

# Supplement digital content 1 for "A systematic review of social contact surveys to inform transmission models of close contact infections"

Table 1: The comprehensive table of all social contact surveys.

Nr	finishing survey	Countries	Authors of first publication	first publicatio	Relevant publications	Study settings	Study subjects	Final Sample size	Response rates	Sampling scheme	Data collection tools	Collection modes	Assistance for young children	Study design	Reporting period	Definiton of a reporting day	Types of contacts	Definition of contacts used	Characteristics of participants	Characteritics of contacted person	of contacts	of contacts	Frequency of contacts	Weekend included	Holiday period included
1	1986	The Netherlands	Wallinga et al	2006		Community	All excluding 0-1 year	2106	68.3%	Random sampling	Paper diary	Face-to-face interview	NA	Retrospective	A typical week	NA	1	Face-to-face conversation	Age, hh size	Age	No	No	No	No	No
2	1986	The Netherlands	Wallinga et al	2006		Community	From 1 to 70 years old	1493	29.9%	Random sampling	Paper diary	Self-report	NA	Retrospective	NA	NA	1	Face-to-face conversation	Age, hh size	Age	No	No	No	No	No
3	1995	UK	Edmunds et al	1997		University	Adult (staff, Students and their families and friends)	92	NA	Convenience sampling	Paper diary	Self-report	NA	Prospective	One randomly assigned day	A day was defined as beginning when the participant got up and ending when they went to bed	1	A contact was defined as a two way conversation (at a distance which did not require raising the voice) in which at least two words were spoken by each party and in which there was no physical barrier between the two parties (such as security screens). Type 1: any face-to-face conversation; Type 2: any skin-to-skin physical contact (such as a handshake or kiss).	Age, living arrangements	Age	Yes	No	No	Yes	No
4	1998	UK	Read et al	2008		University	Staff and students	49	NA	Convenience sampling	Paper diary	Self-report	NA	NA	14 non-consecutive days	From waking until going to sleep	2	Type 1: a two-way conversation of at least three words Type 2: a contact which involved any sort of physical skin-to-skin touching.	Age, gender, hhs size	NA	Yes	No	No	NA	No
5	2003	Belgium	Beutels et al	2006		University	Students and staff	73	NA	Convenience sampling	Paper diary and online diary	Self-report on paper and on web interface	NA	Both retrospective and Prospective	One previous day	NA	2	Type 1: intimate contacts; Type 2: Close contacts (same household); Type 3: direct conversation (>2 minute duration and within 2 meter distance); Type 4: small group (with conversations, but less intensive than in direct conversation); Type 5: larger group (seminary or lecture room); Type 6: occasional contacts (in the range of 2 meter in local transportation, cinema)	Age, gender, occupation	Age, gender	Yes	No	No	Yes	No
6	2003	Germany	Mikolajczyk et al	2008		University	Students	38	50%	Convenience sampling	Paper diary	Self-report	NA	Retrospective	One previous day in 5 consecutive weeks	NA	6	As above	Age, gender, hhs size, country of birth, nationality	Age, gender	No	Yes	Yes	No	No
7	2004	Germany	Mikolajczyk et al	2008		University	Students	196	100%	Convenience sampling	Paper diary	Self-report	NA	Retrospective	One previous day	NA	6	As above	As above	Age, gender	No	Yes	Yes	Yes	No
8	2004	Germany	Mikolajczyk et al	2008		University	Students	28	100%	Convenience sampling	Paper diary	Self-report	NA	Retrospective	2 previous day	NA	6	As above	As above	No	No	No	No	Yes	No
9	2004	Germany	Mikolajczyk et al	2008		Primary school	Pupils	310	79.40%	Convenience sampling	Paper diary	Self-report	NA	Retrospective	One previous day	NA	1	A contact is defined as a person with whom the child spoke or played with	Age, gender, hhs size, country of birth, nationality, school grade	Age	No	Yes	Yes	Yes	No
10	2005	UK	Edmunds et al	2006		University	Students	35	NA	Convenience sampling	Paper diary	Self-report	NA	Prospective	3 randomly assigned day	A day is defined as the time period between getting up and going to bed	4	Type 1: physical contact without conversation; Type 2: conversation without physical contact; Type 3: conversation with non-sexual physical contact; Type 4: sexual contact including kissing of a sexual nature. A conversation is defined as a situation in which either party said a single word or more, at a distance that did not require voices to be raised and in the absence of physical barriers such as security screens.	Age, gender, living and working arrangements	Age, gender	Yes	No	No	Yes	No
11	2005	Germany	Mikolajczyk et al	2008		University	Students	803	69%	Convenience sampling	Paper diary	Self-report	NA	Retrospective	2 previous day	NA	6	As above	As above	No	No	No	No	Yes	No
12	2006	Germany	Mikolajczyk et al	2008		University	Students	115	100%	Convenience sampling	Paper diary	Self-report	NA	Both retrospective and Prospective	One previous day and same day next week	NA	6	As above	As above	Age, gender	No	Yes	Yes	Yes	No
13	2006	Belgium	Mossong et al	2008	Hens (2009), Potter (2011), Potter (2013), Goyvaerts (2010), Melegaro(2011), Ogunjimi (2009), Kretzschmar (2009), Xia(2016), Volz (2011), De Cao (2014)	Community	People of all ages	750	NA	Quota sampling by age, sex, geographical region, rural/urban	Paper diary	Self-report	Parents to fill in diaries of young children (<10) on their behalf	Prospective	2 random days: 1 weekday and 1 weekend day	During a 24-hour period starting at 5 am	2	Type 1: a two-way face-to-face conversation of at least three words Type 2: a contact which involved any sort of physical skin-to-skin touching	Age, gender, hhs size, occupation,education	Age, gender	Yes	Yes	Yes	Yes	Yes
14	2006	Finland	Mossong et al	2008	Melegaro(2011), Kretzschmar (2009), Potter (2011), Xia(2016), Volz (2011), De Cao (2014)	Community	People of all ages	1006	NA	Quota sampling by age and sex	Paper diary	Self-report	Parents to fill in diaries of young children (<10) on their behalf	Prospective	A randomly assigned day	As above	2	As above	Age, gender, hhs size, occupation,education	Age, gender	Yes	Yes	Yes	Yes	Yes
15	2006	Germany	Mossong et al	2008	Kretzschmar (2009), Potter (2011), Volz (2011), De Cao (2014)	Community	People of all ages	1341	NA	Quota sampling by age	Paper diary	Self-report	as above	Prospective	A randomly assigned day	As above	2	As above	Age, gender, hhs size, occupation,education	Age, gender	Yes	Yes	Yes	Yes	Yes
16	2006	Great Britain	Mossong et al	2008	Melegaro(2011), Bryan (2013), Kretzschmar (2009), Potter (2011), Xia(2016), Volz (2011), De Cao (2014)	Community	People of all ages	1012	NA	Quota sampling by age, sex, geographical region	Paper diary	Self-report	as above	Prospective	A randomly assigned day	As above	2	As above	Age, gender, hhs size, occupation,education	Age, gender	Yes	Yes	Yes	Yes	Yes
17	2006	Italy	Mossong et al	2008	Melegaro(2011), Kretzschmar (2009), Potter (2011), Xia(2016), Volz (2011), De Cao (2014)	Community	People of all ages	849	NA	Quota by age, sex, geographical region, rural/urban and day of the week	Paper diary	Self-report	as above	Prospective	A randomly assigned day	As above	2	As above	Age, gender, hhs size, occupation,education	Age, gender	Yes	Yes	Yes	Yes	Yes
18	2006	Luxembourg	Mossong et al	2008	Kretzschmar (2009), Potter (2011), Volz (2011), De Cao (2014)	Community	People of all ages	1051	NA	Quota sampling by age and sex	Paper diary	Self-report	as above	Prospective	A randomly assigned day	As above	2	As above	Age, gender, hhs size, occupation,education	Age, gender	Yes	Yes	Yes	Yes	Yes
19	2006	Poland	Mossong et al	2008	Melegaro(2011), Kretzschmar (2009), Potter (2011), Xia(2016), Volz (2011), De Cao (2014)	Community	People of all ages	1012	NA	Quota sampling by age, sex, geographical region, rural-urban	Paper diary	Self-report	as above	Prospective	A randomly assigned day	As above	2	As above	Age, gender, hhs size, occupation,education	Age, gender	Yes	Yes	Yes	Yes	Yes
20	2006	The Netherlands	Mossong et al	2008	Bryan (2013), Kretzschmar (2009), Potter (2011), Volz (2011), De Cao (2014)	Community	People of all ages	269	NA	Quota sampling by age and geographical region	Paper diary	Self-report	as above	Prospective	A randomly assigned day	As above	2	As above	Age, gender, hhs size, occupation,education	Age, gender	Yes	Yes	Yes	Yes	Yes

