

June 2022

The health effects of noise

Central City Ratepayers Group

History

- ❖ In 44 BC, Julius Caesar rules, ‘no-one shall drive a wagon along the streets of Rome... after sunrise or before the tenth hour of the day’
 - ❖ A late afternoon street scene in ancient Pompeii: with traffic restrictions lifted during the two hours before nightfall, the driver races his chariot between stepping stones over which two ladies have just walked to avoid the puddles of rainwater
- ❖ In 1627 [John Evelyn](#) said of London that so ‘lowd a Town, is no where to be found in the whole world’
- ❖ Society now ignores noise the way it ignored the use of tobacco products in the 1950s — *Goines & Hagler, 2007*



“Unnecessary noise, then, is the most cruel absence of care which can be inflicted either on sick or well”

— *Florence Nightingale, 1860*

How do you sleep at night — Shara Hughes, 2017

Noise & the head

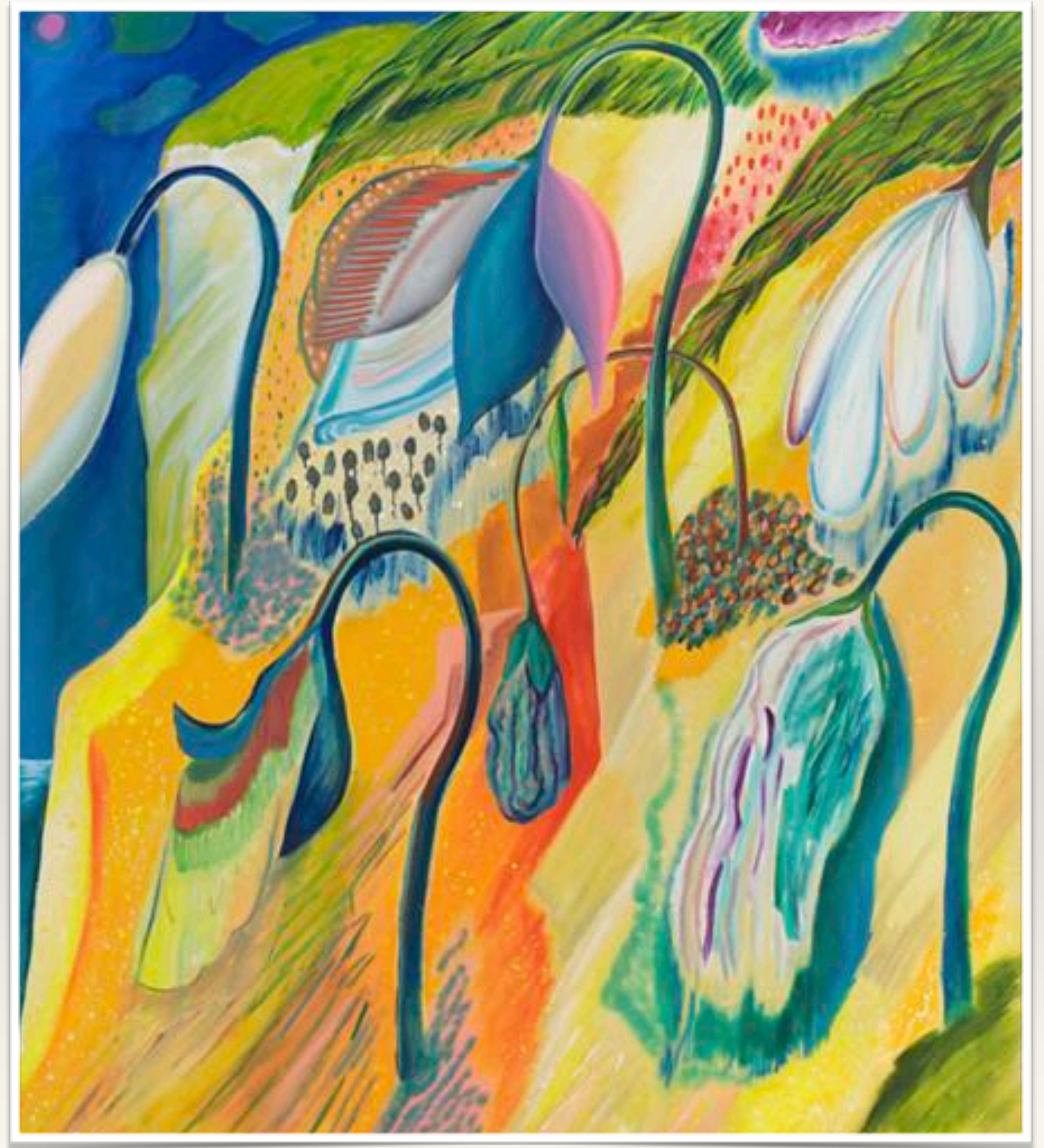
Noise annoyance →

- ❖ Depression (odds ratio 1.23)
- ❖ **Anxiety disorder** (odds ratio 1.55)
- ❖ General mental health (GHQ & SF12/36) (odds ratio 2.19) — *Gong et al., 2022*

‘Public rental tenants, lone parents, residents of socioeconomically disadvantaged areas, and those with long-term health conditions were more likely to report residential noise exposure.

This exposure to noise was consistently associated with poorer mental health... with the relationship strongest for traffic noise... Notably, when noise exposure decreased over time, there was an increase in mental health’

