
| *Acute Otitis Media* | | |
| (Alho, Läärä, & Oja, 1996) | | Primary study |
| (Duffy, Faden, Wasielewski, Wolf, & Krystofik, 1997) | | Primary study |
| (Duncan et al., 1993) | | Primary study |
| (Scariati, Grummer-Strawn, & Fein, 1997) | | Primary study |
| *Asthma* | | |
| (Burgess, Dakin, & O'Callaghan, 2006) | | Primary study |
| (Gdalevich, Mimouni, & Mimouni, 2001) | | Meta-analysis |
| (Kull, Almqvist, Lilja, Pershagen, & Wickman, 2004) | | Primary study |
| (Sears et al., 2002) | | Primary study |
| (Wright, Holberg, Taussig, & Martinez, 2001) | | Primary study |
| *Atopic Dermatitis* | | |
| (Gdalevich, Mimouni, David, & Mimouni, 2001) | | Meta-analysis |
| *Childhood Leukemia* | | |
| (Guise, Austin, & Morris, 2005)\* | | Systematic review |
| (Kwan, Buffler, Abrams, & Kiley, 2004) | | Meta-analysis |
| *Non-specific Gastroenteritis* | | |
| (Duffy et al., 1986) | | Primary study |
| (Eaton-Evans & Dugdale, 1987) | | Primary study |
| (Fergusson, Horwood, Shannon, & Taylor, 1978) | | Primary study |
| (Howie, Forsyth, Ogston, Clark, & Florey, 1990) | | Primary study |
| *Lower Respiratory Infection* | | |
| (Bachrach, Schwarz, & Bachrach, 2003) | | Meta-analysis |
| *Obesity* | | |
| (Arenz, Rückerl, Koletzko, & von Kries, 2004) | | Systematic review |
| (Harder, Bergmann, Kallischnigg, & Plagemann, 2005) | | Meta-analysis |
| (Owen, Martin, Whincup, Smith, & Cook, 2005) | | Systematic review |
| *Type 1 Diabetes* | | |
| (Norris & Scott, 1996)\* | | Meta-analysis |
| *Type 2 Diabetes* | | |
| (Fall et al., 1995) | | Primary study |
| (Owen, Martin, Whincup, Smith, & Cook, 2006) | | Systematic review |
| (Young et al., 2002) | | Primary study |
| *SIDS* | | |
| (Brooke, Gibson, Tappin, & Brown, 1997)\* | | Primary study |
| (Mitchell et al., 1997) | | Primary study |
| (Fleming et al., 1996) | | Primary study |
| (Mitchell et al., 1992)\* | | Primary study |
| (Vennemann et al., 2005) | | Primary study |
| (Wennergren et al., 1997)\* | | Primary study |

