CidB et Métrople Côte d'Azur « parlons d'environnement sonore dans votre région »

Favoriser la nature en ville – les bienfaits pour la santé…

Renaud DAVID

NICE BRAIN / CHU Nice / Labo URRIS

unesco La Semaine du Son

la semaine du son

NICE BRAIN

UNIVERSITÉ CÔTE D'AZUR

UR2CA Unité de Recherche Clinique Côte d'Azur

URRIS Radiologically Isolated Syndrome

chu de Nice

« Végétation Urbaine » impacte :

- qualité de l'air
- bruits de circulation
- atténue la hausse des températures

Le son dans la ville…

Le bruit…

- son affecté d'une valeur négative, vécu comme une agression sensorielle et même physique
- Rapport OMS 2018, « Lignes directrices relatives au bruit dans l'environnement pour la région européenne » :
  - bruit=2e facteur environnement provoquant le plus de dommages sanitaires en Europe, derrière la pollution de l'air
- « En France, 9,8 millions de personnes seraient affectées par une forte gêne dont 3,3 millions par de fortes perturbations de leur sommeil liées au bruit des transports » Fanny Mietlicki et al, revue ADSP du Haut Conseil de la santé publique
- Perception du bruit évolue :
  - 4e inconvénient majeur d'habiter en Ile de France
  - Après coût de la vie, insécurité, pollution (et très proche de celui lié à la pollution de l'air)
- Selon les seuils de bruit recommandés par l'OMS, 9 franciliens sur 10 sont exposés à des niveaux supérieurs
- Bruit aux abords du périphérique de Paris 68 dB

Intensité sonore et « types » de son…

BRUITS POTENTIELLEMENT « AGREABLES »	NIVEAU EN dB(A)	ECHELLE DE COULEURS	BRUITS POTENTIELLEMENT « DESAGREABLES »
Concert rock en plein air	110		*Avion au décollage à 200 m*
Pub dansant	100		*Marteau piqueur*
Ambiance de fêtes foraine	90		*Moto sans silencieux à 2 m* *Poids lourd à 1 m*
Tempête, *Match en gymnase*	80		*Circulation intense à 1 m*
Sortie école, rue piétonne *Vent violent, cinéma*	70		*Circulation importante à 5 m*
Ambiance de marché *Rue résidentielle*	60		*Automobile au ralenti à 10 m*
Rue calme sans *trafic routier*	50		*La télévision du voisin ?*
Place tranquille, cour *intérieure, Jardin abrité*	40		*Moustique vers l'oreille !*

