

Statutory Consultation 2022

Preliminary Environmental Information Report

Volume 3: Appendix 13.4
**Methodology for Health
and Community Assessment**

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1 INTRODUCTION TO HEALTH AND COMMUNITY ASSESSMENT

- 1.1.1 This appendix should be read in conjunction **Section 13.5** of **Chapter 13** Health and Community in Volume 2 of the Preliminary Environment Information Report (PEIR).
- 1.1.2 The health and community assessment applied the established principles and methods of both health impact assessment (HIA) and community assessment. These two assessments have been combined and presented as a joint topic within the PEIR as they share similar baseline information and are both concerned with assessing the effects on people living close to, or affected by, the Proposed Development.
- 1.1.3 This section outlines the methodology used for assessing the likely significant effects on health and community arising from impacts arising from the construction and operation of the Proposed Development. It is structured as follows:
- a. relationship of the assessment to other environmental impact assessment (EIA) topics;
 - b. stages in the health and community assessment process;
 - c. baseline methodology for health and community assessment;
 - d. construction assessment methodology; and
 - e. operation assessment methodology.

2 METHODOLOGY OVERVIEW

- 2.1.1 The health and community assessment identifies effects on the health of the population and on the lives of people within the local community, arising from direct and indirect impacts on community resources and the environmental, social and economic impacts of the Proposed Development. The health and community effects resulting from these impacts of the Proposed Development are defined as follows:
- a. Health effects have been identified when an environmental, social, or economic factor that influences health and wellbeing (a 'health determinant') is impacted, and the number of people exposed to this change is considered sufficient to cause a change in health at population level¹ (see **Inset 1** for an illustration of the health impact pathway and potential effects). The below health determinants have been considered within the assessment. Further information about the evidence base

¹ An effect on population health may be defined as a change in the health outcomes, and the distribution of those outcomes, within a defined group of people at a defined geographical level. Further information on population health available in the document: TheKingsFund. (2018) A vision for population health: Towards a healthier future.

relating to health determinants is provided in **Appendix 13.5** in Volume 3 of the PEIR.

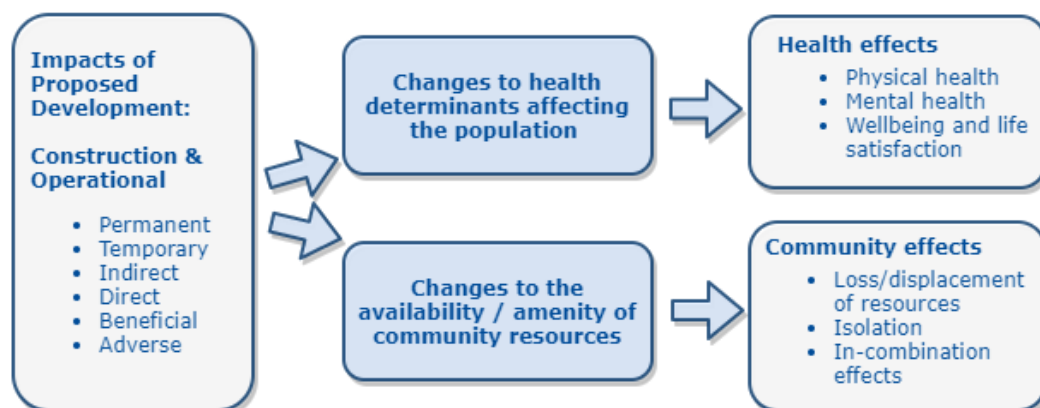
- i. access to open space, recreation, and physical activity;
 - ii. access to services;
 - iii. employment and income;
 - iv. housing;
 - v. neighbourhood quality;
 - vi. aircraft noise;
 - vii. perception and uncertainty; and
 - viii. social capital.
- b. Impacts on community resources, and the resultant effects on the people ('receptors') using those resources, have been identified as community effects, including:
- i. residential properties;
 - ii. schools;
 - iii. community facilities;
 - iv. open spaces and Public Rights of Way (PRoW); and
 - v. leisure and recreation facilities.

