

Introduction

Human time-activity patterns and their relationship to environmental factors are an important part of exposure assessment for environmental contaminants. In Europe, a database of time-use patterns developed for social science research, the Multinational Time Use Survey (MTUS), provides data that can potentially be used for exposure studies and covers a wide range of countries. In HEIMTSA, an EU FP6 project on integrated health assessment, MTUS is used for modeling exposures to outdoor air pollution on a European level.

Methodology

MTUS provides aggregated daily diary data for 41 activity categories which were reclassified into the microenvironments (MEs) home, work (includes school), travel, outdoor and other (unspecified locations which might occur both indoors and outdoors). The population was stratified into 8 subgroups, distinguishing between gender, age groups (<15, 15-64, >64), and employment status for the middle age group.

For each country, descriptive statistics for time spent in the MEs per day were calculated using diaries from 1990 to 2005. Linear regression was used to assess the impact of a set of socio-demographic and environmental factors on time spent at home, work and travel.

Results

Figure 1 shows the distribution of average time spent in the various MEs by agegroups, gender and country. Home dominates time spent in indoor locations, as people spent more than 60% of their daily time at home. The oldest age group and female spent more time at home than other sub groups.

The results of the linear regression models on total time spent at home are presented in Table 1, and show that the most significant factors affecting time use were *gender*, *employment*, *living alone* and *day*.

The most significant factors on time spent at work/school were *gender*, *day* and *education level*. For all countries, men work longer than women, men in Austria work in average the most of all countries.

On average, men travel more than female for all countries. The population above the age of 64 travels the least. Living in rural areas increased average time spent on travel for all countries except UK. Men from Austria travel the least of all countries (See Figure 2).

