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BMJ Open  Urban green spaces and cancer: a protocol for a scoping review

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ABSTRACT

Introduction Green space in the built environment is an important topic on the health agenda today. Studies have shown that access to green spaces is associated with better mental and physical health, yet green spaces can also be detrimental to health if they are not managed appropriately. Despite the increasing interest in urban green spaces, little research has so far been conducted into the links between green spaces and cancer.

Objective The purpose of this scoping review is therefore to map the literature available on the types of relationship between urban green spaces and cancer.

Method and analysis We followed the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols 2015 guideline to report the protocol. To conduct this scoping review, we will use a structured search strategy based on controlled vocabulary and relevant key terms related to green space, urban space and cancer. We will search MEDLINE (PubMed), GreenFILE (EBSCOhost), Cumulative Index to Nursing and Allied Health Literature (EBSCOhost) and ScienceDirect as electronic database as well as hand-search publications for grey literature. This review will therefore provide evidence on this current topic, one which could have practical implications for policy-makers involved in choices which are more conducive to healthy living.

Ethics and dissemination No primary data will be collected since all data that will be presented in this review are based on published articles and publicly available documents, and therefore ethics committee approval is not a requirement. The findings of this review will be presented at workshops and conferences, and will be submitted for publication in a peer-reviewed journal.

RATIONALE

Healthy urban planning

Expanding urbanisation across our society has become a major health issue for urban population and as such, there is growing interest in urban health determinants. The relationship between urban planning and health is complex and includes social, environmental and economic dimensions.4–10 In its report on healthy urban planning, WHO recognises that the state of cities, resulting from planning policies, can have an impact on health, well-being and quality of life.6 Urban planning includes areas such as housing, transport, water (supply, drainage or sanitation), waste management and green space.

Green spaces as a component of healthy urban planning

Healthy urban planning connects with recent research into the relationship between nature conservation and health. This is not something new; Hickman has shown that this was already an issue back in 19th century Britain when the National Health Society took an early interest in the urban parks movement.11 At the time, green spaces were already looked on as the ‘lungs’ of the city: ‘a park in the East End of London would probably diminish the annual deaths by several thousands, prevent many years of sickness and add several years to the lives of the entire population’ (Hickman, p115).11

Green spaces and health

Today urban green spaces are of growing interest to public health experts and citizens alike. While research first focused on risk factors relating to green spaces, scientists are now looking at salutogenic factors.12–15 Studies have shown that access to green spaces is associated with better mental and physical health.2 16 17 A recent WHO review has shown that green spaces promote relaxation and this may impact on the immune
系统。它们也有一个积极的影响在管理慢性疾病，如高血压、2型糖尿病和心血管疾病（CVD）。18 15 城市绿色空间鼓励更健康的行为，如体育和娱乐活动。20 21 它们也可以提供娱乐性设置，并促进社会凝聚力。22 它们的物理特征、性质和大小有助于调节城市生态系统，避免污染空气和提高声音景观的质量。23 24 其他改善城市生活的措施包括娱乐性绿地、绿色路径、流动床和花卉墙。暴露于阳光可以提升维生素D的供应，调节昼夜节律和睡眠质量。更多的研究发现这表明这些特征有助于绿色空间和改善生活质量在居民。25 26 这些特征也很重要，因为它们允许人们遇到不同的动植物，以及欣赏自然景观和花卉墙。27 28

**Green spaces and cancer**

绿色空间可以对癌症产生直接影响或间接影响癌症的决定因素。29

许多研究强调了绿色空间和癌症之间的联系。有些研究显示了某些积极的效果，表明绿色空间可能减少在人口中癌症的风险和健康行为。30 其中不同癌症的危险因素，有直接与绿色空间相关的区域（如紫外线、卫生产品和空气污染）和那些间接相关的区域（如水平活动、久坐生活和肥胖）。27 28 29