21	2006	The Netherlands	van de Kastele et al	2017		Community	People of all ages	825	NA	Quota sampling by age and geographical region	Paper diary	Self-report on paper	Parents	Prospective	A randomly assigned day	During a 24-hour period starting at 5 am	2	Type 1: a two-way face-to-face conversation of at least three words Type 2: a contact which involved any sort of physical skin-to-skin touching	Age, gender, h/s size, occupation, education	Age, gender	Yes	Yes	Yes	Yes	Yes
22	2007	Germany	Bernard et al	2009		Hospital	Nurses	131	82%	Multi-stage sampling	Paper diary	Self-report	NA	Prospective	An assigned day	During a 24-hour period starting at 5 am	2	Type 1: skin-to-skin contact; Type 2: a two-way face-to-face conversation with three or more words	Age, gender, h/s size, occupation, education	Age, gender	Yes	Yes	Yes	Yes	No
23	2007	US	Glass et al	2008		School	Pupils	249	NA	Convenience sampling	Paper diary	Self-report	NA	Retrospective	Typical school days, weekends, weeks, months or years	NA	4	Type 1: close within 3 feet; Type 2: close and talking; Type 3: close, talking and touching; Type 4: kissing	Age, gender, grade	Age	No	No	No	Yes	No
24	2007	Vietnam	Horby et al	2011		Community	People of all ages	865 /264 hhs	NA	Multi-stage sampling	Paper diary	Face-to-face interview	child's parent or guardian	Retrospective	The day preceding the interview	Starting at 5 a.m. on the morning of the day assigned and ending at 5 a.m. the next morning	2	Type 1: skin-to-skin contact (a physical contact); Type 2: a two-way conversation with three or more words in the physical presence of another person but no skin-to-skin contact (a nonphysical contact)	Age, gender, h/s size	Age, gender	Yes	Yes	Yes	Yes	No
25	2008	US	DeStefano et al	2011		Community	People of all ages	4135	21.7%	Stratified sampling	Electronic questionnaire	Computer assisted telephone interview	Parents responded on behalf of children aged less than 18 years	Retrospective	A previous day	NA	2	Type 1: A face-to-face conversation lasting from 1 minute or over (Speaking interaction); Type 2: Close proximity contacts within 6 feet for equal and more than 15 minutes	Age, gender, symptoms	No	Yes	NA	NA	Yes	Yes
26	2008	Australia	Mccaw et al	2010	Bolton (2012)	Community	University employees	65	NA	Convenience sampling	Paper diary and A hand-held electronic diary	Self-report	NA	Both retrospective and Prospective	6 days including 3 days using a paper diary and 3 days using an electronic recording device	A study day commenced on waking and ended with sleep.	2	Type 1: a two way or small group conversational exchange of at least 3 words; Type 2: Any skin-to-skin contact	Age, gender, h/s size	Age, gender, occupation	Yes	Yes	No	Yes	No
27	2009	US	Potter et al	2012		High schools	Pupils	246	57.9%	Convenience sampling	Paper diary	Self-report	NA	NA	During class break and lunch break	NA	1	Being in close proximity for more than roughly 5 minutes Type1: a mutual conversation of more than 10 words within a short distance (<2m); Type 2: physical contact in general; Type 3: contact involving kisses.	Age, gender	NA	No	No	No	No	No
28	2009	Switzerland	Smieszek et al	2009		Community	Adult	54	NA	Convenience sampling	Paper diary	Self-report	NA	Retrospective	14 days	NA	3	words were spoken at a distance that did not require raised voice, no physical barrier between 2 parties (conversation)	Age, gender, occupation	No	No	Yes	No	Yes	No
29	2010	Taiwan	Chen et al	2012	You (2013)	Junior high school	Pupils	274	67%	Convenience sampling	Paper diary	Self-report	NA	Prospective	assigned weekday and 1 during a randomly assigned weekend day	After awakening until bedtime	2	Type 1: Talking face to face; Type 2: skin-to-skin contact, e.g. a handshake, a kiss, contact sports...	Age, gender, h/s size, health status	Age, health status, wearing a mask	Yes	Yes	Yes	Yes	No
30	2010	Great Britain	Danon et al	2012	Danon(2013)	Community	People of all ages	5388	3.8%	Random sampling	Paper diary and web-based questionnaires	Self-report	NA	Prospective	A single day	NA	2	Type 1: Face to face conversation within 3m/ 10 feet Type 2: Physical contact	Age, gender	NA	Yes	Yes	Yes	NA	No
31	2010	UK	Eames et al	2010		Schools	Pupils	119	10.8%	Convenience sampling	Paper diary	Self-report	NA	NA (paired survey)	Two assigned day (one day during school term and one day during half-term holiday)	NA	2	Type 1: Talking face to face; Type 2: skin-to-skin contact, e.g. a handshake, a kiss, contact sports...	Age, sex, h/s size and composition	Age, gender	Yes	Yes	Yes	NA	No
32	2010	UK	Eames et al	2011		Primary and secondary schools	Pupils	135	12.3%	Convenience sampling	Paper diary	Self-report	NA	Prospective	2 days (1 in school term and 1 in holiday)	NA	2	As above	Age, gender, h/s size, public transport use	Age, gender	Yes	Yes	Yes	NA	Yes
33	2010	UK	Eames et al	2010	Van kerckhove (2013)	Community	Patients	317	10.6%	Convenience sampling	Paper diary	Self-report	NA	NA (paired survey)	Two assigned day (one day when being ill and one day when recovered)	NA	2	Type 1: Talking face to face; Type 2: skin-to-skin contact, e.g. a handshake, a kiss, contact sports...	Age, sex, h/s size and composition	Age, gender	Yes	Yes	Yes	NA	No
34	2010	UK	Eames et al	2012		Community	Internet users	3338	NA	Convenience sampling	Online diary	Self-report on web interface	NA	Retrospective	A previous day	NA	2	Type 1: face-to-face conversation; Type 2: Physical contact	Age, gender, vaccination	Age	Yes	No	No	NA	Yes
35	2010	Taiwan	Fu et al	2012	Bryan (2013), Chan (2015)	Community	People of all ages	1943	46.2%	Three-stage systematic probability sampling	Paper diary	ace-to-face interview	A parent or a guardian who knew the child well answered the questions on the child's behalf	Retrospective	A previous day	The past 24 hours	2	Type 1: Verbal communication made within 2 meters; Type 2: Physical contact	Age, gender, h/s size	Age	Yes	Yes	Yes	NA	No
36	2010	UK	Jackson et al	2011		Secondary schools	Pupils	107	83.6%	Convenience sampling	Paper diary	Self-report	NA	Retrospective	A typical school day and a typical day during school closures	NA	1	Face-to-face conversation	Age, gender	Age	Yes	No	No	No	Yes
37	2010	South Africa	Johnstone et al	2011	Wood (2012)	Community (a town)	People of all ages	571	77.4%	Stratified sampling by age groups	Paper diary	Self-report	For participants under 11, parents /guardians completed the diary survey together with the child.	Prospective	An assigned day	During a 24-hour period starting at 5 am	3	Type 1: skin-to-skin contact; Type 2: a two-way conversation with three or more words Type 3: Casual contact occurring in an in-door location, but not satisfying the criteria for Type 1 and Type 2	Age, gender, employment status, level of schooling	Age, gender	Yes	Yes	Yes	Yes	No
38	2010	Hong Kong	Kwok et al	2014		Community	People of all ages	770	NA	Random sampling (random digit dialing)	Paper diary	ace-to-face interview	NA	Retrospective	A previous day	NA	2	Type 1: face to face conversation Type 2: skin-to-skin contact	Age	Age	Yes	Yes	No	Yes	No