Réglementation 102 dB pour boîtes de nuit et salles de concert

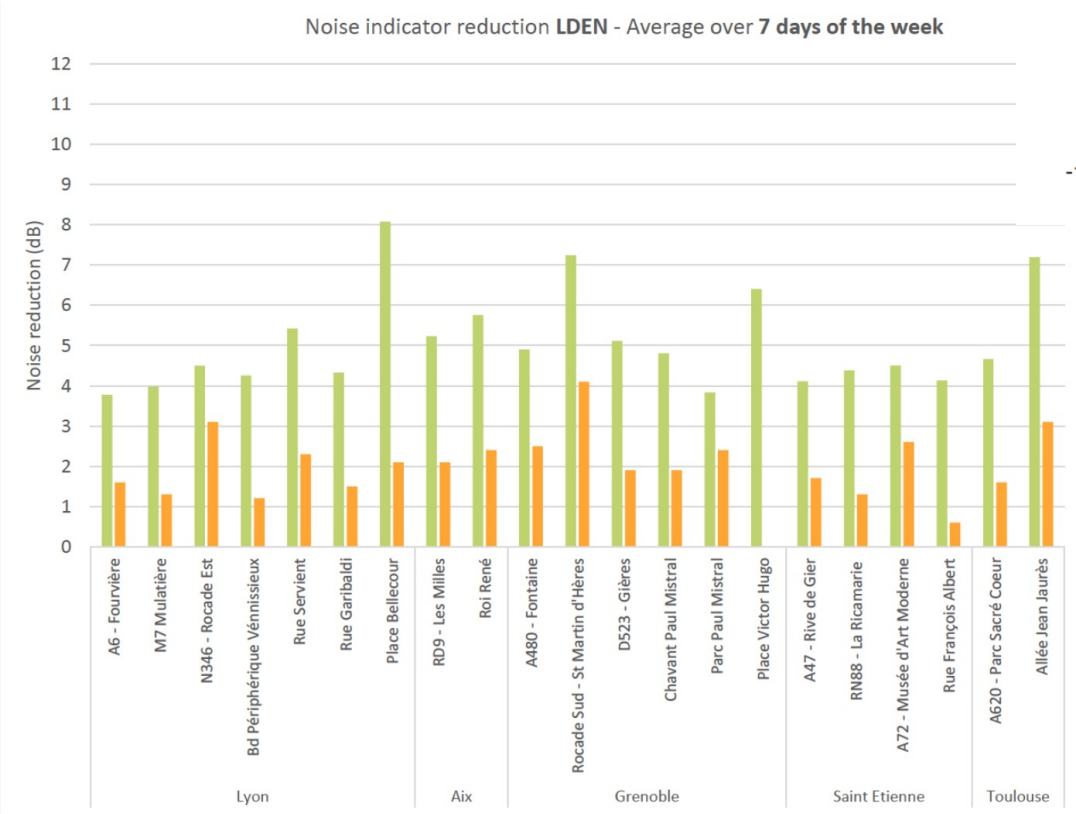
Un constat…

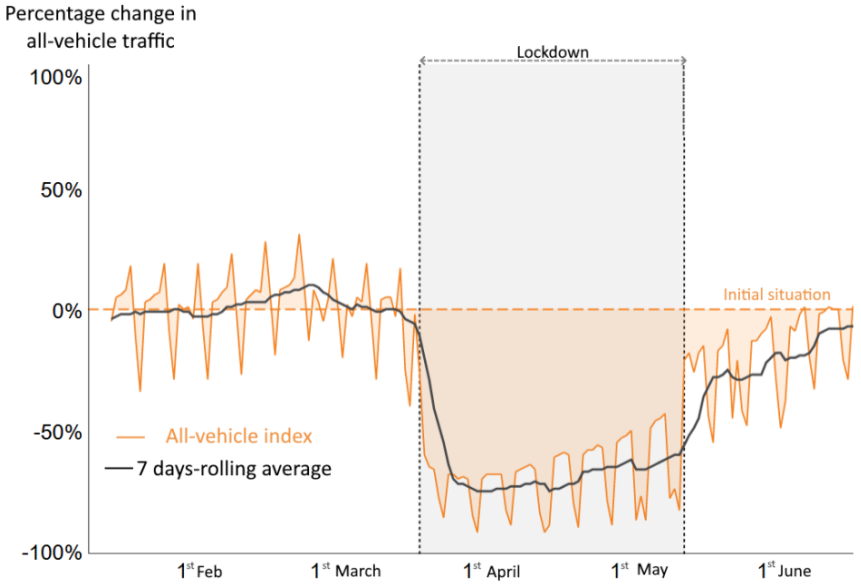
DE GRUYTER Noise Mapp. 2020; 7:287–302

Research Article

Patricio Munoz*, Bruno Vincent, Céline Domergue, Vincent Gissinger*, Sébastien Guillot, Yann Halbwachs, and Valérie Janillon

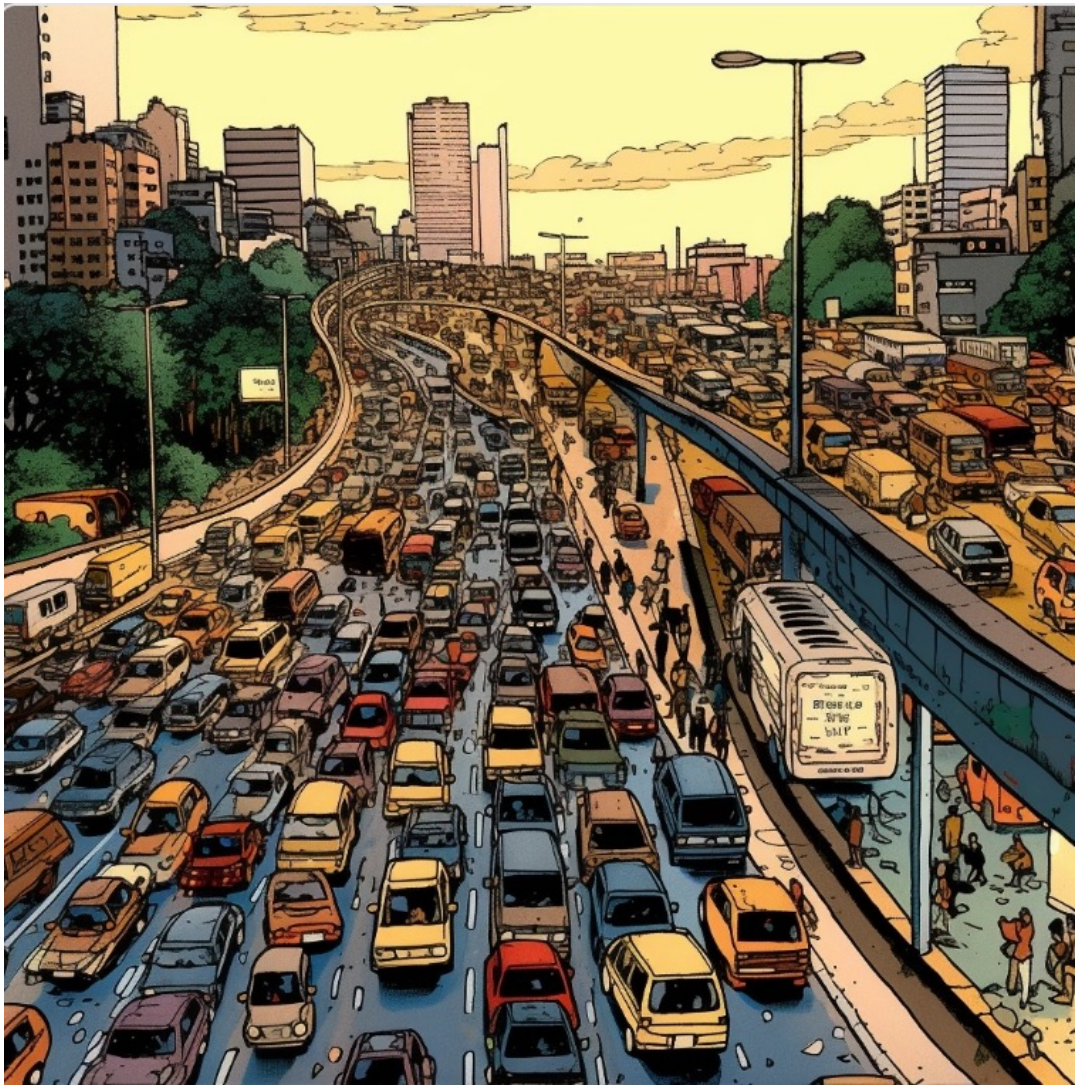
Lockdown during COVID-19 pandemic: impact on road traffic noise and on the perception of sound environment in France





NICE BRAIN UNIVERSITÉ CÔTE D'AZUR UR2CA Unité de Recherche Clinique Côte d'Azur URRIS Radiologically Isolated Syndrome chu de Nice

« Le silence pour les riches, le bruit pour les pauvres… », Cynthia Fleury



Les effets du bruit sur la santé…

- **Effet du bruit sur l'audition**
  - Fatigue auditive
  - Perte de la discrimination des sons
  - Surdité
  - Acouphènes
  - Hyperacousie (exacerbation des sons, les rendant dérangeants)

- **Conséquences extra-auditives du bruit** :
  - Troubles du sommeil (retard endormissement, réveils nocturnes, diminution du sommeil lent profond)
  - Troubles cardio vasculaires : infarctus du myocarde, risque d'HTA
  - Troubles psychologiques

