

Appendix 8.3 ♦ Health Literature Review

INTRODUCTION

8.3.1 This health appendix reviews the literature on the links between health determinants and the potential effects on an individual's health, providing an evidence base which underpins the assessment provided in **Chapter 8: Health**.

8.3.2 Whilst there is an abundance of available literature on determinants of health, this review focuses specifically on those potential effects identified within the health assessment scope (in **Chapter 8: Health**). The topics covered in this review include:

Construction phase effects:

- Displacement to land and property as a result of the land take;
- Construction activity;

Operational phase effects:

- Changes in noise exposure;
- Changes in air quality;
- Changes in traffic and transport;
- Changes in electromagnetic field exposure;
- Inclusive design; and
- Changes arising as a result of the existence of the London Resort.

8.3.3 Each section first presents information on the health effects of the above activities on the general population. This information is used to establish health pathways – in other words, to establish the relationship between the activities and potential effects of the London Resort and potential resulting health effects for the receptor population. This is the evidence base underpinning the assessment of the London Resort's health effects. The second part of each section assesses the potential impact on vulnerable groups in particular and is used to understand health inequalities and the extent to which the activities listed above may affect different groups in different ways. The potential impacts considered in the literature review are deliberately cautious, with a 'worst-case' view taken, meaning that potential impacts are considered even if they are deemed to be highly unlikely to occur.

8.3.4 Within this literature review, professional judgement is used to inform the importance of each possible determinant. Issues looked at here to inform this judgement include whether there is a sufficient amount of evidence linking the effect to health outcomes, and whether there any particular groups in the population that are affected disproportionately in regard to this effect. Evidence linking each effect and the associated human health outcomes is judged as either **weak**, **moderate**, or **strong**, with a definition for each provided in **Table 8.3.1**.

Table 8.3.1 Evaluation of the strength of evidence – ratings

Strength of evidence	Description
Strong	A wide range of peer-reviewed research has found an association between the determinant and health outcomes. There is consensus in the scientific community about the existence of the association.
Moderate	Several peer-reviewed studies have found an association between the determinant and health outcomes. There is broad agreement in the scientific community about the existence of the association, but there may be a number of dissenting voices about the particulars.
Weak	A few peer-reviewed or non-peer-reviewed research articles have found an association between the determinant and health outcomes. There is little consensus in the scientific community, or there are conflicting studies.

8.3.5 Where the strength of evidence related to a health determinant is judged to be “weak”, it is not considered evidence for the lack of a potential relationship between the project activities and health outcomes. It simply reflects gaps in the state of our (and, more generally, the scientific community’s) knowledge about the causal links involved. However, it does show that there is uncertainty in the assessment of the likely effect. The London Resort welcomes feedback during the PEIR process, which points to pieces of literature which may help to fill some of the gaps in the state of our knowledge that are identified within this preliminary literature review.

CONSTRUCTION PHASE EFFECTS AT THE LONDON RESORT

DISPLACEMENT TO LAND AND PROPERTY AS A RESULT OF THE LAND TAKE

Potential health effect of displacement or change in access affecting public services and community facilities

- 8.3.6 Due to the land take and associated activities that would occur as part of the London Resort proposals, there may be some community facilities, e.g. educational facilities, community centres, places of worship, or public services (e.g. police stations, and fire stations) affected, either through displacement or change in access. This may cause a range of adverse health effects for the general population and some groups in particular who are prone to the effects of social isolation. The social impacts of health-related public services are captured within the **‘potential effects from a change in the demand for health services’** effect under **‘Existence of the London Resort’**.
- 8.3.7 The literature focuses on the adverse health effects of the displacement of particular facilities to particular groups. For children and young people, this would include the loss of educational facilities; for older people, ethnic minority groups and those with a disability this might include community facilities with a specific function which is important to those groups of people; and for the low-income groups and the

unemployed this would include job centres and other key public services.

