Supplementary Table 1: Data extraction for environmental noise effects on self-reported quality of life or health

	Reference	Population: general population in settings (hospitals, residences, public venues, educational facilities) + response rate and other selection /bias factors Cross-sectional or longitudinal	Exposure: exposure to high levels of environmental noise from various noise sources + noise metric involved + modelled or measured noise	Comparator: no noise exposure or lower levels of noise exposure	Confounding : adjusted for confounding	Outcome: assessment of outcome	Findings: expressed as effect per dB if possible. Type of analyses Sample size relating to the effect size	Comments: Anything else to note
AIRC	RAFT NOISE EXP	OSURE			•		L	L
	D POPULATIONS							
CROS	SS-SECTIONAL EV			1		1		1
1.	Clark et al, Am J	Population: school	Noise exposure:	Comparator :	Confounding:	Outcome:	Findings:	Comments:
	Epidemol, 2012	children, total n=960,	aircraft noise	lower levels	Modelled	Perceived child's	No association	Findings:
		aged 9-10yrs.	levels at home	of noise	concentrations of	health – very	between aircraft and	No association
		Cross sectional study	and at school	exposure	NO2 (µg/m3);	good/good vs.	road traffic noise	between aircraft
			measured in an		age, gender,	fair/poor/very	and self-rated health	and road traffic
			area from 7 am		socio-economic	poor, perceived by	or psychological	noise and
			to 11 pm; road		status	parents;	distress	systolic and
			traffic noise at		(employment,	Psychological	Type of analyses:	diastolic blood
			school		home ownership,	distress measured	Multilevel linear	pressure
			combined from		home crowding),	using Strengths	and logistic	
			measurements		ethnicity,	and Difficulties	regression models	
			and models		maternal	Questionnaire	Sample size	
			Noise source:		education, main	(Goodman, 1997),	relating to the	
			aircraft and road		language spoken	fulfilled by	effect size:	
			traffic		at home, long-	parents	n=719 with air	
			Noise metrics:		standing illness,		pollution data and	
			LAeq, 16h (dB)		parental support		n=241 without air	
					for schoolwork,		pollution data	
					classroom glazing		-	
2.	Van Kempen et	Population: school	Noise exposure:	Comparator:	Confounding:	Outcomes:	Findings:	Comments:
	al, J Acoust Soc	children, 89 schools	aircraft noise	lower levels	age, gender,	Perceived health	Children annoyed	Findings:

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	Am, 2010	around three airports,	levels at home	of noise	country, socio-	- self-reported	by aircraft or road	No association
		total n=2844, aged 9-	and at school	exposure	economic status	health symptoms	traffic noise at	between aircraft
		11yrs.	measured in an		(home crowding,	(headache,	school reported	and road traffic
		Cross sectional study	area from 7 am		home ownership,	vomiting,	significantly more	noise and
			to 11 pm; road		employment,	stomachache,	symptoms compared	number of self-
			traffic noise at		mother's	difficulty falling	to children who	reported health
			school modelled		education),	asleep, being	were not annoyed.	symptoms.
			or combination		ethnicity, long-	woken at night or	After pooling the	No differences
			of		standing illness,	feeling sleepy	data, the association	between children
			measurements		main language	during a day);	was no longer	annoyed by road
			with models		spoken at home,	Neurobehavioral	evident.	traffic noise and
			Noise source:		parental support	functioning –	Children annoyed	not-annoyed
			aircraft and road		for school work,	Neurobehavioral	by aircraft noise at	children in any
			traffic		other noise	Evaluation	school made	NES tests.
			Noise metrics:		exposure,	System (NES)	significantly more	Conclusion: The
			LAeq, 16h (dB)		annoyance	(Letz, 1991),	faults at the switch	association
						including the	condition of SAT	between noise
						following: Simple	test and had shorter	and health and
						Reaction Time	span length on	neurobehavioral
						Test (SRTT),	DMST test,	functioning is
						Switching	compared to not-	not confounded
						Attention Test	annoyed children.	by annoyance.
						(SAT), Hand-Eye	Type of analyses:	
						Coordination Test	Multilevel	
						(HECT), Symbol	modelling analyses	
						Digit Substitution	Sample size	
						Test (SDST),	relating to the	
						Digit Memory	effect size: n=553	
						Spin Test	with complete NES	
						(DMST);	data, n=2844 with	
						Aircraft and	complete health	
						road traffic noise	symptoms data	
						annoyance	* 1	
						measured on 5-		
						point scale (ISO		
						2003) fulfilled by		
						children		
3.	Stansfeld et al,	Population: school	Noise exposure:	Comparator:	Confounding:	Outcomes:	Findings:	Comments:
	Lancet, 2005	children, 89 schools	aircraft noise	lower levels	age, gender,	Self-reported	Increase of aircraft	Findings:

		around three airports, total n=2844, aged 9-	levels at home and at school	of noise exposure	parental employment,	health – perceived by	noise at school by 1 dB was significantly	No association between aircraft
		13yrs. Cross sectional study	measured in an area from 7 am		home ownership, home crowding,	children; Psychological	associated with an increase of noise	and road traffic noise and self-
		5	to 11 pm; road		mother's	distress –	annoyance by 0.037	reported health,
			traffic noise at school modelled		educational attainment,	perceived children's mental	marks. Increase of road	and perceived children's
			or combination		long-standing	health, measured	traffic noise at	mental health.
			of		illness, main	using Strengths	school by 1 dB was	
			measurements with models		language spoken at home, parental	and Difficulties Questionnaire	significantly associated with an	
			Noise source:		support for school	(Goodman, 1997),	increase of noise	
			aircraft and road		work, classroom	fulfilled by	annoyance by 0.016	
			traffic Noise metrics:		glazing	parents Aircraft noise	marks. Type of analyses:	
			LAeq, 16h (dB)			annoyance	Multilevel model	
						measured by 5-	analyses (for data	
						point scale (ISO 2003) fulfilled by	clustering) Sample size	
						children	relating to the	
							effect size: range	
							from 1939 to 2014 with complete data	
	T POPULATIONS						_	
	GITUDINAL EVID		I -	I		1 -	I	-
4.	Schreckenberg	Population: Four	Noise	Comparison:	Confounding:	Outcomes:	Findings:	Comments:
	et al., NORAH study, 2015	airports in Germany Frankfurt/Main,	exposure: Noise contours	Change estimate per	Age, gender, migrant	Health-related quality of life –	Cross-sectional study: significant	Findings: Significant
	Study, 2015	Koln/Bonn,	around	5 dBA	background.	measured with	negative	interaction of
		Stuttgart,	airports; alone	increase of	Social factors:	SF-8 scale (short	correlation	age, female
		Berlin/Brandenburg;	or combined	Leq_24h	adjustment to	version of SF-36,	between mental	gender, BMI,
		airport; adults: total	with road-		traffic,	Ellert et al,	and physical	socio-economic
		n=14959 eligible	traffic, rail-		expectations for	2005); two sub-	quality of life	status, physical
		persons, response	traffic		traffic	components	scores and	activity, noise
		rate 7-31% (by	Noise source:		development,	defined: physical	Leq_24h at all four	sensitivity and
		area), age 18 to	aircraft noise		expectations for	and mental	airports.	noise
		above 80 years	Noise metrics:		airport use, trust	quality of life	Follow-up study:	annoyance on
		Cross-sectional	LAeq_day,		in the efforts of	(Quality Metrics,	following the	the association

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		study (in 2011)	LAeq_night,	those reponsible	2011)	reduction of noise	between
		Follow-up study	Leq_24h, Lden	for noise	Other	levels, mental	aircraft noise
		2012-2013 after the	Noise groups:	regulation,	outcomes:	quality of life	levels and
		opening of a new	10 classes of	fairness.	Noise annoyance,	increased in	mental and
		runway in	noise levels in	Personal factors:	sleep	groups exposed to	physical quality
		Frankfurt/Main	range 40-65 dB	noise coping	disturbances,	noise levels ≥50	of life in all
		airport	(by 2.5 dB) for	strategies, noise	disturbance of	dBA; physical	airports.
			cross-sectional	sensitivity (short	everyday	quality of life	
			study; noise	form 12-item	activities,	decreased in	
			levels changes:	NoiSeQ-	psycho-	almost all noise	
			increase > + 2	Reduced),	vegetative	exposure groups.	
			dB, decrease > -	physcial activity,	disturbances,	Following the	
			2 dB or stable	smoking, alcohol	residential	increase of noise	
			levels for the	intake, BMI.	satisfaction	levels, mental	
			follow-up study	Dwelling		quality of life	
				characteristics,		decreased only in	
				exposure to		group exposed to	
				other noise		40-45 dBA;	
				sources.		following the	
						reduction of noise	
						levels, physical	
						quality of life was	
						not significantly	
						changed.	
						A significant	
						correlation	
						between mental	
						and physical	
						quality of life with	
						noise annoyance.	
						Type of analyses:	
						Correlation,	
						inferential analysis,	
						multilevel	
						regression	
						Sample size	
						relating to the	
						effect size:	
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CROS	SS-SECTIONAL EV	VIDENCE					n=9244 cross- sectional; n=4867 (1-year follow-up), n=3508 (2-year follow-up) in Frankfurt/Main study	
5.	Black et al, J Air Transp Manag, 2007	Population: adult residents from a suburb area near the airport and control area matched for socio-economic status, total n=704, aged 15-87yrs. Selection: n=1500 estimated sample size, n=796 returned questionnaire, n=704 filled the data, response rate 50% Cross sectional study	Noise exposure: aircraft noise levels measured in the area from 7 a.m. to 6 p.m. Noise source: aircraft noise Noise metrics: LAeq 7am-6pm (dB) Noise groups: aircraft noise and control group	Comparator: Aircraft noise exposed area compared to control area	Confounding : Noise sensitivity, traffic noise annoyance, aircraft noise annoyance	Outcomes: Health-related quality of life – assessed with SF- 36 (Ware & Sherbourne, 1992), including physical functioning, general health, vitality and mental health; Noise annoyance from road traffic and aircraft noise – not explained; Noise stress– not explained; Noise sensitivity – assessed by modified Weinstein scale (Weinstein, 1978)	Findings: Persons exposed to aircraft noise had significantly lower scores on mental health subscale in comparison to persons from the control area. Persons exposed to aircraft noise had higher levels of noise annoyance and noise stress, but similar noise sensitivity. Type of analyses: Logistic regression model Sample size relating to the effect size: n=704	Comments: Findings: Chronic noise stress was significantly predicted by noise exposure group, noise sensitivity, traffic annoyance and aircraft annoyance.
6.	Schreckenberg et al, Int J Environ Res Public Health, 2010	Population : adult residents living near an airport, total n=2312, aged 17 to >80yrs. Selection : n=3795 eligible, n=2312	Noise exposure: aircraft noise exposure, road traffic and railway noise were modelled at daytime and	Comparator : lower levels of noise exposure	Confounding : Age, gender, house ownership, socioeconomic status (income, education, occupational	Outcomes: Health-related quality of life – measured with SF-36 and SF-12 scales (Bullinger & Kirchberger	Findings: Aircraft noise annoyance and noise sensitivity (but not aircraft noise levels) were significant predictors of poor	Comments: Findings: Aircraft Lden correlated significantly and positively with noise annoyance,