Inset 1: The health impact pathway and potential effects.



2.1.2 **Inset 2** illustrates the relationship between, and the key components of, the health and community assessment.

Inset 2: The relationship between, and the key components of, the health and community assessment.

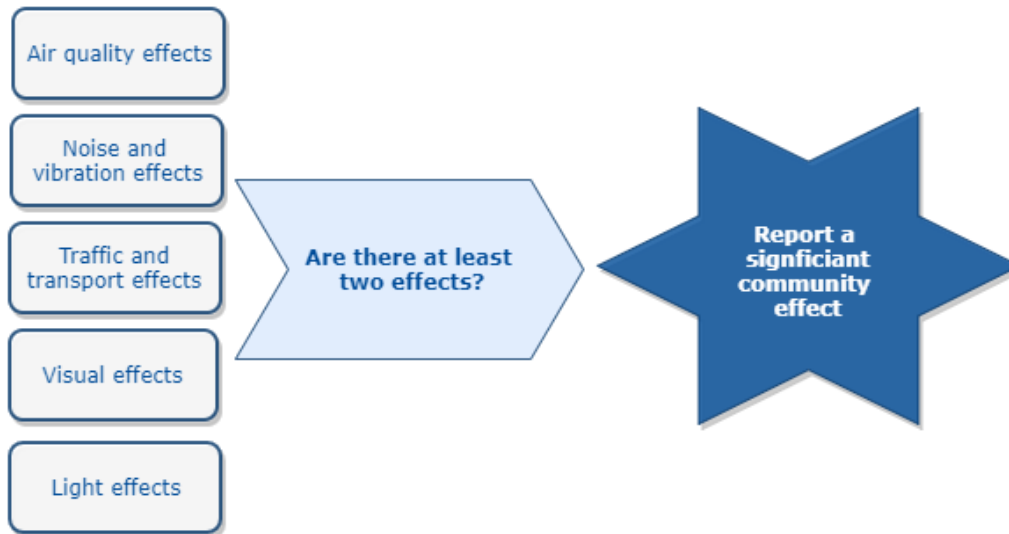


2.1.3 The assessment methodology for health and community effects is applicable to both the construction and operational phases of the Proposed Development.

3 RELATIONSHIP OF ASSESSMENT TO OTHER EIA TOPICS

- 3.1.1 The health and community assessment has on drawn information from other topic assessments in order to identify impacts on health determinants and community resources, including:
- a. Air quality (**Chapter 7** of PEIR);
 - b. Economics and employment (**Chapter 11** of PEIR);
 - c. the **Draft Equalities Impact Assessment** (EqIA) (provided as part of statutory consultation);
 - d. Landscape and Visual (**Chapter 14** of PEIR);
 - e. Lighting Obtrusion Assessment (**Appendix 5.2** of the PEIR);
 - f. Noise and vibration (**Chapter 16** of PEIR); and
 - g. Traffic and transport (**Chapter 18** of PEIR).
- 3.1.2 The health and community assessment has been largely based on the significant and residual effects identified by the topics listed above. Residual effects are effects which remain after mitigation measures have been taken into account e.g. acoustic screening, landscape planting.
- 3.1.3 The EqIA is a standalone consultation document which shares a baseline with the health and community assessment, and cross-references are provided where appropriate. The Light Obtrusion Assessment has been included within the Health and Community assessment in response to scoping opinion comments.
- 3.1.4 The health assessment considered impacts of the Proposed Development on the health determinant of 'neighbourhood quality', which is determined by the character and attractiveness of the public realm within a neighbourhood. An impact on this health determinant has been identified where there are two or more significant impacts on the physical environment, i.e. noise, air quality, landscape, visual, light and traffic and transport impacts. When these environmental factors are altered, people's level of satisfaction with their neighbourhood and living environment may change, which in turn may affect their wellbeing. This is a slightly different approach to that used in the community assessment which requires two or more residual significant effects.
- 3.1.5 The community assessment contained an assessment of in-combination effects. The assessment of in-combination effects on community receptors drew from the findings of other assessment topics, taking into account professional judgement about the sensitivity of the individual receptor to the predicted effect. An in-combination community effect occurs where two or more residual significant effects from air quality, noise and vibration, traffic, and transport, or visual or light effects occur on specific community receptors, as presented in **Inset 3**.