Effects on the general population

- 8.3.8 There is a large body of evidence indicating that social networks have a positive impact upon individuals health. Community facilities, such as educational facilities, community centres, and places of worship, bring communities together and create increased levels of social interaction. Generally, established social networks allow individuals to have their support needs met by their social contacts through helpful interaction.¹ Health is related to the availability of supportive ties we have with others, e.g. the frequency and contact with friends in these networks.² Positive health outcomes also arise as individuals with strong social support networks feel more in control of their environment, which leads to increased self-confidence and thus improved health.³
- 8.3.9 Community facilities allow members of the community to come together to interact, and have an overall positive impact on individuals through the improvement of health and well-being.⁴ From forming social ties, individuals are more likely to engage in preventive health behaviour, reinforcing positive health attitudes such as better nutrition and exercise.⁵ A change in access to or displacement of these facilities may lead to changes in people's resistance to illness and disease. Syme (1975) hypothesized this finding as: "When people have uninterrupted ties with others, disease rates are low. When those ties are broken, disease rates increase."⁶ Several studies have shown that the risk of coronary heart disease, for example, increases with major changes in places of residence, occupation, or social situation, all of which might be brought about through displacement of community facilities.
- 8.3.10 When established social networks that arise from community facilities are displaced or made harder to access in the community, some individuals in society may be cut off from others and experience loneliness and social isolation, both of which can be damaging to physical and mental health.⁷ The loneliness brought on by reduced access to community facilities may increase the likelihood of premature mortality by up to 26%⁸, showing the importance of social networks on health.
- 8.3.11 Public services directly contribute to the health of individuals in communities through the purpose for which they serve, for example security from the police or protection from the fire brigade. A loss of, or decrease in access to, vital public services can sometimes lead to negative health outcomes. For example, the existence of drug and

¹ Smith, K. and Christakis, N. 2008. Social networks and health.

² Alcalay, R. 1983. Health and social support networks: A case for improving interpersonal communication

³ Ibid

⁴ Hertfordshire Council, 2015. Community facilities

⁵ Alcalay, R. 1983. Health and social support networks: A case for improving interpersonal communication

⁶ Syme, L., 1975. Social and psychological risk factors in coronary heart disease

⁷ Public Health England, 2018. Health matters: community-centred approaches for health and well-being

⁸ Ibid

alcohol support services in communities has been linked to lower crime.⁹ This affects the poorest communities the most, increasing the burden of health inequalities. There is also a wide amount of evidence on the link between reduced levels of police in an area and higher crime rates.¹⁰

- 8.3.12 The evidence linking the displacement of or change in access to public services and community facilities and negative health outcomes is judged to be **strong**. There is clear evidence on the positive impacts of social networks for all individuals, such as improved self-confidence and preventive health behaviours, with further evidence linking the loss of these networks to negative health outcomes through increased loneliness, social isolation and higher rates of disease.

Children and young people

- 8.3.13 The literature here focuses on the displacement of educational facilities and the corresponding effect on children. There is a strong body of research on the link between education and health. Low education levels are linked with poor health, more stress, and lower self-confidence in people.¹¹ Education is beneficial for children and young people as it can lead to positive health outcomes throughout their working lives, including better wages and secure employment.¹² Research explores the benefits that education can bring inter-generationally as well, concluding that “People with better qualifications are more likely to have healthier lifestyles, to be fitter and slimmer – and such health advantages can be transferred to the next generation at the earliest age. Children of better-educated mothers are less likely to be born prematurely or to have a low birth weight.” It goes on to illustrate powerful findings with regards to cancer prevention, life expectancy and health lifestyles.”¹³
- 8.3.14 Displacement may affect a child’s social life and academic progress. Events which result in ongoing community disruption create an extended period of time in which learning may be affected, and some children might fall behind academically as a result of the displacement.¹⁴ In this case, the ‘event’ in question refers to the period of construction, which may reduce access to community/educational facilities for children if they exist within the vicinity of the construction site.
- 8.3.15 Furthermore, displacement of educational facilities which results in moving children may cause small declines in social skills and emotional and behavioural problems.¹⁵ Moving schools has also been shown to be more detrimental to children’s cognitive development

