

Respiratory health of Austrian school children



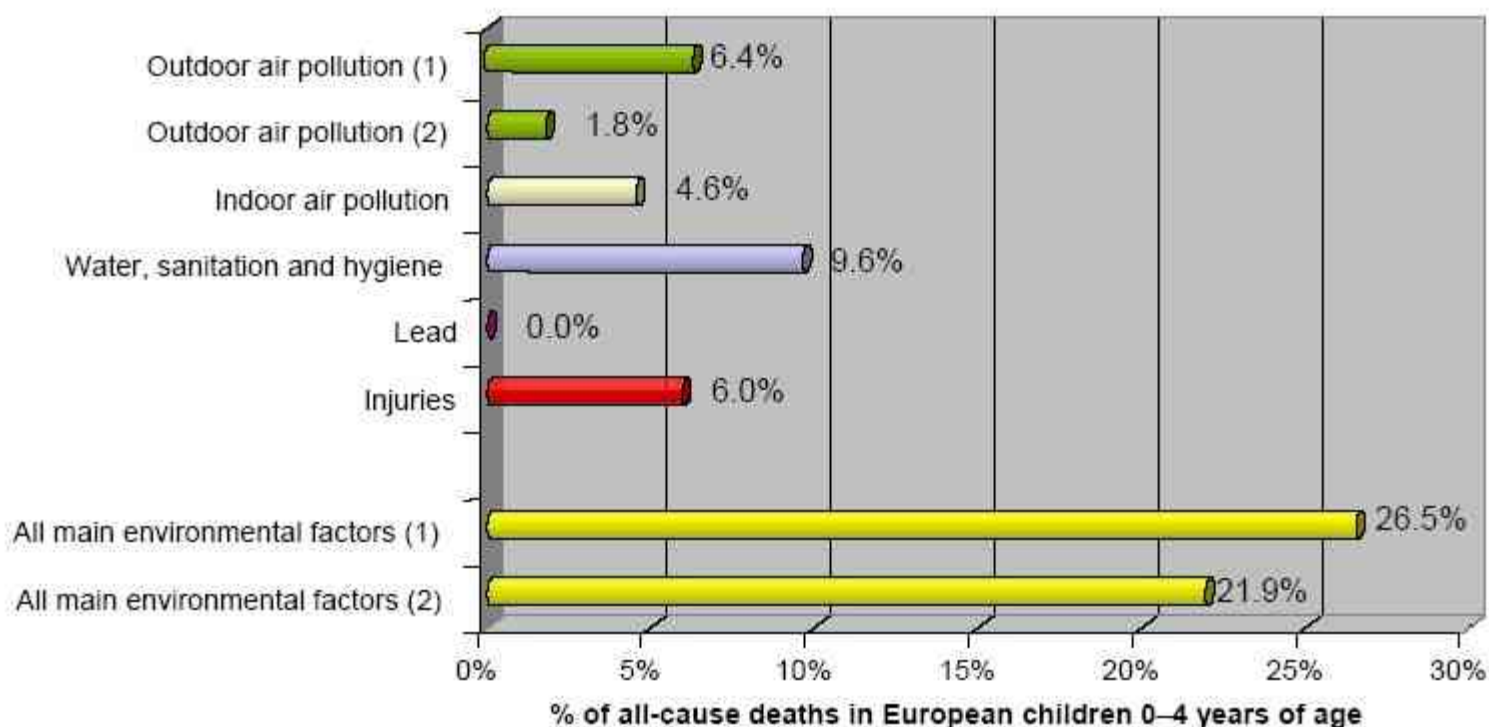
Hanns Moshhammer

MedUniWien, Vienna, Austria

hanns.moshhammer@meduniwien.ac.at

