### Qualifying Studies for Home-based Asthma Interventions: Health Care Utilization Outcomes

<table>
<thead>
<tr>
<th>Author &amp; Year (Study Period)</th>
<th>Location, Country Urbanicity Study Population Sample Size</th>
<th>Intervention Components Follow up time Comparison</th>
<th>RESULTS Outcome Measure and time period</th>
<th>Reported Measures</th>
<th>Estimated Effect Size</th>
<th>Absolute pct pt change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown (2006) (2004)</td>
<td>Grand Rapids, MI, USA Urban Adults and children with moderate or severe asthma, mixed income N=239 (110 adults, 129 children)</td>
<td>Home-based asthma education AE, EA, EE, SM 12 mo Comparison: usual care</td>
<td>% population with asthma acute care visits in last 6 mo</td>
<td>Pre (post) Children: I: NR (22.7%) C: NR (38.1%) HR (95% CI): 0.62 (0.33-1.19) p=0.29 Adults: I: NR (23.5%) C: NR (23.7%) HR (95% CI): 1.08 (0.50-2.33) p=0.85</td>
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<td>-15.4</td>
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<tr>
<td>Study (Year)</td>
<td>Location</td>
<td>Sample Description</td>
<td>Intervention</td>
<td>Outcomes</td>
<td>Results</td>
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<tr>
<td>Carter (2001) (NR)</td>
<td>Atlanta, GA-Grady Clinic</td>
<td>Urban, African American children with asthma, low income</td>
<td>Asthma home intervention including allergen avoidance</td>
<td>Pre (post)</td>
<td>Absolute Mean Difference</td>
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<td>EA, EE, ER</td>
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<td>-0.02</td>
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<td>18 mo Control: no home visits until after study completed, routine medical care Placebo: home visits with ineffective ER, EE (ineffective mattress covers, roach traps, etc.)</td>
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<td>0.03</td>
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<td>% of children with asthma acute care visits/past 3 mo</td>
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<tr>
<td>8 cities, US Urban</td>
<td>National Cooperative Inner-City Asthma Study, NCICAS (Phase II)</td>
<td>Mean # of unscheduled visits/yr at 12 months</td>
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<tr>
<td>5 – 11 yo children with physician diagnosed moderate to severe asthma, African American, low income N = 1033</td>
<td>Interventions to reduce asthma symptoms of inner city children</td>
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<tr>
<td></td>
<td>EA, EE, ER, SM, SS Tailored intervention 24 months</td>
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<td>Comparison: Usual care</td>
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<td></td>
<td>Comment: Home visit only for pest control</td>
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<tr>
<th><strong>Hasan (2003)</strong></th>
<th><strong>(1998-1999)</strong></th>
<th><strong>Least: Before-After</strong></th>
<th><strong>Fair : 4 limitations</strong></th>
<th><strong>Academic Medical Center</strong></th>
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<tbody>
<tr>
<td>Flint, MI, USA Urban</td>
<td>Home-based asthma education program</td>
<td>Mean # of asthma ED visits/yr</td>
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<tr>
<td>Children with previous asthma hospitalization N=142</td>
<td>CC, EE, SM 12 mo</td>
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<td></td>
<td>Home-based asthma education program</td>
<td>Mean # of hospitalizations/yr</td>
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<td>Total # of hospital visits/yr</td>
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<tr>
<th><strong>Hughes (2001)</strong></th>
<th><strong>(2001)</strong></th>
<th><strong>Greatest (RCT)</strong></th>
<th><strong>Fair (2 limitations)</strong></th>
<th><strong>Children’s Hospital, Health Dept</strong></th>
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<tbody>
<tr>
<td>Nova Scotia, Canada Unknown</td>
<td>Home-based asthma education program</td>
<td>Total # of hospital visits/yr</td>