Noise Pollution and Associated Hearing Loss in a Metropolitan City–a Preliminary Report

Roopak Visakan Raja [1], Gurumani Sriraman [2], Mohan Kameswaran [3]

Affiliations + expand

PMID: 37206820 PMCID: PMC10188883 (available on 2024-04-01)
DOI: 10.1007/s12070-022-03432-3

Abstract

To measure the amount of noise produced in busy parts of a metropolitan and also to assess the audiological status of the civilians exposed to such noise. Cross-sectional study for one year between June 2017 and May 2018 was conducted. Noise was measured in four busy parts of an urban city with a digital sound level meter. People involved in various occupations in the busy parts for more than one year within the age range of 15-45 years were included. Maximum noise level recorded was 106.4 dBA in Koyembedu. Average noise was around 70-85 dBA in Chennai. Totally 100 people were subjected to audiological assessment (69 Males; 31 Females). Among them 93% had hearing loss. Hearing loss was almost equal both in sexes. Sensory hearing loss was the major type (83%). All areas were almost equally affected with maximum (100%) being affected in Annanagar and Koyembedu. The right ear was more affected than the left. All age groups were affected among which the working age group (36-45) years was most affected. The unskilled occupation group was most affected (100%). There was a positive relation between noise levels and hearing loss. Duration of exposure did not have positive correlation with hearing loss. Noise pollution and its induced hearing loss was more prevalent and increased in all four areas. As hearing loss due to noise pollution is predominant as observed in the study, awareness about noise pollution and its effects among the community is a necessity.

-âge 15-45 ans
-bruit moyen 70-85 dB
-échantillon de 100 personnes
-93% ont une perte auditive

NICE BRAIN UNIVERSITÉ CÔTE D'AZUR UR2CA URRIS chu de Nice

JACC: ADVANCES
VOL. 2, NO. 2, 2023
© 2023 THE AUTHORS. PUBLISHED BY ELSEVIER ON BEHALF OF THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION. THIS IS AN OPEN ACCESS ARTICLE UNDER THE CC BY LICENSE (http://creativecommons.org/licenses/by/4.0/).

ORIGINAL RESEARCH

BASIC AND TRANSLATIONAL RESEARCH

Road Traffic Noise and Incidence of Primary Hypertension

A Prospective Analysis in UK Biobank

Jing Huang, PhD,[a,b] Teng Yang, MS,[a] John Gulliver, PhD,[c,d] Anna L. Hansell, PhD,[c,d] Mohammad Yutong Samuel Cai, PhD,[c,d,*] Kazem Rahimi, PhD[b,*]

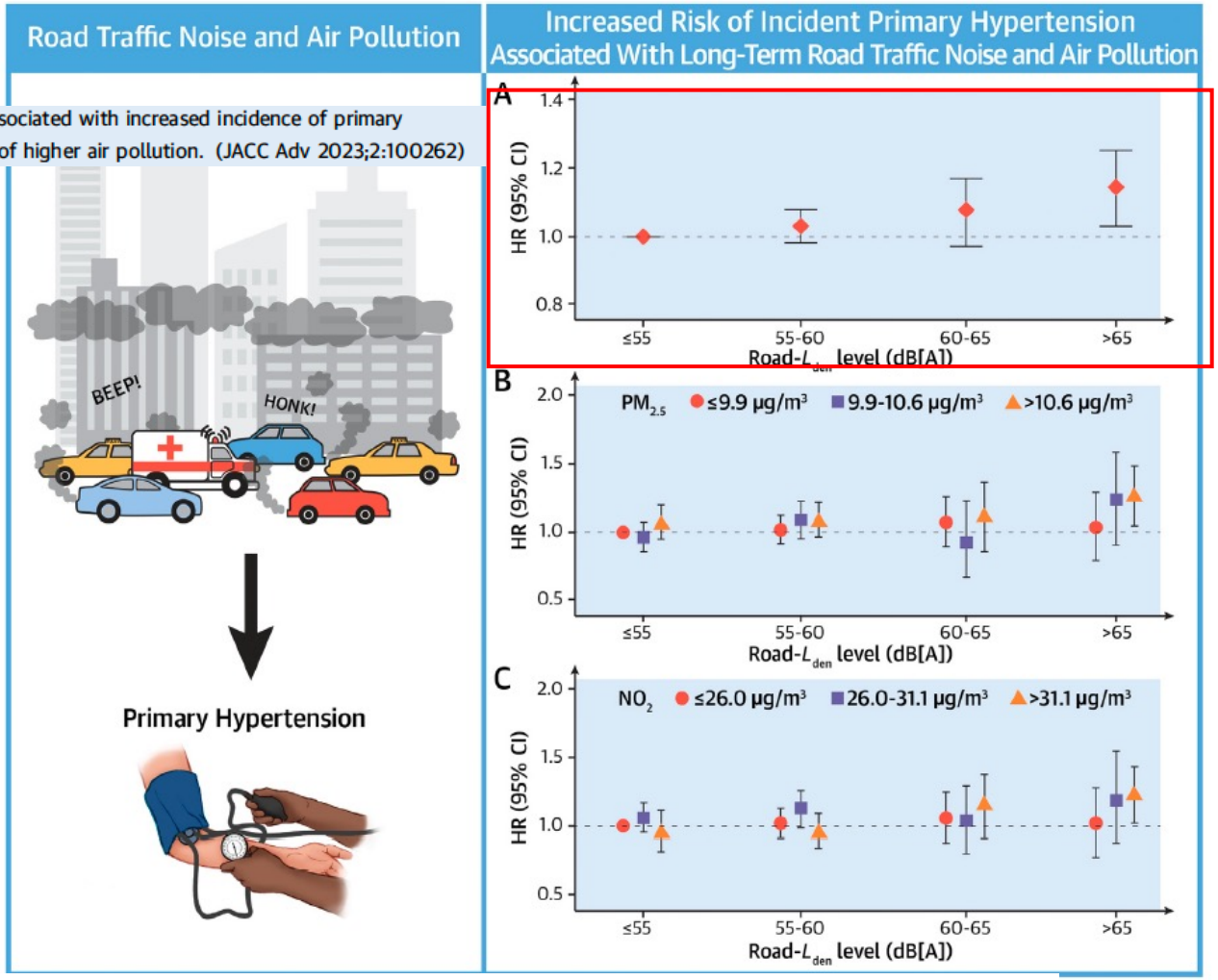
METHODS Road traffic noise was estimated at baseline residential address using the common noise assessment method model. Incident hypertension was ascertained through linkage with medical records. Cox proportional hazard models were used to estimate hazard ratios (HRs) for association in an analytical sample size of over 240,000 participants free of hypertension at baseline, adjusting for covariates determined via directed acyclic graph.