— *Li et al., 2022*

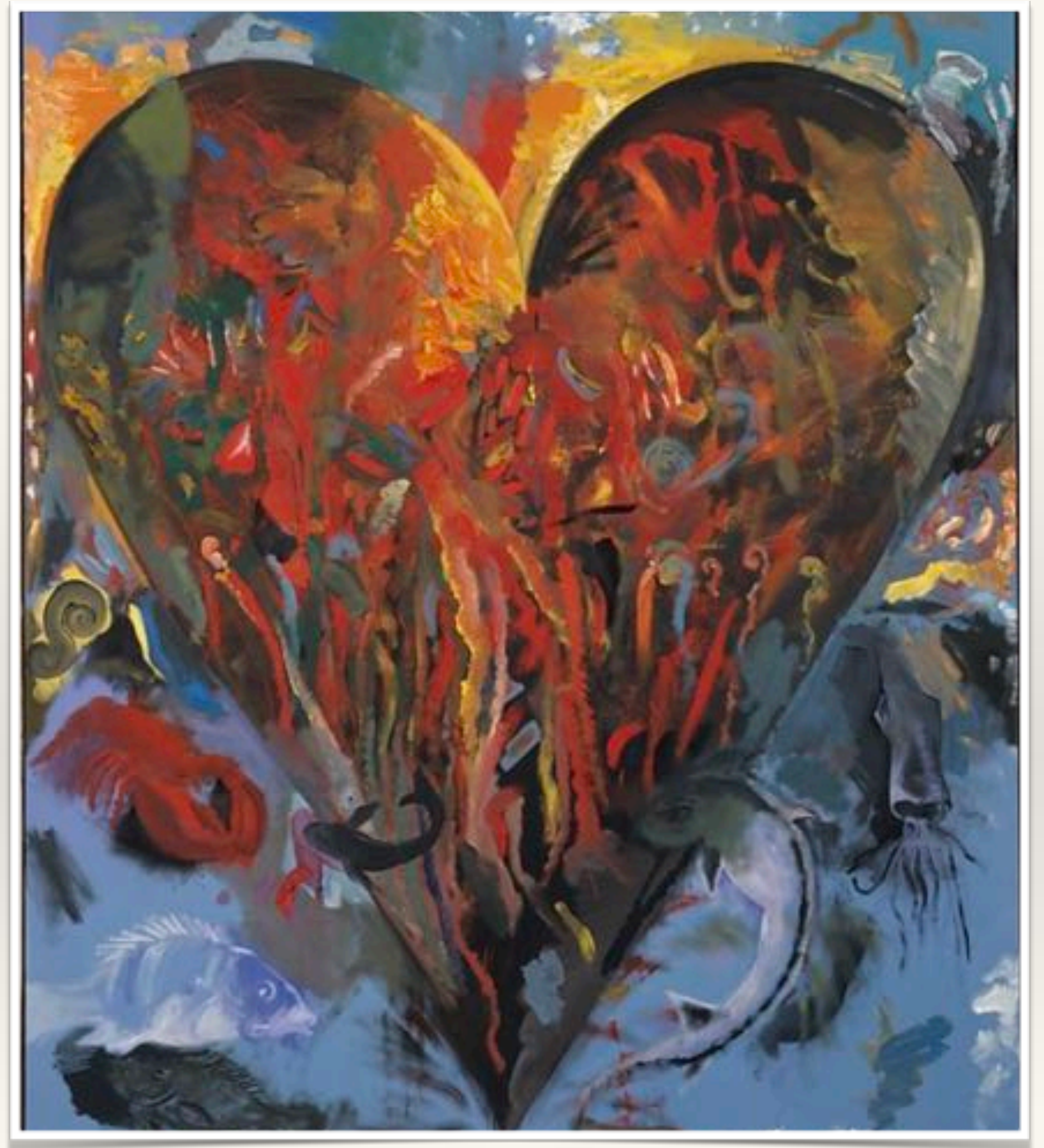


The heart, south of Naples — Jim Dine, 1986

Noise & the heart

Road traffic and railway noise →
increased death from...

- ❖ Stroke
- ❖ Heart attack
- ❖ Heart failure
- ❖ Blood pressure-related
— *Vienneau et al., 2022*