returned the	nighttime	status), noise	1998);	health-related	disturbance of
			Health		
questionnaire,	Noise source:	sensitivity,		quality of life,	activities, coping
response rate 61%	aircraft	residential	complaints – self-	health complaints	strategies,
Cross sectional study	Noise metrics:	satisfaction, usual	reported scale	and poor sleep	negative
	LAeq 16h	window position	(GSCL-24)	quality.	expectations,
	daytime (6 a.m.	in the sleeping	(Braehler et al,	Type of analyses:	fears related to
	and 10 p.m.),	room at night,	2008);	Linear correlation,	aircraft, and
	Leq 8h night (10	number of hours	Residential	logistic regression	negatively with
	p.m. to 6 a.m.),	away from home,	satisfaction –	models, multi-	residential
	Ldn, Lden (dB)	railway and road	assessed with 5-	factorial general	satisfaction
		traffic sound	point scale,	linear model	parameters.
		level, morbidity	including	Sample size	Pre-existing
			dwelling,	relating to the	health problems
			residential area,	effect size:	(multi-
			infrastructure	n=2311 with	morbidity) may
			(Wirth, 2000);	complete data	moderate the
			Attitudes related	-	impact of
			to air traffic – a		aircraft noise
			self-reported		exposure on
			scale;		health-related
			Noise annoyance		quality of life.
			– assessed on a 5-		1 0
			point verbal and a		
			11-point		
			numerical scale;		
			Coping with		
			aircraft noise –		
			measured on a 5-		
			point frequency		
			scale;		
			Noise sensitivity		
			– assessed from		
			one question;		
			Sleep quality –		
			assessed by the		
			Pittsburgh Sleep		
			Quality Index		
			(PSQI) (Buysse et		
			al, 1989)		
			ai, 1909)	ļ	

7	Schreckenberg et	Population : adult	Noise exposure:	Comparator:	Confounding:	Outcomes:	Findings:	Comments:
/.	al, Noise &	residents living near	aircraft noise	lower levels	Age, gender,	Noise sensitivity	Aircraft and road	Findings:
	Health, 2010	an airport, total	and road traffic	of noise	social status	– assessed from	traffic noise	Noise sensitivity
	11eann, 2010	n=190, aged 17-80yrs.	noise were	exposure	(income,	35-item	annoyance and	was predicted by
		Selection : n=2310	modelled at	слрозите	education, and	questionnaire	aircraft noise level	age and reported
		eligible, n=190 with	daytime and		occupational	(NoiSeQ) (Schütte	at daytime were	physical health,
		noise sensitivity data	nighttime		status)	et al, 2007);	negatively	but not with
			Noise source:		status)		correlated with	reported mental
		Cross sectional study				Noise annoyance		
			aircraft and road			- due to aircraft	residential	health.
			traffic			and road traffic	satisfaction, but not	Noise sensitivity
			Noise metrics:			noise, assessed on	with health-related	was direct
			LAeq 16h			a 5-point verbal	quality of life.	predictor of total
			daytime (6 a.m.			scale (Fields,	Noise annoyance	and aircraft
			and 10 p.m.)			2001);	(aircraft and road	noise annoyance,
			(dB)			Environmental	traffic) was	higher
						and social	significantly	perception of
						problems – using	predicted by	environmental
						a 23-item scale;	daytime Leq 16h	and social
						Residential	(respectively).	problems, and
						satisfaction –	Aircraft noise	predictor of
						assessed with 16-	levels were	residential
						item scale (Wirth,	associated with	satisfaction
						2000);	higher perception of	(lower
						Health-related	global	quietness).
						quality of life –	environmental	Conclusion:
						measured with	problems, and with	Noise sensitivity
						SF-12 scale	lower global	is not part of a
						(Bullinger &	residential	general tendency
						Kirchberger	satisfaction.	to be more aware
						1998);	Type of analyses:	of the negative
						Diagnosed	Linear correlation,	aspects of one's
						diseases – self-	linear multiple	environment.
						reported scale	regression analysis	
						(Bellach et al,	Sample size	
						(Benaen et al, 1998);	relating to the	
						Life satisfaction	effect size:	
						– measured with	n=163-190 with	
						FLZ-A scale	complete data	
							complete data	
						(Herschbach &		

_	D TRAFFIC NOISE D POPULATIONS					Henrich 1991); Sleep quality – assessed by the Pittsburgh Sleep Quality Index (PSQI) (Backhaus et al, 2001)		
_	S-SECTIONAL EV	/IDENCE						
	See Clark et al, Am J Epidemol, 2012							
	See Van Kempen et al, J Acoust Soc Am, 2010 See Stansfeld et							
ADIJI	al, Lancet, 2005							
	GITUDINAL EVID							
8.	Heritier et al, 2014	Population: adults from Basel Switzerland. Response rate cross- sectional 37% (n=1375); one-year follow up 82% (n=1172)	Noise Exposure: Modelled noise exposure geocoded. Road traffic for 2007. Time-weighted daily average levels. Ldn calculated for road traffic noise including the 10dBA penalty for the night-time.	Comparator: Estimates for 10dB increase in Ldn.	Confounding: age, gender, physical activity, smoking, educational level, marital status, urban/suburban region.	Outcomes: SF-36 and von Zerssen symptom score. Self-reported health status.	Findings: a 10 dB(A) increase of the road traffic noise Ldn was associated with a 0.47 (95% CI: -0.01, 0.95, p=0.05) point increase of the von Zerssen symptom score. Borderline significant. No association between a 10dB(A) increase in road traffic noise Lden and SF36 (0.09	Comments: Low response rate for the original survey. Self-reported health outcomes. No adjustment for noise sensitivity. It isn't clear if some of the findings are cross-sectional, longitudinal or combine both time-points for analysis.

INTE	RVENTION EVIDI	ENCE					(95%CI -0.43, 0.61), p=0.73). A 10dB(A) incrase in road traffic noise Ldn was associated with a decrease in self-reported health status OR=1.28, 95%CI 1.12-1.48), p=0.001. Confirm association of noise with self- reported health and no associations between noise and von Zerssen symptom score and SF36.	
9.	Stansfeld et al, Noise Health, 2009	Population : adult residents living in noisy and quiet areas, total n=387, aged 16- 90yrs. Response rate at	Noise exposure: road traffic noise levels measured between 10 am and 5 pm on	Comparator: Noise exposed group compared to control group;	Confounding: Deprivation index (Townsend's scale including: car ownership, home ownership,	Outcomes: Health status – SF-36 General Health Survey (Ware & Sherbourne 1992);	Findings: At baseline, people from high and low noise groups had similar health status. At follow-up no	Comments: Findings: At follow-up, there was a decrease in noise annoyance in the
		baseline 70%, at follow-up 74% Longitudinal / Intervention study, baseline in 1997, n=337, follow-up in 1998, n=228 after the opening of a bypass read (shence of noise	weekdays; Noise source: road traffic Noise metrics: Leq, L10 (dBA) Noise groups: noise exposed group (facing the mein streagt	within- subjects comparison	crowding, unemployment), baseline health, age, sex	Psychological distress – General Health Questionnaire (GHQ), 28 items (Goldberg & Hillier, 1979); Prevalence of montal disorders	differences in health status between the groups. At follow-up, after the bypass opened, there was a decrease in prevalence rates of mental disorder in heath groups.	high noise group.
		road (change of noise level by 2-4 dBA)	the main street, L_{10} =75-78 dBA), control group (on			mental disorders – assessed by the Revised Clinical Interview	both groups. Type of analyses: Univariate analyses of covariance	

TUDINAL EVID	FNCE	uncongested side streets, L ₁₀ =55-58 dBA)			Schedule (Lewis et al, 1992); Noise annoyance – from neighbors, road traffic and train noise (Fields, 1992)	(ANCOVA), Univariate analyses of covariance adjusted for baseline health status Sample size relating to the effect size: n=387 with complete data; n=71 interviewed for prevalence of mental disorder	
Roswall et al, PLOS One, 2015	Population : adult residents in greater urban area, n=38,964, aged 50-64 yrs. Selection : n=45,271 eligible of the original cohort (79%), n=5662 excluded due to missing data Nationwide cohort study	Noise exposure: road traffic and railway noise were modeled at daytime and nighttime Noise source: road traffic and railway Noise metrics: road traffic: Lden (dBA); Railway noise: categories 0 dB, <55 dB, ≥55 dB	Comparator: lower levels of noise exposure (per 10 dBA)	Confounding: Age, sex, education, cohabiting status, income, Charlson Comorbidity Index, railway noise exposure, smoking status, waist circumference, alcohol intake	Outcomes: Health-related quality of life – measured with SF-36 scale- Danish (Maruish, 2011); two summary scales: physical component summary (PCS) and mental component summary (MCS)	Findings: Road traffic noise exposure 1 year preceding the testing was associated with a decrease in both PCS (by 0.32 points) and MCS (by 0.42 points) – crude models. Similar results for 10 year noise exposure. After adjustment for socioeconomic factors, a 10 dBA increase in road traffic noise was associated with a decrease of MCS (by 0.14 points for 1 year exposure; by 0.15 points for 10 yrs noise exposure.	Comments: Findings: No association of road traffic noise exposure with physical or mental component summaries when individual lifestyle covariates are taken into account (smoking, alcohol intake, waist circumference).