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<tr>
<td>Children with previous asthma hospitalization N=95</td>
<td>EA, EE, SM Tailored intervention 24 mo</td>
<td>Total # of ED visits/yr</td>
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<td></td>
<td>Total # of children with asthma acute care visits/past 12 mo</td>
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<tr>
<th><strong>Pre (post)</strong></th>
<th><strong>I: NR (2.64)</strong></th>
<th><strong>C: NR (2.85)</strong></th>
<th><strong>Difference</strong></th>
<th><strong>95% CI: -0.62, 0.20</strong></th>
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<tbody>
<tr>
<td><strong>Mean # of unscheduled visits/yr at 12 months</strong></td>
<td>-0.21</td>
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<td><strong>p=0.32</strong></td>
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<tr>
<th><strong>Pre (post)</strong></th>
<th><strong>I: NR (14.80%)</strong></th>
<th><strong>C: NR (18.90%)</strong></th>
<th><strong>Difference</strong></th>
<th><strong>95% CI: -8.75, 0.36</strong></th>
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<tr>
<td><strong>% of children with hospital visits in the past 12 mo</strong></td>
<td>-4.19</td>
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<td><strong>p=0.071</strong></td>
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<tr>
<th><strong>Pre (post 12mo)</strong></th>
<th><strong>I: NR (20)</strong></th>
<th><strong>C: NR (25)</strong></th>
<th><strong>Difference</strong></th>
<th><strong>95% CI: -8.75, 0.36</strong></th>
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<tr>
<td><strong>Total # of hospital visits/yr</strong></td>
<td>-0.15</td>
<td></td>
<td><strong>p=0.071</strong></td>
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| **Absolute Mean Difference** | -0.21 |
| **Absolute pct pt change** | -4.1 |

| **Absolute Mean Difference** | -0.10 |
| **Absolute pct pt change** | -0.7 |

<p>| <strong>Absolute Mean Difference</strong> | -0.10 |
| <strong>Absolute pct pt change</strong> | 6 |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Location</th>
<th>Participants</th>
<th>Intervention</th>
<th>Pre (post)</th>
<th>Absolute Mean Difference</th>
<th>Absolute pct pt change</th>
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</thead>
<tbody>
<tr>
<td>Kercsmar (2006)</td>
<td>Cleveland, OH, USA Urban</td>
<td>African American children, low income</td>
<td>Asthma environmental intervention aimed at home moisture sources EA, EE, ER, SM</td>
<td>Mean # of asthma acute care visits/yr</td>
<td>I: NR (0.28)</td>
<td>-0.63</td>
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<td>12 mo</td>
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<td>C: NR (0.91) p=0.06</td>
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<td>Comparison: SM and EE (offered ER at end of study)</td>
<td>% population with ≥1 ED or inpatient visit</td>
<td>I: NR (17.2)</td>
<td>-0.15</td>
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<td>C: NR (36.4) p=0.15</td>
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<td>Klinnert (2005)</td>
<td>Denver, CO USA Urban</td>
<td>Low income children ages 9-24mo with wheezing episodes (majority Hispanic)</td>
<td>Childhood Asthma Prevention Study (CAPS)</td>
<td>Mean # of hospitalizations/yr at 12 mo</td>
<td>I: 0.68 (0.15)</td>
<td>-0.12</td>
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<td></td>
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<td>Asthma education, ETS and allergen reduction intervention</td>
<td>Mean # of ED visits/yr at 12 mo</td>
<td>C: 0.52 (0.11) p=0.63</td>
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<td></td>
<td>EA, EE, ER, SM, SS 4 years</td>
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<td>I: 1.91 (0.66)</td>
<td>-0.26</td>
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<td>Comparison: Baseline home assessment and usual care; educational videotape about asthma</td>
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<td>C: 1.52 (0.53) p=0.40</td>
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<tr>