⁹ IPPR, 2019. Hitting the poorest worst? How public health cuts have been experienced in England’s most deprived communities

¹⁰ Unison, (no date). Cut crime not police

¹¹ World Health Organisation, 2017. Health Impact Assessment – The determinants of health

¹² JRF, 2014. Reducing poverty in the UK: a collection of evidence reviews

¹³ Feinstein et al. 2008. The social and personal benefits of learning: a summary of key research findings

¹⁴ Ibid

¹⁵ MacArthur Foundation, (no date). Is moving during childhood harmful?

than residential relocation.¹⁶ Generally, reduced access to community facilities used by children and young people may cause social isolation, leading to lower subsequent educational attainment and an increased tendency to be psychologically distressed in adulthood.¹⁷

Older people

- 8.3.16 The change in access to community facilities that are regularly accessed by older people may cause negative health outcomes. It has been found that an important determinant of a 'good life' in old age is the value that older people attach to inter-dependence and being part of a cohesive community.¹⁸ Older people value inter-dependent lives and communities, attaching a high level of importance to local community facilities.
- 8.3.17 A loss of access to or displacement of community facilities may contribute towards social isolation in older people. NHS research finds that older people are more susceptible to social isolation due to being cut off from society.¹⁹ As older people get frailer and less mobile, their lives are increasingly affected by their immediate physical and social environments. Social isolation and loneliness in older people has been found to lead to a higher prevalence of adverse physical health outcomes such as high blood pressure, heart disease, obesity, as well as mental health outcomes such as anxiety, depression, and cognitive decline.²⁰ The importance of local communities for older people cannot be understated, and the loss of facilities that this group rely on may lead to negative health outcomes.

Ethnic minority groups

- 8.3.18 Ethnic minorities typically place a lot of value on community facilities in helping unite small communities. Certain groups disproportionately benefit from the use of community facilities and spaces, such as ethnic and religious groups.²¹ Ethnic groups gain support and self-confidence from their community, leading to positive health outcomes.²²
- 8.3.19 A study into 150 BAME organisations in England found that more than half were at risk of closure in the future due to a range of factors including gentrification and the reluctance of councils to renew or extend leases²³, due to potentially not seeing them as

¹⁶ Ibid

¹⁷ Lacey et al., 2014. Social isolation in childhood and adult inflammation: evidence from the National Child Development Study

¹⁸ JRF, 2004. Building a good life for older people in local communities

¹⁹ NHS, 2018. Loneliness in older people

²⁰ National Institute on Aging, 2019. Social isolation, loneliness in older people pose health risks

²¹ LBC, 2017. Community uses, leisure facilities and pubs

²² Age UK, 2012. Fit as a fiddle – Engaging faith and BME communities in activities for wellbeing

²³ Third Sector, 2015. Minority groups fear the loss of community spaces

worthwhile elements of the community. This highlights the potential disproportionate impacts associated with the loss of community facilities on ethnic minority groups. Ethnic groups generally feel they have more in common with those from the same ethnic background and feel more accepted as a result²⁴, hence leading them to feel that they have a better connection. A change in access to the facilities which enable these relationships may cause upset amongst this group through lower perceived levels of personal security²⁵, leading to adverse health outcomes.

