National Epidemiology Center

PERSON-TO-PERSON INTER-INDIVIDUAL CONTACT PATTERNS AND THE SPREAD OF EPIDEMICS. DESCRIPTIVE ANALYSIS

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BACKGROUND/OBJETIVE

Disease spread depends on the infection rate. The infection rate depends on the time and number of contacts a person has per time unit and the disease transmission probability. We aim to estimate the average time of contacts using the Spanish Time Use Survey (STUS).

METHODS

The information about main and secondary activities was conducted on 46.774 persons of ≥10 year old. Stratified analysis by age, sex and place of contact was done. We used general estimating equations to estimate the weighted number of households and the number of person of 10 year old and over. For the subsample 1 (Monday to Thursday) we used equation 1 (10 462/20 603) and for subsample 2 (Friday to Sunday) we used equation 2 (10 141/20 603).

RESULTS

- Frequency of days per week in which people responded to the DI: Monday to Thursday = 23 738 (50,8%) and Friday to Sunday = 23 036 (49,2%).
- Mean age = 44,2 (Min: 10 Max: 102, SE: 20,2), Gender: Men = 26 452 (48,2%), Females = 28 454 (51,8%)
- In general: been alone = 5,12 (SE: 4,2) hours and were accompanied = 18,8 (SE: 4,2) hours.

Table I. Average time in minutes in an hour of daily contacts. Weighted data distributed by age and sex. N = 54906.

Age Group (Years)	n(%)	Men n (%)	Women n (%)	≤ 10 years			Other household members			Other Well-known		
				T	M	W	T	M	W	T	M	W
10-19	7003 (12,8)	3154 (16,3)	2979 (15,1)	13,9	13,1	14,9	13,6	13,0	14,2	**14,6**	**14,7**	**14,4**
20-29	8752 (15,9)	3763 (19,5)	3436 (17,4)	17,2	11,9	20,2	11,7	10,6	12,8	13,5	14,0	13,0
30-39	8569 (15,6)	2949 (15,3)	2997 (15,2)	**17,3**	**13,7**	**20,1**	17,2	16,1	18,2	10,2	11,1	9,3
40-49	8870 (16,2)	2956 (15,3)	2830 (14,3)	14,4	12,6	16,7	18,1	17,1	19,1	9,4	9,8	9,0
50-59	7606 (13,9)	2438 (12,6)	2488 (12,6)	11,8	10,3	13,5	18,4	17,4	19,4	9,7	9,9	9,4
60-69	6594 (12,0)	2046 (10,3)	2286 (11,6)	9,6	10,1	9,3	20,6	20,5	20,6	9,5	9,6	9,4
70-79	5233 (9,5)	1465 (7,6)	1905 (9,6)	8,6	7,6	9,1	**21,1**	**21,5**	**20,8**	9,4	9,4	9,5
80-89	2001 (3,6)	487 (2,5)	743 (3,8)	11,0	14,0	8,3	20,3	20,9	19,8	9,1	9,1	9,2
≥ 90	278 (0,5)	49 (0,3)	107 (0,5)	11,5	3,6	17,1	19,5	21,1	18,7	10,0	10,0	9,9

T=Total, M=Men, W=Women,

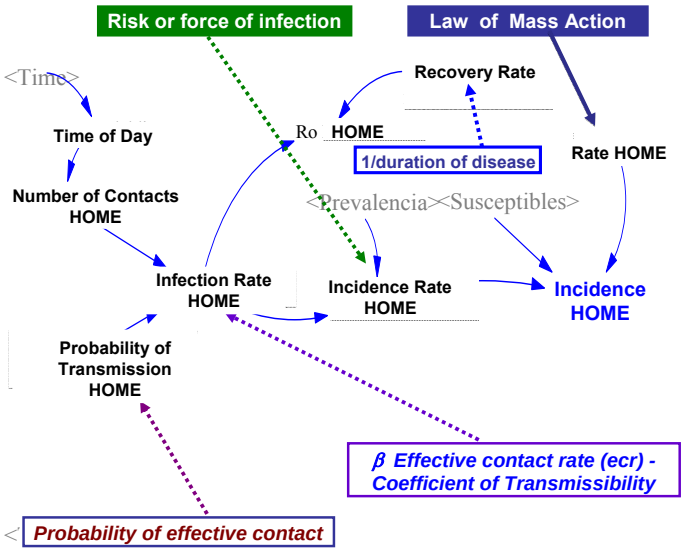
Table II. Average time in hours contact during the main and secondary activities undertaken at home. Weighted data distributed by age and sex.

N=54906

	ACTIVITIES														
	MA			MA			MA			SA			SA		
Age Group year old (n)	Home and Family			Hobbies and Games			Media			Watching TV/Video			Listen radio/music		
	T	M	W	T	M	W	T	M	W	T	M	W	T	M	W
10-19 (7003)	0,92	0,63	1,22	**0,98**	**1,22**	**0,72**	2,12	2,07	2,17	0,45	0,44	0,46	0,38	0,30	0,46
20-29 (8752)	1,73	0,88	2,61	0,39	0,53	0,25	1,81	1,86	1,76	0,53	0,47	0,58	**0,57**	**0,50**	**0,63**
30-39 (8569)	3,61	1,78	5,31	0,18	0,24	0,11	1,79	1,96	1,62	0,59	0,52	0,65	0,48	0,42	0,54
40-49 (8870)	3,59	1,73	5,41	0,17	0,25	0,09	2,01	2,20	1,82	0,62	0,53	0,70	0,48	0,39	0,56
50-59 (7606)	3,69	1,59	**5,67**	0,19	0,28	0,11	2,34	2,58	2,12	0,66	0,54	0,78	0,46	0,33	0,58
60-69 (6594)	**4,03**	**2,16**	**5,67**	0,23	0,35	0,12	2,94	3,37	2,56	0,81	0,67	0,93	0,36	0,32	0,39
70-79 (5233)	3,71	2,07	4,96	0,27	0,42	0,15	3,41	3,86	3,06	**0,83**	**0,73**	**0,90**	0,29	0,26	0,31
80-89 (2001)	2,73	1,55	3,48	0,21	0,33	0,14	**3,62**	**3,93**	**3,43**	0,83	0,73	0,89	0,26	0,22	0,29
≥ 90 (278)	1,34	0,80	1,57	0,10	0,15	0,08	3,40	4,11	3,09	0,66	0,51	0,72	0,16	0,11	0,18

T=Total, M=Men, W=Women, MA= Main Activities, SA=Secondary Activities

Graphic I. Particular model for the transmission of infections due to contacts at home.



CONCLUSIONS

1. This study allow to analyze how social interactions and patterns of contacts between people may be useful for estimating and analyzing how infection can spread in places like work, school and how this is interconnected with household contacts.
2. The results underline the importance of number of hours in which a person is accompanied by one form or another.
3. This model is useful for investigating the contact pattern relevant to the spread of infections transmitted from person to person and thus propose preventive measures, although more detailed studies are needed.