# Asthma Control: Home-based Multi-trigger, Multicomponent Environmental Interventions

## Summary Evidence Tables

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

Author & Year (Study Period)	Location, Country Urbanicity	Intervention <ul> <li>Name</li> <li>Definition</li> </ul>	RESULTS		
Design Suitability: Design Quality of Execution: (limitations) Implementer	Study Population Sample Size	<ul> <li>Definition</li> <li>Components</li> <li>Follow up time</li> <li>Comparison</li> </ul>	Outcome Measure and time period	Reported Measures	Estimated Effect Size
Brown (2006)	Grand Rapids, MI, USA	Home-based asthma education	% population with asthma	Pre (post) Children:	Absolute pct pt change
(2004) Greatest: RCT Fair (3 limitations)	Urban Adults and children with moderate or severe asthma, mixed income	AE, EA, EE, SM 12 mo	acute care visits in last 6 mo	I: NR (22.7%) C: NR (38.1%) HR (95% CI): 0.62 (0.33- 1.19) p=0.29	-15.4
Academic Medical Center and Community Hospital	N=239 (110 adults, 129 children)	Comparison: usual care		Adults: I: NR (23.5%) C: NR (23.7%) HR (95% CI):1.08 (0.50-2.33) p=0.85	-0.2

Carter (2001) (NR)	Location: Atlanta, GA- Grady Clinic	Asthma home intervention including allergen avoidance	Total # of	Pre (post)	Absolute Mean Difference
	Urban	allergen avoldance	hospitalizations/yr	C: 0 (1)	-0.02
Greatest : Individual RCT	African American children	EA, EE, ER			0.02
Fair (3 limitations)	with asthma, low income N=104	18 mo Control: no home visits until after study	Total # of ED visits/yr	I: 7 (5) C: 5 (14)	0.03
Emory University and University of VA researchers	<i>Comment: Also includes placebo group in addition</i>	completed, routine medical care Placebo: home visits with	Total # of UO visits/yr	I: 43 (28) C: 40 (33)	-0.20
	to control group (results not shown for placebo)	ineffective ER, EE (ineffective mattress covers, roach traps, etc.)	Total # of combined hospitalizations, ED, UO visits/yr	I: 51 (34) (Down 33%) C: 45 (48) (Up 6%)	-0.51
Eggleston (2005)	Baltimore, MD, US	Home environmental intervention in inner city		Pre (post)	Absolute pct pt change
(2002-2003) Greatest: Individual RCT	Urban Children with physician- diagnosed asthma, African American, Iow	Reduce environmental pollutants and allergen exposure in homes	% of children with asthma acute care visits/past 3 mo	I: 32 (15) C: 36(13)	6
Fair (3 limitations)	income	EA, EE, ER Tailored intervention			
Academic Medical Center	N = 100	12 months			
		Comparison: Delayed intervention			

Evans (1999)	8 cities, US	National Cooperative		Pre (post )	Absolute Mean Difference
(1994-1996) Greatest : Individual	Urban	Inner- City Asthma Study, NCICAS (Phase II)	Mean # of unscheduled visits/yr at 12 months	I: NR (2.64) C: NR (2.85) Difference	-0.21
RCT	5 – 11 yo children with physician diagnosed	Interventions to reduce asthma symptoms of		-0.21 (95% CI: -0.62, 0.20) p=0.32	
Fair (2 limitations)	moderate to severe asthma, African	inner city children			Absolute pct pt change
Eight Academic Medical Centers and NIH	American, low income N = 1033	EA, EE, ER, SM, SS Tailored intervention 24 months	% of children with hospital visits in the past 12 mo	I: NR (14.80%) C: NR (18.90%) Difference -4.19 (95% CI: -8.75, 0.36)	-4.1
		Comparison: Usual care		p=0.071	
		Comment: Home visit only for pest control			
Hasan (2003)	Flint, MI, USA	Home-based asthma	Mean # of asthma ED	<b>Pre (post)</b> 0.94 (0.84)	Absolute Mean Difference
(1998 -1999)	Urban	education program	visits/yr	p > 0.30	-0.10
Least: Before-After	Children with previous asthma hospitalization	CC, EE, SM 12 mo	Mean # of	1.2 (0.5)	
Fair : 4 limitations	N=142		hospitalizations/yr	p < 0.05	-0.7
Academic Medical Center					
Hughes (2001)	Nova Scotia, Canada	Home-based asthma education program	Total # of hospital visits/yr	Pre (post 12mo) I: NR (20)	Absolute Mean Difference
Greatest (RCT)	Unknown	EA, EE, SM		C: NR (25)	-0.10
Fair (2 limitations)	Children with previous asthma hospitalization	Tailored intervention	Total # of ED visits/yr	I: NR (20) C: NR (27)	-0.15
Children's Hospital, Health Dept	N=95	24 mo	Total		
·			# of children with asthma acute care visits/past 12 mo	I: NR (13) C: NR (11)	Absolute pct pt change 6