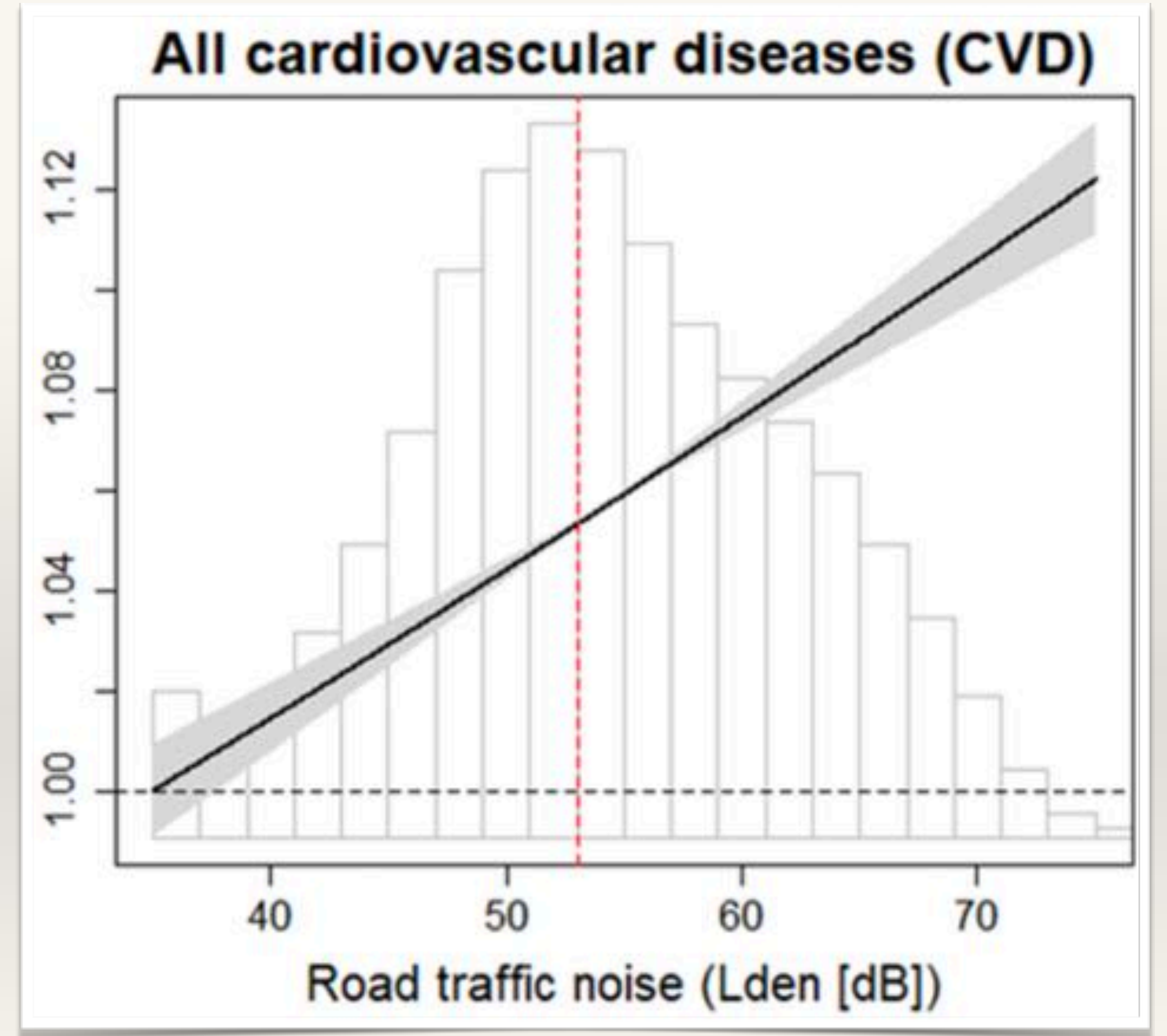
Vienneau et al. 2022

Noise & the heart

Linear relationship