<td>Krieger (2005)</td>
<td>Seattle, WA, USA Urban</td>
<td>Low income children age 4-12 with persistent asthma</td>
<td>Seattle-King County Healthy Homes Project 5-9 home visits</td>
<td>% of children with asthma acute care visits/past 2 mo</td>
<td>I: 23.4 (8.4)</td>
<td>-11.2</td>
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<td></td>
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<td></td>
<td>EA, EE, ER, SS Tailored intervention</td>
<td></td>
<td>C: 20.2 (16.4) P=0.026</td>
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<td>12 mo</td>
<td>GEE coefficient (95% CI): -0.97 (-1.8, -0.12)</td>
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<td>Comparison: Home visits with EA, low intensity EE, ER (allergen impermeable covers and minor education)</td>
<td>OR (95 % CI): 0.38 (0.16, 0.89) P=0.026</td>
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</tbody>
</table>
| **Krieger (2009)** | Seattle, WA, USA  
Urban  
Low income children age 3-13 with persistent or uncontrolled asthma  
N=309 | Seattle-King County Healthy Homes II Project  
4 home visits by CHW  
CC, EA, EE, ER, SM, SS  
Tailored intervention  
15 mo  
Comparison: Clinic visits with EE, SM, SS, CC (no home visits) | % of children with asthma acute care visits/past 3 mo  
Pre (post)  
I: 47.4 (24.4)  
Difference (95% CI): -23.1 (-32.6, -13.6)  
C: 49 (31.4)  
Difference (95% CI): -17.6 (-27.2, -0.08)  
OR (95% CI): 0.69 (0.38, 1.26)  
P < 0.228 | Absolute pct pt change  
-5.4 |
| **Levy (2006)** | Boston, MA USA  
N = 58  
Children with asthma living in public housing;  
Boston Healthy Public Housing Initiative  
CBPR research study of multifaceted in-home environmental intervention; mainly integrated pest management  
EA, EE, ER, SM, SS  
6 mo  
Comparison: None | Total # of hospitalizations  
No change in hospitalizations | |
<table>
<thead>
<tr>
<th>Study (Year)</th>
<th>Design</th>
<th>Quality</th>
<th>Setting</th>
<th>Population</th>
<th>N</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Outcomes</th>
<th>Pre (post)</th>
<th>Absolute Mean Difference (CI)</th>
<th>Absolute pct pt change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morgan (2004)</td>
<td>Greatest: RCT</td>
<td>Good (1 limitation)</td>
<td>NY, MA, TX, AZ, IL, WA, NC; USA</td>
<td>Urban</td>
<td>Atopic children 5-11 with previous asthma ED visit or hospitalization in past 6mo</td>
<td>5 (+2) home visits</td>
<td>EA, EE, ER Tailored intervention</td>
<td>24 mo</td>
<td>Mean # of ED visits/yr at 12 mo</td>
<td>I: NR (0.93) C: NR (1.08)</td>
<td>-0.14 (0.17)</td>
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<td>937</td>
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<td>Mean # of UO visits/yr at 12 mo</td>
<td>I: NR (1.28) C: NR (1.49)</td>
<td>-0.21 (0.11)</td>
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<td>Mean # of combined ED, UO visits/yr at 12 mo</td>
<td>I: NR (2.22) C: NR (2.57)</td>
<td>-0.35 (0.04)</td>
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<td>% of children with &gt;1 asthma hospitalization /yr at 12 mo</td>
<td>I: NR (17.1) C: NR (15.5)</td>
<td>+1.6 (0.56)</td>
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<tr>
<td>Nicholas (2005)</td>
<td>Least (before-after)</td>
<td>Fair (4 limitations)</td>
<td>Harlem, NYC, USA</td>
<td>Urban</td>
<td>Children with asthma living in the 60 block radius of Central Harlem</td>
<td>Multiple home visits</td>
<td>EA, EE, ER, SM, SS</td>
<td>18 mo</td>
<td>% of children with ED asthma visits/yr</td>
<td>Pre (post) I: 35.0% (14.3%) C: 39.7% (15.2%)</td>
<td>p&lt;0.001</td>
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<tr>
<td>Oatman (2007)</td>
<td>Least (before-after)</td>
<td>Fair (4 limitations)</td>
<td>Minneapolis, MN, USA</td>
<td>Urban</td>
<td>Children with persistent asthma</td>
<td>1 home visit + 2 f/u visits</td>
<td>AE, EA, EE, ER Tailored intervention</td>
<td>12 mo</td>
<td>Mean # of hospital visits/yr at 12 mo</td>
<td>Pre (post) I: 0.07 (0.05) C: 0.97 (1.8)</td>
<td>Difference: -0.3</td>
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<td>64</td>