Kercsmar (2006)	Cleveland, OH, USA	Asthma environmental intervention aimed at		Pre (post)	Absolute Mean Difference
Greatest (RCT)	Urban	home moisture sources	Mean # of asthma acute	I: NR (0.28)	Difference
Greatest (RCT)	Urban	nome moisture sources	care visits/yr	C: NR $(0.28)$	-0.63
Fair (2 limitations)	African American children, low income	EA, EE, ER, SM			
Academic Medical		12 mo			Absolute pct pt change
Center	N=62 children		% population with $\geq$ 1 ED or	I: NR (17.2)	
		Comparison: SM and EE (offered ER at end of study)	inpatient visit	C: NR (36.4) p=0.15	-19.2
Klinnert (2005)	Denver, CO	Childhood Asthma		Pre (post)	Absolute Mean
	USA	Prevention Study (CAPS)	Mean # of	I: 0.68 (0.15)	Difference
(1998-2000 and		······································	hospitalizations/yr at 12 mo	C: 0.52 (0.11)	
2000-2003)	Urban	Asthma education, ETS		p=0.63	-0.12
2		and allergen reduction		1	
Greatest : RCT	Low income children ages	intervention			
	9-24mo with wheezing		Mean # of	I: 1.91 (0.66)	
Fair (3 limitations)	episodes	EA, EE, ER, SM, SS	ED visits/yr at 12 mo	C: 1.52 (0.53)	-0.26
	(majority Hispanic)	4 years	_	p=0.40	
Academic Medical		-			
Center and Private		Comparison: Baseline			
clinics	N=181 children	home assessment and			
		usual care; educational			
		videotape about asthma			
Krieger (2005)	Seattle, WA, USA	Seattle-King County		Pre (post)	Absolute pct pt change
		Healthy Homes Project	% of children with asthma	I: 23.4 (8.4)	
Greatest (RCT)	Urban		acute care visits/past 2 mo	C: 20.2 (16.4)	
		5-9 home visits		P=0.026	-11.2
Fair (3 limitations)	Low income children age				
	4-12 with persistent	EA, EE, ER, SS		GEE coefficient (95% CI):	
Public Health	asthma	Tailored intervention		-0.97 (-1.8, -0.12)	
Department,					
Academic Medical	N= 274	12 mo		OR (95 % CI):	
Center				0.38 (0.16, 0.89)	
Community		Comparison: Home visits		P=0.026	
collaboration		with EA, low intensity EE,			
O a manufactura da la c		ER (allergen impermeable			
Comments: Uses		covers and minor			
community health		education)			
workers (CHW)					

Krieger (2009)	Seattle, WA, USA	Seattle-King County Healthy Homes II Project	% of children with asthma	Pre (post) 1: 47.4 (24.4)	Absolute pct pt change
Greatest: (RCT) Fair (2 limitations) Public Health Department	Urban Low income children age 3-13 with persistent or uncontrolled asthma	4 home visits by CHW CC, EA, EE, ER, SM, SS Tailored intervention	acute care visits/past 3 mo	Difference (95% CI): -23.1 (-32.6, -13.6) C: 49 (31.4) Difference (95% CI): -17.6 (-27.2, -0.08)	-5.4
Academic Medical Center Community collaboration Comments: Uses community health workers (CHW)	N=309	15 mo Comparison: Clinic visits with EE, SM, SS, CC (no home visits)		OR (95 % Cl): 0.69 (0.38, 1.26) P < 0.228	
Levy (2006) Least: Before after, no control (2002 – 2003) Fair (3 limitations) CBPR involving Housing agencies Academic Medical Centers	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	-