continued down to <40 dB

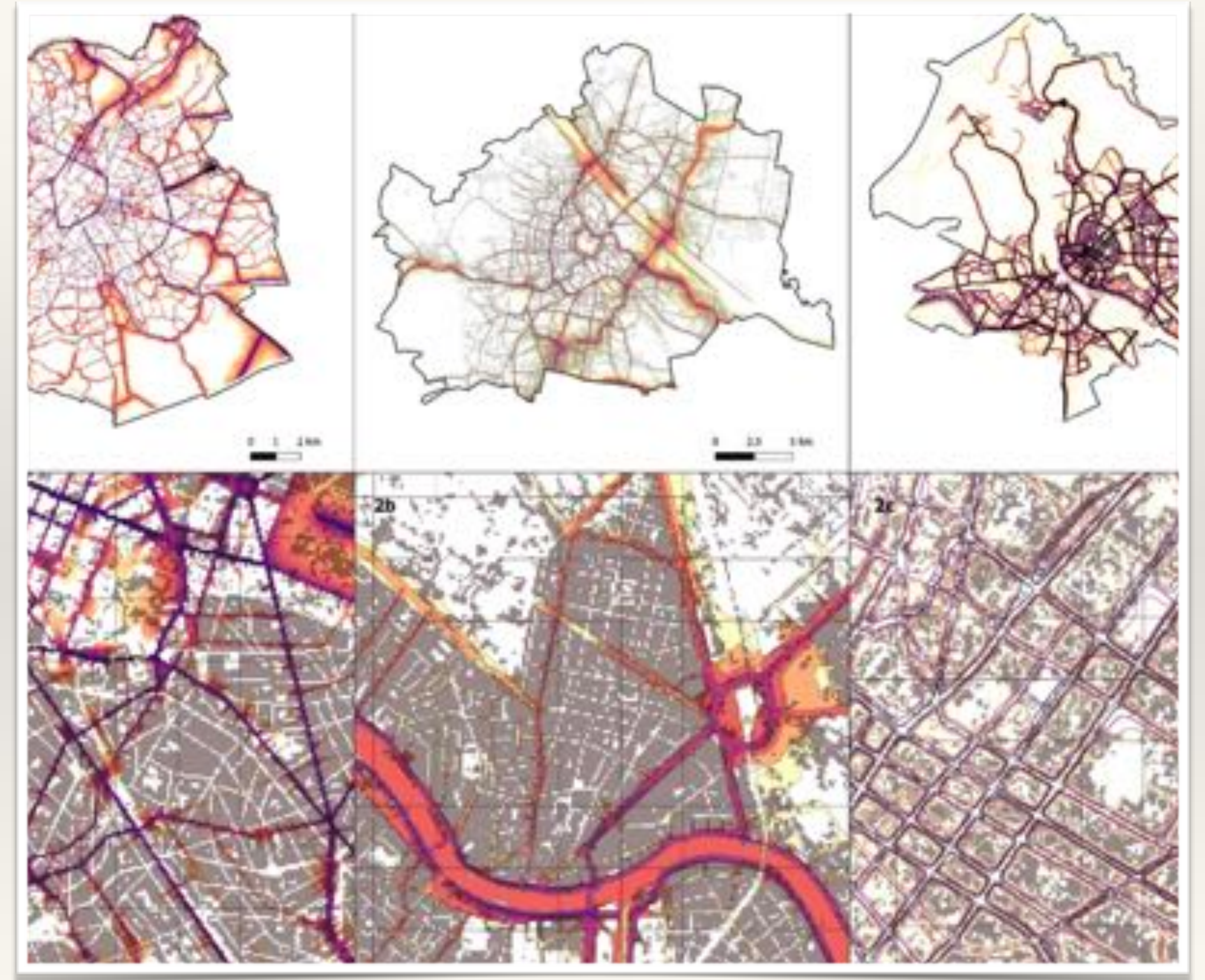
Red vertical line represents WHO guideline