Inset 3: In-combination effects for community assessment.



4 STAGES IN THE HEALTH AND COMMUNITY ASSESSMENT

4.1.1 The health and community assessment has been completed in the following stages:

- a. **Population profile:** The demographic, social and health characteristics of the population has been described using publicly available data. This provided an overview of the population's resilience to health effects, and the prevalence and distribution of vulnerable sub-groups. The term 'vulnerable groups' refers to groups of individuals who are made vulnerable by the situations and environments they are exposed to (as opposed to any inherent weakness or lack of capacity). This includes groups of people who may be more likely to be exposed to a change in a health determinant, or to experience health effects as a result of exposure (see **Appendix 13.5** for further information about vulnerable groups).
- b. **Community baseline:** A description of the existing community resources in the Study Area has been provided. This includes residential properties, schools, community centres, parks and open spaces and leisure facilities.
- c. **Surveys:** Additional baseline information has been gathered through surveys of open spaces, recreational spaces, and routes, to inform the community impact assessment. This includes quality surveys, user counts and questionnaires (see **Appendix 13.2** and **Appendix 13.3**).
- d. **Health evidence base:** A review of publicly available scientific literature describing how environmental, social, and economic factors influence health and wellbeing. The literature review uses credible, up to date sources, focusing on secondary evidence such as Government literature reviews (see **Appendix 13.5**).

- e. **Assessment of effects:** An assessment of the likely significant health and community effects, using qualitative and quantitative techniques.
- f. **Mitigation:** A description of measures to be incorporated to reduce the adverse and/or enhance the beneficial effects of the Proposed Development on population health and community receptors.
- g. **Residual effects:** An assessment of the likely residual effects of the Proposed Development after health and community mitigation measures are implemented.

4.1.2 Engagement with key health and community stakeholders has been ongoing throughout the health and community assessment process (see **Section 13.4 of Chapter 13** Health and Community).

5 BASELINE METHODOLOGY FOR HEALTH AND COMMUNITY ASSESSMENT

5.1 Health baseline

5.1.1 The health assessment considers the effects on the population within the study area arising from impacts of the Proposed Development on relevant health determinants. In order to understand the current demographic, social and health characteristics of the population, baseline data for the health assessment was obtained from the following principal sources:

- a. 2011 Census;
- b. The English Index of Multiple Deprivation 2019;
- c. Office for National Statistics;
- d. Public Health England Local Authority Health Profiles;
- e. Mental Health and Wellbeing Joint Strategic Needs Assessment; and
- f. Information from consultation with technical and community stakeholders.

5.1.2 Baseline health data for the local neighbourhood and wider study area has aimed to look at the same indicators. However, in some instances data for indicators at the two spatial scales was not available so different indicators have been used. For local neighbourhood baseline conditions, mental health data at ward level was not available; however, corresponding National Health Service (NHS) CCG data has been used to provide an overview of mental health baseline within the local neighbourhood area.

5.2 Community baseline

5.2.1 The community baseline identified community resources within the study area. Only those community resources considered to be potentially affected by the Proposed Development have been reported within the community assessment. In order to understand the community resources and the receptors (people) that

use them, baseline data for the community assessment has been identified using the following principal sources:

- a. OS Address Base Data which contains information about the type of property to which the address relates to (e.g. dwelling, school, place of worship etc.);
- b. search engine mapping features;
- c. information from local strategies and policies;
- d. information from consultation with community stakeholders and relevant feedback received from public consultation on the Proposed Development.