RESULTS During a median of 8.1 years follow-up, 21,140 incident primary hypertension (International Classification of Diseases-10th Revision [ICD-10]: I10) were ascertained. The HR for a 10 dB[A] increment in mean weighted average 24-hour road traffic noise level (L_{den}) exposure was 1.07 (95% CI: 1.02-1.13). A dose-response relationship was found, with HR of 1.13 (95% CI: 1.03-1.25) for L_{den} >65 dB[A] vs ≤55 dB[A] (P for trend <0.05). The associations were all robust to adjustment for fine particles ($PM_{2.5}$) and nitrogen dioxide (NO_2). Furthermore, high exposure to both road traffic noise and air pollution was associated with the highest hypertension risk.

CONCLUSIONS Long-term exposure to road traffic noise was associated with increased incidence of primary hypertension, and the effect estimates were stronger in presence of higher air pollution. (JACC Adv 2023;2:100262)

-240 000 participants
-21 000 développent HTA au bout de 8 ans

-effet majoré de la pollution de l'air au trafic automobile



(A) The association between road traffic noise and incident primary hypertension, **(B)** The combined effects of road traffic noise and $PM_{2.5}$ on incident primary hypertension, **(C)** The combined effects of road traffic noise and NO_2 on incident primary hypertension. L_{den} = weighted average 24-hour road traffic noise level; L_{night} = average nighttime road traffic noise level from 23:00 to 7:00.

NICE BRAIN

chu de Nice

A Section 508–conformant HTML version of this article
is available at https://doi.org/10.1289/EHP11587.

Suicide and Transportation Noise: A Prospective Cohort Study from Switzerland

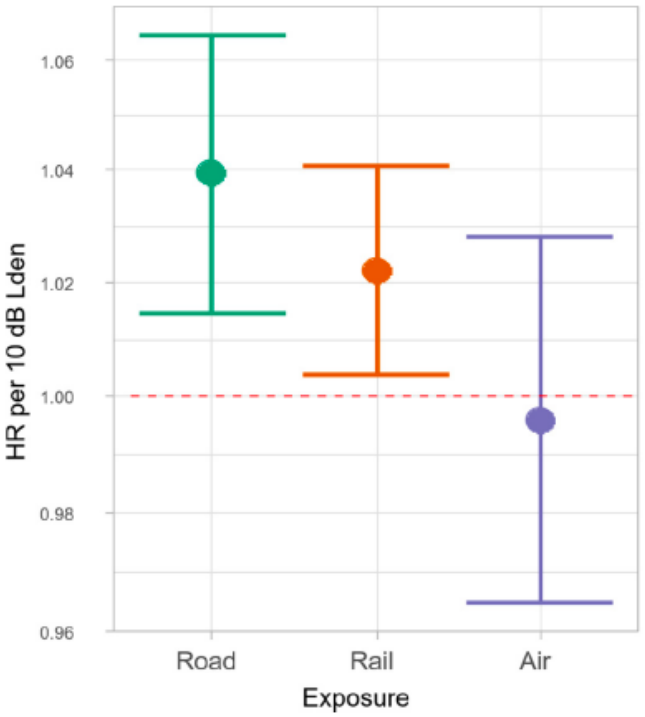
Benedikt Wicki,[1,2] Beat Schäffer,[3] Jean Marc Wunderli,[3] Thomas J. Müller,[4,5] Charlotte Pervilhac,[5,6] Martin Röösli,[1,2] and Danielle Vienneau[1,2]

[1]Swiss TPH (Swiss Tropical an
[2]University of Basel, Basel, Sw
[3]Empa, Swiss Federal Laborato
[4]Translational Research Centre,

Methods: Road traffic, railway a
and greenness [normalized differe
accounting for their address histo
Time-varying Cox regression moc
and NDVI plus individual and sp
degree of urbanization was explor

Results: During the follow-up, t
railway noise were associated witl
per 10 dB day-evening-night level
very low exposure range (30–40 d
ness and air pollution.

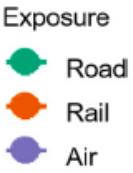
Conclusion: In this longitudinal,
of death by suicide after adjusting
disorders may be related to chroni



rland
r ≤2.5 µm ($PM_{2.5}$)]
iss National Cohort,
15 y (2001–2015).
oise sources, $PM_{2.5}$,
mic indicators, and

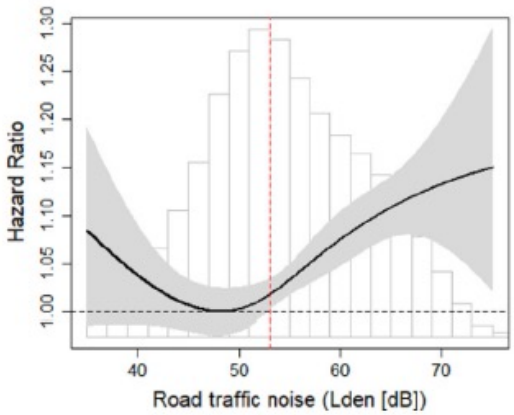
ls). Road traffic and
% CI: 1.004, 1.041)
se association in the
or residential green-