Burden of disease

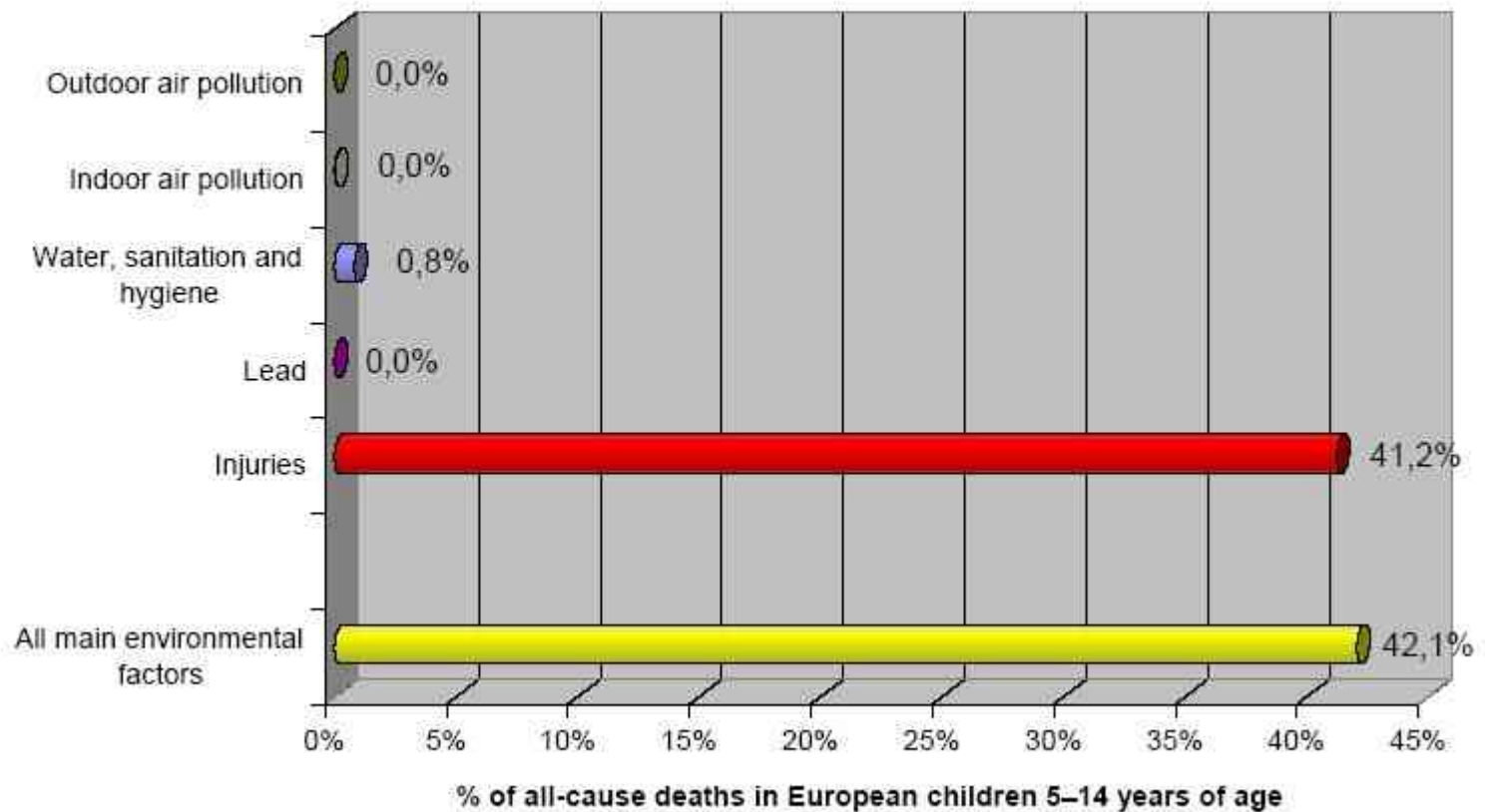
Figure 6.1 Proportion of all-cause deaths attributable to environmental factors among European children 0–4 years of age