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| **Table 2:** Primary Studies from Systematics Reviews and Meta-Analysis | | |
| **Meta-Analysis** | |  |
| *Asthma*: (Gdalevich, Mimouni, & Mimouni, 2001) | | |
| (Marini, Agosti, Motta, & Mosca, 1996)  (McConnochie & Roghmann, 1986)  (Oddy et al., 1999)  (S. M. Tariq et al., 1998)Wilson (1998) | | |
| *Atopic Dermatitis:* (Gdalevich, Mimouni, David, et al., 2001) | | |
|  | (Arshad & Hide, 1992)  (Berth‐Jones, George, & Graham‐Brown, 1997)  (Chandra, Puri, Suraiya, & Cheema, 1986)  (Chandra, Puri, & Hamed, 1989)  (Chandra, 1997)  (Cogswell et al., 1982)  (Cogswell, Mitchell, & Alexander, 1987)  (Flohr et al., 2011)  (Marini et al., 1996)  (Poysa, Remes, Korppi, & Juntunen‐Backman, 1989)  (S. M. Tariq et al., 1998) | |
| *Childhood Leukemia:* (Kwan et al., 2004) | | |
|  | (Dockerty et al., 1999)  (Hardell & Dreifaldt, 2001)  (Infante-Rivard, Fortier, & Olson, 2000)  (Lancashire & Sorahan, 2003)  (Perrillat et al., 2002)  (Schüz, Kaletsch, Meinert, Kaatsch, & Michaelis, 1999)  (Shu et al., 1995)  (Smulevich, Solionova, & Belyakova, 1999)  (U.K. Childhood Cancer Study, 2001) | |
| *Lower Respiratory Infection:* (Bachrach et al., 2003) | | |
| (Alho et al., 1996)  (Beaudry, Dufour, & Marcoux, 1995)  (Fergusson, Horwood, Shannon, & Taylor, 1981)  (Haby, Peat, Marks, Woolcock, & Leeder, 2001)  (Howie et al., 1990)  (Nafstad, Jaakkola, Hagen, Botten, & Kongerud, 1996)  (Oddy et al., 1999)  (Oddy et al., 2003)  (Raisler, Alexander, & O'Campo, 1999)  (Rubin et al., 1990)  (Sinha, Madden, Ross-Degnan, Soumerai, & Platt, 2003) | | |
| *Obesity:* (Arenz et al., 2004)/ (Harder et al., 2005)/ (Owen et al., 2005) | | |
| (Armstrong & Reilly, 2002)  (Bergmann et al., 2003)  (Gillman et al., 2001)  (Grummer-Strawn & Mei, 2004)  (Hediger, Overpeck, Kuczmarski, & Ruan, 2001)  (Li, Parsons, & Power, 2003)  (Liese et al., 2001)  (Parsons, Power, & Manor, 2003)  (Poulton & Williams, 2001)  (Toschke et al., 2002)  (Von Kries et al., 1999) | | |
| *Type 2 Diabetes:* (Owen et al., 2006) | | |
|  | (Fall et al., 1995)  (Haffner et al., 1992)  (Ravelli, Van der Meulen, Osmond, Barker, & Bleker, 2000)  (Singhal & Lucas, 2004) | |
| \* Articles that only included case-control studies from which risk of developing the disease in  either exposure group could not be discerned. | | |
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| **Table 3**: Results of Meta-Analysis for Health State Diagnosis Probabilities | | | |
| **Health State** | **EFF Pooled Probability** | **EBF Pooled Probability** | **References** |
| AOM | 0.61 (CI: 0.32-0.90) | 0.49 (CI: 0.10-0.87) | (Scariati et al., 1997)  (Duffy et al., 1997)  (Duncan et al., 1993)  (Alho et al., 1996) |
| Asthma | 0.06 (CI: 0.03-0.08) | 0.03 (CI: 0.02-0.05) | (McConnochie & Roghmann, 1986)  (Wilson et al., 1998)  (S. M. Tariq et al., 1998)  (Burgess et al., 2006)  (Kull et al., 2004)  (Sears et al., 2002)  (Wright et al., 2001) |
| Atopic Dermatitis | 0.06 (CI: 0.05-0.07) | 0.05 (CI: 0.03-0.06) | (S. M. Tariq et al., 1998)  (Arshad & Hide, 1992) |
| Nonspecific Gastroenteritis | 0.61 (CI: 0.27-0.95) | 0.19 (CI: 0.08-0.29) | (Fergusson et al., 1978)  (Duffy et al., 1986)  (Eaton-Evans & Dugdale, 1987)  (Howie et al., 1990) |
| Respiratory Tract Infection | 0.27 (CI: 0.07-0.48) | 0.14 (CI: 0.10-0.18) | (Ball & Wright, 1999)  (Beaudry et al., 1995)  (Fergusson et al., 1981)  (Hoey & Ware, 1997)  (Howie et al., 1990)  (Nafstad et al., 1996)  (Oddy et al., 1999) |
| Obesity | 0.02 (CI: 0.01-0.03) | 0.01 (CI: 0.01-0.01) | (Armstrong & Reilly, 2002)  (Gillman et al., 2001)  (Liese et al., 2001)  (Toschke et al., 2002)  (Von Kries et al., 1999)  (Bergmann et al., 2003)  (Grummer-Strawn & Mei, 2004) |
| Diabetes | 0.01 (CI: 0.00-0.05) | 0.00 (CI: 0.00-0.01) | (Ravelli et al., 2000) |
| HIV | 0.00 | 0.05 (CI: 0.039-0.063) | (M. Loutfy et al., 2015) |

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| **Table 4:** Relative Risk of Mortality due to Asthma | | |
| **Author, Year** | **Relative Risk (CI)** | **Weight** |
| (Ali, Dirks, & Ulrik, 2013) | 1.900 (1.100-3.200) | 3.68 |
| (Lange, Ulrik, Vestbo, & Copenhagen City Heart Study, 1996) | 1.100 (0.900-1.300) | 31.03 |
| (Ringbaek, Seersholm, & Viskum, 2005) | 1.700 (1.400-2.100) | 25.52 |
| (Vandentorren et al., 2003) | 1.160 (0.990-1.370) | 39.76 |
| **Pooled Estimate** | **1.281 (1.156-1.419)** |  |