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<td>Mean # of ED visits/yr at 12 mo</td>
<td>Pre (post) I: 1.82 (0.10) C: 0.97 (1.8)</td>
<td>Difference: +0.8</td>
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<td>Mean # of UO visits/yr at 12 mo</td>
<td>Pre (post) I: 1.82 (0.10) C: 0.97 (1.8)</td>
<td>Difference: -1.35</td>
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<tr>
<td>Study (Year)</td>
<td>Location</td>
<td>Setting</td>
<td>Population</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Outcome</td>
<td>Pre (post)</td>
<td>Absolute pct pt change</td>
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<td>Parker (2007)</td>
<td>Detroit, MI, USA Urban</td>
<td>Community Action Against asthma (CAAA)</td>
<td>% of children with acute care visits/12 mo</td>
<td>( I: 65 \ (59) ) ( C: 58 \ (73) ) (-21)</td>
<td>( \text{OR (95% CI): 0.40 (0.22, 0.74)} )</td>
<td>( p = 0.004 )</td>
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<tr>
<td>Primomo (2006)</td>
<td>Tacoma, WA, USA Urban</td>
<td>Clean Air For Kids (CAFK) partnership</td>
<td>% of children with asthma ED visits/yr</td>
<td>( 50% \ (45%) ) ( p=0.30 )</td>
<td>( p = 0.004 )</td>
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<td>Shelledy (2005)</td>
<td>Little Rock, AK, USA Urban</td>
<td>Pilot study including 8 home visits by respiratory therapists for asthma</td>
<td>Mean # of ED visits/yr</td>
<td>1.78 (0.33) ( \text{Effect: -82% reduction (p=0.001)} )</td>
<td>( p = 0.001 )</td>
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<td>Mean # of UO visits/yr</td>
<td>4.22 (0.61) ( \text{Effect: -86% reduction (p=0.001)} )</td>
<td>( p = 0.001 )</td>
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<td>Mean # of hospitalizations/yr</td>
<td>6.39 (2.17) ( \text{Effect: -66% reduction (p=0.001)} )</td>
<td>( p = 0.001 )</td>
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<tr>
<td>Least (before-after)</td>
<td>Total # of hospitalizations/yr</td>
<td>18 (8) Effect: -56% reduction p=0.076</td>
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<tr>
<td>Fair (4 limitations)</td>
<td>Total # of ED visits/yr</td>
<td>20 (7) Effect: -65% reduction p=0.038</td>
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<tr>
<td>Academic Medical Center; Public Health Dept</td>
<td>Total # of unscheduled clinic visits/yr</td>
<td>40 (22) Effect: -45% reduction p=0.063</td>
<td>-0.42</td>
<td>-0.54</td>
<td>-0.75</td>
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## Qualifying Studies for Home-based Asthma Interventions: Quality of Life Outcomes

<table>
<thead>
<tr>
<th>Author &amp; Year (Study Period)</th>
<th>Location, Country Urbanicity</th>
<th>Intervention</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barton (2007)</strong> (1999 – 2000)</td>
<td>Torbay, UK Rural</td>
<td>Improving housing conditions in past 1 month</td>
<td>Mean Symptom score in past 1 month</td>
</tr>
<tr>
<td>Greatest: Group RCT Fair (4 limitations) Government Public Health and Community Partnership Comment: randomized by house</td>
<td>Children and adults Residents of Watcombe houses, white, mixed income N =126 (45 adults, 81 children)</td>
<td>Watcombe Housing Study</td>
<td>(decreased=improved)</td>
</tr>
<tr>
<td>Greatest: Individual RCT Fair (3 limitations) Academic Medical Center</td>
<td>Children with physician-diagnosed asthma, African American, low income N = 100</td>
<td>Home environmental intervention in inner city</td>
<td>% of children reporting any daytime symptoms in the previous 2 weeks at 12 months</td>
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<tr>
<td>Study</td>
<td>Location</td>
<td>Sample Description</td>
<td>Interventions</td>
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<td><strong>Evans (1999)</strong></td>
<td>8 cities, US</td>
<td>5 – 11 yo children with physician diagnosed moderate to severe asthma, African American, low income</td>
<td>National Cooperative Inner-City Asthma Study, NCICAS (Phase II)</td>
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<td>Urban</td>
<td>N = 1033</td>
<td>Interventions to reduce asthma symptoms of inner city children</td>