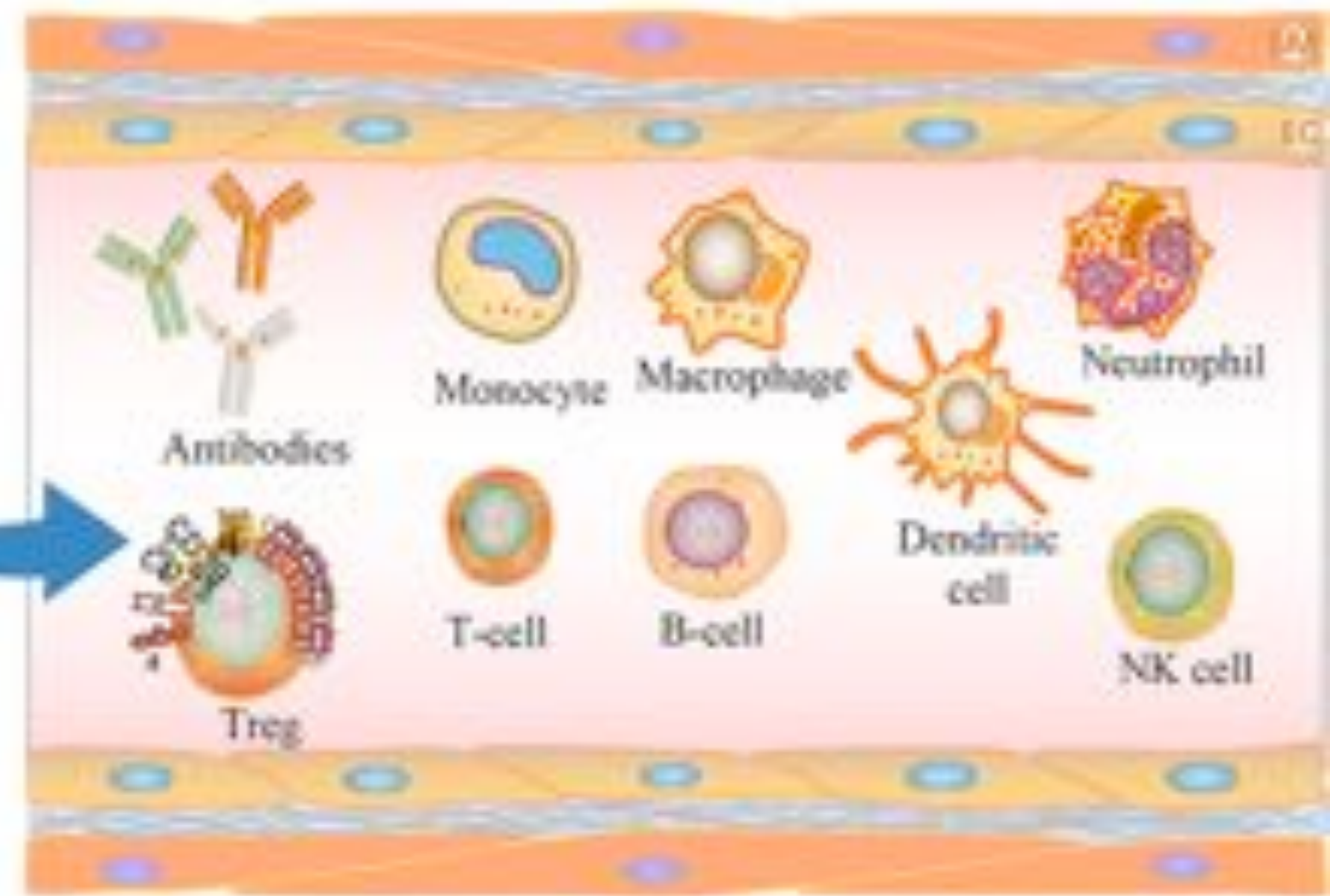