39	2010	France	Lapidus an et al	2012	Lapidus (2013)	Community	People of all ages	1377/601 hhs	NA	Stratified sampling by geography	Paper diary	ace-to-face interview	NA	Retrospective	3 consecutive days	NA	2	Type 1: have a conversation with at least 3 words; Type 2: Physical contact with	Age, gender	Age	Yes	Yes	No	NA	
40	2010	China	Read et al	2014		Community	Greater than 2 years old	1821/856 hhs	49.9%	random sampling of household	Paper diary	ace-to-face interview	Parents were interviewed on behalf of children deemed too young	Retrospective	1 previous day	From waking to going to bed	2	Type 1: a face-to-face conversation; Type 2: a skin-to-skin contact	NA	NA	Yes	Yes	Yes	NA	No
41	2010	Switzerland	Smieszek et al	2012	Potter (2015)	Research Institute	Staffs	50	NA	Convenience sampling	Paper diary	Self-report	NA	NA	5 working days	NA	2	Type 1: A conversation held at less than 2 meters distance and with more than ten words spoken with other participants; Type 2: any sort of physical contact with other participants	Age, gender	Name	No	Yes	No	No	No
42	2011	Australia	Campbell et al	2017		Community	Mothers with an infant	220	97.34%	Convenience sampling	Paper diary	Self-report on paper	NA	Prospective	2 random days: 1 weekday and 1 weekend day	A study day commenced on waking and ended with sleep.	2	Type 1: skin-to-skin contact; Type 2: a two-way conversation with at least 3 words	Age, household size, income, gender, occupation	Yes	Yes	No	Yes	No	
43	2011	South Africa	Dodd et al	2015	Mccreesh (2016)	Community	Adults	1272	NA	Stratified sampling	Paper diary	ace-to-face interview	NA	Retrospective	A previous day	The 24 hours preceding the midnight the interview	2	was longer than a greeting and thithin an arms' reach'; Type 2: Casual contacts: contacts with people who were	Age, gender, h/s size	Age, gender	Yes	Yes	Yes	Yes	No
44	2011	Zambia	Dodd et al	2015	Mccreesh (2016)	Community	Adults	2256	NA	Stratified sampling	Paper diary	ace-to-face interview	NA	Retrospective	A previous day	The 24 hours preceding the midnight the interview	2	As above	Age, gender, h/s size	Age, gender	Yes	Yes	Yes	Yes	No
45	2011	Peru	Grijalva et al	2015		Community	People of all ages	588/114 hhs	100%	Convenience sampling	Paper diary	ace-to-face interview	Parents	Retrospective	A previous day	From 5 am on the previous day to 5 am on the present day	2	another person that is physically present and no farther than 3 meters; Type 2: a physical contact involving skin-to-skin touching, a kiss or handshake (either with or without conversation)	Age, gender, h/s size	Age, gender	Yes	Yes	Yes	Yes	No
46	2011	Japan	Ibuka et al	2016			People of all ages	3146	NA	Convenience sampling	Paper diary and online diary	Self-report on paper and web interface	NA	Retrospective	A previous day	From 00:00 to 23:59	1	Face-to-face meetings with words exchanged within a distance of 2 meters	Age, gender, h/s size	Age, gender	Yes	Yes	No	Yes	No
47	2011	Belgium	Willem et al	2012		Community	People of all ages	1752	NA	Stratified sampling by age and geography	Paper diary	Self-report	Proxy will fill in diary for children less than 13 and the elderly	Prospective	One randomly assigned day	NA	2	Type 1: a two-way conversation of at least 3 words; Type 2: skin-to-skin touching either with or without conversation	Age, gender, education, smoking habit, alcohol assumption	Age, gender	Yes	Yes	Yes	Yes	Yes
48	2012	France	Beraud et al	2015		Community	People of all ages	2033	51.1%	Quota sampling for age, gender, days of week and	Paper diary	Self-report	Caregives	Prospective	2 consecutive days	NA	2	Type 1: talking to someone within a distance of less than 2 meters.	Age, gender, h/s size, occupation	Age, gender	Yes	Yes	Yes	Yes	yes
49	2012	Kenya	Kiti et al	2014		Community	People of all ages	568	50.1%	Stratified random sampling	Paper diary (Text and pictorial diary)	Self-report	The people who spent most time with the children under 11	Prospective	One assigned day	A period between first waking and going to bed for the night	1	A contact person was defined as someone with whom the participant had a direct physical encounter and involved direct skin-to-skin touch such as embracing, kissing or shaking hand	Age, gender	Age	Yes	No	Yes	Yes	
50	2012	US	Smieszek et al	2014		High schools	Pupils, teachers and other staff	256	26.3%	Convenience sampling	Online diary and proximity sensors	Self-report on web interface	NA	Retrospective	A previous day	NA	1	A person with whom the participants had one or more interactions that were a maximum 2 arms-lengths apart, more than 10 word conversation and occurred only while at school	Age, gender, occupation	No	No	Yes	No	No	No
51	2012	Sweden	Stromgren et al	2017		Community	People of all ages	694	43.8%	Random sampling	Paper diary	Telephone interview	NA	Prospective	One previous day	NA	1	Physical contact: at least physical touch is required Type 1: An interaction in close proximity with three or more words directed to the infant. Type 2: a physical skin-to-skin contact between infant and another person	Age, gender, occupation, living area	No	Yes	No	No	Yes	No
52	2012	UK	Van Hoek et al	2013		Community	Infant (under 11 weeks)	115	11.5%	Stratified random sampling	Paper diary	Self-report	Mothers and guardian	Prospective	One assigned day	NA	2		Age, gender, siblings, edu	Age, gender	Yes	Yes	Yes	Yes	Yes
53	2013	US	Aiello et al	2016		University/residence halls	Students	590	NA	Randomized clusters of residence halls, snowball sampling	Online diary	Self-report on web interface	NA	Retrospective	10 weeks	NA	1	Have a face-to-face conversation with other participants	Age, gender	Symptoms of illness	Yes	Yes	No	No	No
54	2013	Taiwan	Chen et al	2015		Junior high school	Pupils	150	44.0%	Convenience sampling	Paper diary	Self-report	NA	Prospective	2 days (one randomly assigned day during a holiday (weekday) and	After awakening until bedtime starting with activities in the morning after waking, on the way to school, playing during breaks, and otheractivities	2	Type 1: two-way conversations during which at least three words were spoken (conversation only); Type 2: a physical skin-to-skin contact between infant and another person	Age, gender, h/s size, living arrangement, Age, gender, h/s size, health status, living situation and vaccination	Age, gender, health status wearing a	Yes	Yes	Yes	Yes	Yes
55	2013	Taiwan	Luh ad et al	2016		Junior high school	Pupils	373	44.37% -66.25%	Convenience sampling	Paper diary	Self-report	No	Prospective	1 day		2	Type 1: two-way conversations during which at least three words were spoken (conversation only); Type 2: Any sort of skin-to-skin contact (physical contact)	Age, gender, physical conditions	Yes	Yes	Yes	Yes	Yes	No
56	2013	France	Mastrandrea et al	2015		High school	Students	120	31.7%	Convenience sampling	Paper diary and proximity sensors	Self-report	NA	Prospective	A school day	NA	1	Close face-to-face proximity during a day in high school	Age, gender, class	Age, gender, class	No	Yes	No	No	No