绿色空间可能改善在病和康复者的生存率，以及对癌症康复有益。31 其他文章指出一些负面影响，如通过暴露污染物。32 这样，绿色空间的管理政策可能对健康有害。这包括使用拟生物产品，如杀虫剂和除草剂，以及影响植物和产品的影响。33 34

与那个其他确定因素对慢性疾病，如癌症，这些因素可能导致积极和消极的成果。此外，户外娱乐区域，绿色空间可能暴露于紫外线，紫外线对皮肤可能是一个影响皮肤癌的因素。35 然而，同一篇文章强调，最近的研究也表明了紫外线引起的皮肤氧化可能产生意想不到的健康益处，包括降低血压和CVD，这在低纬度和冬季月份特别相关。24 25

**OBJECTIVES**

这个扫描性审查是在GoveRnance for Equity ENvironment and Health in the City (GREENH-City - ethical approval CERES 2017-36)项目中进行的，该项目专注于这一问题并旨在确定绿色空间和癌症的联系。我们专注于城市环境，绿色空间被认为是具有积极影响的。21 22 23 24 25 26

**METHODS AND ANALYSIS**

**Design**

扫描性审查被证明是最适于映射现有文献并描述其结果的，特别是在当一个主题还没有被广泛研究时或很复杂。34 一个扫描性审查的目的是：随着接近和增强一致性。35 我们将遵循扫描性审查的五个阶段描述的Arsey和O’Malley。36 两者之间的联系和健康在出现的证据。As Levac et al.35 所述，使用扫描性研究允许考虑一个范围的‘研究设计’，包括在已发表和灰色文献，回答那些相关于干预有效性的和产生可以补充临床试验的成果。36 其中，(1) 确定研究问题；(2) 确定相关研究；(3) 选择研究；(4) 绘制数据和(5) 总结，总结和报告结果。

我们遵循了Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015指南来报告该协议。37 扫描性审查的协议不适用于在国际Prospective Register of Systematic Reviews注册。
Data selection
Search for electronic databases
We will search MEDLINE (via PubMed), GreenF ILE (via EBSCO host), Cumulative Index to Nursing and Allied Health Literature (via EBSCOhost) and Science Direct as electronic databases. To conduct this scoping review, we will use a structured search strategy based on controlled vocabulary and relevant key term. The key terms for the inclusion criteria are related to green space, urban space and cancer. The search terms and equations for MEDLINE can be found in online supplementary appendix 1 and will be adapted for other databases. We will also screen reference lists of included studies.

Search for other resources
Google and Google scholar will be also examined. We will also hand-search websites of key organisations involved in addressing and reporting research on green spaces (WHO, Agency for Healthcare Research and Quality, National Institute for Health and Care Excellence (NICE), Medical Research National Institute (INSERM), French National Cancer Institute, The Institute of Cancer Research, Commission for Architecture and the Built Environment, national urbanism agencies, etc) and grey literature databases (eg, OpenGrey). We will screen all the reference lists of included studies (backward search) for new article and search articles (forward search) that have cited the included studies (Web of Science).

Data analysis
Eligibility criteria
► All types of studies (randomized controlled trial, prospective cohort studies, case studies, observational studies, non-comparative studies) are eligible for inclusion, including grey literature. We will not select studies on their methodological design and quality. We will limit our search to publications in English, French and Spanish. No date restriction will be applied.
► Reports that document any type of link between urban green space and cancer in human beings.

Exclusion criteria
► Studies relating to contamination hazards in agricultural soils as well as cemeteries.
► Articles such as commentary, editorial reviews and opinion articles.