Disability and long-term illness

- 8.3.20 Those living with disabilities may be disproportionately affected by the displacement of or access to community facilities, as communities play an important role in their lives. Some disabled people rely on their communities for physical and emotional support, as well as help in adapting to new ways of life.²⁶ Communities contained within community facilities help disabled people through the support systems and the encouragement they provide, as well as the services often accessed via these facilities.
- 8.3.21 A lack of appropriate services and support puts people with disabilities at risk and may have negative consequences on their ability to control their lives. This places additional pressure on this group, and increases the risk of segregation and isolation from the community.²⁷ A change in access to these facilities may therefore cause a greater disturbance of equilibrium for those with disabilities, leading to negative health outcomes.
- 8.3.22 A decline in access to vital mental health services may hit those with pre-existing mental health issues the worst. 99% of GPs feared that young people with mental health problems will come to harm as a result of difficulties in accessing treatment.²⁸ Facilities regularly used by individuals in addressing their mental health concerns that are displaced may cause disruption for members and a resultant worsening of their mental health outcomes.

Low-income groups and the unemployed

- 8.3.23 Low income groups may be hit worse by the loss or displacement of public services and community facilities. The loss of job centres may lead to lost contracts and lost jobs²⁹, causing adverse health outcomes. Reduced access to jobcentres may in turn also lead to the increase in demand on the advice, welfare, and employment services provided by

²⁴ Pew Research Center, 2015. Chapter 5: Race and social connections – friends, family and neighborhoods

²⁵ Age UK, 2012. Fit as a fiddle – Engaging faith and BME communities in activities for wellbeing

²⁶ Livability, (no date). Why community is so important to disabled people and how it works for me

²⁷ Embracing Diversity, (no date). Support services to ensure the inclusion of persons with disabilities

²⁸ The Guardian, 2018. Lack of NHS mental health services puts under-18s at risk, say GPs

²⁹ The Conversation, 2018. Why are Britain's jobcentres disappearing?

other councils or local providers.³⁰

- 8.3.24 Change in access to or displacement of key public services can affect the poorest members of society the most. Public services are disproportionately relied on by socio-economically deprived people who need most community-level support.³¹

Potential health effect of displacement or change in access to open spaces

- 8.3.25 Due to the proposed land take associated with the London Resort, there is the possibility for open spaces to be displaced, or there may be a change in the ease of access to the existing open spaces currently used by local residents and workers. Reduced access to open spaces may be associated with the loss of many health benefits that open spaces create, which may affect some groups in particular.

Effects on the general population

- 8.3.26 The link between access to open spaces and positive health outcomes has been evidenced for decades. The World Health Organisation (WHO) state that physical activity has significant health benefits and contributes to preventing non-communicable diseases.³² Open spaces contribute to increased physical activity³³, improved cognition³⁴, and reduced obesity³⁵, all of which can lead to increased happiness and health outcomes throughout life.
- 8.3.27 Shortages of and lack of access to green spaces has been associated with perception of loneliness and lack of social support³⁶, both of which can lead to feelings of social isolation. Moreover, a lack of suitable amenities and open spaces in some communities can discourage physical activity and contribute to obesity.³⁷ In general, reduced access to open space or displacement of open space may lead to negative health outcomes, as well as the failure to realise the multitude of positive health benefits associated with green spaces.
- 8.3.28 In a study in Chicago, researchers found 52% fewer crimes were reported near buildings surrounded by trees and other vegetation. In New York, neighbourhoods with higher investment in public green space see an average of 213 fewer crimes per year.³⁸ Open spaces have been found, therefore, to reduce crime, and so displacement of open spaces

³⁰ Ibid

³¹ IPPR, 2019. Hitting the poorest worst? How public health cuts have been experienced in England's most deprived communities

³² World Health Organisation, 2017. Physical activity

³³ O' Brien et al., 2010. Urban health and health inequalities and the role of urban forestry in Britain: a review

³⁴ Keijzer et al., 2016. Long-term green space exposure and cognition across the life course: a systematic review

³⁵ O' Brien et al., 2010. Urban health and health inequalities and the role of urban forestry in Britain: a review

³⁶ Braubach et al., 2017. Effects of urban green space on environmental health, equity and resilience

³⁷ Gascon et al., 2016. Residential green spaces and mortality: a systematic review

³⁸ The Conversation, 2019. Can parks help cities fight crime?

may lead to the potential positive impacts on health outcomes for the general population not being realised.