57	2013	Zimbabwe	Melegaro et al	2017		Community	People of all ages	1245	86.3%	Stratified sampling	Paper diary	Self-report on paper	Proxies for illiterate adults and children aged less than 10 years	Prospective	Two consecutive days	NA	2	Type 1: skin-to-skin contact (a physical contact); Type 2: a two-way conversation with three or more words in the physical presence of another person but no skin-to-skin contact (a nonphysical contact)	Age, gender, education, occupation, household size	Age, gender	Yes	No	No	Yes	Yes
58	2013	Australia	Rolls et al	2015		Community	Adults	1307	33.5%	Random digit dialling	Electronic questionnaire	Computer assisted telephone interview	NA	Retrospective	A previous day	NA	2	As above	Age, gender, hhs size, occ	Age, gender	Yes	Yes	No	Yes	No
59	2013	Thai Lan	Stein et al	2014	Stein (2014)	University	Students and their friends	220	85.6%	line respondent driven sample	Online diary	Self-report on web interface	NA	Retrospective	A previous day	NA	1	A person sitting or standing within arm's length of the participant for 30 seconds or longer	Age, sex, education and symptoms	Age (less, equal or older)	Yes	No	No	Yes	No
60	2013	The Netherlands	Stein et al	2014		University	Students and their friends	322	89.9%	line respondent driven sample	Online diary	Self-report on web interface	NA	Retrospective	A previous day	NA	1	Sitting or standing within arm's length of the participant for at least 30 second	Age, sex, education and symptoms	Age (less, equal or older)	Yes	No	No	Yes	No
61	2014	Germany	Smieszek et al	2016		Conference	Adult	74	24.7%	Convenience sampling	Paper diary and proximity sensors	Self-report and wearable proximity sensor	NA	Prospective	One day	Time duration of the conference	2	Type 1: physical contact Type 2: mutual conversation of at least 10 words	Age, gender	Age, gender	No	Yes	No	No	No
62	2014	Belgium	Stein et al	2015		Community	Internet users	109	NA	line respondent driven sample	Online diary	Self-report on web interface	NA	Retrospective	A previous day	NA	2	Type 1: have a conversation with distance within one's arm length; Type 2: any sort of skin-to-skin contact	Age, gender, hhs size, syr	Age, symptoms	Yes	No	No	Yes	No
63	2014	The Netherlands	Stein et al	2015		Community	Internet users	1451	NA	line respondent driven sample	Online diary	Self-report on web interface	NA	Retrospective	A previous day	NA	2	Type 1: have a conversation with distance within one's arm length; Type 2: any sort of skin-to-skin contact	Age, gender, hhs size, syr	Age, symptoms	Yes	No	No	Yes	No
64	2015	Hong Kong	Lyung et al	2017		Community	People of all ages	1149	NA	Quota sampling by age and sex	Paper diary and online diary	Self-report on paper and web interface	Parents	Both prospective and retrospective	A random day	5 AM of an assigned day until 5 AM of the day after	2	Type 1: skin-to-skin contact; Type 2: a two-way face-to-face conversation with three or more words within 2 meters	Age, gender, household size, education and income	Age, gender	Yes	Yes	Yes	Yes	No
65	2016	Russia	Ajelli et al	2017		Community	People of all ages	505	NA	Mixed samplings	Paper diary	Self-report on paper	Parents or guardians for underages	Prospective	A random day	During a 24-hour period starting at 5 am	1	A two-way conversation of at least five words in the physical presence of another person	Age, employment status	Age, relation	Yes	No	No	Yes	No