5.2.2 The community assessment has considered effects arising from impacts on the following community resources and the receptors (people) that use them:

- a. residential properties;
- b. schools;
- c. community centres;
- d. parks and open spaces; and
- e. leisure and recreation facilities.

5.2.3 Please refer to the Scoping Report (**Appendix 1.1** in Volume 3 of the PEIR) for details of the community resources considered within the baseline.

5.2.4 A series of surveys of open spaces and recreational routes have been undertaken to verify the baseline of community resources, and to ascertain quality and usage. These were undertaken throughout 2019 (from April to November) prior to any changes in usage resulting from the Covid-19 lockdowns. Results of the open space surveys have been used to determine significance and in particular receptor sensitivity by providing further details on use of the space. Further details of the methodology for undertaking open space surveys and the results can be found in **Appendices 13.1 and 13.2**.

5.3 Future baseline

5.3.1 Over the timescale of the Proposed Development's delivery, the profile of the affected communities is likely to change, influenced by wider economic and health policy, and demographic trends. The approach to defining future baseline is described in **Section 5.4** of **Chapter 5** Approach to the Assessment. The future baseline considered for health and community is described in **Section** Error! Reference source not found. of **Chapter 13**.

6 CONSTRUCTION ASSESSMENT METHODOLOGY

6.1 General approach for assessing significance of effects

6.1.1 The health and community assessment is largely qualitative in nature. However, for health effects arising from operational noise, the effects have been

quantified. See the Operation Assessment Methodology (**Section 7**) for information on quantitative assessment of noise related health effects.

6.1.2 The assessment determined the significance of health and community effects in line with the requirements of the EIA Regulations. This is a judgement-based exercise to identify those effects that are significant enough to be reported in an Environmental Statement (ES) and considered in the overall evaluation of the Proposed Development by decision makers. It should be noted that this assessment does not refer to the ‘clinical’ or ‘statistical’ significance of health effects².

6.1.3 The approach for defining significance has considered:

- a. the magnitude of the impact on a health determinant and/or community resource; and
- b. the sensitivity of the population or receptors who will experience the impact.

6.2 Magnitude of impact

6.2.1 The magnitude of an impact on a health determinant and/or community resource has been assessed on a scale of high, medium, low, and very low. **Table 1** below provides guidance on the criteria used to determine the magnitude of impact. This guidance has been applied using professional judgement.

Table 1: Guidelines for the assessment of magnitude of health and community impacts.

Magnitude	Guidelines for magnitude of impact on health determinants	Guidelines for magnitude of impact on community resources
High	<p>A substantial change to a health determinant, with two or more of the following characteristics:</p> <ul style="list-style-type: none"> • assessed as ‘major’ by relevant environmental topics (where applicable*); • likely to be perceived by the population as a substantial change; • has the potential to affect the occurrence of acute or chronic mental or physical illness; • A high level of exposure would occur over a wide geographical 	<p>An impact that has the potential to result in loss or be substantially disruptive (positively or negatively) to the way in which a resource or receptor is currently used.</p> <p>Usually has a long term or permanent impact on the baseline conditions (judgements on timescales are dependent on nature of impact).</p>

² Statistical significance is attributed to quantitative population-based health indicator outcomes relating to large-scale epidemiological data comparisons and cannot be attributed to a judgement-based assessment without appropriate large-scale population data. Clinical significance is a measure of the importance of changes in health status relating to individual patient outcomes.