- 8.3.29 Good access to parks and natural settings is associated with improved levels of mental health and reduced anxiety,³⁹ contributing to an overall better quality of life. The literature evidencing links between green/open space and mental health is extensive, with other benefits including protecting against mood disorders, depression, neurotic behaviour, and other stress-related issues. Also, those with longer exposures to green spaces have greater health benefits.⁴⁰
- 8.3.30 The evidence linking the displacement of or change in access to open spaces to health is considered to be **strong**. There is clear and strong evidence on the positive impacts of open spaces across all groups including increased physical activity, better cognition and better mental health outcomes. There also exists strong evidence on the negative outcomes associated with displacement of or a clear lack of access to open spaces, such as loneliness, increased crime, and mental health problems in children.

Children and young people

- 8.3.31 Access to open space particularly benefits children through improved cognition, educational attainment and school performance.⁴¹ Access to open space also promotes competence, self-discipline, attention restoration, and memory in children⁴², as well as encouraging physical activity and healthy weight.⁴³
- 8.3.32 A lack of access to open spaces or displacement of existing open spaces commonly used by children may lead to negative health outcomes. Less open space may induce children to use smart phones more and increase their screen time, which could lead to less physical activity and possible addiction in the long run.⁴⁴ A decline in physical activity is also one of the greatest contributors to childhood obesity, and a lack of open space could be just one of many determinants for this.
- 8.3.33 Furthermore, some studies have found that a lack of access to open spaces can be the cause of severe mental health issues in children. In one experiment, 54% of the child population sampled showed signs of mental health problems such as slow emotional development, anxiety, depression, and loss of attention and self-control due to a lack of outdoor play spaces.⁴⁵ Thus, any displacement of open spaces causing children to have

³⁹ McCormack et al., 2010. Characteristics of urban parks associated with park use and physical activity: a review of qualitative research

⁴⁰ NASA Earth Observatory, 2019. Green space is good for mental health

⁴¹ Keijze et al., 2016. Long-term green space exposure and cognition across the life course: a systematic review

⁴² McCormick, 2017. Does access to green space impact the mental well-being of children: a systematic review

⁴³ McCormack et al., 2010. Characteristics of urban parks associated with park use and physical activity: a review of qualitative research

⁴⁴ MBA Universe, (no date). Shortage of open spaces and playgrounds lead to negative tendencies in children

⁴⁵ Ibid

limited access to these spaces may lead to negative health outcomes.

Older people

- 8.3.34 Open space is particularly beneficial for older people as they are more bound to their direct home surroundings⁴⁶, and are therefore more likely to benefit from the physical and mental health advantages associated with nearby green and open spaces. As older people place more of a reliance on their local community and surroundings, the displacement of open spaces may disproportionately affect this group.
- 8.3.35 The same is true when access is reduced to commonly frequented open spaces that are currently present in the community. A study investigating the relationship between older people's health and perceived neighbourhood environment found that neighbourhoods with good quality facilities (open spaces included) were associated with positive self-rated health and physical function, whereas poor neighbourhood perceptions were associated with poorer self-rated health.⁴⁷
- 8.3.36 Nearly half of people over the age of 60 are inactive, with access difficulties being one of the barriers to physical activity participation in older people.⁴⁸ A lack of physical activity (which may be brought about by a displacement of open space) can lead to an increased risk of fracturing bones when falling relative to those who are more physically active, obesity and reduced mental health⁴⁹, including loneliness and social isolation, which are already prevalent issues amongst older people.