Table 2: Determinants of social contacts

Nr	Year of finishing survey	Countries	Authors of first publication	Year of first publication	Age	Gender	Weekend /weekday	School terms/holiday	Being ill/recovered	Rural /urban	Flu/non-flu season	Household size
1	1986	The Netherlands	Wallinga et al	2006	Yes	NA	NA	NA	NA	NA	NA	NA
2	1986	The Netherlands	Wallinga et al	2006	Yes	NA	NA	NA	NA	NA	NA	NA
3	1995	UK	Edmunds et al	1997	Yes	NA	Yes	NA	NA	NA	NA	NA
4	1998	UK	Read et al	2008	No	NA	NA	NA	NA	NA	NA	NA
5	2003	Belgium	Beutels et al	2006	Yes	No	Yes	NA	NA	NA	NA	No
6	2003	Germany	Mikolajczyk et al	2008	NA	NA	NA	NA	NA	NA	NA	NA
7	2004	Germany	Mikolajczyk et al	2008	NA	NA	NA	NA	NA	NA	NA	NA
8	2004	Germany	Mikolajczyk et al	2008	NA	NA	Yes	NA	NA	NA	NA	NA
9	2004	Germany	Mikolajczyk et al	2008	Yes	No	Yes	NA	NA	NA	NA	NA
10	2005	Germany	Mikolajczyk et al	2008	NA	NA	Yes	NA	NA	NA	NA	NA
11	2005	UK	Edmunds et al	2006	Yes	No	Yes	NA	NA	NA	NA	No
12	2006	Finland	Mossong et al	2008	Yes	No	Yes	NA	NA	NA	NA	Yes
13	2006	Great Britain	Mossong et al	2008	Yes	No	Yes	NA	NA	NA	NA	Yes
14	2006	Italy	Mossong et al	2008	Yes	No	Yes	NA	NA	NA	NA	Yes
15	2006	Luxembourg	Mossong et al	2008	Yes	No	Yes	NA	NA	NA	NA	Yes
16	2006	Poland	Mossong et al	2008	Yes	No	Yes	NA	NA	NA	NA	Yes
17	2006	Belgium	Mossong et al	2008	Yes	No	Yes	NA	NA	NA	NA	Yes
18	2006	Germany	Mikolajczyk et al	2008	NA	NA	Yes	NA	NA	NA	NA	NA
19	2006	Germany	Mossong et al	2008	Yes	No	Yes	NA	NA	NA	NA	Yes
20	2006	The Netherlands	van de Kasstele et al	2017	NA	NA	NA	NA	NA	NA	NA	NA
21	2006	The Netherlands	Mossong et al	2008	Yes	No	Yes	NA	NA	NA	NA	Yes
22	2007	Germany	Bernard et al	2009	NA	No	Yes	NA	NA	NA	NA	NA
23	2007	US	Glass et al	2008	NA	NA	NA	NA	NA	NA	NA	NA
24	2007	Vietnam	Horby et al	2011	Yes	No	No	NA	NA	NA	NA	No
25	2008	Australia	Mccaw et al	2010	No	No	Yes	NA	NA	NA	NA	Yes
26	2008	US	DeStefano et al	2011	Yes	No	Yes	Yes	Yes	NA	No	NA
27	2009	Switzerland	Smieszek et al	2009	NA	NA	NA	NA	NA	NA	NA	NA
28	2009	US	Potter et al	2012	NA	NA	NA	NA	NA	NA	NA	NA
29	2010	China	Read et al	2014	Yes	NA	NA	NA	NA	No	NA	NA
30	2010	France	Lapidus et al	2012	Yes	NA	NA	NA	NA	NA	NA	NA
31	2010	Great Britain	Danon et al	2012	NA	NA	NA	NA	NA	NA	NA	NA
32	2010	Hong Kong	Kwok et al	2014	Yes	NA	NA	NA	NA	NA	NA	NA
33	2010	South Africa	Johnstone et al	2011	Yes	NA	NA	NA	NA	NA	NA	NA
34	2010	Switzerland	Smieszek et al	2012	NA	NA	NA	NA	NA	NA	NA	NA
35	2010	Taiwan	Chen et al	2012	Yes	NA	Yes	NA	Yes	NA	NA	Yes
36	2010	Taiwan	Fu et al	2012	Yes	No	NA	NA	NA	NA	NA	NA
37	2010	UK	Eames et al	2010	NA	NA	NA	Yes	No	NA	NA	NA

38	2010	UK	Eames et al	2011	No	Yes	NA	Yes	NA	NA	NA	Yes
39	2010	UK	Eames et al	2010	NA	NA	NA	NA	Yes	NA	NA	NA
40	2010	UK	Eames et al	2012	Yes	NA	NA	Yes	NA	NA	NA	NA
41	2010	UK	Jackson et al	2011	NA	NA	NA	Yes	NA	NA	NA	NA
42	2011	Australia	Campbell et al	2017	NA	NA	NA	NA	NA	NA	NA	NA
43	2011	Belgium	Willem et al	2012	NA	NA	Yes	Yes	NA	NA	NA	NA
44	2011	Japan	Ibuka et al	2016	Yes	Yes	Yes	NA	NA	NA	NA	Yes
45	2011	Peru	Grijalva et al	2015	Yes	Yes	No	NA	NA	NA	NA	Yes
46	2011	South Africa	Dodd et al	2015	No	No	Yes	NA	NA	NA	NA	Yes
47	2011	Zambia	Dodd et al	2015	No	No	Yes	NA	NA	NA	NA	Yes
48	2012	France	Beraud et al	2015	Yes	Yes	Yes	Yes	NA	NA	NA	NA
49	2012	Kenya	Kiti et al	2014	Yes	No	No	NA	NA	Yes	NA	NA
50	2012	Sweden	Stromgren et al	2017	NA	NA	NA	NA	NA	NA	NA	NA
51	2012	UK	Van Hoek et al	2013	Yes	NA	No	NA	NA	NA	NA	Yes
52	2012	US	Smieszek et al	2014	NA	NA	NA	NA	NA	NA	NA	NA
53	2013	Australia	Rolls et al	2015	NA	NA	No	NA	NA	NA	NA	NA
54	2013	France	Mastrandrea et al	2015	NA	NA	NA	NA	NA	NA	NA	NA
55	2013	Taiwan	Chen et al	2015	NA	No	Yes	Yes	NA	NA	NA	No
56	2013	Taiwan	Luh ad et al	2016	Yes	NA	Yes	NA	NA	NA	No	Yes
57	2013	Thai Lan	Stein et al	2014	NA	NA	NA	NA	NA	NA	NA	NA
58	2013	The Netherlands	Stein et al	2014	NA	NA	NA	NA	NA	NA	NA	NA
59	2013	US	Aiello et al	2016	NA	NA	NA	NA	NA	NA	NA	NA
60	2013	Zimbabwe	Melegaro et al	2017	Yes	Yes	No	NA	NA	Yes	NA	Yes
61	2014	Belgium	Stein et al	2015	Yes	No	Yes	NA	Yes	NA	NA	Yes
62	2014	Germany	Smieszek et al	2016	NA	NA	NA	NA	NA	NA	NA	NA
63	2014	The Netherlands	Stein et al	2015	Yes	No	Yes	NA	Yes	NA	NA	Yes
64	2015	Hong Kong	Lyung et al	2017	Yes	No	Yes	NA	NA	NA	NA	Yes
65	2016	Russia	Ajelli et al	2017	Yes	NA	NA	NA	NA	NA	NA	NA

Notes: Determinants for number of social contacts. Surveys are tagged as 'Yes' if they found a relevant connection between the number of contacts and the determinant, as 'No' if they did not find evidence and as 'NA' if they did not analyze the given determinant

## Supplement digital content 2 for “A systematic review of social contact surveys to inform transmission models of close contact infections”

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### Data collection tools

Most surveys (83%) used paper diaries to collect contact data. Diaries were delivered and collected by mail in nine surveys [1, 2, 3, 4, 5] and in person in the remaining surveys. Six surveys exclusively used online diaries [6, 7, 8, 9], and four surveys used both online and paper diaries [10, 5, 11, 12]. A Personal Digital Assistant (PDA) was used with paper diaries in one survey in 2008 [13]. In contrast, proximity sensor devices were used with online diaries in one survey in 2012 [14] and with paper diaries in two surveys in 2013 [15] and 2014 [16]. Most of these studies primarily aimed to explore different social contact data collecting tools.