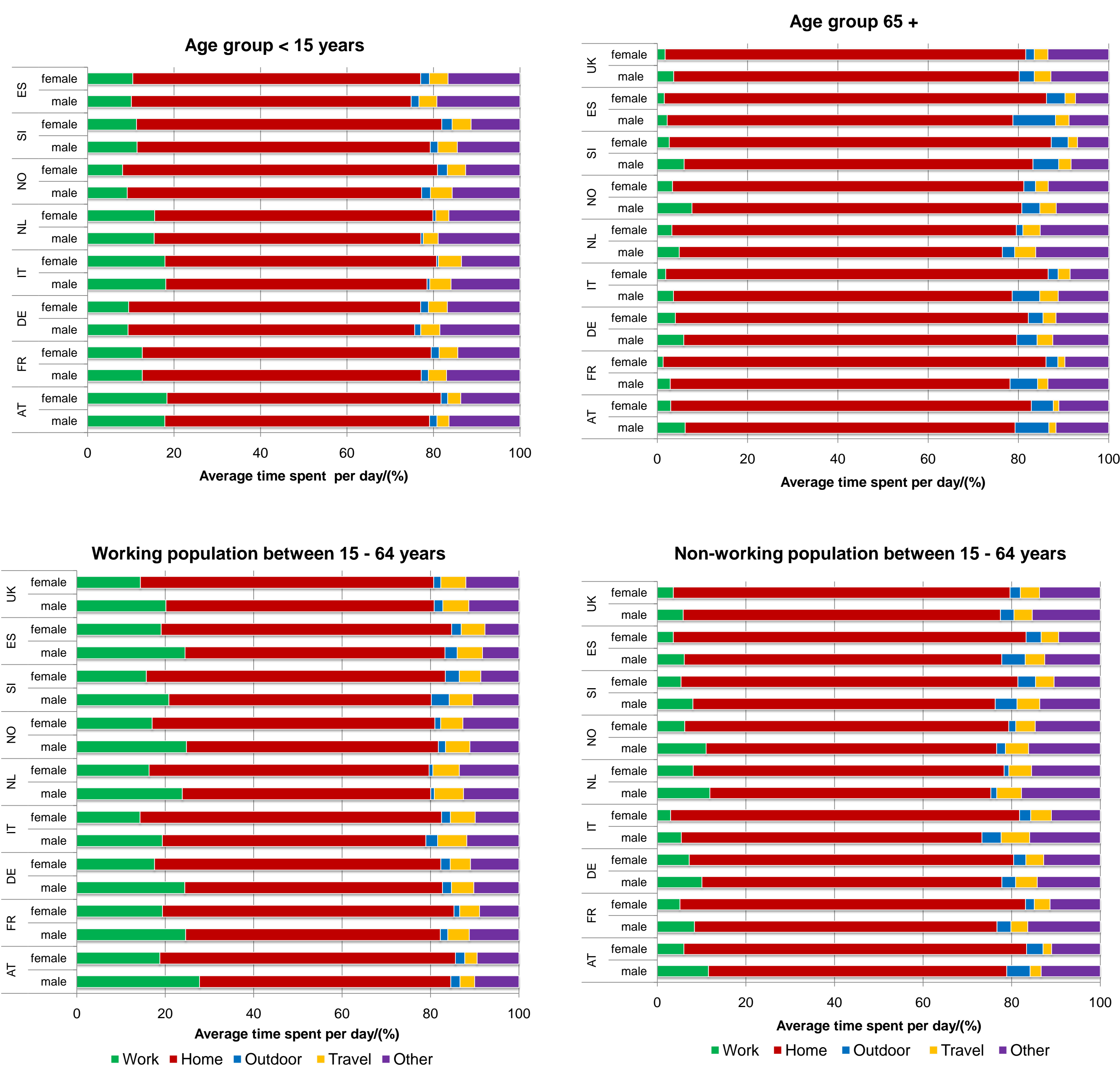


Figure 1. Distribution of average time spent (given in percent per day) in the various MEs (home, outdoor, work, travel and other) by age group, gender and country.

Table 1. Results of linear regression of socio-demographic and environmental factor on percentage time spent per day at home. The significant covariates are highlighted.

Dependent variable: time spent(%/day)	Austria	France	Germany*	Italy	Netherlands*	Norway	Slovenia	Spain	UK
n	25233	15441	61315	51206	28119	13590	12216	46774	19821
Adjusted R ²	0.25	0.34	0.25	0.31	0.20	0.24	0.25	0.35	0.16
B; intercept	66.19	70.66	64.44	69.70	63.55	63.79	65.18	71.61	67.30
Independent covariates	Coefficients (95% CI)								
Gender									
0: Male	9.68(9.31, 10.06)	9.07(8.65, 9.49)	5.90(5.68, 6.11)	8.51(8.28, 8.74)	6.46(6.13, 6.80)	6.47(6.00, 6.93)	7.71(7.19, 8.22)	7.27(7.02, 7.51)	4.46(4.05, 4.87)
1: Female									
Age									
0: < 40 years	3.68(3.22, 4.15)	3.69(3.19, 4.19)	2.04(1.78, 2.30)	3.36(3.07, 3.64)	4.66(4.28, 5.04)	3.79(3.26, 4.33)	3.90(3.24, 4.56)	3.31(3.02, 3.61)	3.67(3.17, 4.18)
1: > 40 years									
Employment									
0: In Paid Work	-10.06(-10.46, -9.66)	-13.99(-14.44, -13.53)	-10.19(-10.42, -9.95)	-10.57(-10.83, -10.31)	-8.00(-8.35, -7.64)	-11.18(-11.73, 10.62)	-10.58(-11.14, -10.02)	-14.05(-14.32, -13.78)	-9.34(-9.80, -8.87)
1: Not in Paid work									
Education									
0: <ISCED level 3	-1.40(-1.86, -0.94)	-2.98(-3.51, -2.44)	0.98(0.75, 1.21)	-1.76(-2.03, -1.49)	-2.31(-2.70, -1.93)	0.34(-0.27, 0.95)	-0.74(-1.30, -0.19)	-1.60(-1.88, 1.32)	0.14(-0.31, 0.59)
1: >ISCED level 3									
Living alone									
0: No	-5.37(-5.78, -4.96)	-3.42(-3.91, -2.94)	-3.68(-3.94, -3.43)	-5.29(-5.55, -5.03)	-3.97(-4.34, -3.60)	-4.01(-4.57, -3.45)	-2.74(-3.38, -2.10)	-3.20(-3.47, -2.92)	-3.17(-3.64, -2.70)
1: Yes									
Children at home									
0: No	0.59(0.16, 1.01)	0.48(0.01, 0.97)	0.02(-0.22, 0.26)	-1.2(-1.45, -0.95)	0.28(-0.08, 0.65)	1.15(0.63, 1.67)	0.46(-0.11, 1.03)	-0.06(-0.33, 0.21)	-0.21(-0.68, 0.26)
1: Yes									
Season									
0: Summer	0.65(0.28, 1.02)	0.83(0.41, 1.25)	1.23(1.02, 1.44)	0.87(0.65, 1.10)	NA	1.29(0.83, 1.76)	1.85(1.35, 2.36)	0.68(0.44, 0.92)	1.05(0.64, 1.47)
1: Winter									
Day									
0: Weekday	4.18(3.72, 4.64)	5.51(5.03, 5.99)	10.01(9.85, 10.31)	3.79(3.56, 4.03)	6.26(5.90, 6.63)	8.98(8.46, 9.49)	7.03(6.52, 7.53)	5.39(5.13, 5.64)	6.04(5.64, 6.45)
1: Weekend									
Urban									
0: Yes	0.68(0.29, 1.06)	0.37(-0.10, 0.84)	NA	-0.33(-0.56, -0.10)	NA	0.06(-0.49, 0.61)	-0.02(-0.54, 0.51)	-0.28(-0.52, -0.04)	0.04(-0.67, 0.75)
1: No									