	55-SECTIONAL EV						Type of analyses: Linear regression models Sample size relating to the effect size: n=38,964 with complete data	
11		Population: housewives living in an urban area in one city, total n=133, mean age 31yrs. Inclusion criteria: age range 20-40yrs, unemployed, literacy Cross sectional study	Noise exposure: road traffic noise levels measured for 1 hour at daytime in a typical urban area Noise source: road traffic Noise metrics: Leq, 1 hour (dB A, F)	Comparator: None	Confounding : Age, length of residence, education, level of profession, urban characteristics	Outcomes: Noise annoyance -self-reported 5- point scale (no reference); Perceived stress test – 10-item scale (Cohen, 2008); Health status – abbreviated form (11-items) of SF- 36 test (Ware, 2005); Perception of noise – self- reported	Findings: Noise annoyance was associated with medical history, urban characteristics, education level and occupation. It was not related with noise levels. Health status was associated with age, length of residence. Noise perception was associated with education, length of residence, not with noise levels. Type of analyses: Linear regression analysis Sample size relating to the	Comments: The method is observational, no comparisons, no correlation with noise exposure.
12	Halonen et al, Scand J Work Environ Health, 2014	Population : adult residents from a cohort study in three towns, total n=15 611, aged 21-76yrs. Cross sectional study	Noise exposure: road traffic noise levels modeled for the streets Noise source:	Comparator: Five noise level groups	Confounding: Trait anxiety as an indicator of noise sensitivity; age, sex, occupational status, education	Outcomes: Self-rated health – using a 5-point scale; Psychotropic medication use –	effect size: n=133 Findings: Men exposed to road traffic noise >60 dBA had poorer self-rated health compared to men	Comments: Findings: No association between noise exposure and use of psychotropic

		road traffic Noise metrics : Lden (dBA) Noise groups : ≤45 dB (n=2821), 45.1– 50 dB (n=4110), 50.1–55 dB (n=3597), 55.1– 60 dB (n=2445), >60 dB (n=2638)		level, size of apartment, job strain, smoking, leisure-time physical activity, obesity, heavy alcohol drinking, chronic illness, area-level socio- economic status, population density	from National Prescriptions Register, including anxiolytics, antidepressants, and hypnotics; Trait anxiety score – based on a 6-item inventory	exposed to ≤45 dBA. The association was significant even after adjustment for trait anxiety, smoking, alcohol, obesity, physical inactivity. Type of analyses: Logistic regression models Sample size relating to the effect size: n=15611 with complete data	medication in men and women.
13 Honold et al, J Environ Psychol, 2012	Population: adult residents living in high noise, high air pollution area, total n=428, aged 16-91yrs. Selection: n=2000 approached, n=428 returned, response rate 21.4% Cross sectional study	Noise exposure: road traffic noise levels modeled in the area; Noise source: air traffic Noise metrics: not specified, probably Leq,24h (dBA) Noise groups: High-burden blocks (high noise >65 dBA, high air pollution), low- burden blocks (noise ≤50 dBA)	Comparator: High-burden group compared to low-burden group	Confounding : Gender, age, educational attainment, nationality, marital status, employment, occupational position, size of community, use of medications, housing conditions	Outcomes: Neighborhood satisfaction – using a 4-item scale (Feuersenger, 2004); Life satisfaction – assessed using an 5-item scale (Diener et al, 1985); Health behavior – smoking, alcohol intake, physical activity (Feldman & Steptoe, 2004); General physical health – one item from the SF-36 health survey (Bullinger &	Findings: People from high burden blocks had significantly lower neighborhood satisfaction, and poorer health behavior. Poor health behavior was related to employment, perceived traffic noise and perceived air quality. Type of analyses: Analysis of variance (ANOVA), logistic regression, analysis of covariance (ANCOVA), hierarchical regression analysis Sample size	Comments: Findings: No difference in life satisfaction, general physical health, anxiety and depression between high- burden and low- burden groups. Perceived air quality was related to life satisfaction, general health, anxiety and depression.

						Kirchberger, 1998); Depression and anxiety – items on the Brief Symptom Inventory (Franke, 2000); Environmental perception – six factors, 5-point scale; Environmental stress appraisal /annoyance – four factors, 5-point scale	relating to the effect size: n=215 from high-burden group, n=213 from low-burden group	
14	Kishikawa, et al, Noise Health,	Population : adult residents living along	Noise exposure: road traffic	Comparator : lower levels	Confounding : Age, gender,	Outcomes: Subjective health	Findings: Among noise	Comments: Findings:
	2009	truck roads, total n=323, aged 20-70yrs.	noise levels at home measured	of noise	socioeconomic status, noise	– using General Health	sensitive persons, the odds ratios for	Among noise- sensitive persons
		n=323, aged 20-70yrs. Selection: n=486	in the area for	exposure	sensitivity	Questionnaire	overall GHQ scale,	in the highest
		approached, response	24 hours;		(sensitive vs.	GHQ-28	somatic symptoms	noise exposure
		rate 88.2%, exclusion:	Noise source:		insensitive)	(Goldberg, 1978)	and anxiety and	group (>65
		aged over 70yrs.	traffic on the trunk roads			with four	insomnia increased	dBA), the odds ratio for
		Cross sectional study	Noise metrics:			subscales (somatic symptoms,	significantly with Ldn.	psychiatric cases
			Ldn (dBA)			anxiety &	Among noise-	on GHQ scale
			Noise groups:			insomnia, social	insensitive persons	increased with
			<55 dBA, 55-65			dysfunction,	the odds ratio for	sleep disturbance
			dBA, >65 dBA			severe	social dysfunction	- sleep
						depression); Noise sensitivity	decreased with Ldn. Type of analyses:	disturbance a possible
						– using original	Multiple logistic	modifier
						WNS scale	regression models	between noise
						(Weinstein, 1978),	Sample size	exposure,
						and a modified	relating to the	sensitivity and
						scale (WNS-6B);	effect size:	psychiatric
						Disturbances of	n=323 with	cases.

15	Public Health, 2007	Population: adult residents living in noisy area, total n=159, aged <18 to >50yrs. Cross sectional study	Noise exposure: road and railway traffic noise levels measured at each point of the selected area three times for a week; Noise source: road and railway traffic Noise metrics: Average L (dBA) Noise groups: ≤65 dBA, >65 dBA	Comparator: High acoustic exposure group (>65 dBA) compared to low acoustic exposure group (≤65 dBA)	Confounding : Age, gender, educational level, hours spent at home, acoustic exposure level	daily life – sleep disturbance, speech interference, disturbance of watching TV (all assessed using a 5-point scale) Outcomes: Health status – Short-Form 36 item questionnaire (Apolone & Mosconi 1997), with four subscales: general health, vitality, emotional role and status, and mental health	complete data Findings: People with high acoustic exposure had a significantly lower (worse) score on the mental health scale in comparison to low exposure level. High exposure is inversely associated with mental health scores in women only (adjusted). Type of analyses: Multiple linear regression models Sample size relating to the effect size: n=159 with complete data	Comments: Findings: People with high education level had significantly higher (better) scores on the general health scale, mental health subscale and emotional role subscale. Age and hours spent at home were inversely associated with all subscales.
	See Schreckenberg et al, Noise & Health, 2010							
16		Population : adult residents living near motorways, control area matched for	Noise exposure: road traffic noise levels modelled on	Comparator: Motorway group compared to	Confounding : Area of dwelling, noise sensitivity	Outcomes: Health-related quality of life – short form of	Findings: People from motorway area had lower scores on total	Comments: Findings: Noise sensitivity significantly

		socio-demographics, total n=502, aged 18 to >70yrs. Selection: n=1250 approached, n=502 returned, response rate 40.1% Cross sectional study	motorways based on traffic count; Noise source: road traffic Noise metrics: Ldn (dBA) Noise groups: Motorway group (Ldn 75-77 dBA), non- motorway group (Ldn 50-61 dBA)	non- motorway group		WHO scale (WHOQOL), including subscales: physical, psychological, social, environmental; Neighborhood satisfaction - Noise sensitivity - single question, agreement; Noise sensitivity - self-rated into three categories (none, moderate, severe); Noise annoyance - from road traffic and railway traffic (Fields, 1993); Annoyance by traffic fumes -	quality of life scale and all subscales. Noise annoyance and annoyance from traffic fumes were significantly related to lower quality of life on all subscales in the whole sample and in the motorway group. Type of analyses: Spearman's and Pearson's correlation, analysis of variance (ANOVA) Sample size relating to the effect size: n=257 from high-noise area, n=245 from low-noise area	modified the association between quality of life and area of dwelling.
17	Brink 2011, Environment International	Population : adult residents from a household survey, n=8261, mean age 45 yrs. Nationwide cohort :	Noise exposure: road traffic, railway, aircraft noise were modeled at daytime and	Comparator : lower levels of noise exposure (per 5 dBA)	Confounding : Age, sex, body mass index, socioeconomic status, financial satisfaction,	self-rated Outcomes: Subjective health status – self- rated 5-point Likert scale;	Findings: Road traffic and railway noise exposure are significantly related to	Comments: Findings: Age and sex are the strongest determinants of subjective
		Swiss Household Panel survey on living conditions, cases collected from 2004 to 2007 Cross-sectional	nighttime Noise source: road traffic and railway Noise metrics: Lday, Lnight, Ldn (dBA)		satisfaction with living situation, satisfaction with personal relationships, region of residence, Swiss	Satisfaction with health status – self- rated 5-point Likert scale	subjective health only in unadjusted models. Road traffic noise exposure is significantly related to	health; the satisfaction with personal relationships and the financial satisfaction are

			nationality	satisfaction with health status only in unadjusted models. Type of analyses: Hierarchical linear regression models Sample size relating to the effect size: n=8261 with complete data; n=8247 exposed to road traffic noise, n=4685 exposed to railway noise,	related with subjective health.
				n=499 exposed to aircraft noise	
RAILWAY NOISE	1				<u> </u>
LONGITUDINAL EVID	ENCE	 			
See Roswall et al, PLoS One 2015 above					
CROSS-SECTIONAL E	VIDENCE				
See La Torre et al, J Public Health, 2007 above					
See Brink Environment International 2011 above					