Data extraction items
In order to identify the type relationships between urban green spaces and cancer, the characteristics of green spaces that have an effect on cancer, and the factors which may influence the relationship between green space and cancer, we will extract the following data for the academic and grey literature data:
► study characteristics (title, author and date of publication, journal, country);
► aim and methods;
► context;
► study objectives;
► study design;
► methods;
► population: type of participants, settings and sample size;
► green space characteristics: type of green space, method to characterise green space, contributive factor related to green space that has an effect on cancer;
► if there is a green space intervention, its aim (create, change, remove and improve green spaces), its setting (brownfield intervention and area regeneration, combination with blue spaces, gardening and edible green spaces, schools and institution setting);
► outcomes: type of measures reported to evaluate effects of urban green spaces on cancer, type of green spaces effects;
► effects on cancer: type of cancer involved, type of exposure, relation to exposure (indirect or direct);
► other links/relationships (issues that might be of interest addressed by the study).

Data management
We will download the references retrieved from the electronic database searches and from the hand searching to Covidence (https://www.covidence.org/) and remove duplicates.

All identified references screened independently by two reviewers (from pool of five authors: MP, ML, MG, JP, J-PR) using a three-stage approach to reviewing the title, abstract and full text. The results of this selection process will be documented in a standardised flowchart. Any potential disagreement will be recorded and resolved by further discussion. We will keep a record of reasons for excluding studies.

Two authors will independently extract information for the first stage. Any potential disagreement will be recorded and resolved by further discussion. For the other stages, the members of the research team will screen the full text and extract the relevant data. To support this process, we will pilot test a data extraction form and test it on five studies. It will be modified when necessary to ensure comprehensiveness and comparability between results. Tables will be prepared in Excel sheets to extract the data where relevant information will be reported.

Data synthesis
We do not plan to perform meta-analyses and statistical methods of synthesis in this review due to the heterogeneity of the identified evidence. The purpose of a scoping review is to aggregate the findings and provide a narrative synthesis.

Quantitative data will be report using descriptive numerical summary analysis.

A qualitative synthesis will be used to describe the key characteristics of urban green spaces and cancer populations, the relationships between urban green spaces and cancer. If additional data emerge, they will be reported with the findings. We will summarise publications and
their characteristics in tables to support the narrative synthesis. We will create a table that will constitute our map of the literature to present interventions and outcomes that aim to address relationships between urban green spaces and cancer. We will use the method described by the International Initiative for Impact Evaluation (http://www.3ieimpact.org/en/evidence/gap-maps/) to build the table.

We will use the approach of level of scientific evidence to drive the conclusions on the relationship between urban green space and cancer.

We will assess the quality of the body of evidence from all the included studies and reports. We will adapt the ‘evidence for corroboration’ grading system developed by NICE38 for each characteristic identified (see table 1). Each level will take in account the number and methodological quality of the included studies.

We will use the PRISMA statement to guide the reporting of our findings (https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-016-0279-4).

CONCLUSION
This review will provide a picture of the current topic of the link between green spaces and health, with a narrowed focus on cancer genesis. By exploring the pathways between green space components and cancer, the findings could have practical implications on how to manage urban green spaces and how policy-makers may make choices which are more conducive to healthy living.

Contributors JPR, MP, ML, MG and JP wrote the original protocol. MP, JPR and JP drafted the paper. NLC, JS, ARLG, SR, Zh and EF revised the protocol and the paper. ML and MG contribute during Master’s internship. Besides the main authors (JP, J-PR, MP and ML), all the listed authors are involved in the GREENH-City project as researchers (EF, NLC, JS, SR, LC and ARLG) or practitioners (ZH).

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Competing interests None declared.

Patient consent Not required.

Table 1 Grading system to assess the level of evidence

<table>
<thead>
<tr>
<th>Strength of evidence</th>
<th>Type of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>Consistent findings in two or more studies of ++ quality</td>
</tr>
<tr>
<td>Moderate</td>
<td>One study or consistent findings in two or more + quality</td>
</tr>
<tr>
<td>Limited</td>
<td>Only one + study, two or more studies with inconsistent findings</td>
</tr>
<tr>
<td>No evidence</td>
<td>No study of acceptable quality (-), inconsistent findings or no relevant research available</td>
</tr>
</tbody>
</table>

++, very low risk; +, low risk; −, high risk of confounding, bias or chance.

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