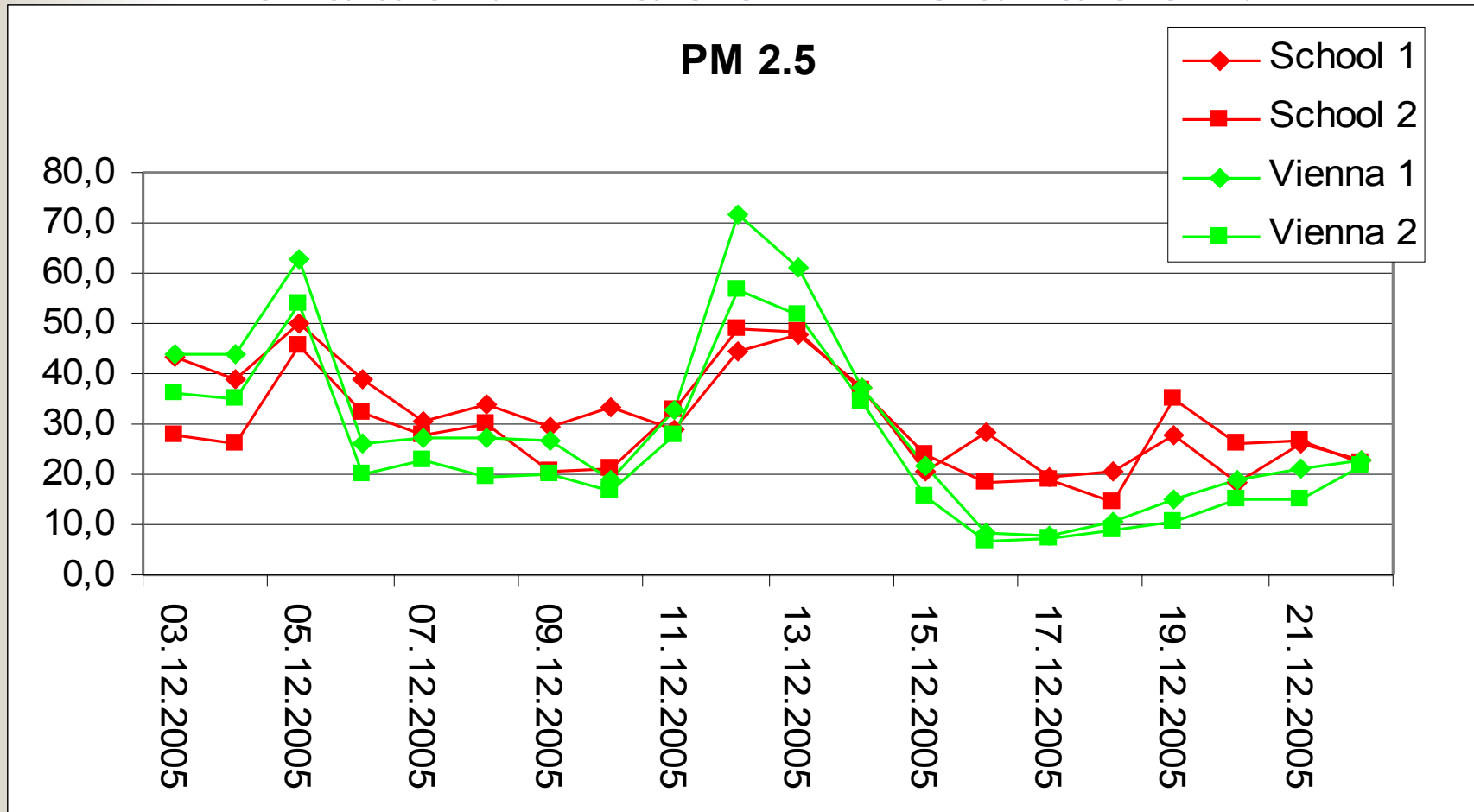
- (1) Applying relative risk to all-cause deaths for outdoor air pollution.
- (2) Applying relative risk to respiratory infections for outdoor air pollution.

Burden of disease

Figure 6.2 Proportion of all-cause deaths attributable to environmental factors among European children 5–14 years of age



Fine dust: Indoor = outdoor!