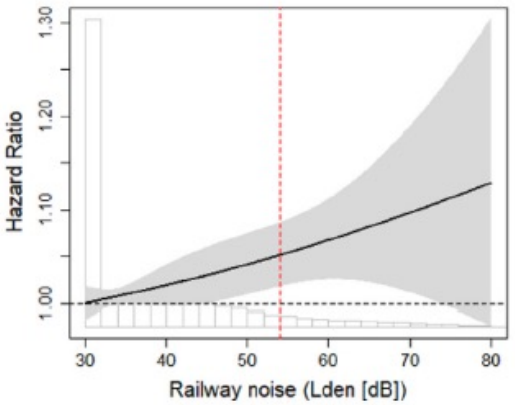
ilway noise and risk
e that mental health

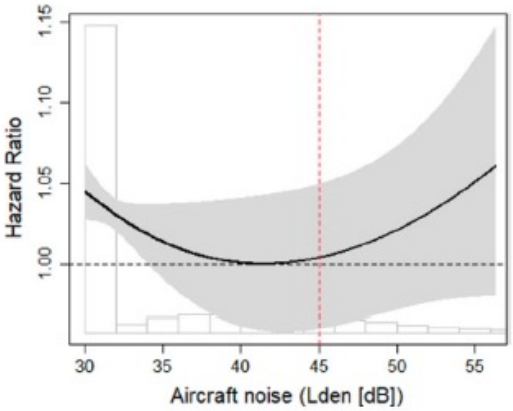


-5M d'habitants
-suivis pendant 15 ans
-11 000 suicides

-suicide lié au trafic routier et ferroviaire







NICE E

Seuils de bruit urbain pour une bonne santé mentale

International Journal of
Environmental Research and Public Health

Article

Building a City with Low Noise Pollution: Exploring the Mental Health Effect Thresholds of Spatiotemporal Environmental Noise Exposure and Urban Planning Solution

Xue Zhang [1] and Suhong Zhou [2,3,*]

[1] School of Architecture and Planning, Yunnan University, Yunnan 650500, China
[2] School of Geography and Planning, Sun Yat-Sen University, Guangzhou 510006, China
[3] Guangdong Provincial Engineering Research Center for Public Security and Disaster, Guangzhou 510275, China
* Correspondence: eeszsh@mail.sysu.edu.cn

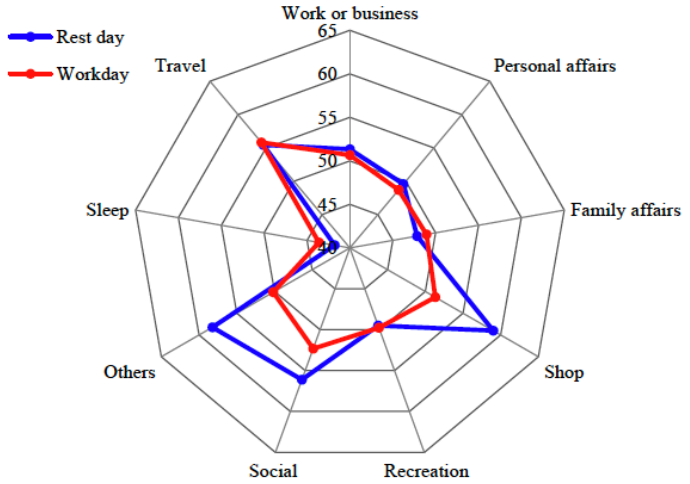


Figure 7. Noise exposure under different activity types on workdays and weekends.

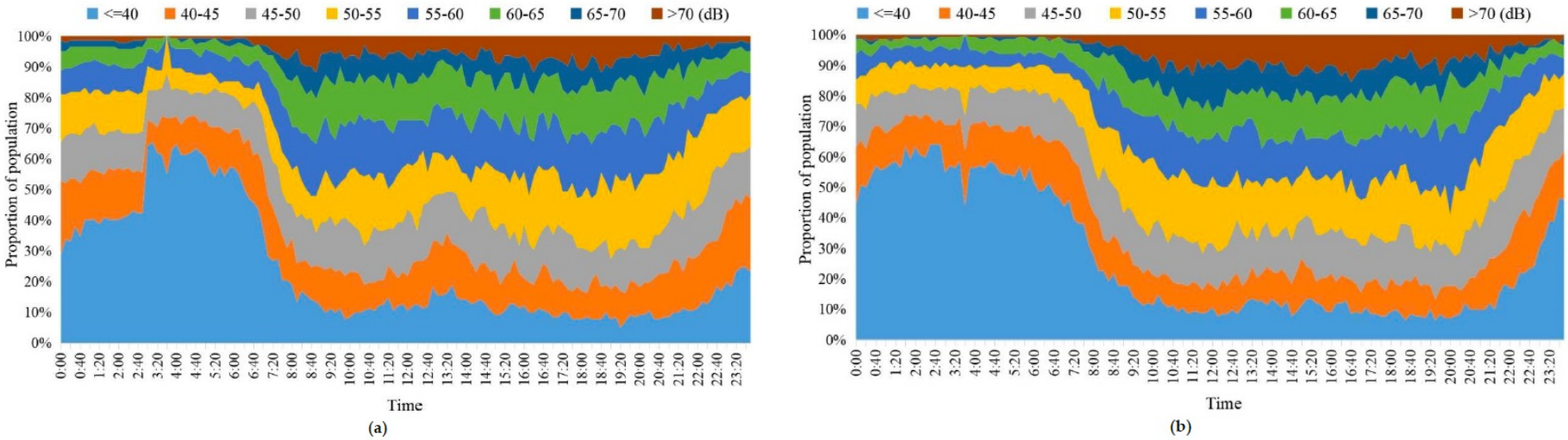


Figure 6. The 24 h noise exposure of 142 residents on workdays and weekends. **(a)** Workday; **(b)** weekend.