In contrast to the work of Beutel et al.(2006) [10], which concluded that the paper diary yielded similar results of contact numbers compared with the online diary, Leung et al. [12] showed that participants using paper diary reported on average 9.99 contacts per day, which is substantially increased compared with those using the online diary with only 5.10 contacts per day. In McCaw et al. [13], respondents preferred the paper diary compared with the PDA based on timeliness and completeness. The majority of respondents (63%) described the paper diary as easy to use, whereas only 35% respondents had the same opinion regarding the use of PDA. Smieszek et al. [14]

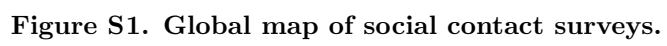
conducted a survey at a high school using both the online diary and wearable proximity sensors, making the two sources of data comparable by matching names of contacts reported by online diaries with names associated with sensor ID numbers. They found the use of online diaries to be more accurate for longer duration contacts but much less accurate for short duration contacts. Mastrandrea et al. [15] and Smieszek et al. [16] reached similar conclusions comparing paper diaries with wearable proximity sensor devices, with better accuracy for contacts of longer duration using paper diaries. However, there was a distinction in self-reported ease of use with 25% of respondents reporting difficulties in remembering contacts to complete paper diaries, and 25% stating that filling in the diary was too much work. In contrast, 93% respondents felt comfortable having their contacts measured by sensors [16].

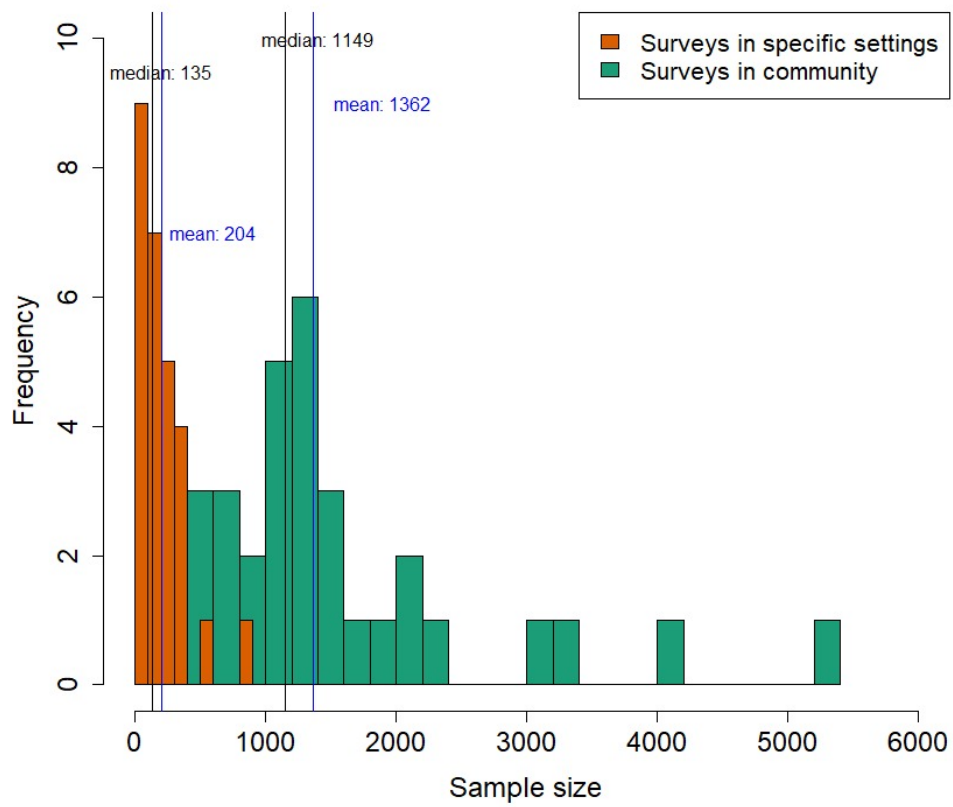
### **Data Collection methods**

Fifty-two of the 64 surveys (81%), relied on self-reporting, i.e. respondents single-handedly completed a paper or online diary after receiving oral instructions (in person or via telephone) or written guidelines from investigators. A face-to-face interview was used in nine surveys [17, 18, 19, 20, 21, 22, 23, 24] and a Computer-Assisted Telephone Interview (CATI) was employed in three [25, 26, 27]. Although self-reporting can be used for both retrospective and prospective designs, face-to-face interviews and the CATI only allow for a retrospective design, unless they are supplemented by some form of personal diary keeping that is used during the interview. Akakzia et al. [28] found the paper diary to provide more number of contacts compared with CATI (the median number of reported daily contacts per participant was

13.5 for the paper diaries and 4 for CATI) because it gives the respondent more time to recall contacts. All four household-based surveys conducted face-to-face interviews at the respondent's residence [18, 19, 22, 23]. Face-to-face interviews exhibited a greater response rate (46% [20] to 100% [19]) compared with self-reporting and CATI. We could not identify any contact survey directly comparing self-reporting with a face-to-face interview, but different surveys were compared in one work [24].