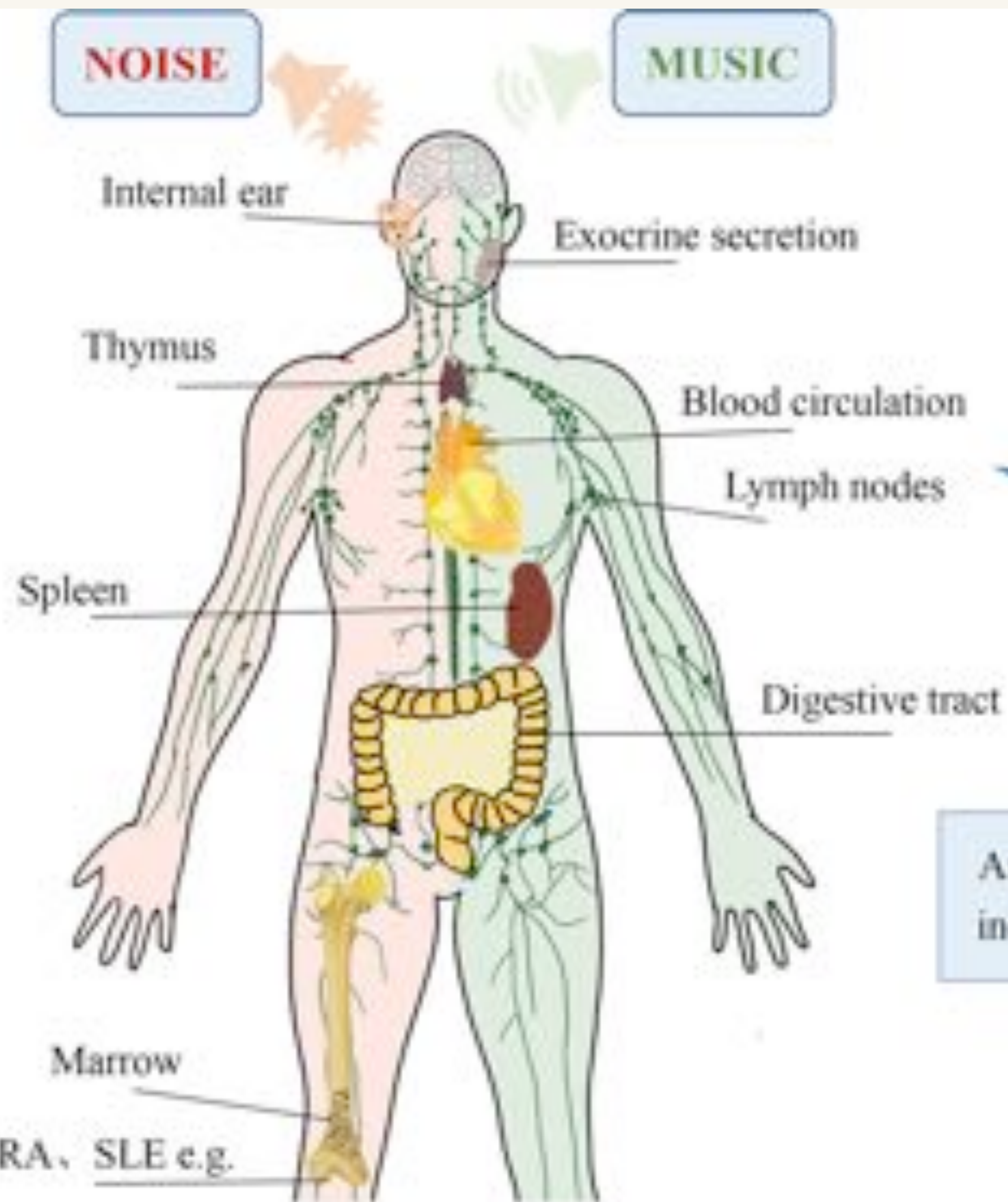
— *Vienneau et al., 2022*