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<td>24 months</td>
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<td>Comparison: Usual care</td>
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<td><em>Comment: Home visit only for pest control</em></td>
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<td><strong>Hasan (2003)</strong></td>
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<td>Inner City children with previous asthma hospitalization</td>
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<tr>
<td></td>
<td>Urban</td>
<td>N=142</td>
<td>EE, CC, SM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12 mo</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pre: (post)</td>
</tr>
<tr>
<td><strong>Kercsmar (2006)</strong></td>
<td>Cleveland, OH, USA</td>
<td>African American children, low income</td>
<td>Asthma environmental intervention aimed at home moisture/mold sources</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>N=62 children</td>
<td>EA, ER, EE, SM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12 mo</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Comparison: SM and EE (offered ER at end of study)</td>
</tr>
<tr>
<td>Study (2005)</td>
<td>Location</td>
<td>Population</td>
<td>Study Design</td>
</tr>
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<tr>
<td>Klinnert (2005)</td>
<td>Denver, CO, USA</td>
<td>Urban</td>
<td>Low income children ages 9-24mo with wheezing episodes (majority Hispanic)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N = 181 children</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Childhood Asthma Prevention Study (CAPS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EA, EE, ER, SM, SS</td>
</tr>
<tr>
<td>Krieger (2005)</td>
<td>Seattle, WA, USA</td>
<td>Urban</td>
<td>Low income children age 4-12 with persistent asthma</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Seattle-King County Healthy Homes Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5-9 home visits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EA, EE, ER, SS Tailored intervention</td>
</tr>
<tr>
<td>Krieger (2008)</td>
<td>Seattle, WA, USA Urban</td>
<td>Seattle-King County Healthy Homes II Project</td>
<td>Pre (post)</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td>Greatest: (RCT) Fair (2 limitations) Public Health Department Academic Medical Center Community collaboration</td>
<td>Low income children age 3-13 with persistent or uncontrolled asthma N=309</td>
<td>4 home visits by CHW EA, EE, ER, CC, SM, SS Tailored intervention 15 mo Comparison: Clinic visits with EE, SM, SS, CC (no home visits)</td>
<td></td>
</tr>
<tr>
<td>mean number of asthma symptom days in last 2 wks Comment: not reported-derived from symptom free days gained</td>
<td>Symptom Free Days gained in the last 2 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver QoL score Comment: increase = improved</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre (post)</td>
<td>I: 9.3 (11.3); Difference (95%CI) 1.9 (1.1, 2.8) C: 9.5 (10.8) Difference (95%CI) 1.3 (0.5, 2.1) OR (95% CI) 0.94 (0.02, 1.86) p &lt; 0.046</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I: 5.6 (6.2) Difference (95% CI) 0.6 (0.4, 0.8) C: 5.6 (6.0) Difference (95% CI)0.4 (0.3, 0.6) OR (95% CI) 0.22 (0.00, 0.44) p &lt; 0.049</td>
<td></td>
<td></td>
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<tr>
<td>Absolute mean difference</td>
<td>-0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study (Year)</td>
<td>Location</td>
<td>Sample Description</td>
<td>Methodology</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
<tr>
<td>Levy (2006)</td>
<td>Boston, MA, USA Urban</td>
<td>Children aged 4 – 17 with self reported asthma and living in one of the targeted housing developments N = 58</td>
<td>Boston Healthy Public Housing Initiative CBPR research study of multifaceted in-home environmental interventions for children with asthma living in public housing; mainly integrated pest management EA, EE, ER, SM, SS 5 months</td>
</tr>
<tr>
<td>Morgan (2004)</td>
<td>New York, MA, TX, AZ, IL, WA, NC; USA Urban</td>