Morgan (2004)	NY, MA, TX, AZ, IL, WA, NC; USA	Inner City Asthma Study (ICAS)		Pre (post)	Absolute Mean Difference (CI)
Greatest: RCT Good (1 limitation)	Urban Atopic children 5-11 with	5 (+2) home visits EA, EE, ER	Mean # of ED visits/yr at 12 mo	I: NR (0.93) C:NR (1.08) Difference (p-value) -0.14 (0.17)	-0.15
7 sites: Academic medical schools and research centers	previous asthma ED visit or hospitalization in past 6mo N= 937	Tailored intervention 24 mo Comparison: usual care	Mean # of UO visits/yr at 12 mo	I: NR (1.28) C:NR (1.49) Difference (p-value) -0.21 (0.11)	-0.21
		and 2 home visits (measurements only)	Mean # of combined ED, UO visits/yr at 12 mo	I: NR (2.22) C:NR (2.57) Difference (p-value) -0.35 (0.04)	-0.35
			% of children with <u>&gt;</u> 1asthma hospitalization /yr at 12 mo	I: NR (17.1) C: NR (15.5) Difference (p-value) +1.6 (0.56)	Absolute pct pt change +1.6
Nicholas (2005)	Harlem, NYC, USA	Harlem Children's Zone		Pre (post)	Absolute pct pt change
Least (before-after) Fair (4 limitations)	Urban Children with asthma	Project Multiple home visits	% of children with ED asthma visits/yr	35.0% (14.3%) p<0.001	-20.7
Community center and pediatric hospital	living in the 60 block radius of Central Harlem N=314	EA, EE, ER, SM, SS 18 mo			
Comments: large loss to follow up (N at 12 mo = 70)		Comparison: None			
Oatman (2007)	Minneapolis, MN, USA Urban	Reducing Environmental Triggers of Asthma Program (RETA)	Mean # of hospital visits/yr	Pre (post) 0.07 (0.05)	Absolute Mean Difference
Least (before-after)	Children with persistent	1 home visit + 2 f/u visits	at 12 mo	Difference: - 0.3	-2.60
Fair (4 limitations)	asthma	AE, EA, EE, ER	Mean # of ED visits/yr at 12 mo	0.97 (1.8) Difference: +0.8	+3.32
Health Dept and Home Health Agency	N = 64	Tailored intervention 12 mo	Mean # of UO visits/yr at 12 mo	1.82 (0.10) Difference: -1.35	-6.88

Parker (2007)	Detroit, MI, USA	Community Action Against asthma (CAAA)		Pre (post)	Absolute pct pt change
Greatest (RCT)	Urban	Community-based participatory research	% of children with acute care visits/12 mo	I: 65 (59) C: 58 (73)	-21
Fair (2 limitations)	Children with persistent asthma	9 home visits by		OR (95% CI):	
Academic Medical Center	N= 298	community health workers		0.40 (0.22, 0.74) p = 0.004	
		AE, EA, EE, ER, SS Tailored intervention			
		12 mo			
		Comparison: Baseline (AE only) and f/u visit (measurement only)			
Primomo (2006)	Tacoma, WA, USA	Clean Air For Kids (CAFK) partnership		Pre (post)	Absolute pct pt change
(2001-2003)	Urban	Community-based	% of children with asthma	50% (45%)	
Least: (before-after)	Children with caregiver reported asthma	Asthma Outreach Workers (AOW) program for	ED visits/yr	(p=0.30)	-5
Execution : Fair (3 limitations)	N=71	children			
CBPR –Clean Air For Kids		EA, EE, ER, SM Tailored intervention			
		2 mo			
Shelledy (2005)	Little Rock, AK, USA	Pilot study including 8 home visits by respiratory	Mean # of	Pre (post) 1.78 (0.33)	Absolute Mean Difference
Least (before-after)	Urban	therapists for asthma	hospitalizations/yr	Effect: -82% reduction (p=0.001)	-1.45
Fair (4 limitations)	Children age 3-18 with asthma and high users of	CC, EA, EE, ER, SM Tailored intervention		4.22 (0.61)	
Academic Medical Centers	health care $N = 18$	12 mo	Mean # of ED visits/yr	Effect: -86% reduction (p=0.001)	-3.61
			Mean # of UO visits/yr	6.39 (2.17) Effect: -66% reduction (p=0.001)	-4.22

Stout (1998)	Seattle, WA, USA	Asthma Outreach Project		Pre (post) p value	Absolute Mean Difference
Least (before-after)	Urban	Coordinated care model involving 8 home visits	Total # of hospitalizations/yr	18 (8) Effect: -56% reduction	-0.42
Fair (4 limitations)	Majority African- American, low-income	CC, EA, EE, SM, SS		p=0.076	
Academic Medical Center; Public	children with poorly controlled asthma	Tailored intervention	Total # of ED visits/yr	20 (7) Effect: -65% reduction	-0.54
Health Dept	N=23	12 mo		p=0.038	
			Total # of unscheduled clinic visits/yr	40 (22) Effect: -45% reduction p=0.063	-0.75