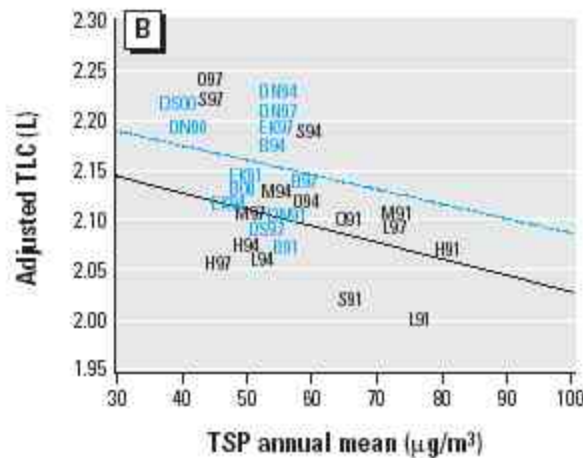
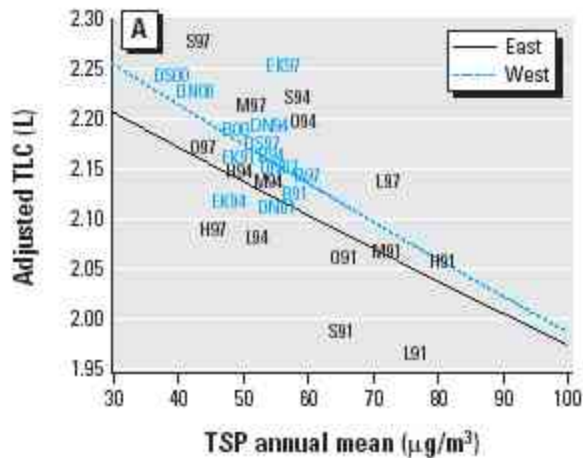
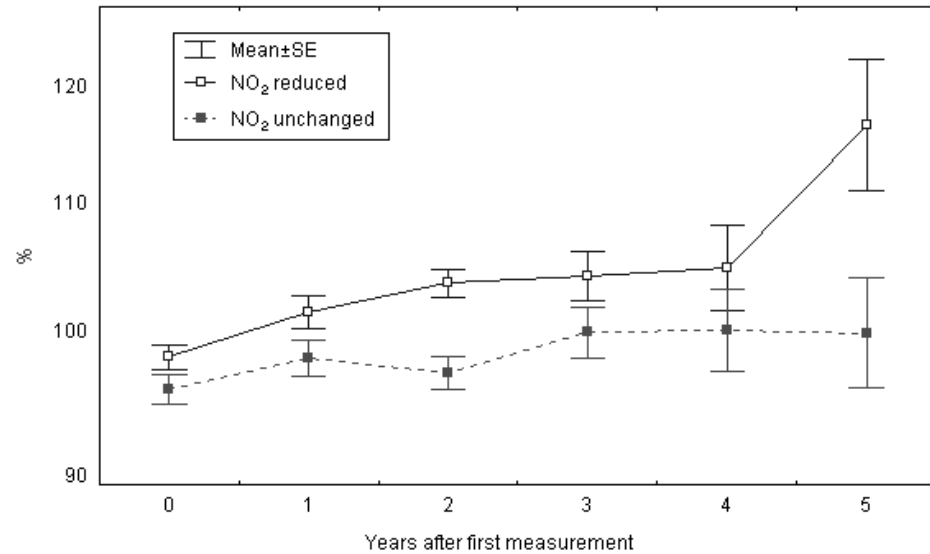


New sources of pollutants

Lung function improved in these parts of the town where NO₂ was reduced.

Data from approx. 3500 children observed over 5 years each beginning between 1984 and 1990.

MEF₂₅ as Percentage of Reference



Lung volume of 6 year old German children living more (A) or less (B) than 50 m away from a busy road.



The underestimated threat

- Pregnancy

- Birth weight, miscarriage, malformation, consecutive diseases later in life

- Children

- Respiratory tract: symptoms, lung growth, diseases, (mortality)

- Adults

- Respiratory and cardiovascular system: symptoms, diseases, mortality

CESAR Study areas



Example of some risk factors for Wheeze: Prevalence, Odds ratios and Attributable fractions

Variable	Level	Prev. %	OR	95% CI	AFs %
Air pollution	29 $\mu\text{g}/\text{m}^3$	5			
	67 $\mu\text{g}/\text{m}^3$	5 - 95	1.49	1.07 - 2.07	11.3
Traffic intensity	None	52			
	Light	29	1.16	1.03 - 1.31	3.0
	Medium	12	1.18	1.03 - 1.35	1.4
	Heavy	6	1.17	1.05 - 1.31	0.7
Traffic					5.1
Heating with Gas Oven	No	96			
	Yes	4	1.04	0.85 - 1.28	0.1
Kerosene heater	No	96			
	Yes	4	1.32	1.05 - 1.67	0.8
Indoor combustion sources					0.9

Housing conditions and LF I



Children enjoy the change in their school routine

Children (n=207) in the first and second form in three elementary schools of the town were invited to participate in the study (January and February 2005).