Supplementary Table 2: Data extraction for environmental noise effects on medication intake for the treatment of anxiety and depression

Occup Environ Med, 2011adult residents living near 7 airports in six countries, total n=4861, aged 45-70yrs.aircraft and road traffic noise levels modelled daytime (6 am-10 pm) and at night length of residence ≥5yrs in six samplesLeq, 16h and Lnight 10 dBA intervalsAge, gender, body mass index, alcohol intake, physical activity, education, smoking, aircraft noise annoyanceThe use of anxiolytics was significantly related to aircraft in the self-reported use in the previous 2Find was significantly related to aircraft in the activity, education, smoking, aircraft noise annoyancePrescribed medication use – self-reported use anxiolytics, hypnotics, anti- depressants, antacids, anti- hypertensives,The use of anxiolytics was significantly related to aircraft in the some some some some anxiolytics, higher per 10 dBA)Find some some some some some some anxiolytics, hypnotics, anti- depressants, antacids, anti- hypertensives,Prescribed medication use – self-reported use in the previous 2The use of anxiolytics some some some some some some some some anxiolytics, higher per 10 dBA)Find some some some some some some some some antacids, anti- hypertensives,Prescribed medication use – self-reported use in the previous 2The use of anxiolytics some some some some dBA)Find some <br< th=""><th>Reference</th><th>Population: general population in settings (hospitals, residences, public venues, educational facilities) + response rate and other selection /bias factors Cross- sectional or longitudinal</th><th>Exposure: exposure to high levels of environmental noise from various noise sources + noise metric involved + modelled or measured noise</th><th>Comparator: no noise exposure or lower levels of noise exposure</th><th>Confounding: adjusted for confounding</th><th>Outcome: assessment of outcome</th><th>Findings: expressed as effect per dB if possible. Type of analyses Sample size relating to the effect size</th><th>Comments: Anything else to note</th></br<>	Reference	Population: general population in settings (hospitals, residences, public venues, educational facilities) + response rate and other selection /bias factors Cross- sectional or longitudinal	Exposure: exposure to high levels of environmental noise from various noise sources + noise metric involved + modelled or measured noise	Comparator: no noise exposure or lower levels of noise exposure	Confounding : adjusted for confounding	Outcome: assessment of outcome	Findings: expressed as effect per dB if possible. Type of analyses Sample size relating to the effect size	Comments: Anything else to note
CROSS-SECTIONAL EVIDENCE1.Floud et al, Occup Environ Med, 2011Population: adult residents living near 7 airports in six countries, total $n=4861$, aged $45-70yrs$.Noise exposure: aircraft and road traffic noise levels modelled in the area at daytime (6 am-10 pm) and at night length of residence $\geq 5yrs$ Comparator: Leq, 16h and Lnight 10 dBA intervalsConfounding: Age, gender, body mass index, alcohol intake, physical activity, education, smoking, aircraft noise annoyanceOutcomes: Prescribed medication use – self-reported use in the previous 2Findings: The use of anxiolytics was significantly related to aircraft noise, both with betwo daytime (1.28 times noise annoyanceComparator: Age, gender, body mass index, alcohol intake, physical activity, education, smoking, aircraft noise annoyanceFindings: The use of anxiolytics was significantly related to aircraft noise, both with betwo depressants, antacids, anti- hypertensives,Com		JSURE						
Occup Environ Med, 2011adult residents living near 7 airports in six countries, total n=4861, aged 45-70yrs.aircraft and road traffic noise levels modelled daytime (6 am-10 pm) and at night length of residence ≥5yrs in six samplesLeq,16h and traffic noise levels modelled dBA intervalsAge, gender, body mass index, alcohol intake, physical activity, education, smoking, aircraft noise annoyanceThe use of anxiolytics was significantly related to aircraft in the second medication use – self-reported use anxiolytics, hypnotics, anti- antacids, anti- hypertensives,The use of anxiolytics was significantly related to aircraft in the some anxiolytics, higher per 10 dBA) antacids, anti- hypertensives,Find was significantly related to aircraft moise activity, education, some anxiolytics, hypnotics, anti- antacids, anti- hypertensives,The use of anxiolytics was significantly related to aircraft moise some some antic depressants, antacids, anti- hypertensives,The use of anxiolytics was significantly related to aircraft some some depressants, antacids, anti- hypertensives,Find was significantly related to aircraft moise some some some some some some anxiolytics, higher per 10 dBA)Image: mather mather mather antacids, anti- in six samplesaircraft and road traffic noise traffic		IDENCE						
Med, 2011living near 7 airports in six countries, total $n=4861$, aged 45 -70yrs.traffic noise levels modelled in the area at daytime (6 am-10 pm) and at night length of n is is samplesLnight 10 dBA intervalsmass index, alcohol intake, physical activity, education, smoking, aircraft noise annoyancemedication use – self-reported use in the previous 2 weeks, including anxiolytics, higher per 10 dBA)was significantly related to aircraft in the betwo daytime (1.28 times higher per 10 dBA)Some in the self-reported use anxiolytics, hypnotics, anti- antacids, anti- hypertensives,was significantly related to aircraft in the betwo anxiolytics, antacids, anti- hypertensives,was significantly related to aircraft in the betwo anxiolytics, and with Lnight (1.27 drugs antacids, anti- hypertensives,Med, 2011living near 7 airports in six countries, total mass index, alcohol in the area at daytime (6 am-10 pm) and at night in six samplesLnight 10 daytime (6 am-10 pm) and at night in six samplesLnight 10 daytime (10 pm-6 am or mos and an or times higher per 10 betwo antacids, anti- hypertensives,was significantly related to aircraft moise annoyanceSome self-reported use anxiolytics, higher per 10 dBA) dBA increase).Some countries times higher per 10 betwo to use		1	-	-	Ũ		8	Comments:
airports in six countries, total $n=4861, aged$ levels modelled in the area at daytime (6 am-10 pm or 7 am-11dBA intervalsintake, physical activity, education, smoking, aircraft noise annoyanceself-reported use in the previous 2 weeks, including anxiolytics, higher per 10 dBA)related to aircraft noise, both with betweet betweet betweet betweet anxiolytics, higher per 10 dBA)in the daytime (1.28 times higher per 10 dBA)in the betweet of hypertensives,Inclusion: length of residence $\geq 5yrs$ in six samplespm or 7 am-11 (10 pm-6 am or 11 pm-7 am)moise annoyanceself-reported use in the previous 2 weeks, including anxiolytics, antacids, anti- hypertensives,related to aircraft in the betweet activity, education, smoking, aircraft antacids, anti- hypertensives,related to aircraft in the betweet times higher per 10 dBA)in the betweet of hypertensives,								Findings: Some differences
countries, total $n=4861, aged$ in the area at daytime (6 am-10 pm or 7 am-11activity, education, 	Nied, 2011	0			· · ·		8	in the association
n=4861, aged 45-70yrs.daytime (6 am-10 pm or 7 am-11smoking, aircraft noise annoyanceweeks, including anxiolytics,Ldaytime (1.28 times higher per 10 dBA)noise of hy of hy drugsInclusion: length of residence $\geq 5yrs$ pm) and at night (10 pm-6 am or in six samples11 pm-7 am)noise annoyanceanxiolytics, antacids, anti- hypertensives,Ldaytime (1.28 times higher per 10 dBA)noise of hy of hy and with Lnight (1.27				dD/Y miler vals				between aircraft
45-70yrs.pm or 7 am-11noise annoyanceanxiolytics,higher per 10 dBA)of hyInclusion:pm) and at nightpm) and at nighthypnotics, anti-and with Lnight (1.27)drugslength of(10 pm-6 am or11 pm-7 am)antacids, anti-dBA increase).betweenin six samplesNoise source:Noise source:hypertensives,People annoyed byhigher								noise and the use
length of residence $\geq 5yrs$ (10 pm-6 am or 11 pm-7 am)depressants, antacids, anti- hypertensives,times higher per 10 dBA increase).between count higherNoise source:Noise source:hypertensives,People annoyed byhigher		45-70yrs.	pm or 7 am-11			anxiolytics,	higher per 10 dBA)	of hypertensive
residence \geq 5yrs11 pm-7 am)antacids, anti- hypertensives,dBA increase).count higherin six samplesNoise source:hypertensives,People annoyed byhigher						• I		drugs reported
in six samples Noise source: hypertensives, People annoyed by higher								between the
			1 /					countries (the
						* 1	1 0 0	highest in UK,
						,		the lowest in Italy).

ROAD	TRAFFIC NOISE	Cross sectional study	Noise metrics: aircraft noise: Leq,16h daytime, Lnight (dBA); road traffic noise: Leq,24h Noise groups: aircraft noise: cut-off for Ldaytime 35 dBA, for Lnight 30 dBA; road traffic noise: cut- off 45 dBA			- by aircraft and road traffic noise, using 11-point numerical scale (ISO/TS 15666: 2003)	odds of taking: anti- hypertensives, anxiolytics or hypnotics (group), anxiolytics only, anti- depressants. Type of analyses: Hierarchical multilevel logistic regression, Spearman's correlation Sample size relating to the effect size: n=4641-4646 with complete data	No association between road traffic noise and use of any medication. Positive (but non- significant) association between road traffic noise and the use of antihypertensives or antacids in men.
ADULT	POPULATIONS							
2.	Bocquier et al, Eur J Public Health, 2013	Population: adult residents from a cohort study in one city, total n=190 617, aged 18-64yrs. Cross sectional study	Noise exposure: road traffic noise levels modeled in the city Noise source: road traffic at nighttime Noise metrics: Lnight (dBA) Noise groups: <45 dBA (21.4% of population), 45–50 dBA (31.6%), 50–55 dBA (35.2%), >55 dBA (11.8%)	Comparator: Lnight 5 dBA intervals	Confounding: Deprivation level calculated from: individual characteristics (sociodemographic, consultations with GP, chronic psychiatric disorder), char. of prescribers (demographic, specialty, work load), and neighborhood char. (medical density, complaints filed for noise)	Outcomes: Anxiolytic- hypnotic drug use – from National Health Insurance Fund, classified as N05B, N05CD and N05CF	Findings: Among persons from the low deprivation stratum, the risk of purchasing higher numbers of anxiolytics-hypnotics was higher only for Lnight levels >55 dB(A) (adjusted model). Type of analyses: Kruskal-Wallis test, Zero-inflated negative binomial (ZINB) model Sample size relating to the effect size: n=190 617	Comments: Findings: The proportion of persons exposed to high night- time noise levels increased with deprivation level.
3.	Halonen et al,	Population:	Noise exposure:	Comparator:	Confounding:	Outcomes:	Findings:	Comments:
	Scand J Work	adult residents	road traffic noise	Five noise	Trait anxiety as an	Self-rated health	Men exposed to road	Findings:

Environ Healt	h, from a cohort	levels modeled	level groups	indicator of noise	– using a 5-point	traffic noise >60 dBA	No association
2014	study in three	for the streets		sensitivity; age, sex,	scale;	had poorer self-rated	between noise
	towns, total	Noise source:		occupational status,	Psychotropic	health compared to	exposure and use
	n=15 611, aged	road traffic		education level, size	medication use -	men exposed to ≤45	of psychotropic
	21-76yrs.	Noise metrics:		of apartment, job	from National	dBA. The association	medication in
	Cross sectional	Lden (dBA)		strain, smoking,	Prescriptions	was significant even	men and women.
	study	Noise groups:		leisure-time	Register, including	after adjustment for	
		≤45 dBA		physical activity,	anxiolytics,	trait anxiety, smoking,	
		(n=2821), 45.1–		obesity, heavy	antidepressants,	alcohol, obesity,	
		50 dBA		alcohol drinking,	and hypnotics;	physical inactivity.	
		(n=4110), 50.1–		chronic illness,	Trait anxiety	Type of analyses:	
		55 dBA		area-level socio-	score – based on a	Logistic regression	
		(n=3597), 55.1–		economic status,	6-item inventory	models	
		60 dBA		population density		Sample size relating	
		(n=2445), >60				to the effect size:	
		dBA (n=2638)				n=15611 with	
						complete data	

Supplementary Table 3: Data extraction for associations of environmental noise exposure and self-reported anxiety and depression

	Reference OISE EXPOSURI	Population: general population in settings (hospitals, residences, public venues, educational facilities) + response rate and other selection /bias factors Cross-sectional or longitudinal	Exposure: exposure to high levels of environmental noise from various noise sources + noise metric involved + modelled or measured noise	Comparator: no noise exposure or lower levels of noise exposure	Confounding : adjusted for confounding	Outcome: assessment of outcome	Findings: expressed as effect per dB if possible. Type of analyses Sample size relating to the effect size	Comments: Anything else to note
	POPULATIONS							
INTERV	ENTION EVIDEN					I _		
1.	Stansfeld et al,	Population:	Noise exposure:	Comparator:	Confounding:	Outcomes:	Findings:	Comments:
	Noise Health,	adult residents	road traffic noise	Noise	Deprivation index	Health status –	At baseline, people	Findings:
	2009	living in noisy	levels measured	exposed	(Townsend's scale	SF-36 General	from high and low	At follow-up,
		and quiet areas,	between 10 am	group	including: car	Health Survey	noise groups had	there was a
		total n=387,	and 5 pm on	compared to	ownership, home	(Ware &	similar health status.	decrease in noise
		aged 16-90yrs.	weekdays;	control	ownership,	Sherbourne 1992);	At follow-up no	annoyance in the
		Response rate at	Noise source:	group;	crowding,	Psychological	differences in health	high noise
		baseline 70%, at	road traffic	within-	unemployment),	distress – General	status between the	group.
		follow-up 74%	Noise metrics:	subjects	baseline health,	Health	groups.	
		Longitudinal	Leq, L10 (dBA)	comparison	age, sex	Questionnaire	At follow-up, after the	
		/Intervention	Noise groups:			(GHQ), 28 items	bypass opened, there	
		study, baseline	noise exposed			(Goldberg &	was a decrease in	
		in 1997, n=337,	group (facing the			Hillier, 1979);	prevalence rates of	
		follow-up in	main street,			Prevalence of	mental disorder in	
		1998, n=228	L ₁₀ =75-78 dBA),			mental disorders	both groups.	
		after the	control group (on			– assessed by the	Type of analyses:	
		opening of a	uncongested side			Revised Clinical	Univariate analyses of	
		bypass road	streets, L ₁₀ =55-58			Interview	covariance	

		(change of noise level by 2-4 dBA)	dBA)			Schedule (Lewis et al, 1992); Noise annoyance – from neighbors, road traffic and train noise (Fields, 1992)	(ANCOVA), Univariate analyses of covariance adjusted for baseline health status Sample size relating to the effect size: n=387 with complete data; n=71 interviewed for prevalence of mental disorder	
2.	SECTIONAL EVI Kishikawa, et al, Noise Health, 2009	Population: adult residents living along truck roads, total n=323, aged 20-70yrs. Selection: n=486 approached, response rate 88.2%, exclusion: aged over 70yrs. Cross sectional study	Noise exposure: road traffic noise levels at home measured in the area for 24 hours; Noise source: traffic on the trunk roads Noise metrics: Ldn (dBA) Noise groups: <55 dBA, 55-65 dBA, >65 dBA	Comparator: lower levels of noise exposure	Confounding: Age, gender, socioeconomic status, noise sensitivity (sensitive vs. insensitive)	Outcomes: Subjective health – using General Health Questionnaire GHQ-28 (Goldberg, 1978) with four subscales (somatic symptoms, anxiety & insomnia, social dysfunction, severe depression); Noise sensitivity – using original WNS scale (Weinstein, 1978), and a modified scale (WNS-6B); Disturbances of daily life – sleep disturbance, speech	Findings: Among noise sensitive persons, the odds ratios for overall GHQ scale, somatic symptoms and anxiety and insomnia increased significantly with Ldn. Among noise- insensitive persons the odds ratio for social dysfunction decreased with Ldn. Type of analyses: Multiple logistic regression models Sample size relating to the effect size: n=323 with complete data	Comments: Findings: Among noise- sensitive persons in the highest noise exposure group (>65 dBA), the odds ratio for psychiatric cases on GHQ scale increased with sleep disturbance – sleep disturbance a possible modifier between noise exposure, sensitivity and psychiatric cases.

3.	Honold et al, J Environ Psychol, 2012	Population: adult residents living in high noise, high air pollution area, total n=428, aged 16-91yrs. Selection: n=2000 approached, n=428 returned, response rate 21.4% Cross sectional study	Noise exposure: road traffic noise levels modeled in the area; Noise source: air traffic Noise metrics: not specified, probably Leq,24h (dBA) Noise groups: High-burden blocks (high noise >65 dBA, high air pollution), low- burden blocks (noise ≤50 dBA)	Comparator: High-burden group compared to low-burden group	Confounding : Gender, age, educational attainment, nationality, marital status, employment, occupational position, size of community, use of medications, housing conditions	interference, disturbance of watching TV (all assessed using a 5-point scale) Outcomes: Neighborhood satisfaction – using a 4-item scale (Feuersenger, 2004); Life satisfaction – assessed using an 5-item scale (Diener et al, 1985); Health behavior – smoking, alcohol intake, physical activity (Feldman & Steptoe, 2004);	Findings: People from high burden blocks had significantly lower neighborhood satisfaction, and poorer health behavior. Poor health behavior was related to employment, perceived traffic noise and perceived air quality. Type of analyses: Analysis of variance (ANOVA), logistic regression, analysis of	Comments: Findings: No difference in life satisfaction, general physical health, anxiety and depression between high- burden and low- burden groups. Perceived air quality was related to life satisfaction, general health, anxiety and depression.
			high air pollution), low- burden blocks			alcohol intake, physical activity (Feldman & Steptoe, 2004); General physical health – one item from the SF-36 health survey (Bullinger & Kirchberger, 1998);	Type of analyses: Analysis of variance (ANOVA), logistic regression, analysis of covariance (ANCOVA), hierarchical regression analysis Sample size relating to the effect size: n=215 from high-	general health, anxiety and
						Depression and anxiety – items on the Brief Symptom Inventory (Franke, 2000); Environmental perception – six factors, 5-point	burden group, n=213 from low-burden group	

						scale; Environmental stress appraisal /annoyance – four factors, 5-point scale		
4.	Sygna et al, Environ Res, 2014	Population: adult residents living in one city, total n=2898, aged 18-88yrs. Selection: n=5390 eligible, n=3262 returned the questionnaire, response rate 60.5% Cross sectional study	Noise exposure: road traffic noise levels at the most exposed façade were obtained from official noise maps Noise source : road traffic Noise metrics : Lden (dBA) Noise groups : exposed to road traffic noise	Comparator: Lower noise levels	Confounding : Age, gender, socioeconomic status (income, education, employment), somatic diseases, noise sensitivity, sleep quality categories	Outcomes: Psychological distress – measured by Hopkins Symptom Checklist-25 (HSCL- 25) (Derogatis et al, 1974, Strand et al, 2003); probable mental disorder defined when mean score ≥1.55; Sleep quality – self-reported; Noise sensitivity – modified Weinstein's scale (Weinstein, 1978)	Findings: In the group with poor sleep quality, the mean score of psychological distress increased by 0.08 per 10 dBA increase in road traffic noise exposure (unadjusted model). In the group with poor sleep quality, the odds for probable mental disorder increased by 47% per 10 dBA increase of Lden (unadjusted). Type of analyses: Linear regression, logistic regression Sample size relating to the effect size: n=2774 with complete data, n=274 with poor sleep quality	Comments: Findings: In the groups with medium and good sleep quality, there was no association between noise exposure and the mean score of psychological distress or the odds for probable mental disorder. Conclusion: Sleep quality may be modify the relationship between noise and mental health.