**Figure S2. Sample sizes.** Sample sizes of surveys in general population and surveys in specific setting.

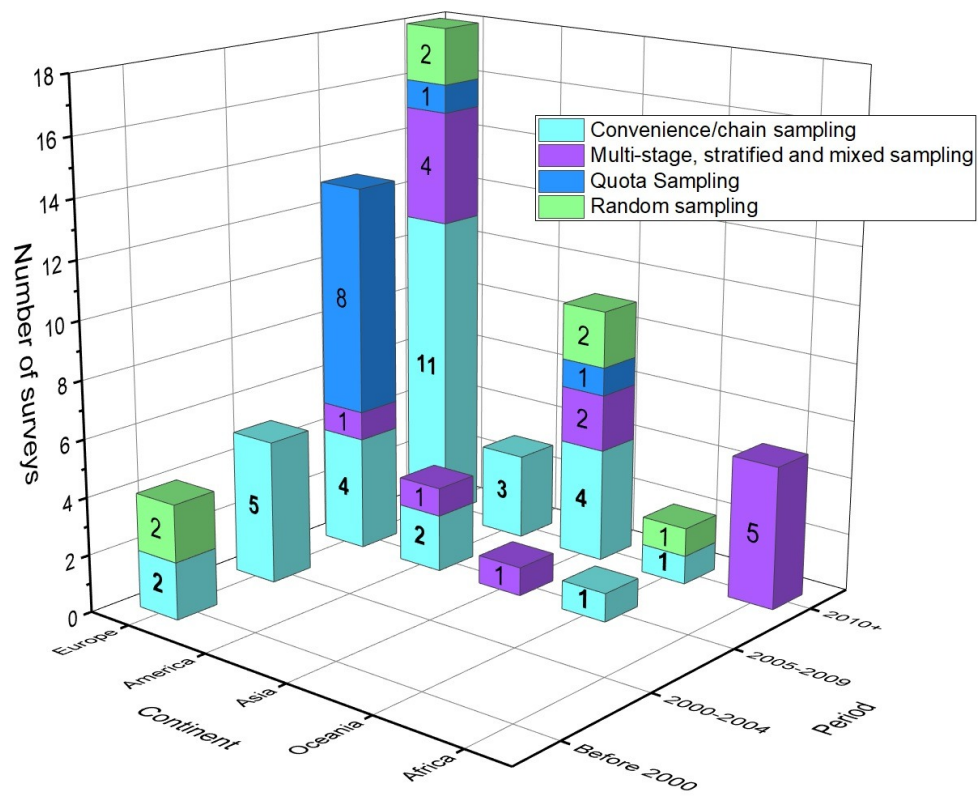
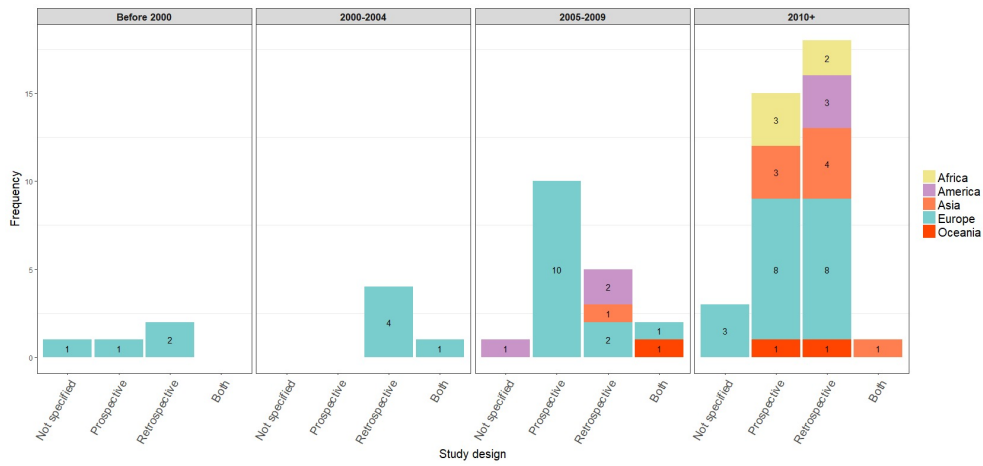
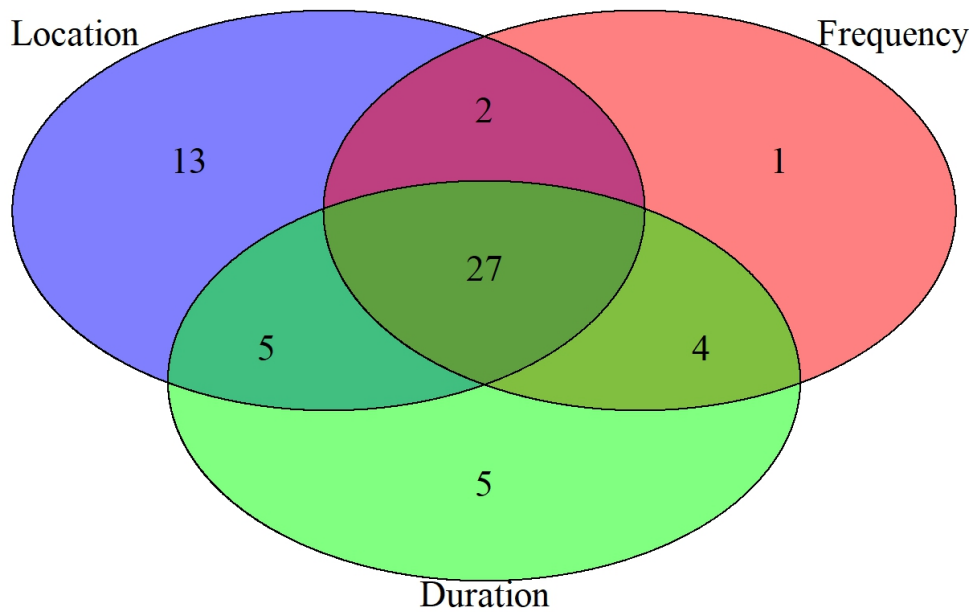


Figure S3. Sampling schemes by continents and periods.

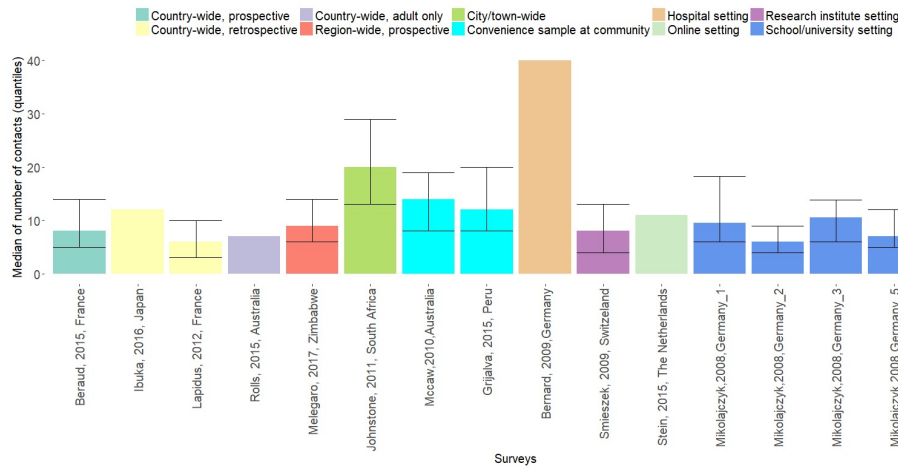


**Figure S4. Distribution of social contact surveys by study designs.** The four panels correspond to different time-intervals



**Figure S5. Location, duration and frequency of contacts** The Venn diagram shows the number of surveys collecting information about duration, location and frequency of contacts.





**Figure S7. Median of number of contacts among surveys.** Median and quantiles of contacts. Surveys are labeled according to the publication's first author, year and the country in which the survey was performed.