*NA indicates no observations for the corresponding variable. Linear regression is also performed without the covariate urban.

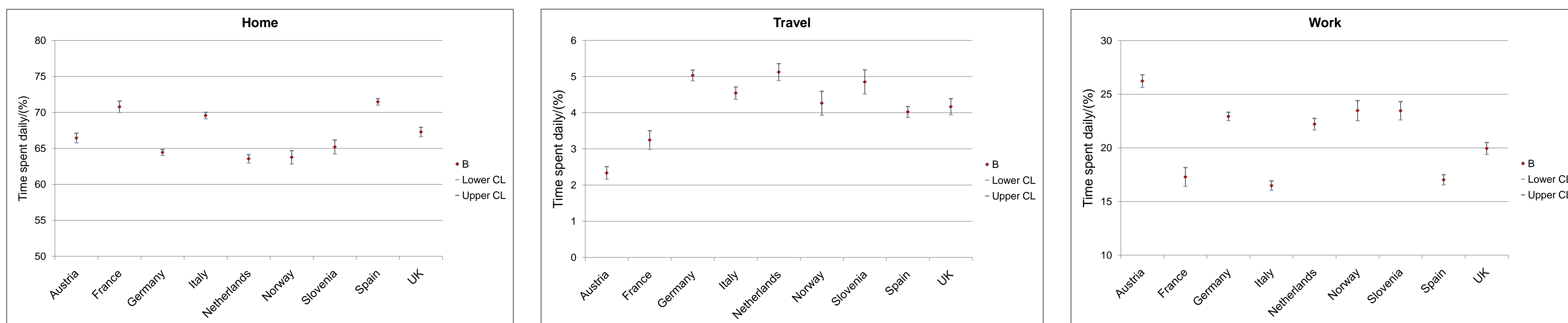


Figure 2. Distribution of the constant B (intercept) with 95% confidence interval (CL) from linear regression analysis for home, travel and work. The covariates used in the analysis can be found in Table 1, urban is not taken into account.