Supplementary Table 4: Data extraction for environmental noise effects on interviewer assessed depression and anxiety

	Reference	Population: general population in settings (hospitals, residences, public venues, educational facilities) + response rate and other selection /bias factors	Exposure: exposure to high levels of environmental noise from various noise sources + noise metric involved + modelled or measured noise	Comparator: no noise exposure or lower levels of noise exposure	Confounding: adjusted for confounding	Outcome: assessment of outcome	Findings: expressed as effect per dB if possible. Type of analyses Sample size relating to the effect size	Comments: Anything else to note
		Cross-sectional						
DOADN		or longitudinal						
	OISE EXPOSUR POPULATIONS	E						
	ENTION EVIDE	NCF						
1.	Stansfeld et al.	Population:	Noise exposure:	Comparator:	Confounding:	Outcomes:	Findings:	Comments:
1.	Noise Health,	adult residents	road traffic noise	Noise	Deprivation index	Health status –	At baseline, people	Findings:
	2009	living in noisy	levels measured	exposed	(Townsend's scale	SF-36 General	from high and low	At follow-up,
		and quiet areas,	between 10 am	group	including: car	Health Survey	noise groups had	there was a
		total n=387,	and 5 pm on	compared to	ownership, home	(Ware &	similar health status.	decrease in noise
		aged 16-90yrs.	weekdays;	control	ownership,	Sherbourne 1992);	At follow-up no	annoyance in the
		Response rate at	Noise source:	group;	crowding,	Psychological	differences in health	high noise group.
		baseline 70%, at	road traffic	within-	unemployment),	distress – General	status between the	
		follow-up 74%	Noise metrics:	subjects	baseline health,	Health	groups.	
		Longitudinal	Leq, L10 (dBA)	comparison	age, sex	Questionnaire	At follow-up, after the	
		/Intervention	Noise groups:			(GHQ), 28 items	bypass opened, there	
		study, baseline	noise exposed			(Goldberg &	was a decrease in	
		in 1997, n=337,	group (facing the			Hillier, 1979);	prevalence rates of	
		follow-up in	main street,			Prevalence of	mental disorder in	
		1998, n=228	L ₁₀ =75-78 dBA),			mental disorders	both groups.	
		after the	control group (on			– assessed by the	Type of analyses:	
		opening of a	uncongested side			Revised Clinical	Univariate analyses of	
		bypass road	streets, L ₁₀ =55-58			Interview	covariance	

		(change of noise level by 2-4 dBA)	dBA)			Schedule (Lewis et al, 1992); Noise annoyance – from neighbors, road traffic and train noise (Fields, 1992)	(ANCOVA), Univariate analyses of covariance adjusted for baseline health status Sample size relating to the effect size: n=387 with complete data; n=71 interviewed for prevalence of mental disorder	
-	FT NOISE EXPO							
2.	Hardoy et al, Soc Psychiatry Psychiatr Epidemiol, 2005	Population: adult residents living in a suburban estate near an airport and quiet districts, total n=111 eligible from exposed area, n=1040 eligible from control area, aged over 18yrs. Selection: Control group matched for sex, age, employment Cross sectional study	Noise exposure: not explained Noise source: aircraft noise Noise metric: not specified	Comparator: Aircraft noise- exposed group compared to quiet area	Confounding: Not specified	Outcomes: Life-time prevalence of psychiatric disorders – assessed by a psychiatric interview, including Generalized Anxiety Disorder (GAD), Anxiety Disorder not otherwise specified (NOS), Major Depressive Disorder, Eating Disorder	Findings: People from aircraft- exposed area had higher lifetime prevalence of GAD and NOS in comparison to persons from quiet areas. Type of analyses: Univariate analysis Sample size relating to the effect size: n=71 from aircraft noise exposed group, n=284 from quiet area	Comments: The method is observational, no correlation with noise exposure.

	Reference	Population: general population in settings (hospitals, residences, public venues, educational facilities) + response rate and other selection /bias factors Cross- sectional or longitudinal	Exposure: exposure to high levels of environmental noise from various noise sources + noise metric involved + modelled or measured noise	Comparator: no noise exposure or lower levels of noise exposure	Confounding : adjusted for confounding	Outcome: assessment of outcome	Findings: expressed as effect per dB if possible. Type of analyses Sample size relating to the effect size	Comments: Anything else to note
AIRCRAFT	NOISE EXPOS							
	PULATIONS							
CROSS-SE	CTIONAL EVIE	DENCE						
1.	Clark et al,	Population:	Noise exposure:	Comparator :	Confounding:	Outcome:	Findings:	Comments:
	Am J	school	aircraft noise	lower levels	Modelled	Perceived	No association between	Findings:
	Epidemol,	children, total	levels at home	of noise	concentrations of	child's health –	aircraft and road traffic	No association
	2012	n=960, aged 9-	and at school	exposure	NO2 (µg/m3);	very good/good	noise and self-rated	between aircraft
		10yrs.	measured in an		age, gender, socio-	vs. fair/poor/very	health or psychological	and road traffic
		Cross	area from 7 am		economic status	poor, perceived	distress	noise and
		sectional study	to 11 pm; road		(employment, home	by parents;	Type of analyses:	systolic and
			traffic noise at		ownership, home	Psychological	Multilevel linear and	diastolic blood
			school		crowding),	distress	logistic regression	pressure
			combined from		ethnicity, maternal	measured using	models	
			measurements		education, main	Strengths and	Sample size relating to	
			and models		language spoken at	Difficulties	the effect size:	
			Noise source:		home, long-	Questionnaire	n=719 with air pollution	
			aircraft and road traffic		standing illness,	(Goodman,	data and n=241 without	
			Noise metrics:		parental support for	1997), fulfilled	air pollution data	
					schoolwork,	by parents		
2	Clark at -1 I	Donulottore	LAeq, 16h (dB)	Composed	classroom glazing	Outcome	Findinga	Commontes
2.	Clark et al, J	Population:	Noise exposure:	Compared	Confounding:	Outcome:	Findings:	Comments:

Supplementary Table 5: Data extraction for associations of environmental noise exposure and emotional and conduct disorders in children

	Enviro	school	aircraft noise	to: noise	age, gender,	Psychological	Increase of aircraft noise	Findings:
	Psychol, 2013	children, total	levels at primary	levels at	employment,	distress	at secondary school by 1	Increase of
	1 59 01101, 2010	n=461, aged	and secondary	secondary	home ownership,	(including	dB was non-	aircraft noise at
		15-16yrs.	schools	schools	home crowding,	emotional	significantly associated	primary school
		Sampling	measured in an	compared to	mother's	symptoms,	with a	or of cumulative
		procedure:	area from 7 am	noise levels	educational	conduct	decrease in	aircraft noise at
		baseline	to 11 pm; road	at primary	attainment,	problems and	psychological	school by 1 dB
		sample tested	traffic noise at	schools	long-standing	hyperactivity)	distress by 0.023 marks,	were
		in 2001-2003:	school	Seneois	illness, parental	was measured	and in emotional	significantly
		1355 children	combined from		support for school	using Strengths	symptoms by 0.034	associated with
		aged 9-10yrs;	measurements		work at baseline,	and Difficulties	points; and with an	an increase of
		follow-up	and models		classroom glazing	Questionnaire	increase of hyperactivity	aircraft noise
		sample testing	available for		at primary school,	(Goodman,	by 0.001 marks, and of	annoyance
		in 2008: 1015	elementary		road traffic noise	1997), fulfilled	conduct problems by	unitoyunee
		children	schools		Toud thurne house	by parents at	0.011 marks;	
		eligible for	Noise source:			baseline,	Increase of aircraft noise	
		testing, 461	aircraft			fulfilled by	at secondary school by 1	
		children	Noise metrics:			children at	dB was significantly	
		participated,	LAeq, 16h (dB)			follow-up;	associated with an	
		aged 14-15;	Li ieq, ion (uD)			Aircraft noise	increase of noise	
		response rate				annoyance	annoyance by 0.048	
		45.4%				measured by 5-	marks (unadjusted), or	
		Longitudinal				point scale (ISO	0.043 marks (adjusted)	
		study; follow-				2003) at baseline	Type of analyses:	
		up period: 6				and at follow-up	Multilevel linear	
		years				fulfilled by	regression analyses	
		(2001/2003-				children	Sample size relating to	
		2008)				ennaren	the effect size:	
		2000)					n=461 with complete	
							data	
3.	Crombie et al,	Population :	Noise exposure:	Compared	Confounding:	Outcome:	Findings:	Comments:
	Enviro Health,	school	aircraft noise	to: lower	early biological risk	Mental health	Increase of aircraft	Findings:
	2011	children, 89	levels at school	levels of	(low birth weight or	was measured	noise at school by 1 dB	Aircraft noise at
		schools around	measured in an	noise	born prematurely);	using Strengths	was significantly	school was not
		three airports,	area from 7 am	exposure	country, gender,	and Difficulties	associated with an	associated with
		total $n=2279$,	to 11 pm; road	r	age, employment	Questionnaire	increase of hyperactivity	overall mental
		aged 10yrs.	traffic noise at		status, crowding at	(subscales:	by 0.01 points (adjusted	health score,
		Response rate:	school modelled		home, home	emotional	for all confounders,	emotional
		89%	or combination		ownership,	symptoms,	except biological risk).	symptoms, and
	1			1				- ,

		Cross sectional study	of measurements with models Noise source: aircraft and road traffic Noise metrics: LAeq, 16h (dB)		mother's education, long-standing illness, main language spoken at home, parental support for school work, classroom glazing	conduct problems and hyperactivity) (Goodman, 1997), fulfilled by parents;	Increase of road traffic noise at school by 1 dB was significantly associated with an increase of conduct problems by 0.01 points (fully adjusted). Type of analyses: Multilevel linear regression analyses Sample size relating to the effect size: n=1900 with complete data	conduct problems (either unadjusted or adjusted for early biological risk). Road traffic noise at school was not associated with overall mental health score, emotional symptoms, and hyperactivity (either unadjusted or adjusted for early biological risk). No interaction between noise avacura and
4.	Stansfeld et al, J Enviro Psychol, 2009	Population: school children, 89 schools around three airports, total n=2844, aged 9-10yrs. Response rate 89% among children, 80% among parents. Cross sectional study	Noise exposure: aircraft noise levels at home and at school measured in an area from 7 am to 11 pm; road traffic noise at school modelled or combination of measurements with models Noise source:	Comparator : lower levels of noise exposure	Confounding: age, gender, country, socio- economic position – occupation, employment, free meal at school, maternal education, ethnicity, main language spoken at home; home ownership, crowding, long- standing illness,	Outcomes: Mental health measured using Strengths and Difficulties Questionnaire (Goodman, 1997), fulfilled by parents, subscales: hyperactivity, conduct disorder, peer problems, prosocial	Findings: Increase of aircraft noise at school by 1 dB was significantly associated with an increase of hyperactivity score by 0.013 points. Increase of road-traffic noise at school by 1 dB was significantly associated with a decrease of conduct disorder by 0.010 points. Type of analyses:	exposure and early biological risk. Comments: Findings: No association between aircraft or road traffic noise and children's mental health (total SDQ score).