Magnitude	Guidelines for magnitude of impact on health determinants	Guidelines for magnitude of impact on community resources
	<p>area and/or be likely to affect a large number of people (e.g., over 500).</p> <ul style="list-style-type: none"> long term duration or permanent (judgements on timescales are dependent on nature of impact). 	
Medium	<p>A change to a health determinant, with two or more of the following characteristics:</p> <ul style="list-style-type: none"> assessed as 'moderate' by relevant environmental topics (where applicable*); likely to be perceived by the population as a noticeable change; has the potential to improve / reduce mental wellbeing or quality of life, or exacerbate / alleviate symptoms of existing illness; A medium level of exposure would occur over a relatively localised area and/or be likely to affect a moderate-large number of people (e.g. 100-500). medium to long-term duration 	<p>An impact that has the potential to be considerably disruptive (positively or negatively) to the way in which a resource or receptor is currently used.</p> <p>Usually has a medium to long term impact on the baseline conditions, but likely to be reversible</p>
Low	<p>A modest change to a health determinant, with two or more of the following characteristics:</p> <ul style="list-style-type: none"> assessed as 'minor' by relevant environmental topics (where applicable*); likely to be perceived by the population as a modest change; has the potential to lower or raise wellbeing in terms of levels of comfort and contentment; A low level of exposure would cover a small area and/or affect a small number of people (e.g. fewer than 100). short to medium term duration 	<p>An impact that has the potential to noticeably change (positively or negatively) the way in which a resource or receptor is currently used, but the overall purpose of the resource is unchanged.</p> <p>Usually has a short to medium term impact on the baseline conditions, but likely to be reversible.</p>

Magnitude	Guidelines for magnitude of impact on health determinants	Guidelines for magnitude of impact on community resources
Very Low	<p>A minor change to a health determinant, with two or more of the following characteristics:</p> <ul style="list-style-type: none"> likely to be perceived as a small change by some members of the population; occurs over a localised area; has the potential to lower or raise wellbeing in terms of levels of comfort and contentment; affects a small number of individuals. 	<p>Anticipated to make little or no difference or no discernible change to the way a receptor can use a resource.</p> <p>An impact that is very short term in nature and completely reversible.</p>

*Note that other EIA topics' assessment results are not always relevant to the health assessment. For example, a 'major' effect identified by a topic for an individual receptor would not necessarily constitute a major change to a health determinant. However, other topic assessments may assist with judgements made about the magnitude of impacts. Professional judgement is required when using information from other topics in the health assessment.

6.3 Sensitivity of receptors

6.3.1 For the health assessment, sensitivity is defined by the vulnerability of the population to potential health and wellbeing impacts. This takes into account demographic, health and social factors as described in the baseline.

6.3.2 For the community assessment, sensitivity of receptors (people using community resources) has been determined by the extent to which the individuals have the capacity to experience the effect without a substantial loss or gain. Factors considered when assessing receptor sensitivity will include personal circumstances and ability to access alternatives.

6.3.3 **Table 2** sets out guidelines for defining the sensitivity of the population and receptors.

Table 2: Guidelines for the assessment of sensitivity.

Sensitivity	Guidelines on sensitivity of population (for health assessment)	Guidelines on sensitivity of receptors (for community assessment)
High	Affected population includes a higher than national average proportion of groups who are more likely to experience health effects as a result of the impact in	Receptors who are at risk and have little or no resilience to the impact either through personal circumstance or an inability to

Sensitivity	Guidelines on sensitivity of population (for health assessment)	Guidelines on sensitivity of receptors (for community assessment)
	question by virtue of their socio-demographic or health status.	access alternatives or no alternative resources provided locally.
Medium	Affected population includes an average or close to average proportion of groups who are more likely to experience health effects as a result of the impact in question by virtue of their socio-demographic or health status.	Receptors who have limited resilience to the impact either through personal circumstance or a restricted ability to access alternatives or a shortage of alternative resources provided locally.
Low	Affected population includes a below average proportion of vulnerable or disadvantaged groups who are more likely to experience health effects as a result of the impact in question by virtue of their socio-demographic or health status.	Receptors who have average resilience or some slight restrictions on resilience to the impact either through personal circumstance or a slightly restricted ability to access alternatives.
Very Low	Not applicable (no population is considered more likely to experience health effects as a result of the impact in question by virtue of their socio-demographic or health status).	Receptors that generally have adequate capacity to experience impacts without incurring a significant effect. Many comparable and accessible alternative options exist within the relevant catchment area

6.4 Significant effects

6.4.1 The matrix used for the assessment of the significance of effects for the health and community assessment is provided in **Table 3**.