- Outdoor air pollution: lack of variation hampers the investigation.
- Home address (urban / rural, neighborhood) and housing conditions display sufficient variability.

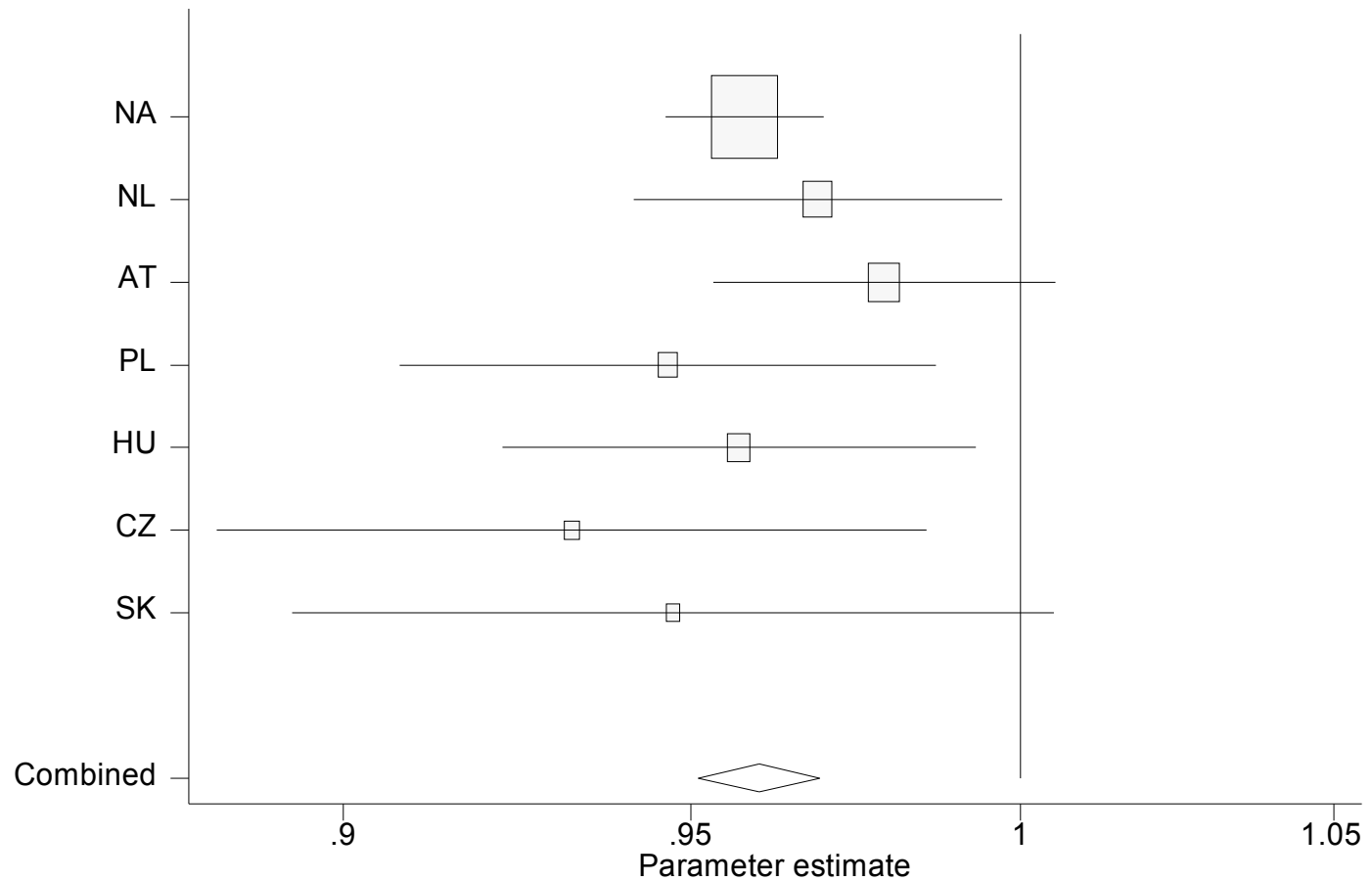
Housing conditions and LF II

	no mould	carpet	number of persons	number of lorries	rural surrounding
ln (FVC)	-	-	-	-	0.0208 (0.0078; 0.0338)
ln (FEV1)	-	-	-	-0.0256 (-0.0423; -0.0089)	-
ln (PEF)	0.1388 (0.0660; 0.2116)	-	-	-	-
ln(MMEF)	0.0810 (-0.0067; 0.1687)	0.0936 (0.0215; 0.1657)	0.0289 (-0.0021; 0.0598)	-	-
ln (MEF25)	-	0.1454 (0.0474; 0.2435)	0.0366 (-0.0051; 0.0782)	-	-
ln (MEF50)	0.0763 (-0.0075; 0.1600)	0.0803 (0.0114; 0.1492)	0.0272 (-0.0024; 0.0567)	-	-
ln (MEF75)	0.1318 (0.0578; 0.2058)	-	-	-	-

Tab.: Some results from the lung-function testing. Independent factors considered: ln(age), ln(weight), sex x ln(height), school as a random effect term, and all exposure factors that at least yield an effect estimate with a p-value < 0.1.

The “protective” effect of carpets even grew stronger when these few children were excluded for whom the parents reported that carpets had been removed because of asthmatic problems of the child.

Smoking in Pregnancy & MMEF



New campaign in urban schools I

% Diff	Mother smokes		Mother smoked 1 yr		per 10 zig father		per 10 zig mother		per smoker		per 10 zig/day	
fvc					-1,1				-2,5			