<td>Atopic children 5-11 with previous asthma ED visit or hospitalization in past 6mo N= 937</td>
<td>Outer City Asthma Study, (ICAS) 5 (+2) home visits EA, EE, ER Tailored intervention 24 mo</td>
</tr>
<tr>
<td>Nicholas (2005)</td>
<td>Harlem, NYC, USA Urban</td>
<td>Children with asthma living in the 60 block radius of Central Harlem N=314</td>
<td>Harlem Children’s Zone Project Multiple home visits EA, EE, ER, SM, SS 18 mo</td>
</tr>
<tr>
<td>Study (Year)</td>
<td>Location</td>
<td>Setting</td>
<td>Participants</td>
</tr>
<tr>
<td>-------------</td>
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</tr>
<tr>
<td>Oatman (2007)</td>
<td>Minneapolis, MN, USA</td>
<td>Urban</td>
<td>Children with persistent asthma</td>
</tr>
<tr>
<td>Parker (2007)</td>
<td>Detroit, MI, USA</td>
<td>Urban</td>
<td>Children with persistent asthma</td>
</tr>
<tr>
<td>Primomo (2006)</td>
<td>Tacoma, WA, USA</td>
<td>Urban</td>
<td>Children with caregiver reported asthma</td>
</tr>
</tbody>
</table>

- I: intervention, C: control
<table>
<thead>
<tr>
<th>Study (Year)</th>
<th>Region/Country</th>
<th>Setting</th>
<th>Sample Details</th>
<th>Intervention Details</th>
<th>Outcome Measures</th>
<th>Pre (Post)</th>
<th>Relative % change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith (2005) (1999-2003)</td>
<td>Norfolk and Suffolk, UK</td>
<td>Academic Medical Centers and Private Clinics</td>
<td>Adults with severe asthma nonadherent to usual therapy</td>
<td>Six mo psycho educational intervention targeting asthma education and management AE, EE (minor), SM, SS</td>
<td>Mean asthma QOL score at 12 mo (Living with Asthma questionnaire)</td>
<td>I: 1.20 (1.01) C: 1.14 (1.02)</td>
<td>0.05 (-0.16, +0.26) p=0.66</td>
</tr>
<tr>
<td>Somerville (2000)</td>
<td>Cornwall, UK</td>
<td>Health Department and Health Authority</td>
<td>Children with moderate to severe asthma</td>
<td>Housing improvements (heating/moisture control) tailored to exposure</td>
<td>Median symptom score (wheeze by day) in the last 4 wks</td>
<td>2 (1) p&lt;0.001</td>
<td>-20</td>
</tr>
<tr>
<td>Thyne (2006) (1999-2001)</td>
<td>San Francisco, CA, USA</td>
<td>Academic Medical Centers, Community partnerships, Government organizations</td>
<td>Urban Low income children, majority African American and Hispanic</td>
<td>Yes We Can Urban Asthma Partnership Provider education, clinic education, and home visits (medical/social model)</td>
<td>Mean number of asthma symptom days in last 2 wks</td>
<td>5.1 (2.8) p&lt;0.01</td>
<td>-2.3</td>
</tr>
</tbody>
</table>
### Qualifying Studies for Home-based Asthma Interventions: Physiologic Outcomes

<table>
<thead>
<tr>
<th>Author &amp; Year (Study Period)</th>
<th>Location, Country, Urbanicity</th>
<th>Study Population</th>
<th>Intervention</th>
<th>Results</th>
<th>Reported Measures</th>
<th>Estimated Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barton (2007)</strong>&lt;br&gt;(1999 – 2000)</td>
<td>Torbay, UK, Rural</td>
<td>Children and adults&lt;br&gt;Residents of Watcombe houses, white, mixed income&lt;br&gt;N = 126 (45 adults, 81 children)</td>
<td>Watcombe Housing Study&lt;br&gt;Improving housing conditions&lt;br&gt;EA, ER (major)&lt;br&gt;12 months&lt;br&gt;Comparison: Delayed intervention</td>
<td>% predicted FEV1/FVC and peak flow</td>
<td>No changes from baseline</td>
<td>-</td>
</tr>
<tr>
<td><strong>Eggleston (2005)</strong>&lt;br&gt;(2002-2003)</td>
<td>Baltimore, MD, US, Urban</td>
<td>Children with physician-diagnosed asthma, African American, low income&lt;br&gt;N = 100</td>
<td>Home environmental intervention in inner city&lt;br&gt;Reduce environmental pollutants and allergen exposure in homes&lt;br&gt;EA, EE, ER Tailored intervention&lt;br&gt;12 months&lt;br&gt;Comparison: Delayed intervention</td>
<td>FEV 1 % predicted</td>
<td>Pre (post)&lt;br&gt;Ⅰ: 101 (94)&lt;br&gt;C:100 (101)&lt;br&gt;No change from baseline</td>
<td>-</td>
</tr>
<tr>
<td><strong>Hughes (2001)</strong></td>
<td>Nova Scotia, Canada</td>
<td>Home-based asthma education program</td>
<td>FEV1, FEV1/FVC, RV/TLC, exp flow 50% and 25%, exp flow (% predicted)</td>