### Qualifying Studies for Home-based Asthma Interventions: Quality of Life Outcomes

Author & Year (Study Period)	Location, Country Intervention Urbanicity • Name		RESULTS			
Design Suitability: Design Quality of Execution Implementer	Study Population Sample Size	<ul> <li>Definition</li> <li>Components</li> <li>Follow up time</li> <li>Comparison</li> </ul>	Outcome Measure and time interval	Reported Measures	Estimated Effect Size	
Barton (2007)	Torbay, UK	Watcombe Housing Study		Pre (post)	Relative %	
(1999 – 2000)	Rural	Improving housing conditions	Mean Symptom score in past 1 month	Children: I: 12.9 (11.8) C: 14.6 (12.2)	change	
Greatest: Group RCT	Children and adults Residents of Watcombe	EA, ER (major)	(decreased=improve d)	Difference I: -1.8; C: -1.0	+8	
Fair (4 limitations)	houses, white, mixed income	12 months		(p=0.17)		
Government Public Health and Community Partnership	N =126 (45 adults, 81 children)	Comparison: Delayed intervention		Adults: I: 16.4 (14.7) C: 15.0 (15.4)		
Comment: randomized by house				Difference I: -2.3; C: +1.1 (p=0.006)	-13	
Eggleston (2005)	Baltimore, MD, US	Home environmental intervention in inner city		Pre (post)	Absolute pct pt change	
(2002-2003)	Urban	Reduce environmental	% of children	I: 58% (55%)	-12	
Greatest: Individual RCT	Children with physician- diagnosed asthma, African	pollutants and allergen exposure in homes	reporting any daytime symptoms in	C: 50% (59%)		
Fair (3 limitations)	American, low income	EA, EE, ER	the previous 2 weeks at 12 months	1: 3.69 (4.7)	Relative %	
Academic Medical Center	N = 100	Tailored intervention	Quality of Life Score	C: 4.01 (5.0) Difference:	change	
		12 months	(increase=improved)	I: +1.01 C: +0.99 (p =NS)	+ 3	
		Comparison: Delayed intervention				

Evans (1999) (1994-1996) Greatest : Individual RCT Fair (2 limitations) Eight Academic Medical Centers and NIH	8 cities, US Urban 5 – 11 yo children with physician diagnosed moderate to severe asthma, African American, low income N = 1033	National Cooperative Inner- City Asthma Study, NCICAS (Phase II) Interventions to reduce asthma symptoms of inner city children EA, EE, ER, SM, SS Tailored intervention 24 months Comparison: Usual care <i>Comment: Home visit only for</i> <i>pest control</i>	Mean # of symptom days in previous 2 weeks at 12 months	Pre (post) Children: I: 5.1 (3.51) C: 5.1 (4.06) Difference (95% CI) - 0.55 (-0.92, -0.18) (p =0.004)	Absolute mean difference - 0.6
Hasan (2003) (1998-1999) Least : Before-After Fair: 4 Limitations Academic Medical Center	Flint, MI, USA Urban Inner City children with previous asthma hospitalization N=142	Home-based asthma education program EE, CC, SM 12 mo	% of children with ≥ 8 days of activity limitation in the last 1 year	<b>Pre: (post)</b> 35 (13) (p<0.001)	Absolute pct pt change -
<b>Kercsmar (2006)</b> Greatest: RCT Fair (2 limitations) Academic Medical Center	Cleveland, OH, USA Urban African American children, low income N=62 children	Asthma environmental intervention aimed at home moisture/mold sources EA, ER, EE, SM 12 mo Comparison: SM and EE (offered ER at end of study)	mean # asthma symptom days in last 12 months	Pre (post) I:3.2 (1.3) (p=0.053) C: 4.5 (3.1) (p=NS)	Absolute mean difference -0.5