Premature mortality

- ❖ 123 million adults in 724 European cities
- ❖ 42% exposed to traffic noise >55 dB
- ❖ Noise annoyance accounted for...
 - ❖ 221,000 Years Living with Disability
 - ❖ 40,000 Years of Life Lost (death)
— *Khomenko et al., 2022*





Antibodies and immune cells in blood circulation increase or decrease in different noise conditions.

The immune system can hear noise. *Zhang et al., 2021*

The bicyclist — Fernand Léger, 1951

Active transport, noise pollution, & air pollution

- ❖ Active modes of transport absorb more pollutants than others
 - ❖ Noise
 - ❖ Air pollution
- ❖ Road traffic is associated with a significant increase of exposure to atmospheric and noise pollution
- ❖ Despite combined effects of noise, air pollution, and injuries, active transport is still more healthy than driving — *Gelb & Apparicio, 2021*



Nature-based interventions and health

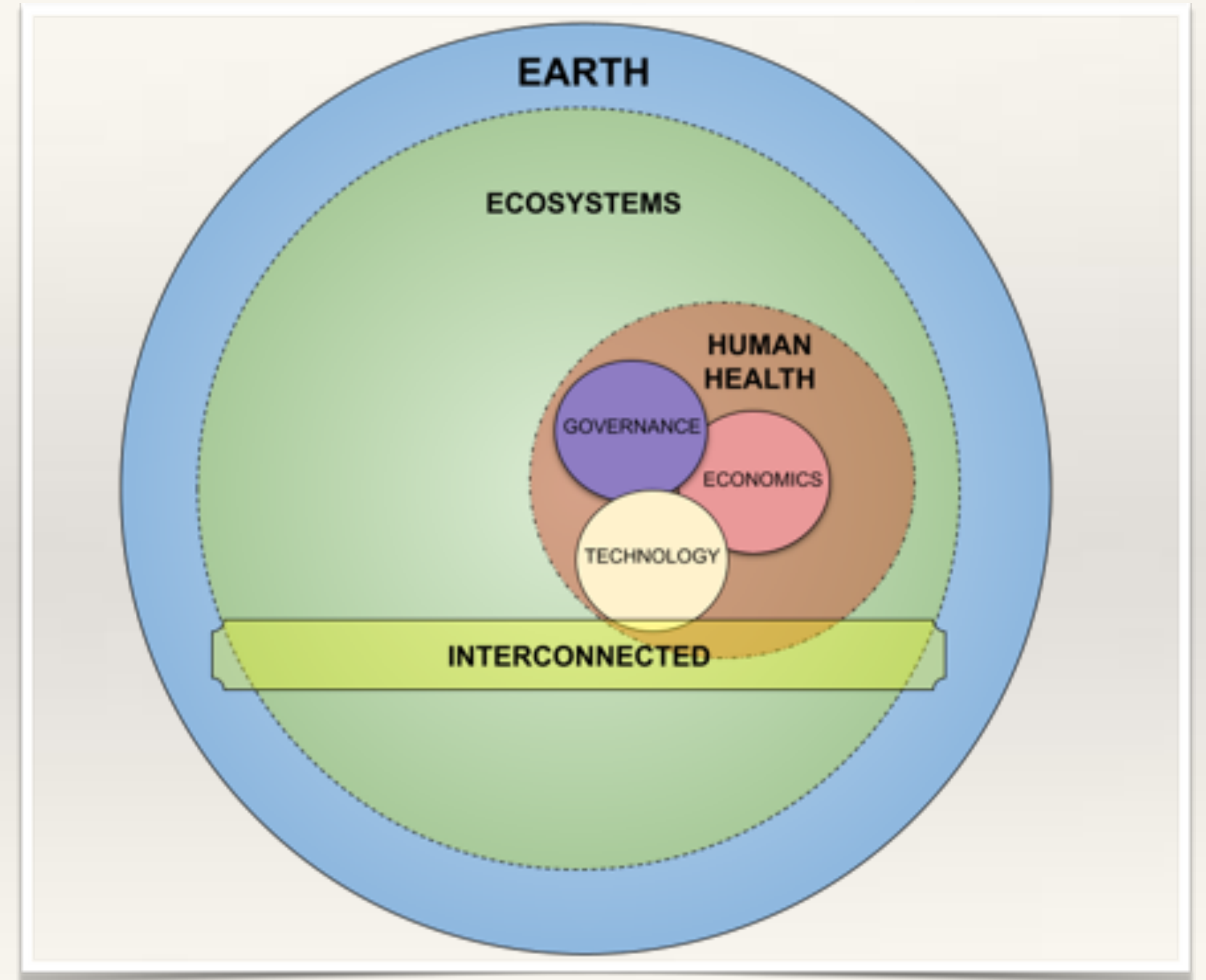
- ❖ Physical activity in nature, leisure activities, gardening, the built environment
- ❖ Engagement increased by
 - ❖ The absence of noise / air pollution
 - ❖ The sense of wilderness
 - ❖ Opportunities for physical activity
 - ❖ Accessibility — *Nejade et al., 2022*