<td>Expiratory flow rates at 50% and 25% were significant at 12 mo (p=0.0001, p=0.001) but differences disappeared by 24 mo</td>
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<td>-----------------------------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Greatest (RCT)</td>
<td>Unknown</td>
<td>EA, EE, SM Tailored intervention</td>
<td>24 mo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair (2 limitations)</td>
<td>Children with previous asthma hospitalization</td>
<td>N=95</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children's Hospital, Health Dept</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Klinnert (2005)</strong></th>
<th>Denver, CO USA</th>
<th>Childhood Asthma Prevention Study (CAPS)</th>
<th>FEV0.5 (liters)</th>
<th>Pre (post)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fair (3 limitations)</td>
<td>Low income children ages 9-24mo with wheezing episodes (majority Hispanic)</td>
<td>EA, EE, ER, SM, SS</td>
<td>FEV0.5/FVC</td>
<td>-0.01 (CI: -0.06 to +0.04) (p=0.59)</td>
</tr>
<tr>
<td>Academic Medical Center and Private clinics</td>
<td>N=181 children</td>
<td>4 years</td>
<td></td>
<td>I: NR (0.74) C: NR (0.79)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comparison: Baseline home assessment and usual care; educational videotape about asthma</td>
<td></td>
<td>-0.04 (CI: -0.11 to +0.02) (p=0.15)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I:NR (0.85) C: NR (0.81)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+0.02 (CI: -0.03 to +0.07) (p=0.52)</td>
</tr>
<tr>
<td>Study (Year)</td>
<td>Details</td>
<td>Location</td>
<td>Sample Description</td>
<td>Intervention</td>
</tr>
<tr>
<td>-------------</td>
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<td>--------------</td>
</tr>
<tr>
<td>Morgan (2004)</td>
<td>Greatest: RCT Good (1 limitation)</td>
<td>NY, MA, TX, AZ, IL, WA, NC; USA Urban</td>
<td>Atopic children 5-11 with previous asthma ED visit or hospitalization in past 6mo N= 937</td>
<td>Inner City Asthma Study (ICAS) 5 (+2) home visits EA, EE, ER Tailored intervention 24 mo Comparison: usual care and 2 home visits (measurements only)</td>
</tr>
<tr>
<td>Parker (2007)</td>
<td>Greatest (RCT) Fair (2 limitations)</td>
<td>Detroit, MI, USA Urban</td>
<td>Children with persistent asthma N= 298</td>
<td>Community Action Against asthma (CAAA) Community-based participatory research 9 home visits by community health workers AE, EA, EE, ER, SS Tailored intervention 12 mo Comparison: Baseline (AE only) and f/u visit (measurement only)</td>
</tr>
<tr>
<td>Thyne (2006) (1999-2001)</td>
<td>Least (before-after)</td>
<td>Fair 4 limitations</td>
<td>Academic Medical Centers, Community partnerships, Government organizations</td>
<td>San Francisco, CA, USA Urban</td>
</tr>
</tbody>
</table>
# Qualifying Studies for Home-based Asthma Interventions: Productivity Outcomes

<table>
<thead>
<tr>
<th>Author &amp; Year (Study Period) Design Suitability: Design Quality of Execution Implementer</th>
<th>Location, Country Urbanicity Study Population Sample Size</th>
<th>Intervention • Name/ Definition • Follow up time Comparison</th>
<th>RESULTS</th>
<th>Outcome Measure and time period</th>
<th>Reported Measures</th>
<th>Estimated Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brown (2006)</strong> (2004) Greatest: RCT Fair (3 limitations) Academic Medical Center and Community Hospital</td>
<td>Grand Rapids, MI, USA Urban Adults and children with moderate or severe asthma, mixed income N=239 (110 adults, 129 children)</td>
<td>Home-based asthma education AE, EA, EE, SM 12 mo Comparison: usual care</td>
<td>% of adults and children that missed ≥ 1 day of work or school (reason unspecified)/ 6mo</td>
<td>Pre (post)</td>
<td>I: NR (58.1) C:NR (54.9) (p=0.62)</td>
<td>Absolute pct pt change + 3</td>
</tr>
<tr>
<td><strong>Hasan (2003)</strong> (1998-1999) Least : Before-After Fair: 4 Limitations Academic Medical Center</td>
<td>Flint, MI, USA Urban Inner City children with previous asthma hospitalization N=142</td>
<td>Home-based asthma education program CC, EE, SM 12 mo</td>
<td>% children missing ≥8 school day from asthma /yr</td>