- [1] Mossong J, Hens N, Jit M, Beutels P, Auranen K, Mikolajczyk R, et al. Social contacts and mixing patterns relevant to the spread of infectious diseases. *PLoS medicine*. 2008;5(3):e74.
- [2] Béraud G, Kazmierczak S, Beutels P, Levy-Bruhl D, Lenne X, Mielcarek N, et al. The French connection: the first large population-based contact survey in France relevant for the spread of infectious diseases. *PloS one*. 2015;10(7):e0133203.
- [3] Willem L, Van Kerckhove K, Chao DL, Hens N, Beutels P. A nice day for an infection? Weather conditions and social contact patterns relevant to influenza transmission. *PloS one*. 2012;7(11):e48695.
- [4] Eames K, Tilston N, White P, Adams E, Edmunds W. The impact of illness and the impact of school closure on social contact patterns. *Health technology assessment (Winchester, England)*. 2010;14(34):267–312.
- [5] Danon L, House TA, Read JM, Keeling MJ. Social encounter networks: collective properties and disease transmission. *Journal of The Royal Society Interface*. 2012;p. rsif20120357.
- [6] Eames KT, Tilston NL, Brooks-Pollock E, Edmunds WJ. Measured dynamic social contact patterns explain the spread of H1N1v influenza. *PLoS computational biology*. 2012;8(3):e1002425.
- [7] Stein ML, Van Steenbergen JE, Buskens V, Van Der Heijden PG, Chanyasanha C, Tipayamongkhogul M, et al. Comparison of contact patterns relevant for transmission of respiratory pathogens in Thailand

- and the Netherlands using respondent-driven sampling. *PLoS One*. 2014;9(11):e113711.
- [8] Stein ML, van der Heijden PG, Buskens V, van Steenbergen JE, Bengtsson L, Koppeschaar CE, et al. Tracking social contact networks with online respondent-driven detection: who recruits whom? *BMC infectious diseases*. 2015;15(1):522.
  - [9] Aiello AE, Simanek AM, Eisenberg MC, Walsh AR, Davis B, Volz E, et al. Design and methods of a social network isolation study for reducing respiratory infection transmission: The eX-FLU cluster randomized trial. *Epidemics*. 2016;15:38–55.
  - [10] Beutels P, Shkedy Z, Aerts M, Van Damme P. Social mixing patterns for transmission models of close contact infections: exploring self-evaluation and diary-based data collection through a web-based interface. *Epidemiology & Infection*. 2006;134(6):1158–1166.
  - [11] Ibuka Y, Ohkusa Y, Sugawara T, Chapman GB, Yamin D, Atkins KE, et al. Social contacts, vaccination decisions and influenza in Japan. *J Epidemiol Community Health*. 2015;p. jech–2015.
  - [12] Leung K, Jit M, Lau EH, Wu JT. Social contact patterns relevant to the spread of respiratory infectious diseases in Hong Kong. *Scientific reports*. 2017;7(1):7974.
  - [13] McCaw JM, Forbes K, Nathan PM, Pattison PE, Robins GL, Nolan TM, et al. Comparison of three methods for ascertainment of contact



information relevant to respiratory pathogen transmission in encounter networks. BMC infectious diseases. 2010;10(1):166.

- [14] Smieszek T, Barclay VC, Seeni I, Rainey JJ, Gao H, Uzicanin A, et al. How should social mixing be measured: comparing web-based survey and sensor-based methods. BMC infectious diseases. 2014;14(1):136.
- [15] Mastrandrea R, Fournet J, Barrat A. Contact patterns in a high school: a comparison between data collected using wearable sensors, contact diaries and friendship surveys. PloS one. 2015;10(9):e0136497.
- [16] Smieszek T, Castell S, Barrat A, Cattuto C, White PJ, Krause G. Contact diaries versus wearable proximity sensors in measuring contact patterns at a conference: method comparison and participants attitudes. BMC infectious diseases. 2016;16(1):341.
- [17] Dodd PJ, Looker C, Plumb ID, Bond V, Schaap A, Shanaube K, et al. Age-and sex-specific social contact patterns and incidence of Mycobacterium tuberculosis infection. American journal of epidemiology. 2015;183(2):156–166.
- [18] Horby P, Thai PQ, Hens N, Yen NTT, Thoang DD, Linh NM, et al. Social contact patterns in Vietnam and implications for the control of infectious diseases. PloS one. 2011;6(2):e16965.
- [19] Grijalva CG, Goeyvaerts N, Verastegui H, Edwards KM, Gil AI, Lanata CF, et al. A household-based study of contact networks relevant for the spread of infectious diseases in the highlands of Peru. PloS one. 2015;10(3):e0118457.

- [20] Fu Yc, Wang DW, Chuang JH. Representative contact diaries for modeling the spread of infectious diseases in Taiwan. PLoS One. 2012;7(10):e45113.
- [21] Kwok KO, Cowling BJ, Wei VW, Wu KM, Read JM, Lessler J, et al. Social contacts and the locations in which they occur as risk factors for influenza infection. Proceedings of the Royal Society of London B: Biological Sciences. 2014;281(1789):20140709.
- [22] Lapidus N, De Lamballerie X, Salez N, Setbon M, Delabre RM, Ferrari P, et al. Factors associated with post-seasonal serological titer and risk factors for infection with the pandemic A/H1N1 virus in the French general population. PloS one. 2013;8(4):e60127.
- [23] Read JM, Lessler J, Riley S, Wang S, Tan LJ, Kwok KO, et al. Social mixing patterns in rural and urban areas of southern China. Proceedings of the Royal Society of London B: Biological Sciences. 2014;281(1785):20140268.
- [24] Wallinga J, Teunis P, Kretzschmar M. Using data on social contacts to estimate age-specific transmission parameters for respiratory-spread infectious agents. American journal of epidemiology. 2006;164(10):936–944.
- [25] DeStefano F, Haber M, Currivan D, Farris T, Burrus B, Stone-Wiggins B, et al. Factors associated with social contacts in four communities during the 2007–2008 influenza season. Epidemiology & Infection. 2011;139(8):1181–1190.

- [26] Rolls DA, Geard NL, Warr DJ, Nathan PM, Robins GL, Pattison PE, et al. Social encounter profiles of greater Melbourne residents, by location—a telephone survey. *BMC infectious diseases*. 2015;15(1):494.
- [27] Strömgren M, Holm E, Dahlström Ö, Ekberg J, Eriksson H, Spreco A, et al. Place-based social contact and mixing: a typology of generic meeting places of relevance for infectious disease transmission. *Epidemiology & Infection*. 2017;p. 1–12.
- [28] Akakzia O, Friedrichs V, Edmunds W, Mossony J. Comparison of paper diary vs computer assisted telephone interview for collecting social contact data relevant to the spread of airborne infectious diseases. In: *EUROPEAN JOURNAL OF PUBLIC HEALTH*. vol. 17. OXFORD UNIV PRESS GREAT CLARENDON ST, OXFORD OX2 6DP, ENGLAND; 2007. p. 189–189.

## Supplement digital content 3 for “A systematic review of social contact surveys to inform transmission models of close contact infections”

The 2 following electronic databases are systematically searched:

- Pubmed
- ISI Web of Science

Search on title and abstract:

- Until 31/01/2018
- No restriction on time and languages

Searching queries for PubMed:

((survey\*[Title/Abstract] OR questionnaire\*[Title/Abstract] OR diary[Title/Abstract] OR diaries[Title/Abstract]) AND (social contact\*[Title/Abstract] OR mixing behavior\*[Title/Abstract] OR mixing pattern\*[Title/Abstract] OR contact pattern\*[Title/Abstract] OR contact network\*[Title/Abstract] OR contact survey\*[Title/Abstract] OR contact data[Title/Abstract]))

Searching queries for Web of Science:

(TS=((survey\* OR questionnaire\* OR diary OR diaries) AND (social contact\* OR mixing behavior\* OR mixing pattern\* OR contact pattern\* OR contact network\* OR contact survey\* OR contact data)))

Note: TS=Topic

Searches for topic terms in the following fields within a record.

- Title
- Abstract
- Author Keywords
- Keywords Plus<sup>®</sup>