Position Paper on Greening of Urban Environments and Public Health

HSE Public Health Medicine
Environment and Health Group

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Summary

Provision of urban green spaces should be a priority of urban planners, including in Ireland, and should be considered not just an aesthetic improvement, but as a necessity for the public health of the urban area. International evidence and international health bodies recommend the use of urban greenery to improve the physical and mental health of the users of the green spaces, and also as a way to protect against urban exposures, such as air pollution, noise and heat. Green spaces in urban areas will contribute to Climate Change prevention/mitigation and adaptation.

The Public Health Medicine Environment and Health Group supports the improved frequency, quality, area and accessibility of green spaces in urban areas across Ireland.

Recommendations

Access to high quality urban green space is integral for the health of urban residents. Given the evidence around urban green space and health, we recommend and support the following:

- Urban green space should be a priority in urban planning. All development plans that are on a village or larger level should mandatorily include provision for public access to quality green space, as both part of the development planning, and as part of the health impact assessment process.
- Public Health will advocate for green space in all responses to public consultations by public bodies that they submit.
- Spaces should be accessible and of good quality to allow people to enjoy the benefits of interaction with nature.
- Green space should be available across all socio-economic populations. In order to achieve this, there needs to be a heightened focus on protecting and developing green spaces in deprived areas (see Appendix, Figure 1).
- Planning at all levels must address improved access to and quality of green spaces. This includes national, regional and local development plans. International evidence, such as that from the WHO, should be used as a guideline for designing urban green spaces[7] including:
    - Prioritising quality over quantity, with variability of green features
    - Attention to the intended use of parks and planning according, such as planning larger parks, trails, playgrounds, resting facilities and blue spaces (water) if aiming to increase physical activity
    - Managing tree density and tidiness for observed benefits, such as feelings of wellbeing, stress relief, and decreased aggression and mental fatigue
    - Ensuring pleasant aesthetics and avoiding unpleasant aesthetics such as littering, graffiti and animal waste
- Tree choice can be tailored to intended health effects; guides exist as to which species of flora are best suited to certain environments, infrastructure and pollution objectives[1].
- Green spaces should be considered vital tools in nature-based planning for future climate needs; trees for local cooling and shade, green space for interruption of air pollution, noise and wind, and varied green spaces for public mental health and resilience.

Background

Urban spaces are by definition non-green areas, having been built upon a cleared natural environment. As urban expansion and density grows, green space is usually lost, particularly inside of the built urban environment. This means that residents of the urban environment can become cut off from exposure to the natural world. This was particularly highlighted during the Covid-19 pandemic, where people under movement restrictions had to rely on amenities available to them locally, and people living in urban environments may be cut off from any interaction with the natural, non-built world. This will be particularly relevant into the future as the climate changes and meteorological conditions and exposures, such as heat, rain, flooding and wind become more intense.

The frequency, quality and accessibility of green spaces is not uniform across urban areas, or between urban areas. Across Europe, urban tree coverage varies; Stockholm, Sweden has been surveyed as having 57.3% tree canopy coverage, whereas Athens, Greece had a coverage of 0.9%[2]. Green coverage varied across urban centres in Ireland; 31.23% of Cork was surveyed as being green covered, whereas 9.47% of Dublin was[2]. The distribution of green spaces, and the presence of impervious surfaces varies across an urban area, with green space frequency, quality and accessibility lower in more deprived areas. Lower socio-economic populations not only have less access to green space, but face more environmental extremes and exposures[4,7]; a situation which could see widening inequalities as the Climate Change takes effect and deprived populations face greater exposures.

The Healthy Ireland Framework unites Ireland's main health promoting policies until 2025. This links to other key policies, such as A Healthy Weight for Ireland and The Physical Activity Plan. Considering the international evidence, benefits towards this framework could be seen from increasing quality urban green spaces, such as in the realms of:

- Healthy weight
- Mental wellbeing
- Physical activity
- Creating 'activity-friendly' environments
- Social inclusion, cohesion and connectedness

Evidence Base

The benefits of urban green spaces are myriad. The World Health Organization makes special note that deprived communities and populations stand to especially benefit from urban greening[3].