Klinnert (2005)	Denver, CO, USA Urban	Childhood Asthma Prevention Study (CAPS)	% of children with >	Pre (post) I: NR (39.4)	Absolute pct pt change
(1998-2000 and 2000-2003)	Low income children ages	EA, EE, ER, SM, SS	1 symptom day in the last 12 wks	C: NR (37.7) OR 1.12 (CI 0.6-2.3)	+1.7
Greatest: RCT	9-24mo with wheezing episodes (majority	4 years	at age 4 years (2007)	(p= 0.76)	
Fair (3 limitations)	Hispanic)	Comparison: Baseline home assessment and usual care;		I: 5.69 (6.47)	Relative % change
Academic Medical Center and Private clinics	N = 181 children	educational videotape about asthma	Total caregiver QOL scores at 12 mo <i>(increase = improved)</i>	C:5.61 (6.34) (p=0.72)	+0.6
	Seattle, WA, USA	Seattle-King County Healthy Homes Project		Pre (post)	Absolute mean difference
Krieger (2005)	Urban	5-9 home visits	mean number of asthma symptom	I : 8.0 (3.2) C: 7.8 (3.9)	- 0.9
Greatest: RCT Fair (3 limitations)	Low income children age 4- 12 with persistent asthma N= 274	EA, EE, ER, SS Tailored intervention	days in last 2 wks	GEE Coeff (95% CI) -1.24 (-2.9, 0.4) p = 0.138	
Public Health Department, Academic Medical Center Community collaboration		12 mo Comparison: Home visits with	Caregiver QoL score ( increase = improved)	I: 4.0 (5.6) C: 4.4 (5.4) GEE Coeff (95% CI)	Relative % change
		EA, low intensity EE, ER (allergen impermeable covers and minor education)		0.58 (0.18, 0.99) p = 0.005	+17

	Seattle, WA, USA Urban	Seattle-King County Healthy Homes II Project	mean number of asthma symptom	Pre (post)	Absolute mean difference
Krieger (2008)		4 home visits by CHW	days in last 2 wks	-	-0.7
Greatest: (RCT)	Low income children age 3- 13 with persistent or uncontrolled asthma	EA, EE, ER, CC, SM, SS Tailored intervention	reported-derived from symptom free		
Fair (2 limitations)	N=309	15 mo	days gained	I: 9.3 (11.3); Difference (95%CI)	
Public Health Department Academic Medical Center Community collaboration		Comparison: Clinic visits with EE, SM, SS, CC (no home visits)	Symptom Free Days gained in the last 2 weeks	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 < 0.046	Relative % change
			Caregiver QoL score <i>Comment</i> : increase = improved	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)	+4
				OR (95% CI) 0.22 (0.00, 0.44) p < 0.049	

Levy (2006) Least: Before after, no control (2002 – 2003) Fair (3 limitations) CBPR Housing agencies Academic Medical Centers Community groups	Boston , MA, USA Urban Children aged 4 – 17 with self reported asthma and living in one of the targeted housing developments N = 58	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 Comparison: None	% children with more than one symptom day in the last 2 weeks Caregiver QoL score at 5mo <i>Comment</i> : increase = improved	Pre (post) 76 (40) 4.86 (5.66) Change: 0.80 pts	Absolute pct pt change - 36 Relative % change +16.8
Morgan (2004) Greatest: RCT Good (1 limitation) 7 sites: Academic medical schools and research centers	NY, MA, TX, AZ, IL, WA, NC; USA Urban Atopic children 5-11 with previous asthma ED visit or hospitalization in past 6mo N= 937	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)	Mean number of asthma symptom days in the last 2 weeks at 12 mo	Pre (post) I: 6 (3.4) C: 6 (4.2) Difference: - 0.82 (p< 0.001)	Absolute mean difference - 0.8
Nicholas (2005) Least : before-after Fair (4 limitations) Community center and pediatric hospital Comments: large loss to follow up (N at 12 mo = 70)	Harlem, NYC, USA Urban Children with asthma living in the 60 block radius of Central Harlem N=314	Harlem Children's Zone Project Multiple home visits EA, EE, ER, SM, SS 18 mo Comparison: None	% of children with more than one symptom day in the past 2 weeks at 12 mo	Pre (post) 61.5 (42.8) (p < 0.001)	Absolute pct pt change -18.7