Disability and long-term illness

- 8.3.37 Open spaces can be particularly beneficial for disabled people, as they provide a safe, risk-managed environment aimed at those disadvantaged by physical and or mental difficulties.⁵⁰ They can provide feelings of safety, relaxation, achievement and happiness, and increased self-esteem. Displacement of open spaces can lead to those living with disabilities not able to realise these benefits, and could lead to adverse health outcomes.
- 8.3.38 Those with mental health issues may be particularly affected by the loss of, displacement of, or change in access to established open spaces due to the multitude of mental health benefits they serve. As detailed previously, good access to parks and natural settings is associated with improved levels of mental health and reduced anxiety. Furthermore, exercising in natural environments can lead to a greater improvement in mental

⁴⁶ IS Global, 2019. Green spaces and healthy ageing

⁴⁷ Bowling et al., 2006. Do perceptions of neighbourhood environment influence health?

⁴⁸ Franco et al., 2015. Older people's perspectives on participation in physical activity: a systematic review and thematic synthesis of qualitative literature

⁴⁹ CDC, (no date). Older adults

⁵⁰ Lambeth Council, (no date). Value of green space

wellbeing relative to indoor activity due to greater enjoyment.⁵¹ The mental health benefits associated with open space mean that a reduction in the access to or displacement of open space would disproportionately affect those with mental health issues.

Low income groups and the unemployed

- 8.3.39 Individuals from lower income backgrounds suffer disproportionately from a lack of access to green spaces. A review conducted by Maas in 2006 found that there is a positive association between the proportion of green space in a residential area and the general health of residents (perceived by themselves), and that this relationship is strongest among lower socio-economic groups.⁵² In areas where 90% of the environment around the home is green, 10% of the residents felt unhealthy, compared to where 10% of the environment is green and 16% of residents felt unhealthy.
- 8.3.40 Further literature exists evidencing this link, as studies have shown that socio-economically disadvantaged individuals tend to benefit the most from improved access to urban greenery.⁵³ This suggests that the displacement of open spaces has potential to be even worse for those from lower socio-economic backgrounds relative to the general population.

Potential health effects from displacement of commercial uses

- 8.3.41 As a result of the land take, there may be relocation of existing commercial businesses, which may lead to disturbances in the community for those who rely on them, job relocations, or job losses in extreme cases. This would cause disruptions and potentially unemployment in the area, which may hit some subsets of the general population harder than others.

Effects on the general population

- 8.3.42 A displacement of commercial uses may cause a loss of jobs and employment. In the short-run, job losses caused by the displacement of commercial businesses can lead to depression, anxiety, and reduced physical activity for the workers impacted.⁵⁴ In the long run, there is a risk of these problems being amplified, and displacement may lead to decreases in lifetime earnings, reduced job stability, and further negative impacts on

⁵¹ Public Health England, 2017. Spatial planning for health. An evidence resource for planning and designing healthier places

⁵² Maas et al., 2006. Green space, urbanity and health: how strong is the relation?

⁵³ Allen, J. and Balfour, R., 2014. Natural solutions for tackling health inequalities

⁵⁴ Schaller, J. and Stevens, A. 2015. Short-run effects of job loss on health conditions, health insurance, and health care utilization

health.⁵⁵ The burden of disease associated with job losses also increases with the duration of unemployment.⁵⁶ The burden of disease (or disease burden) is a concept that describes the loss of health/impact of a health problem due to diseases, injuries and risk factors⁵⁷, describing the overall burden to health as a result of external factors.