Health Effects of Urban Green Space

- Green spaces in urban areas can benefit health in multiple ways. This includes physical health, mental health and social community health and cohesion.
- The WHO states that green spaces facilitate and support health through physical activity, stress reduction and improved community cohesion through social interaction. This occurs because urban green spaces are able to improve physical fitness, cognitive health and immune system function, as well as generally decrease mortality[3].

- Public Health England states that green spaces are “an asset to health” by reporting that green space access is linked to more favourable birth weights, higher likelihood of healthy adult weight, maintenance of healthy immune function and increased self-assessed general health[4]. They also found that green space access was linked to lower all-cause cardiovascular mortality, with the strongest association in the most deprived populations[4].
- Specific benefits of green spaces have been found in vulnerable subpopulations, including:
    - Children – increased birth weight, improved cognitive development and behavioural development, and improved social skills inclusion across diverse groups[7]
    - Older adults – improved self-reported health, decreased sedentary behaviour, increased social ties and sense of community (which could decrease mortality associated with social isolation)[7]
    - Deprived populations – lower levels of health inequality related to income deprivation, reduced cardiovascular mortality and psychological distress, and reduced harm from other environmental exposures associated with urban deprivation, such as heat and air pollution[7]

Mental Health Effects of Urban Green Space

- Access to green spaces in urban environments has been noted by the WHO to be beneficial to mental health[3].
- Systematic reviews have found that green space exposure enhances quality of life in individuals, including both children and adults[4].
- A Public Health England evidence review found that urban green spaces were associated with positive emotions, higher life satisfaction, reduced stress and distress and improved self-assessed mental health, as well as reduced levels of depression, anxiety and fatigue, with the greatest effects in deprived populations[4].
- Children and young people benefit from urban green spaces also, with evidence showing reduced stress, hyperactivity and inattention, in addition to improved resilience, quality of life and emotional well-being[4].
- One study from the UK analysed the rate of anti-depressant prescription in reference to urban tree density and found an association between tree numbers and prescription rate, and that for every extra tree, anti-depressant prescribing frequency decreased by 1.18 per 1000 population[5].

Air Quality

- Urban greenery is both able to chemically absorb some forms of air pollution, as well as disrupt the flow of air pollution and exposure to humans[6].
- The WHO states that green space has a healthy impact on air pollution-related harm for those in contact with the green space[7]. They recommend that urban planning use green space as a way to protect against air pollution-related harm[8]. However, they noted evidence that certain green space layouts could trap air pollution, so this needed to be taken into account when planning green spaces[7].
- Evidence from the UK showed that urban green and blue space absorbed just under 30,000 tonnes of air pollution in a year, saving just over £160 million[4] in associated health costs.

Noise

- Urban noise exposure is a risk to health and causes premature mortality in Ireland, with the European Environmental Agency (EEA) assessing that in 2017 there was an estimated 56 premature mortality events in Ireland due to urban noise, with the vast majority of this health effect due to road noise[9]. Further, they reported 855,300 people in Ireland were exposed to excess daytime noise (>55dB) and 447,300 to excess night time noise (>50dB)[9].
- Green spaces are recognised to be important in reducing urban noise by the WHO[3], as urban green spaces are able to dampen, disperse and absorb urban noise[4].
- The majority of European noise exposure harm is due to transport, especially roads[9].
- Urban green spaces have a direct, positive impact on health, with evidence suggesting green spaces can offset some of the health harm impact from urban noise, with this effect being greater than just the physical ability of green spaces to disrupt noise[4].