			aircraft and road traffic Noise metrics : LAeq, 16h (dB)		parental support, classroom glazing, other noise exposure	behavior, emotional problems; Attention- Deficit Hyperactivity Disorder (ADHD) – assessed by parental questionnaire	Multilevel model analyses Sample size relating to the effect size: n=2844	
	Stansfeld et al, Lancet, 2005	Population: school children, 89 schools around three airports, total n=2844, aged 9-13yrs. Cross sectional study	Noise exposure: aircraft noise levels at home and at school measured in an area from 7 am to 11 pm; road traffic noise at school modelled or combination of measurements with models Noise source: aircraft and road traffic Noise metrics: LAeq, 16h (dB)	Comparator: lower levels of noise exposure	Confounding: age, gender, parental employment, home ownership, home crowding, mother's educational attainment, long-standing illness, main language spoken at home, parental support for school work, classroom glazing	Outcomes: Self-reported health – perceived by children; Psychological distress – perceived children's mental health, measured using Strengths and Difficulties Questionnaire (Goodman, 1997), fulfilled by parents Aircraft noise annoyance measured by 5- point scale (ISO 2003) fulfilled by children	Findings: Increase of aircraft noise at school by 1 dB was significantly associated with an increase of noise annoyance by 0.037 marks. Increase of road traffic noise at school by 1 dB was significantly associated with an increase of noise annoyance by 0.016 marks. Type of analyses: Multilevel model analyses (for data clustering) Sample size relating to the effect size: range from 1939 to 2014 with complete data	Comments: Findings: No association between aircraft and road traffic noise and self- reported health, and perceived children's mental health.
LONGITUD	INAL EVIDEN	CE						
6.	Hjorteberg et al, Env Health	Population : a total of 46.940	Noise exposure: noise levels	Comparison: Children	Confounding: Age, sex,	Outcomes: Behavioral	Findings: An increase of Lden per	Comments: No association

Perspect, 2015	7-year old children Selection: Inclusion: only children from first pregnancy were included out of 57,281 eligible children; Exclusion: missing data Study design: national birth cohort	were modeled Noise source: road traffic and railway noise Noise metrics: Lden (dBA) Noise exposure intervals: 1) during pregnancy, and 2) from birth to 7 years	exposed to higher noise levels compared to children exposed to lower noise levels	gestational age, birth weight, maternal age at delivery, parity, smoking during pregnancy, alcohol during pregnancy, education level, income, railway and airport noise, maternal mental health problems, time-weighted NOx level	problems – measured with Strengths and Difficulties Questionnaire (SDQ-Danish version, Goodman, 1997; Obel et al, 2003); subscales: emotional symptoms, conduct problems, hyperactivity/ inattention, peer relationship problems; fulfilled by mother; scores were classified as normal/ borderline/	10 dBA for road-traffic noise from birth to 7 years significantly increases odds ratios for abnormal total scores, for borderline and abnormal hyperactivity/ inattention scores, for abnormal conduct problem scores and for abnormal peer relationship scores. An increase of Lden per 10 dBA for railway noise from birth to 7 years significantly increases ORs for abnormal total scores, and for abnormal peer relationship scores. Type of analyses: Multinomial logistic regression, logistic	between exposure to road traffic /railway noise during pregnancy and behavioral problems. No significant effect modification by sec, low birth weight, educational level, income.
CROSS-SECTIONAL EVI					fulfilled by mother; scores were classified as normal/	and for abnormal peer relationship scores. Type of analyses: Multinomial logistic	

7.	Tiesler et al, Enviro Res, 2013	Population: two birth cohorts, school children, total n=872, aged 10yrs. Inclusion criteria: participation at 10-year follow up of the cohort, available noise exposure data, available data on behavioral problems; Exclusion: living less than lyr at given address Cross sectional study	Noise exposure: road traffic noise levels at home and at school modelled from noise maps Noise source: road traffic Noise metrics: Lden (dBA), Lnight (from 10 p.m. to 6 a.m.) (dBA) at the most and the least exposed façade	Comparator: Interquartile range of noise levels	Confounding : Age, sex, study group, parental education, television/computer usage, mother's age at child's birth, single parent status; sleeping alone in the room, bedroom window orientation	Outcomes: Behavioral problems – measured with Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997), (subscales: emotional symptoms, conduct problems, hyperactivity/ inattention, peer relationship problems) fulfilled by parents; Sleep problems – including difficulties falling asleep, problems sleeping through the night	Findings: An increase of Lden and of Lnight (per IQR) at the most exposed façade significantly increased odds ratios for hyperactivity/inattention (crude and adjusted). An increase of Lden and of Lnight (per IQR) at the least exposed façade significantly increased odds ratios for abnormal emotional symptoms (crude and adjusted). Lden and Lnight were not associated with overall behavioral problems (total SDQ score). Type of analyses: Logistic regression analyses, continuation ration models Sample size relating to the effect size: n=872 with complete data, n=287 with complete data on sleep problems	Comments: Findings: No association between Lnight at the most exposed façade and sleep problems. Lnight at the least exposed façade associated with any sleeping problems and problems falling asleep (but not problems during sleeping) (crude and adjusted).
8	Belojevic, et al, J Environ Psychol, 2012	Population: urban school children from eight schools, total n=311, aged 7-11yrs. Sampling	Noise exposure: noise levels measured outside schools (from 9 am to 5 pm, Leq 8h) and in the streets of	Compared to: lower levels of noise exposure	Confounding : Age, gender, socio- economic score – obtained as a sum of standardized mother's highest education level and	Outcome: Executive functioning (defined as decision making, working memory and self-	Findings: All road-traffic noise parameters at home (daytime Leq, nighttime Leq, Leq 24 h, traffic density) were negatively correlated to mean	Comments: Findings: No correlation between noise metrics at school; no effect on girls.

	procedure:	children's	standardized	regulation of	executive functioning	
	2000 children	residences (Leq	income variable	emotions and	score in boys;	
	approached,	24h); traffic		behaviors) -	Road-traffic Leq 24h at	
	1150 parents	density –		scale adapted	home significantly	
	granted	number of light		from Attention	related to executive	
	permission to	and heavy		Deficit Disorder	functioning after	
	participate;	vehicles counted		Questionnaire	adjustment for socio-	
	some teachers	in all streets		(Sears and	economic status in	
	refused to	Noise source:		Thompson,	models.	
	complete	road traffic		1998), children's	Type of analyses:	
	questionnaire.	Noise metrics		functioning was	Correlation coefficients	
	Exclusion	at home:		assessed by	(Pearson's,	
	criterion:	daytime Leq		teachers rated	Spearman's); Multiple	
	living outside	(dBA),			linear regression	
	the selected	nighttime Leq			analysis (Leq 24h at	
	municipality	(dBA), Leq 24h			home as continuous	
	Cross	(dBA), light			variable)	
	sectional study	vehicles at			Sample size relating to	
		daytime and at			the effect size: n=146	
		night (N/hour),			boys	
		heavy vehicles				
		at daytime and				
		at night (N/hour)				
		Noise metrics				
		at school:				
		daytime Leq				
		(dBA); light				
		vehicles at				
		daytime				
		(N/hour), heavy				
		vehicles at				
		daytime				
		(N/hour)				
See Clark et						
al, Am J						
Epidemol,						
2012						
See Crombie						
et al, Enviro						

	Health, 2011				
	See Stansfeld				
	et al, J Enviro				
	Psychol, 2009				
	See Stansfeld				
	et al, Lancet,				
	2005				
RAILWAY	NOISE EXPOSU	JRE			
LONGITUD	DINAL EVIDEN	CE			
	See				
	Hjorteberg et				
	al, Env Health				
	Perspect, 2015				
	above				

	Reference	Population: general population in settings (hospitals, residences, public venues, educational facilities) + response rate and other selection /bias factors Cross-sectional	Exposure: exposure to high levels of environmental noise from various noise sources + noise metric involved + modelled or measured noise	Comparator: no noise exposure or lower levels of noise exposure	Confounding : adjusted for confounding	Outcome: assessment of outcome	Findings: expressed as effect per dB if possible. Type of analyses Sample size relating to the effect size	Comments: Anything else to note
		or longitudinal						
AIRCRA	AFT NOISE EXPC			1	1	1	1	<u> </u>
	POPULATIONS							
CROSS-	SECTIONAL EVI					-		
1.	Clark et al, J	Population:	Noise exposure:	Compared	Confounding:	Outcome:	Findings:	Comments:
	Enviro Psychol, 2013	school children, total n=461, aged 15-16yrs. Sampling procedure : baseline sample tested in 2001- 2003: 1355 children aged 9- 10yrs; follow- up sample testing in 2008: 1015 children eligible for testing, 461 children participated, aged 14-15; response rate 45.4%	aircraft noise levels at primary and secondary schools measured in an area from 7 am to 11 pm; road traffic noise at school combined from measurements and models available for elementary schools Noise source : aircraft Noise metrics : LAeq, 16h (dB)	to: noise levels at secondary schools compared to noise levels at primary schools	age, gender, employment, home ownership, home crowding, mother's educational attainment, long-standing illness, parental support for school work at baseline, classroom glazing at primary school, road traffic noise	Psychological distress (including emotional symptoms, conduct problems and hyperactivity) was measured using Strengths and Difficulties Questionnaire (Goodman, 1997), fulfilled by parents at baseline, fulfilled by children at follow-up; Aircraft noise annoyance measured by 5-point scale (ISO 2003) at baseline and at follow-up fulfilled by children	Increase of aircraft noise at secondary school by 1 dB was non-significantly associated with a decrease in psychological distress by 0.023 marks, and in emotional symptoms by 0.034 points; and with an increase of hyperactivity by 0.001 marks, and of conduct problems by 0.011 marks; Increase of aircraft noise at secondary school by 1 dB was significantly associated with an increase of noise annoyance by 0.048	Findings: Increase of aircraft noise at primary school or of cumulative aircraft noise at school by 1 dB were significantly associated with an increase of aircraft noise annoyance