	Minneapolis, MN, USA	Reducing Environmental		Pre (Post)	Relative %
Oatman (2007)		Triggers of Asthma Program	mean asthma	54.0 (70.4)	change
Least: before-after	Urban	(RETA)	symptom scores (ITG Child Asthma Short	51.8 (70.1)	+35
Least: before-after		1 house state 0 f/s state			+ 35
Fair (1 limitations)	Children with persistent asthma	1 home visit + 2 f/u visits	Form)		
Fair (4 limitations)	astrima		Commont		
Lealth Dent and Llama Lealth	N = 64	AE, EA, EE, ER Tailored intervention	Comment:		
Health Dept and Home Health	N = 04	Tailored Intervention	Increase = improved		
Agency		12 mo			
Parker (2007)	Detroit, MI, USA	Community Action Against	Mean Symptom	Pre (Post)	
	Detroit, Mi, OSA	asthma (CAAA)	Score at 12 mo		
Greatest (RCT)	Urban	Community-based	Comment:		
		participatory research	decrease = improved		
Fair (2 limitations)	Children with persistent			I: 3.81 (3.36)	-
(,	asthma	9 home visits by community	Cough:	C: 3.48 (3.44)	
Academic Medical Center		health workers		P = 0.034	
	N= 298				
		AE, EA, EE, ER, SS		1: 4.27 (3.69)	-
		Tailored intervention	Cough With Exercise	C: 3.80 (3.66)	
			5	P = 0.017	
		12 mo			
		Comparison, Bossling (AF	Wheeze, shortness of	no change aver	
		Comparison: Baseline (AE only) and f/u visit	breath, chest	no change over control	-
				control	
		(measurement only)	tightness, sleep disturbance		
			disturbance		
Primomo (2006)	Tacoma, WA, USA	Clean Air For Kids (CAFK)		Pre (Post)	Relative %
	-, ,	partnership			change
(2001-2003)	Urban				
. ,		Community-based Asthma	Mean Caregiver QoL	4.65 (6.06)	
Least: (before-after)	Children with caregiver	Outreach Workers (AOW)	score at 1 mo post		30
. ,	reported asthma	program for children	intervention		
Execution : Fair	-				
(3 limitations)	N=71	EA, EE, ER, SM	Comment:		
		Tailored intervention	increase = improved		
				1	
CBPR –Clean Air For Kids					

Smith (2005)	Norfolk and Suffolk, UK	Siv ma naveha advectional		Pre (Post)	Relative %
(1999-2003)	Not specified	Six mo psycho educational intervention targeting asthma education and management	Mean asthma QOL score at 12 mo	I: 1.20 (1.01) C: 1.14 (1.02)	change
Greatest (RCT)	Adults with severe asthma nonadherent to usual	AE, EE (minor), SM, SS	(Living with Asthma guestionnaire)	Difference (95 % CI) 0.05 (-0.16, +0.26)	5.3
Fair (3 limitations)	therapy	12mo	Comment:	p=0.66	
Academic Medical Centers and Private Clinics	N=92		decrease = improved		
	Comment: Adults only study				
Somerville (2000)	Cornwall, UK			Pre (post)	Relative % change
Least (before-after)	Not specified	Housing improvements (heating/moisture control)	Median symptom score (wheeze by	2 (1) p<0.001	-20
Fair (3 limitations)	Children with moderate to severe asthma	tailored to exposure EA, ER (major)	day) in the last 4 wks		
Health Department and Health Authority	N = 114	11.7 mo (average)			
Thyne (2006)	San Francisco, CA, USA	Yes We Can Urban Asthma Partnership		Pre (post)	Absolute mean difference
(1999-2001)	Urban	Provider education, clinic	Mean number of asthma symptom	5.1 (2.8) p<0.01	-2.3
Least (before-after)	Low income children,	education, and home visits (medical/social model)	days in last 2 wks		
Fair 4 limitations	majority African American and Hispanic				
Academic Medical Centers, Community partnerships, Government organizations	CC, EA, EE, SM, SS				
	N=65				

### Qualifying Studies for Home-based Asthma Interventions: Physiologic Outcomes

Author & Year (Study Period) Design Suitability: Design	Location, Country Urbanicity Study Population	Intervention <ul> <li>Name/</li> <li>Definition</li> </ul>	RESULTS			
Quality of Execution	Sample Size	Follow up time     Comparison	Outcome Measure and time period	Reported Measures	Estimated Effect Size	
Barton (2007)	Torbay, UK	Watcombe Housing Study				
(1999 – 2000) Greatest: Group randomized trial Fair (4 limitations) Government Public Health and Community Partnership	Rural Children and adults Residents of Watcombe houses, white, mixed income N = 126 (45 adults, 81 children)	Improving housing conditions EA, ER (major) 12 months Comparison: Delayed intervention	% predicted FEV1/FVC and peak flow	No changes from baseline	-	
Comment: randomized by house						
Eggleston (2005)	Baltimore, MD, US	Home environmental intervention in inner city		Pre (post)		
(2002-2003)	Urban	Reduce environmental	FEV 1 % predicted	I: 101 (94) C:100 (101)	-	
Greatest: Individual randomized controlled trial	Children with physician- diagnosed asthma, African American, low income	pollutants and allergen exposure in homes		No change from baseline		
Fair (3 limitations)	N = 100	EA, EE, ER Tailored intervention				
Academic Medical Center		12 months				
		Comparison: Delayed intervention				