Queen's Wharf — Chris Dews, 2021

Planetary health healthcare model

❖ *Barber et al., 2022 in press*



*Albert Park —
Chris Dews, 2021*



Noise and health references

Goines, L., & Hagler, L. (2007). Noise pollution: a modern plague. *South Med J*, 100(3), 287-94.

Gong, X., Fenech, B., Blackmore, C., Chen, Y., Rodgers, G., Gulliver, J., & Hansell, A. L. (2022). Association between Noise Annoyance and Mental Health Outcomes: A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health*, 19(5), 2696.

<https://doi.org/10.3390/ijerph19052696>

Li, A., Martino, E., Mansour, A., & Bentley, R. (2022). Environmental Noise Exposure and Mental Health: Evidence From a Population-Based Longitudinal Study. *American Journal of Preventive Medicine*.

<https://doi.org/10.1016/j.amepre.2022.02.020>

Vienneau, D., Saucy, A., Schäffer, B., Flückiger, B., Tangemann, L., Stafoggia, M., Wunderli, J. M., & Rösli, M. (2022). Transportation noise exposure and cardiovascular mortality: 15-years of follow-up in a nationwide prospective cohort in Switzerland. *Environment International*, 158, 106974.

<https://doi.org/10.1016/j.envint.2021.106974>

Khomenko, S., Cirach, M., Barrera-Gómez, J., Pereira-Barboza, E., Iungman, T., Mueller, N., Foraster, M., Tonne, C., Thondoo, M., Jephcote, C., Gulliver, J., Woodcock, J., & Nieuwenhuijsen, M. (2022). Impact of road traffic noise on annoyance and preventable mortality in European cities: A health impact assessment. *Environment International*, 162, 107160.

<https://doi.org/10.1016/j.envint.2022.107160>

Zhang, A., Zou, T., Guo, D., Wang, Q., Shen, Y., Hu, H., Ye, B., & Xiang, M. (2021). The Immune System Can Hear Noise. *Frontiers in Immunology*, 11.

<https://www.frontiersin.org/article/10.3389/fimmu.2020.619189>

Gelb, J., & Apparicio, P. (2021). Cyclists' exposure to atmospheric and noise pollution: A systematic literature review. *Transport Reviews*, 41(6), 742–765.

<https://doi.org/10.1080/01441647.2021.1895361>

Nejade, R., Grace, D., & Bowman, L. R. (2022). *Enabling Health Outcomes of Nature-based Interventions: A Systematic Scoping Review* (p. 2022.03.16.22272412). medRxiv. <https://doi.org/10.1101/2022.03.16.22272412>