NICE BRAIN
UNIVERSITÉ CÔTE D'AZUR
UR2CA Unité de Recherche Clinique Côte d'Azur
URRIS Radiologically Isolated Syndrome
chu de Nice

3.4. Self-Reported Mental Health Characteristics of Residents

Figure 9 showed that the mean value of residents' self-reported mental health was 15.6. According to the World Health Organization's Five Well-Being Indexes (WHO-5) [32], a score of less than 13 indicates the person's mental status is poor. In total, 25.4% of the residents had psychological problems, and their self-rated mental health value was lower than 13.

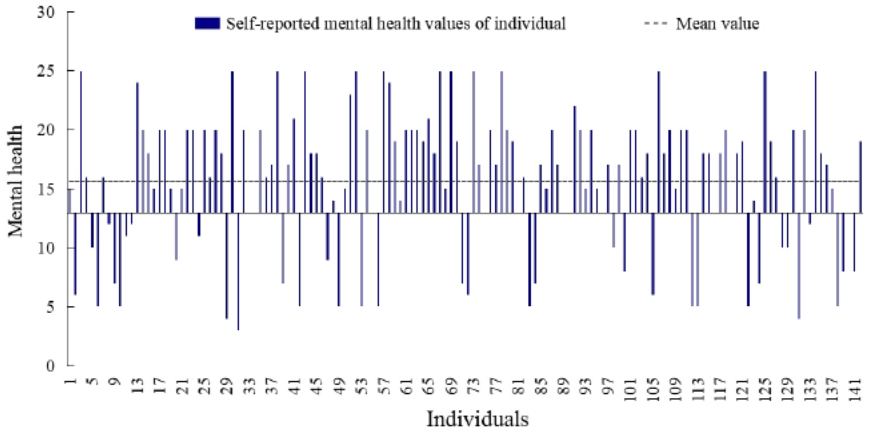


Figure 9. Self-reported mental health values of individual.

at home and at the workplace, had a threshold effect on residents' mental health. Noise thresholds were 60 dB, 60 dB, and about 34 dB at night, during work or at work, and while sleeping, respectively. The optimal sound environment for personal business, travel, and at home were around 50 dB, 55–70 dB, and 45 dB, respectively. The noise thresholds for each time, activity and place determined in this study were different from the existing recommendations and standards. More research is needed to provide a basis for more accurate noise control standards. This study makes an important contribution to explore the noise threshold and optimal acoustic environment level for different times, activities and places. It can also be a policy basis for urban management departments, ecological and environmental departments, and a reference for individual noise prevention and control.

- Seuils pour la santé mentale durant :
  - Sommeil 34 dB
  - Travail et lieu de travail : 60 dB
  - affaires personnelles : 50 dB
  - Voyages : 55-70 dB
  - Temps à la maison : 45 dB

Tempête, Match en gymnase	**80**
Sortie école, rue piétonne Vent violent, cinéma	**70**
Ambiance de marché Rue résidentielle	**60**
Rue calme sans trafic routier	**50**
Place tranquille, cour intérieure, Jardin abrité	**40**

NICE BRAIN UNIVERSITÉ CÔTE D'AZUR UR2CA URRIS chu de Nice

Environmental Research 231 (2023) 116087

Contents lists available at ScienceDirect

Environmental Research

journal homepage: www.elsevier.com/locate/envres

Joint associations and pathways from greenspace, traffic-related air pollution, and noise to poor self-rated general health: A population-based study in Sofia, Bulgaria

Angel M. Dzhambov [a,b,c,*], Veronika Dimitrova [d], Nevena Germanova [e], Angel Burov [b,f], a [i,j]

Associations between greenspace, traffic-related air pollution, and noise with poor self-rated health.

Single-exposure models (N = 910)	Model 1	Model 2
	OR (95% CI)	OR (95% CI)
NDVI $_{300\ m}$	0.63 (0.43, 0.94)*	*0.65 (0.42, 1.01)*
Tree count $_{300\ m}$	0.99 (0.98, 1.00)	0.99 (0.98, 1.01)
Tree cover density $_{300\ m}$	0.89 (0.65, 1.21)	0.91 (0.68, 1.22)
Local greenspace in 300 m	1.35 (0.90, 2.06)	1.31 (0.85, 2.01)
Park in 300 m	0.97 (0.53, 1.77)	0.95 (0.52, 1.71)
Home garden (N = 898)	*0.70 (0.49, 1.01)*	0.72 (0.49, 1.07)
Time in urban greenspace/week		
0 min	1.00	1.00
<30 min	0.65 (0.37, 1.13)	0.67 (0.38, 1.18)
31–60 min	0.61 (0.38, 0.96)*	*0.63 (0.39, 1.00)*
61–120 min	0.78 (0.49, 1.26)	0.80 (0.49, 1.28)
121–180 min	1.20 (0.69, 2.08)	1.20 (0.69, 2.10)
181–240 min	1.06 (0.51, 2.19)	1.04 (0.51, 2.13)
>240 min	0.90 (0.54, 1.52)	0.91 (0.54, 1.54)
Time in nature/wee		
0 min	1.00	1.00
<30 min	0.75 (0.39, 1.45)	0.79 (0.40, 1.56)
31–60 min	0.52 (0.28, 0.96)*	0.54 (0.29, 1.03)
61–120 min	0.51 (0.33, 0.79)*	0.52 (0.33, 0.82)*
121–180 min	0.36 (0.19, 0.67)*	0.37 (0.19, 0.69)*
181–240 min	0.32 (0.16, 0.67)*	0.33 (0.17, 0.65)*
>240 min	0.39 (0.25, 0.61)*	0.37 (0.23, 0.61)*
NO_2	1.56 (1.09, 2.23)*	*1.57 (1.00, 2.48)*
L_{den} road	1.06 (0.91, 1.23)	1.06 (0.91, 1.23)
L_{den} rail	1.12 (1.04, 1.20)*	1.11 (1.03, 1.20)*
L_{den} air	1.18 (1.09, 1.29)*	1.22 (1.11, 1.34)*
Multi-exposure model (N = 898)		
NDVI $_{300m}$	0.82 (0.50, 1.33)	0.87 (0.50, 1.51)
Home garden	0.86 (0.58, 1.27)	0.77 (0.52, 1.16)
NO_2	1.08 (0.74, 1.57)	1.01 (0.66, 1.54)
L_{den} road	1.04 (0.90, 1.19)	1.02 (0.89, 1.17)
L_{den} rail	1.07 (1.00, 1.14)*	*1.07 (1.00, 1.14)*
L_{den} air	1.13 (1.03, 1.25)*	1.18 (1.06, 1.31)*