Hughes (2001) Greatest (RCT) Fair (2 limitations) Children's Hospital, Health Dept	Nova Scotia, Canada Unknown Children with previous asthma hospitalization N=95	Home-based asthma education program EA, EE, SM Tailored intervention 24 mo	FEV1, FEV1/FVC, RV/TLC, exp flow 50% and 25%,, peak flow (% predicted)	Expiratory flow rates at 50% and 25% - were significant at 12 mo (p=0.0001, p=0.001) but differences disappeared by 24 mo
Klinnert (2005) (1998-2000 and 2000-2003) Greatest :RCT Fair (3 limitations) Academic Medical Center and Private clinics	Denver, CO USA Urban Low income children ages 9-24mo with wheezing episodes (majority Hispanic) N=181 children	Childhood Asthma Prevention Study (CAPS) Asthma education, ETS and allergen reduction intervention EA, EE, ER, SM, SS 4 years Comparison: Baseline home assessment and usual care; educational videotape about asthma	FEV 0.5 (liters) FVC (liters) FEV0.5/FVC	Pre (post)       -         I: NR (0.62)       -         C: NR (0.63)       -         -0.01 (CI: -0.06 to       + $+0.04$ )       (p=0.59)         I: NR (0.74)       -         C: NR (0.79)       -         -0.04 (CI: -0.11 to       + $+0.02$ )       (p=0.15)         I:NR (0.85)       -         C: NR (0.81)       + $+0.02$ (CI: -0.03 to $+0.07$ )       (p=0.52)

Morgan (2004) Greatest: RCT Good (1 limitation) 7 sites: Academic medical schools and research centers	NY, MA, TX, AZ, IL, WA, NC; USA Urban Atopic children 5-11 with previous asthma ED visit or hospitalization in past 6mo N= 937	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)	FEV1 (% predicted) FVC (% predicted) Peak Flow (L/min)	Pre (post at 12 mo) I: 88.3 (87.0) C: 87.3 (87.4) Difference: -0.4 p=0.69 I: 96.5 (97.3) C: 96.9 (98.1) Difference: -0.8 p=0.48 I: 202.3 (216.7) C: 205.4 (219.3) Difference: -2.61 p=0.51	-
Parker (2007) Greatest (RCT) Fair (2 limitations) Academic Medical Center	Detroit, MI, USA Urban Children with persistent asthma N= 298	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)	FEV1(% predicted) at 12 mo Peak Flow(% pred) at 12 mo	Pre (post) I: 76.7 (83.1) C: 79.5 (75.6) Difference( 95% CI): 10.0 (0.9, 19.1) p=0.032 I: 79.6 (94.1) C: 82.7 (85.1) Difference( 95% CI): 8.2 (1.1, 15.2) p=0.023	-

Thyne (2006)	San Francisco, CA, USA	Yes We Can Urban Asthma Partnership		Pre (post)	
(1999-2001)	Urban	Provider education, clinic	FEV1(% predicted) at 6 mo (for children	82 (91) p=0.27	-
Least (before-after)	Low income children,	education, and home visits (medical/social model)	> 4 yr)	ρ-0.27	
Fair 4 limitations	majority African American and Hispanic	(medical/social model)			
Academic Medical Centers,					
Community partnerships, Government organizations	CC, EA, EE, SM, SS				
J	N=42				

### Qualifying Studies for Home-based Asthma Interventions: Productivity Outcomes

Author & Year (Study Period) Design Suitability: Design Quality of Execution Implementer	Location, Country Urbanicity Study Population	Intervention <ul> <li>Name/</li> <li>Definition</li> </ul>	RESULTS			
	Study Population Sample Size	Follow up time     Comparison	Outcome Measure and time period	Reported Measures	Estimated Effect Size	
Brown (2006) (2004) Greatest: RCT Fair (3 limitations) Academic Medical Center and Community Hospital	Grand Rapids, MI, USA Urban Adults and children with moderate or severe asthma, mixed income N=239 (110 adults, 129 children)	Home-based asthma education AE, EA, EE, SM 12 mo Comparison: usual care	% of adults and children that missed ≥ 1 day of work or school (reason unspecified)/ 6mo	Pre (post) I: NR (58.1) C:NR (54.9) (p=0.62)	Absolute pct pt change + 3	
Hasan (2003) (1998-1999) Least : Before-After Fair: 4 Limitations Academic Medical Center	Flint, MI, USA Urban Inner City children with previous asthma hospitalization N=142	Home-based asthma education program CC, EE, SM 12 mo	% children missing <u>&gt;</u> 8 school day from asthma /yr	Pre (post) 35 (12) (p<0.01)	Absolute pct pt change -23	
Hughes (2001) Greatest (RCT) Fair (2 limitations) Children's Hospital, Health Dept	Nova Scotia, Canada Unknown Children with previous asthma hospitalization N=95	Home-based asthma education program EA, EE, SM Tailored intervention 24 mo	Mean # school days missed from asthma/yr	Pre (post 12mo) I: 10.8 (5.8) C:10.4 (8.8)	Absolute Mean Difference -3.4	