Table 3: Health and community effects matrix.

Magnitude of impact	Guidelines on sensitivity of receptors			
	High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Minor
Low	Moderate	Minor	Minor	Negligible

Magnitude of impact	Guidelines on sensitivity of receptors			
	High	Medium	Low	Very low
Very Low	Minor	Minor	Negligible	Negligible

6.4.2 As a general rule, major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement has also been applied and the conclusions described in the assessment text.

7 OPERATION ASSESSMENT METHODOLOGY

7.1 Health assessment: quantitative assessment of noise related effects

7.1.1 The assessment methodology for health and community effects described in the Construction Assessment Methodology (**Section 6**) above is applicable to both the construction and operational phases of the Proposed Development. The assessment is largely qualitative in nature. However, for health effects arising from operational aircraft noise, the effects can be quantified, as described below.

7.1.2 It is possible to quantify the effects on health resulting from long term exposure of a population to aircraft noise, using established exposure-response relationships for specific health outcomes. The Department for Transport’s WebTAG assessment method (Ref. 1) will be used to evaluate the health effects (measured by Disability Adjusted Life Years (DALYs) arising from increased aircraft noise. The quantitative assessment and the results of the WebTAG and DALYs assessment are not presented as part of this PEIR but will be presented as part of the ES. A sensitivity test will also be undertaken using the 2018 World Health Organisation European Noise Guideline (Ref. 2) methodology as agreed with PHE.

7.1.3 An assessment of the health outcomes likely to occur as a result of changes in environmental noise due to the project will be presented. These outcomes will be informed by the methodologies set out by Defra guidance for determining likely impacts on annoyance (amenity), self-reported sleep disturbance, Acute Myocardial Infarction (AMI) and hypertension (stroke and dementia) from aviation noise (Ref. 3). These outcomes will be supplemented by an additional assessment of the likely impacts of the project on annoyance, using the exposure-response relationship presented in the 2018 WHO Environmental Noise Guidelines (Ref. 2). An assessment on the likely impact on sleep disturbance, through calculation of additional awakenings, will also be undertaken.

7.1.4 The health and community assessment in the ES will also report the findings of a WebTAG assessment of Disability Affected Life Years (DALYs) (Ref. 1). The assessment will comprise the following steps:

- a. Noise contour outputs will be used to define the geographical scope of properties affected by noise.
- b. DALYs will be calculated with reference to guidance in Defra 2014 and WHO 2011.
- c. Calculate baseline level of DALYs for each health outcome (sleep disturbance, amenity, AMI, stroke and dementia), for a 'without development' scenario, using future baseline noise information.
- d. Calculate the number of DALYs for each health effect as a result of the expanded airport in 2043 ('with development') compared to a 'without development' scenario.
- e. Describe the changes in DALYs individually for each health outcome for the relevant assessment years. The number of properties subject to an increase/reduction in incidence of the health outcome will also be reported.

GLOSSARY AND ABBREVIATIONS

Term	Definition
DALYs	Disability Adjusted Life Years
EIA	Environmental Impact Assessment
EqIA	Equality Impact Assessment
ES	Environmental Statement
Health Determinants	The economic and social conditions that influence individual and group differences in health status.
HIA	Health Impact Assessment
PEIR	Preliminary Environmental Information Report
PRoW	Public right of way
Vulnerable groups	Individuals who are made vulnerable by the situations and environments they are exposed to (as opposed to any inherent weakness or lack of capacity). This includes groups of people who may be more likely to be exposed to a change in a health determinant, or to experience health effects as a result of exposure.
WebTAG	Web-based Transport Analysis Guidance

REFERENCES

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- Ref. 1 UK Government. (2019). Transport Analysis WEBTAG Guidance.
 Ref. 2 World Health Organisation. (2018). Environmental Noise Guidelines for the European Region.
 Ref. 3 Department for Environmental and Rural Affairs (2014), Environmental Noise: Valuing impacts on: sleep disturbance, annoyance, hypertension, productivity and quiet, November 2014.