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| **Table 5:** Relative Risk of Mortality due to Type 2 Diabetes | | |
| **Author, Year** | **Relative Risk (CI)** | **Weight** |
| (De Grauw, Van Den Hoogen, Van de Lisdonk, Van Gerwen, & Van Weel, 1998) | 1.590 (1.200-2.110) | 0.43 |
| (Laukkanen, Mäkikallio, Ronkainen, Karppi, & Kurl, 2013) | 2.300 (1.850-2.860) | 0.72 |
| (Mulnier et al., 2006) | 1.599 (1.568-1.630) | 89.79 |
| (K. S. Taylor et al., 2013) | 1.311 (1.230-1.398) | 8.27 |
| (Vilbergsson, Sigurdsson, Sigvaldason, & Sigfusson, 1998) | 1.800 (1.450-2.200) | 0.79 |
| **Pooled Estimate** | **1.579 (1.550-1.6008)** |  |

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| **Table 6:** Relative Risk of Mortality due to HIV | | |
| **Author, Year** | **Relative Risk (CI)** | **Weight** |
| (Borrell et al., 2006) | 3.490 (1.150-12.300) | 0.23 |
| (Ferreros, Lumbreras, Hurtado, Pérez‐Hoyos, & Hernández‐Aguado, 2008) | 4.080 (3.630-4.580) | 24.28 |
| (Goedert, Fung, Felton, Battjes, & Engels, 2001) | 3.710 (3.270-4.210) | 20.55 |
| (Seminari, De Silvestri, Boschi, & Tinelli, 2008) | 1.800 (1.180-2.770) | 1.80 |
| (Stout, Fulks, & Dolan, 2012) | 7.400 (6.800-8.00) | 49.68 |
| (Van Haastrecht et al., 1996) | 3.410 (2.110-5.530) | 1.41 |
| (Villamor, Misegades, Fataki, Mbise, & Fawzi, 2005) | 4.105 (2.756-6.136) | 2.03 |
| **Pooled Estimate** | **5.285 (4.991-5.596)** |  |

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| **Table 7:** Relative Risk of Mortality due to Obesity | | |
| **Author, Year** | **Relative Risk (CI)** | **Weight** |
| (Aune et al., 2016) | 1.450 (1.310-1.600) | 8.64 |
| (Berraho et al., 2010) | 1.060 (0.890-1.270) | 2.73 |
| (Corrada, Kawas, Mozaffar, & Paganini-Hill, 2006) | 1.250 (1.130-1.380) | 8.65 |
| (Farrell, Braun, Barlow, Cheng, & Blair, 2002) | 1.580 (0.950-2.630) | 0.33 |
| (Ferraro, Thorpe, & Wilkinson, 2003) | 1.404 (1.227-1.606) | 4.77 |
| (Greenberg, 2013) | 1.360 (1.200-1.530) | 5.85 |
| (Håheim, Tonstad, Hjermann, Leren, & Holme, 2007) | 1.020 (0.940-1.110) | 12.50 |
| (Kramer, Zinman, & Retnakaran, 2013) | 1.240 (1.020-1.550) | 1.97 |
| (Kulminski et al., 2008) | 0.780 (0.680-0.910) | 4.07 |
| (Lang, Llewellyn, Alexander, & Melzer, 2008) | 0.990 (0.600-1.610) | 0.35 |
| (Lawlor, Hart, Hole, & Smith, 2006) | 1.873 (1.460-2.420) | 1.35 |
| (McGee & Diverse Populations, 2005) | 1.238 (1.151-1.331) | 16.37 |
| (Orpana et al., 2010) | 1.080 (0.800-1.450) | 0.98 |
| (Park et al., 2012) | 1.120 (1.050-1.190) | 22.06 |
| (Romero-Corral et al., 2006) | 0.930 (0.850-1.030) | 9.37 |
| **Pooled Estimate** | **1.159 (1.126-1.194)** |  |