Heat

- Urban heat is a major threat to public health, and a major concern of the WHO[7]. Heat is predicted to intensify with Climate Change[10], with intensification through the heat-island effect in urban areas, with deprived and vulnerable groups at most risk[4,7].
- Urban parks have been shown to have a cooling effect, not just of the green area, but also of the surrounding area, for up to 1km[7]. The effect is greater when blue spaces are also present[7].
- Other urban greenery, such as trees, green roofs and small parks can also reduce heat stress, provide shade and reduce the need and use of air conditioning, and reduce income-related heat exposure[7]. It was also noted that urban greenery can protect against cold and wind[7].

Flood Risk

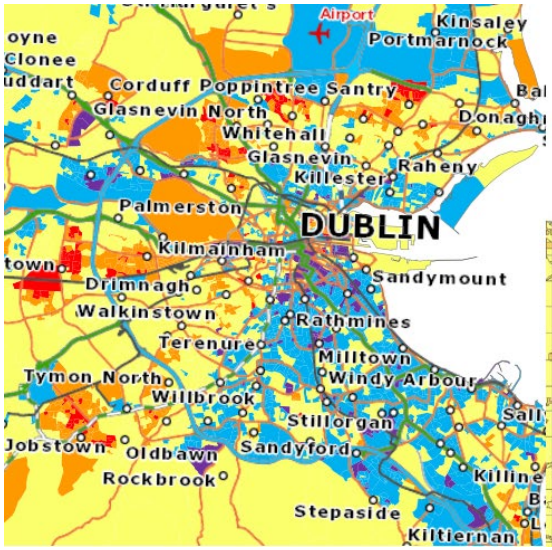
- Climate Change is predicted to increase urban flooding events[4]. This includes in Ireland. Geological Survey Ireland has assessed the coastal flood risk and, for example, that in Dublin, in a worst-case scenario, large areas of the inner city and North and South Dublin, could be vulnerable to flooding events by 2100[11]. Further afield, the survey has stated there is a "high" flood risk for parts of the central East coast, including multiple points along the Wicklow coast between Arklow and Wicklow town, and also a large section of the coast running north from Wicklow town[11].
- Green space has been cited as having the potential to help reduce flooding[4].

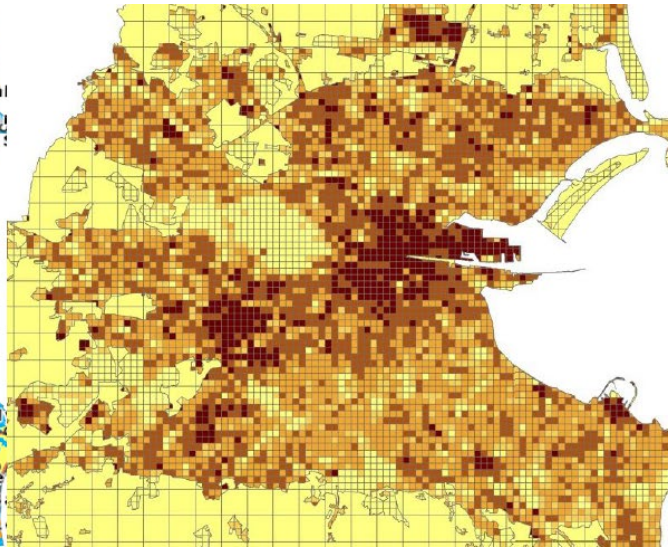
Carbon Sequestration

- The planting of trees and greenery helps to absorb carbon dioxide from the atmosphere, the main driver of Climate Change. Although carbon sequestration purely through greening will not be enough to prevent Climate Change, it will play part in the efforts to prevent the full effects of Climate Change
- The WHO supports the use of urban green spaces to sequester carbon[7]

Appendix

Figure 1. Comparison between deprivation ("HP level") across Dublin[12] and coverage of impervious surfaces as mapped by Brennan et al.[2]





Map source: Health Atlas Finder

Red – most deprived
Purple – least deprived

Map source: Brennan et al.[2]

Darkest – 80.1 – 100.0% impervious surface coverage
Lightest – 0.0 – 20.0% impervious surface coverage

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