-panel de 900 résidents

-questionnaire avec mesure du niveau de santé ressenti

-facteurs qui améliorent la santé globale :

>présence d'espaces verts résidentiels

-facteurs qui altèrent la santé globale :

>trafic aérien et ferroviaire

>NO2

/ERSITÉ CÔTE D'AZUR

UR2CA Unité de Recherche Clinique Côte d'Azur

URRIS Radiologically Isolated Syndrome

chu de Nice

International Journal of Environmental Research and Public Health

Published: 26 May 2023

MDPI

Review

Impacts of Urban Green on Cardiovascular and Cerebrovascular Diseases—A Systematic Review and Meta-Analysis

Alessandro Bianconi, Giulia Longo, Angela Andrea Coa, Matteo Fiore * and Davide Gori

have suggested that urban green (UG), defined as all urban land covered by vegetation of any kind, may impact air quality and traffic noise and help mitigate the temperature rise due to climate change in urban settings [6,7]. Furthermore, the presence of a natural

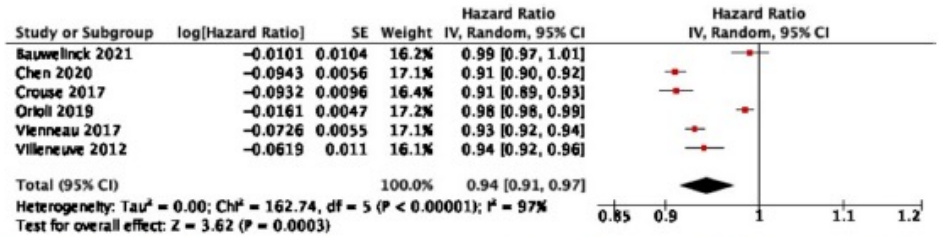


Figure 2. Results of the meta-analysis for CVD mortality. Studies included in the presented meta-

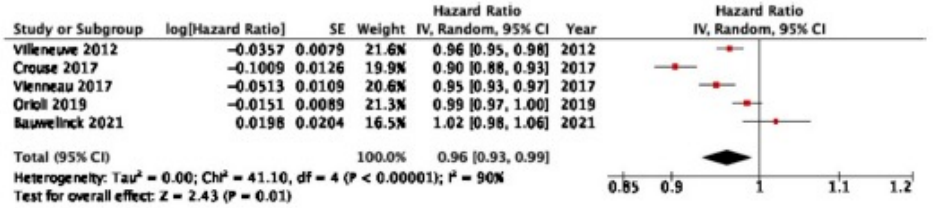


Figure 3. Results of the meta-analysis for IHD mortality. Studies included in the presented

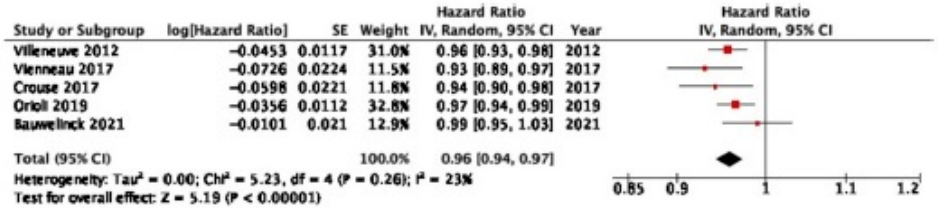


Figure 4. Results of the meta-analysis for CBVD mortality. Studies included in the presented

« Végétation Urbaine » impacte :
-qualité de l'air
-les bruits de circulation
-atténue la hausse des températures

Abstract: Cardiovascular diseases (CVDs) are a leading cause of mortality globally. In particular, ischemic heart diseases (IHDs) and cerebrovascular diseases (CBVDs) represent the main drivers of CVD-related deaths. Many literature examples have assessed the association between CVD risk

Effet bénéfique de la végétation urbaine sur :
>les pathologies cardiovasculaires
>l'infarctus du myocarde
>les AVC

NICE BRAIN

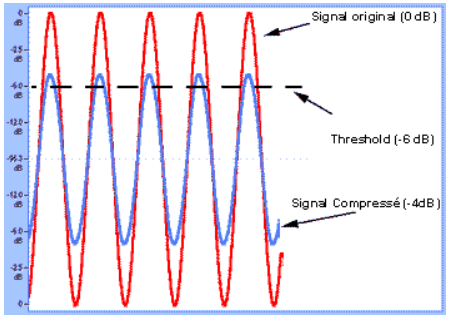
UNIVERSITÉ CÔTE D'AZUR

chu de Nice

Le son dans les habitations…

Acoustique & Techniques n° 99
NUMÉRO SPÉCIAL : CFA 2022
24

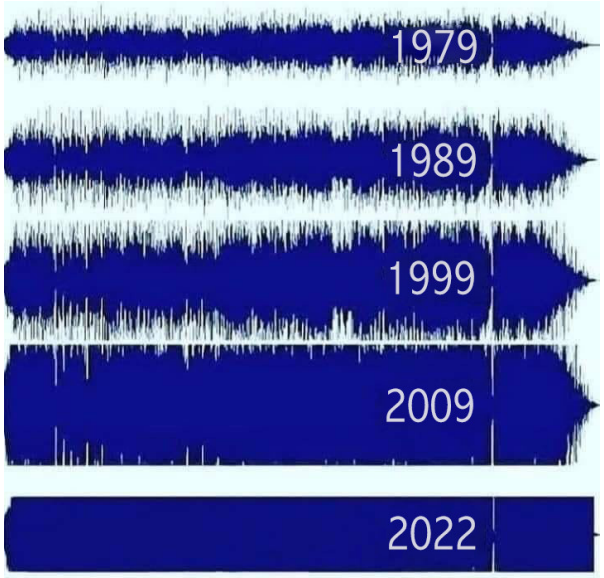
Musique surcompressée : un risque auditif spécifique