		Longitudinal study; follow- up period: 6 years (2001/2003- 2008)					marks (unadjusted), or 0.043 marks (adjusted) Type of analyses: Multilevel linear regression analyses Sample size relating to the effect size: n=461 with complete data	
2.	Crombie et al, Enviro Health, 2011	Population: school children, 89 schools around three airports, total n=2279, aged 10yrs. Response rate: 89% Cross sectional study	Noise exposure: aircraft noise levels at school measured in an area from 7 am to 11 pm; road traffic noise at school modelled or combination of measurements with models Noise source: aircraft and road traffic Noise metrics: LAeq, 16h (dB)	Compared to: lower levels of noise exposure	Confounding: early biological risk (low birth weight or born prematurely); country, gender, age, employment status, crowding at home, home ownership, mother's education, long-standing illness, main language spoken at home, parental support for school work, classroom glazing	Outcome: Mental health was measured using Strengths and Difficulties Questionnaire (subscales: emotional symptoms, conduct problems and hyperactivity) (Goodman, 1997), fulfilled by parents;	Findings: Increase of aircraft noise at school by 1 dB was significantly associated with an increase of hyperactivity by 0.01 points (adjusted for all confounders, except biological risk). Increase of road traffic noise at school by 1 dB was significantly associated with an increase of conduct problems by 0.01 points (fully adjusted). Type of analyses: Multilevel linear regression analyses Sample size relating to the effect size: n=1900 with complete data	Comments: Findings: Aircraft noise at school was not associated with overall mental health score, emotional symptoms, and conduct problems (either unadjusted or adjusted for early biological risk). Road traffic noise at school was not associated with overall mental health score, emotional symptoms, and hyperactivity (either unadjusted or adjusted for early biological risk). No interaction between noise exposure and

3. Stansfeld et al, J							risk.
Enviro Psychol, 2009	Population: school children, 89 schools around three airports, total n=2844, aged 9- 10yrs. Response rate 89% among children, 80% among parents. Cross sectional study	Noise exposure: aircraft noise levels at home and at school measured in an area from 7 am to 11 pm; road traffic noise at school modelled or combination of measurements with models Noise source: aircraft and road traffic Noise metrics: LAeq, 16h (dB)	Comparator: lower levels of noise exposure	Confounding: age, gender, country, socio- economic position – occupation, employment, free meal at school, maternal education, ethnicity, main language spoken at home; home ownership, crowding, long- standing illness, parental support, classroom glazing, other noise	Outcomes: Mental health measured using Strengths and Difficulties Questionnaire (Goodman, 1997), fulfilled by parents, subscales: hyperactivity, conduct disorder, peer problems, prosocial behavior, emotional problems; Attention-Deficit Hyperactivity Disorder (ADHD) – assessed by parental	Findings: Increase of aircraft noise at school by 1 dB was significantly associated with an increase of hyperactivity score by 0.013 points. Increase of road-traffic noise at school by 1 dB was significantly associated with a decrease of conduct disorder by 0.010 points. Type of analyses: Multilevel model analyses Sample size relating to	Comments: Findings: No association between aircraft or road traffic noise and children's mental health (total SDQ score).
ROAD TRAFFIC NOISE				exposure	questionnaire	the effect size: n=2844	
LONGITUDINAL EVIDE	NCE						
4. Hjorteberg et al, Env Health Perspect, 2015	Population: a total of 46.940 7-year old children Selection: Inclusion: only children from first pregnancy were included out of 57,281 eligible children; Exclusion: missing data Study design: national birth cohort	Noise exposure: noise levels were modeled Noise source: road traffic and railway noise Noise metrics: Lden (dBA) Noise exposure intervals: 1) during pregnancy, and 2) from birth to 7 years	Comparison: Children exposed to higher noise levels compared to children exposed to lower noise levels	Confounding: Age, sex, gestational age, birth weight, maternal age at delivery, parity, smoking during pregnancy, alcohol during pregnancy, education level, income, railway and airport noise, maternal mental health problems, time-weighted NOx level	Outcomes: Behavioral problems – measured with the hyperactivity/inattention sub-scale from the Strengths and Difficulties Questionnaire (SDQ- Danish version, Goodman, 1997; Obel et al, 2003). This was completed y mother; scores were classified as normal/ borderline/ abnormal (Danish cut- off scores, Youthin Mind, 2015)	Findings: An increase of Lden per 10 dBA for road-traffic noise from birth to 7 years significantly increases odds ratios for abnormal hyperactivity/ inattention scores Type of analyses: Multinomial logistic regression Sample size relating to the effect size: n=46940 for road traffic exposure; n=3770 for railway exposure	Comments: No association between exposure to road traffic /railway noise during pregnancy and hyperactivity problems. No significant effect modification by sec, low birth weight, educational level, income.

	TT: 1 / 1	D 1.4	N T •	a (D : 1	
5.	Tiesler et al,	Population:	Noise exposure:	Comparator:	Confounding:	Outcomes:	Findings:	Comments:
	Enviro Res,	two birth	road traffic noise	Interquartile	Age, sex, study	Behavioral problems –	An increase of Lden and	Findings:
	2013	cohorts, school	levels at home	range of	group, parental	measured with	of Lnight (per IQR) at	No association
		children, total	and at school	noise levels	education,	Strengths and	the most exposed façade	between Lnight
		n=872, aged	modelled from		television/computer	Difficulties	significantly increased	at the most
		10yrs.	noise maps		usage, mother's age	Questionnaire (SDQ,	odds ratios for	exposed façade
		Inclusion	Noise source:		at child's birth,	Goodman, 1997),	hyperactivity/inattention	and sleep
		criteria	road traffic		single parent status;	(subscales: emotional	(crude and adjusted).	problems.
		participation at	Noise metrics:		sleeping alone in	symptoms, conduct	An increase of Lden and	Lnight at the
		10-year follow	Lden (dBA),		the room, bedroom	problems, hyperactivity/	of Lnight (per IQR) at	least exposed
		up of the	Lnight (from 10		window orientation	inattention, peer	the least exposed façade	façade
		cohort,	p.m. to 6 a.m.)			relationship problems)	significantly increased	associated with
		available noise	(dBA) at the most			fulfilled by parents;	odds ratios for abnormal	any sleeping
		exposure data,	and the least			Sleep problems –	emotional symptoms	problems and
		available data	exposed façade			including difficulties	(crude and adjusted).	problems falling
		on behavioral				falling asleep, problems	Lden and Lnight were	asleep (but not
		problems;				sleeping through the	not associated with	problems during
		Exclusion:				night	overall behavioral	sleeping) (crude
		living less than					problems (total SDQ	and adjusted).
		lyr at given					score).	
		address					Type of analyses:	
		Cross sectional					Logistic regression	
		study					analyses, continuation	
							ration models	
							Sample size relating to	
							the effect size:	
							n=872 with complete	
							data, n=287 with	
							complete data on sleep	
							problems	
	See Crombie et							
	al, Enviro							
	Health, 2011							
	See Stansfeld et							
	al, J Enviro							
	Psychol, 2009							

Supplementary Table 7: Data extraction for associations of environmental noise exposure and other mental health outcomes (not falling into any of the above outcome domains)

ReferenceRoad TRAFFIC NOADULT POPULATICCROSS-SECTIONAI	DNS	Exposure: exposure to high levels of environmental noise from various noise sources + noise metric involved + modelled or measured noise	Comparator: no noise exposure or lower levels of noise exposure	Confounding: adjusted for confounding	Outcome: assessment of outcome	Findings: expressed as effect per dB if possible. Type of analyses Sample size relating to the effect size	Comments: Anything else to note
1. Fooladi, J Environ Pul Health, 201	Population:adult residents	Noise exposure: road traffic noise levels measured near home and workplace Noise source: road traffic Noise metrics: L at morning, noon, afternoon (dBA)	Comparator: None	Confounding : Not specified	Outcomes: Self-reported frustration, anger, and feeling helpless as an aftereffect of persistent noise; Self-reported coping skills when sharing experiences (craving for	Findings: Sleep difficulties reported by 70%; 81% of women reported frustration, anger, feeling helpless as an aftereffect of persistent noise. 93% of men reported habituation techniques; 78% of women reported headaches. Type of analyses: none	Comments: The method is observational, no comparisons, no correlation with noise exposure.

		literacy, not exposed to loud music Cross sectional study				sweets, caffeine intake, smoking); Self-reported techniques for habituation to noise (chewing gums, tooth picks, snacking at work, using incessant noise to sleep); Self-reported sleep disturbance ; Self-reported headaches	Sample size relating to the effect size: n=83	
2.	Urban & Maca, Int J Environ Res Public Health, 2013	Population: adult residents living in six noisy areas, random sampling, total n=354 exposed to road traffic noise, n=228 exposed to railway noise, aged 18-88yrs. Cross sectional study	Noise exposure: road traffic noise levels obtained from official noise maps Noise source: road or railway traffic Noise metrics: Lden (dBA) Noise groups: exposed to road traffic noise (4 areas), exposed to railway noise (2 areas)	Comparator: Comparison between the areas exposed to road traffic or railway traffic	Confounding: Noise source, noise annoyance	Outcomes: Life satisfaction – assessed using an 11-point scale (Cantril, 1966); Residential satisfaction – measured on an 11-point Likert- type scale; Noise sensitivity – answered one question on a 4- point scale; Noise annoyance – from road traffic and railway traffic (ISO, 15666:2003)	Findings: No difference in the average life satisfaction between 4 areas exposed to road traffic noise / between 2 areas exposed to railway noise. Negative effect of road traffic annoyance on life satisfaction and residential satisfaction. Negative effect of railway annoyance on residential satisfaction. Type of analyses: Analysis of variance (ANOVA), structural equation modeling (SEM) Sample size relating to the effect size: n=582 with complete data	Comments: Findings: Proposed models to explain the relationship between noise, noise sensitivity, annoyance, life satisfaction and residential satisfaction.