Krieger (2005)	Seattle, WA, USA Urban	Seattle-King County Healthy Homes Project		Pre (post)	Absolute Pct Pt Change
Greatest: RCT		5-9 home visits	% children missing	I: 31.1 (12.2)	
Fair (3 limitations)	Low income children age 4- 12 with persistent asthma	EA, EE, ER, SS	≥1 school day from asthma /2 wks	C: 28.4 (20.3)	-10.8
Public Health Department, Academic Medical Center Community collaboration	N= 274	Tailored intervention 12 mo Comparison: Home visits with		GEE: -0.77 (-1.7, 0.16) OR: 0.46 (0.18, 1.18)	
Comments: Uses community health workers (CHW)		EA, low intensity EE, ER (allergen impermeable covers and minor education)		P<0.105	
Krieger (2008)	Seattle, WA, USA	Seattle-King County Healthy Homes II Project		Pre (post)	Absolute Pct Pt Change
Greatest: (RCT) Fair (2 limitations) Public Health Department Academic Medical Center Community collaboration Comments: Uses community health workers (CHW)	Urban Low income children age 3- 13 with persistent or uncontrolled asthma N=309	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)	% children missing <u>&gt;</u> 1 school day from asthma/2 wks	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 < 0.624	-1.2
Morgan (2004) Greatest: RCT	NY, MA, TX, AZ, IL, WA, NC; USA	Inner City Asthma Study ICAS	# school days missed from asthma	Pre (post 12mo)	Absolute Mean Difference
Good (1 limitation)	Urban Atopic children 5-11 with	5 (+2) home visits EA, EE, ER	in last 2 wks	I: 1.1 (0.65) C: 0.9 (0.82) Difference: -0.17	-9.6
7 sites: Academic medical schools and research centers	previous asthma ED visit or hospitalization in past 6mo	Tailored intervention		(p=0.003)	
	N= 937	Comparison: usual care and 2 home visits (measurements only)			

Nicholas (2005)	Harlem, NYC, USA	Harlem Children's Zone Project	% children missing	Pre (post)	Absolute Pct Pt Change
Least : before-after	Urban	Multiple home visits	≥1 school day from asthma/2 wks at 12	I: 23.3 (7.1)	-16.2
Fair (4 limitations)	Children with asthma living in the 60 block radius of		mo	P<0.001	
Community center and pediatric hospital	Central Harlem	EA, EE, ER, SM, SS			
	N=314	18 mo			
Comments: large loss to follow up (N at 12 mo = 70)		Comparison: None			
Oatman (2007)	Minneapolis, MN, USA	Reducing Environmental Triggers of Asthma Program		Pre (post)	Absolute Mean Difference
Least (before-after)	Urban	(RETA)	Mean # of school	7.3 (0.1)	-31.2
Fair (4 limitations)	Children with persistent asthma	1 home visit + 2 f/u visits	days missed (reason unspecified)/3 mo at	Difference: -6.7	01.2
Health Dept and Home Health Agency	N = 64	AE, EA, EE, ER Tailored intervention 12 mo	12 mo		
Shelledy (2005)	Little Rock, AK, USA	8 home visits by respiratory therapists		Pre (post)	Absolute Mean Difference
Least (before-after)	Urban	CC, EA, EE, ER, SM	Mean # of school days missed (reason	I: 19 (6.69) Effect: -65% change	-12. 3
Fair (4 limitations)	Children age 3-18 with asthma and high users of	Tailored intervention	unspecified)/ 12 mo	p = 0.002	-12. 3
Academic Medical Centers	health care	12 mo			
	N = 18				
Somerville (2000)	Cornwall, UK			Pre (post)	Absolute Mean Difference
Least (before-after)	Not specified	Housing improvements (heating/moisture control)	Mean # days lost from school due to	I: 5.8 (1.6)	-18.2
Fair (3 limitations)	Children with moderate to	tailored to exposure	asthma/ 3 mo		-10.2
Health Department and Health	severe asthma	EA, ER (major)			
Authority	N = 114	11.7 mo (average)			

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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