					-2,5	0,2			-4,4	-0,6		
fev0.5	-3,2		-3,8		-1,5		-3,1		-3,4		-1,9	
	-6,3	-0,1	-7,2	-0,4	-2,9	0,0	-4,9	-1,3	-5,4	-1,4	-3,7	-0,2
fev1			-3,3		-1,5		-2,4		-3,6		-1,9	
			-6,7	0,1	-2,9	-0,1	-4,2	-0,6	-5,5	-1,6	-3,7	-0,1
pef									-2,1			
									-4,7	0,4		
mef75							-2,7		-3,0			
							-5,1	-0,3	-5,7	-0,4		
mef50	-4,9		-7,0				-4,9		-4,5		-3,1	
	-9,8	0,1	-12,4	-1,6			-7,8	-2,0	-7,6	-1,3	-5,9	-0,3
mef25			-8,4				-5,3		-4,4			
			-16,0	-0,8			-9,5	-1,2	-8,8	0,1		
mmef	-4,4		-6,3				-4,5		-4,0			
	-9,4	0,7	-11,8	-0,8			-7,4	-1,6	-7,2	-0,8		

Approx. 350 children age 6-7, mostly from Vienna

New campaign in urban schools II

% Diff	mould		breastfeeding		YES / duration of breastfeeding / ALL		carpet		persons / sqm	
fvc					1,4	0,8			-93,0	
					0,0	2,7	-0,2	1,8	-177,6	-8,5
fev0.5			3,9		2,0	1,6				
			-0,5	8,2	0,6	3,4	0,6	2,6		
fev1					2,4	1,7				
					1,1	3,8	0,7	2,7		
pef					1,7	1,4				
					0,0	3,5	0,2	2,7		
mef75			5,5		1,7	1,7				
			-0,2	11,3	-0,1	3,5	0,4	3,0		
mef50	-5,1		8,4		2,7	2,6	-5,4			
	-10,6	0,3	1,5	15,3	0,6	4,9	1,0	4,2	-11,6	0,8
mef25	-6,6				3,1	2,5	-7,3			
	-14,2	1,0			0,1	6,1	0,2	4,7	-16,0	1,4
mmef	-5,9		7,7		2,6	2,4	-5,8			
	-11,3	-0,4	0,7	14,7	0,4	4,7	0,8	4,0	-12,1	0,4

Approx. 350 children age 6-7, mostly from Vienna

Thank you
for your attention!



Hanns Moshhammer

Institute f. Environmental Health,
Medical University of Vienna