<td>Pre (post)</td>
<td>35 (12) (p&lt;0.01)</td>
<td>Absolute pct pt change -23</td>
</tr>
<tr>
<td><strong>Hughes (2001)</strong> Greatest (RCT) Fair (2 limitations) Children’s Hospital, Health Dept</td>
<td>Nova Scotia, Canada Unknown Children with previous asthma hospitalization N=95</td>
<td>Home-based asthma education program EA, EE, SM Tailored intervention 24 mo</td>
<td>Mean # school days missed from asthma/yr</td>
<td>Pre (post 12mo)</td>
<td>I: 10.8 (5.8) C:10.4 (8.8)</td>
<td>Absolute Mean Difference -3.4</td>
</tr>
<tr>
<td>Study (Year)</td>
<td>Location</td>
<td>Description</td>
<td>Intervention</td>
<td>Pre (post)</td>
<td>Absolute Pct Pt Change</td>
<td></td>
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</tr>
<tr>
<td><strong>Krieger (2005)</strong></td>
<td>Seattle, WA, USA</td>
<td>Seattle-King County Healthy Homes Project</td>
<td>Tailored intervention</td>
<td>N= 274</td>
<td>% children missing ≥1 school day from asthma /2 wks</td>
<td>I: 31.1 (12.2) C: 28.4 (20.3) GEE: -0.77 (-1.7, 0.16) OR: 0.46 (0.18, 1.18) P&lt;0.105</td>
</tr>
<tr>
<td><strong>Krieger (2008)</strong></td>
<td>Seattle, WA, USA</td>
<td>Seattle-King County Healthy Homes II Project</td>
<td>Tailored intervention</td>
<td>N=309</td>
<td>% children missing ≥1 school day from asthma /2 wks</td>
<td>I: 16.7 (9) Difference (95% CI): -7.7 (-15.1, 0.00) C: 18.3 (11.8) Difference (95% CI): -6.5 (-13.4, 0.00) OR (95% CI): 0.81 (0.35-1.88) P &lt; 0.624</td>
</tr>
<tr>
<td><strong>Morgan (2004)</strong></td>
<td>NY, MA, TX, AZ, IL, WA, NC; USA</td>
<td>Inner City Asthma Study ICAS</td>
<td>Tailored intervention</td>
<td>N= 937</td>
<td># school days missed from asthma in last 2 wks</td>
<td>I: 1.1 (0.65) C: 0.9 (0.82) Difference: -0.17 (p=0.003)</td>
</tr>
</tbody>
</table>

**Notes:**
- **Krieger (2005)**: Greatest: RCT, Fair (3 limitations), Public Health Department, Academic Medical Center, Community collaboration, Comments: Uses community health workers (CHW)
- **Krieger (2008)**: Greatest: (RCT), Fair (2 limitations), Public Health Department, Academic Medical Center, Community collaboration, Comments: Uses community health workers (CHW)
- **Morgan (2004)**: Greatest: RCT, Good (1 limitation), 7 sites: Academic medical schools and research centers
| **Nicholas (2005)** | Harlem, NYC, USA Harlem Children’s Zone Project
Urban
Children with asthma living in the 60 block radius of Central Harlem
N=314 | % children missing ≥1 school day from asthma/2 wks at 12 mo
Pre (post)
I: 23.3 (7.1)
P<0.001 | Pre (post)
Absolute Pct Pt Change
-16.2 |

| **Oatman (2007)** | Minneapolis, MN, USA Reducing Environmental Triggers of Asthma Program (RETA)
Urban
Children with persistent asthma
N = 64 | Mean # of school days missed (reason unspecified)/3 mo at 12 mo
Pre (post)
7.3 (0.1)
Difference: -6.7 | Pre (post)
Absolute Mean Difference
-31.2 |

| **Shelledy (2005)** | Little Rock, AK, USA 8 home visits by respiratory therapists
Urban
Children age 3-18 with asthma and high users of health care
N = 18 | Mean # of school days missed (reason unspecified)/ 12 mo
Pre (post)
I: 19 (6.69)
Effect: -65% change
p = 0.002 | Pre (post)
Absolute Mean Difference
-12.3 |

| **Somerville (2000)** | Cornwall, UK Housing improvements (heating/moisture control) tailored to exposure
EA, ER (major)
11.7 mo (average) | Mean # days lost from school due to asthma/ 3 mo
Pre (post)
I: 5.8 (1.6) | Pre (post)
Absolute Mean Difference
-18.2 |

**Notes:**
1. BL = Baseline, I = Intervention, C = Control, P = Placebo
2. ER = Environmental Remediation, EA = Environmental Assessment, EE = Environmental Education, SM = Self management education, SS + Social Services
3. NR = Not reported, NS = Not significant
4. Outcomes:
   • QOL = Quality of Life
   • HCU = Health Care Utilization
   • PRO = Productivity
   • PHYS = Physiologic Measures
   • AL = Allergen Levels
   • AC = Asthma Control
   • AMB = Asthma Management Behaviors
   • TRB = Trigger Reduction Behaviors
5. CBPR = Community Based Participatory Research
6. RCT = Randomized Controlled Trial

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