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| **Table 8:** Relative Risk of Comorbidities | | |
| **Joint Health State** | **Relative Risk** | **Source** |
| Asthma if HIV | 1.0 | (M. B. Drummond, Kunisaki, & Huang, 2016)\* |
| Asthma if Obese | 1.605 | (Guh et al., 2009)\* |
| Diabetes if HIV | 1.11 | (Achhra et al., 2015; Araujo et al., 2014; Brown et al., 2005; Butt et al., 2009; De Wit et al., 2008; Galli et al., 2012; Petoumenos et al., 2012; Rasmussen et al., 2012; Tripathi et al., 2014) |
| Diabetes if Obese | 0.44 | (Guh et al., 2009)\* |
| Obese if HIV | 1.0 | (Amorosa et al., 2005; Crum-Cianflone et al., 2010; Crum-Cianflone, Tejidor, Medina, Barahona, & Ganesan, 2008; Hasse et al., 2014; Keithley, Duloy, Swanson, & Zeller, 2009; Koethe et al., 2016; Lakey, Yang, Yancy, Chow, & Hicks, 2013; Messina et al., 2014; Tate et al., 2012; Thomsen, 2015) |
| AD\*\* if Asthma | 1.294 | (Draaisma et al., 2015; Garrett et al., 2013; Kahr et al., 2015; Purvis et al., 2005) |
| Asthma if AD | 1.6 | (Illi et al., 2004; Kawada, 2004; Martel et al., 2009; Morais-Almeida et al., 2007; Reijonen et al., 2000; van der Hulst et al., 2007) |
| \*clinical/systematic review; \*\*AD=atopic dermatitis | | |

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| **Table 9:** Cost Data Source | |
| **Health Condition**  **Author, Year of Pub.** | **Amount (Place of Costing)** |
| *Acute Otitis Media* | |
| (Petit et al., 2003)  **Total Average** | **$73 (Canada)** |
| *Asthma* | |
| (Sadatsafavi et al., 2010) | 518.05 (British Columbia) |
| (Ungar & Coyte, 2001) | 980.47 (Ontario) |
| (Ungar et al., 1997) | 1,183.24 (Ontario) |
| **Total Average** | **$893.92** |
| *Atopic Dermatitis* | |
| (Barbeau & Bpharm, 2006)  **Total Average** | **$179.13 (Ontario)** |
| *Non-specific Gastroenteritis* | |
| (Majowicz et al., 2006)  **Total Average** | **$1,368.78 (Ontario)** |
| *Lower Respiratory Infection* | |
| (Langley, 1997) | 43.30 (Canada) |
| (Dixon, 1985) | 1,832.15 (U.S.) |
| (Sinha et al., 2012) | 1,640.60 (South Africa) |
| **Total Average** | **$1,172.02** |
| *Obesity* | |
| (Cawley & Meyerhoefer, 2012) | 4,429 (U.S.) |
| (Finkelstein et al., 2009) | 2,217 (U.S.) |
| **Total Average** | **$3,323.00** |
| *Diabetes* | |
| (B.C. Ministry of Health, 2005) | 4,186 (British Columbia) |
| (Johnson et al., 2006) | 4,488 (Saskatchewan) |
| (Rosella et al., 2015) | 10,433.11 (Ontario) |
| (Simpson et al., 2003) | 5,020 (Saskatchewan) |
| (Van der Heijden, 2013) | 3,830 (Netherlands) |
| **Total Average** | **$5,591.00** |
| *HIV* | |
| (Association of Local Public Health Agencies, 2006) | 18,140 (Ontario) |
| (Kingston-Riechers, 2011) | 18,932.90 (Canada) |
| **Total Average** | **$18,536.45** |

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|  | **Author (Date)** | **Study**  **Population** | **Outcome**  **Measure** | **Results** |  |
|  | Maredza et al 2013 | South Africa | Cost per DALY  averted, short-term | When > 55% of women are on cART, BF dominates; FF cost-effective in rural settings when the infant mortality rate is < 45/1000 births. |  |
|  | Maclean & Stringer 2005 | Zambia | Cost per QALY,  short-term | cART during pregnancy and 6 mo. of breastfeeding most clinically effective infant feeding strategy, but not cost-effective in a developing country context |  |
|  | Rauner, Brailsford, & Flessa 2005 | Rural Tanzania | Cost per additional living HIV negative child, 12-years | BF was the most cost-effective strategy ($97/additional living HIV-negative child), followed by bottle-feeding (commenced at delivery) ($326/additional HIV-negative child alive). |  |
|  | Yu et al 2014 | South Africa | Cost per infant LY saved, short term | Regardless of antenatal HIV testing and treatment, breastfeeding was less cost-effective than replacement feeding strategies. |  |
|  | DALY = disability-adjusted life years. QALY = Quality-adjusted life years. LY = Life years. cART = combinational antiretroviral therapy.  BF = breastfeeding. FF = formula feeding.    **Table 10: Other Cost-Effectiveness Studies on Breast/Formula Feeding and HIV** | | | |  |