Thamara Dos Santos, Pierrick Bordiga, Paul Avan
Laboratoire de Biophysique Neurosensorielle
Université Clermont Auvergne
UFR Médecine
28, Place Henri Dunant
63001 Clermont-Ferrand
E-mail : paul.avan@uca.fr ; pierrick.bordiga@uca.fr

Résumé

La règle d'isoénergie selon laquelle le risque pour l'audition est décrit p
totale d'énergie sonore reçue par les oreilles d'un sujet exposé, est app
présent à tous les sons. Ainsi, la réglementation mentionne des niveau
équivalents, mais rien sur leur structure temporelle. Or, la musique su
dans laquelle le gain est manipulé pour effacer les intervalles de silen
extrêmement courts, est de plus en plus utilisée malgré les plaintes d



- Pour réduire les écarts entre les sons forts et sons faibles
- Retirent les micro silences donc l'oreille ne se reposent plus (cinéma, musique, radios, réunions en visio, plates-formes de musique)
  - L'oreille a besoin de plages de repos pour se régénérer

Sons compressés et la perte des micro-silences…

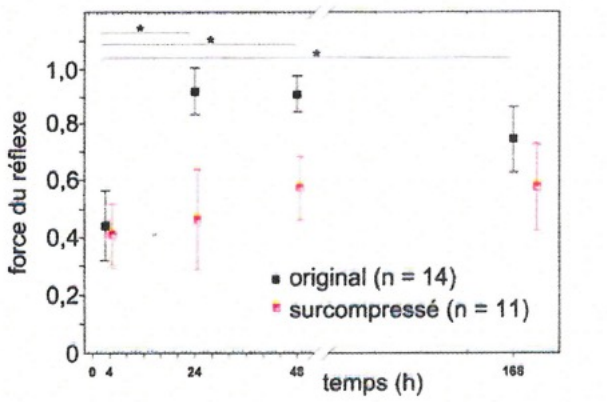
Des chercheurs de l'Inserm et de la faculté de médecine de Clermont-Ferrand ont fait écouter *I Miss You*, d'Adèle, à 90 cochons d'Inde, la moitié en son compressé, l'autre en format original, et cela en boucle durant quatre heures sans pause, autour de 102 dB, le niveau habituel d'une boîte de nuit. « *Aucune perte auditive n'a été constatée, mais le groupe qui a écouté le son compressé n'avait pas complètement récupéré en une semaine le réflexe stapédien, qui diminue les vibrations du tympan pour protéger l'oreille interne. Leurs circuits nerveux de contrôle des sons étaient altérés* », explique Paul Avan, qui a coordonné cette étude, publiée en partie dans *Acoustique & Techniques*, la revue du Centre d'information sur le bruit, fin 2022.

-Cochon d'inde

- « I miss you » d'adèle en boucle pendant 4h à 102 dB

Réflexe stapédien : qui atténue la transmission des sons intenses à la cochlée devient inefficace pendant plus de 48h

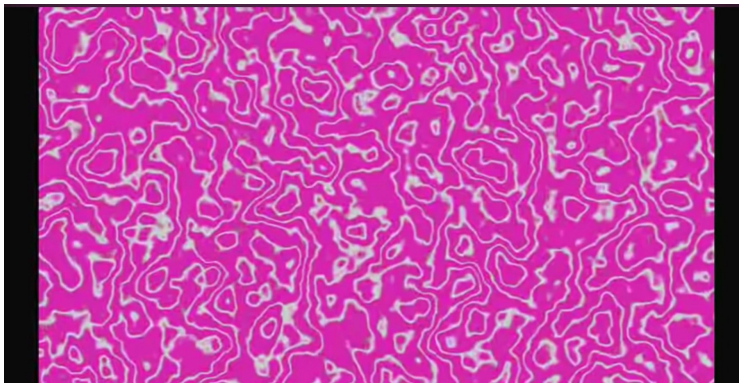
Cochlée : altération des cellules ciliés externes (rôle dans l'amplification et le filtrage des vibrations induites sur la membrane basilaire de la cochlée par les sons ; ils sont fragiles et leur stimulation répétée aboutit à la mort cellulaire



Systematic review: auditory stimulation and sleep

Elizabeth Capezuti, PhD, RN, FAAN[1]; Kevin Pain[2]; Evelyn Alamag, BS[1]; XinQing Chen, BS[1]; Valicia Philibert, MS, RN[3]; Ana C. Krieger, MD, MPH[4]

Study Objectives: Auditory stimulation devices (white and pink noise) are used to mask sounds and facilitate relaxation and sleep; however, the effectiveness of this intervention is not well established. This systematic review examined the scientific literature for the effect of specific types of auditory stimulation on sleep outcomes in adults.



Results: Thirty-four studies reported results of 1,103 persons participating in 3 categories of interventions: white noise (18), pink noise (11), and 6 multiaudio (some combination of white, pink, music, or silence). Nineteen studies had positive findings in terms of improving sleep outcomes: 6 white noise (33%), 9 pink noise (81.9%), and 4 multiaudio (66.7%). Multiaudio had the lowest (better) risk of bias (mean/standard deviation: 1.67/0.82) compared to white (2.38/0.69) and pink noise (2.36/0.81).

Summary	No. Positive/Total*	Percentage Positive	Mean/SD Global Rating
Multiaudio	4/6	66.7	1.67 (0.82)
White noise	7/18	38.0	2.45 (0.69)
Pink noise	9/11	81.8	2.36 (0.80)

NICE BRAIN
UNIVERSITÉ CÔTE D'AZUR
UR2CA Unité de Recherche Clinique Côte d'Azur
URRIS Radiologically Isolated Syndrome
chu de Nice

Repenser le son des villes…