- 8.3.43 There exists a strong amount of evidence on the link between employment and health. It provides access to basic living standards and can expand an individual's social networks.⁵⁸ Within the WHO's list of health determinants, income and social status are included⁵⁹, both of which are influenced by employment opportunities. Greater economic status is typically associated with better health outcomes, whereas unemployment contributes to poorer health outcomes.⁶⁰ There are also large amounts of evidence on the link between employment and mental health, as being in a job gives individuals a purpose, an income, and promotes independence.⁶¹ Unemployment can also lead to poorer self-rated levels of mental health.⁶²
- 8.3.44 By contrast, unemployment can lead to adverse health outcomes. Public Health England state that "unemployed people have a greater risk of poor health than those in employment, contributing to health inequalities."⁶³ Studies have found that the anxiety and stress that comes from unemployment contributes towards negative health outcomes⁶⁴, as well as long-standing mental illnesses, psychological distress, and medical consulting for mental health issues.⁶⁵ Unemployment, amongst other factors, is also associated with higher rates of suicide.⁶⁶
- 8.3.45 Commercial displacement may not cause jobs to be lost, but relocated. Relocation impacts, and the financial burdens that come with them, are more of a concern for local family-based businesses that cater to locals in the area.⁶⁷ Larger and more commercial entities are more suited to relocation due to national demand existing everywhere, whereas smaller businesses which rely on being part of a specific neighbourhood may experience greater difficulties in securing a move.⁶⁸
- 8.3.46 Similarly, the relocation of businesses may adversely affect the individuals who rely on

⁵⁵ Ibid

⁵⁶ Herbig et al., 2013. Health in the long-term unemployed

⁵⁷ World Health Organisation, (no date). Burden of disease

⁵⁸ The Health Foundation, 2020. Will Covid-19 be a watershed moment for health inequalities?

⁵⁹ World Health Organisation, 2017. Health Impact Assessment – the determinants of health

⁶⁰ Marmot et al., 2010. Fair society, Healthy Lives: strategic review of health

⁶¹ Mental Health Foundation, 2012. Employment is vital for maintaining good mental health

⁶² Kim, T. and Knesbeck, O. 2015. Is an insecure job better for health than no job at all? A systematic review of studies investigating the health-related risks of both job insecurity and unemployment

⁶³ Public Health England, 2014. Increasing employment opportunities and improving workplace health

⁶⁴ Urbanos-Garrido, R. and Lopez-Valcarecel, B. 2015. The influence of economic crisis on the association between unemployment and health: an empirical analysis for Spain

⁶⁵ Goodman, 2015. The impact of employment on the health status and health care costs of working-age people with disabilities

⁶⁶ NHS, 2015. Unemployment and job insecurity linked to increased risk of suicide

⁶⁷ Center for Urban Transportation Research, (no date). Chapter 9: Relocation and displacement

⁶⁸ Ibid

these local entities. Relocation of businesses can remove essential facilities for some local residents, reduce the sense of community, and reduce the cohesiveness of the neighbourhood.⁶⁹ For employees working at these businesses, they may have to pay increased travel expenses to reach new locations, spend more time commuting, and may even lose employment if the business has financial troubles as a result of the relocation. For families, there is a greater chance that some would give up their careers when faced with the prospect of relocation, with other long-term impacts including family separation and increased financial difficulties.⁷⁰

- 8.3.47 The evidence linking the displacement of commercial uses to health is considered to be **moderate**. There is clear and strong evidence on the positive impacts of employment, such as income and social status, along with the adverse health outcomes that are associated with displacement of various commercial uses (causing unemployment), where some groups are affected more so than others. The impact of displacement may cause relocation which can lead to reduced cohesion in the community as well as financial burdens for smaller businesses. However, the evidence is less strong on the overall burden on health as a result of job relocation or the effect on the community as a result of lost commercial entities.

Children and young people

- 8.3.48 The effects of the displacement of commercial uses may be particularly felt by children and young people. Children may be indirectly affected if there are job losses when their parents/carers are displaced, leading to worse health outcomes for the child resulting from the knock-on impacts of a lower family income. Long-term impacts on older children include reductions in mental wellbeing and happiness.⁷¹
- 8.3.49 Young adults with limited employment history may also be disproportionately affected by displacements that cause job losses. Unemployed young adults are more likely to experience negative health outcomes such as mental health problems, health risk behaviours, and a general poorer quality of life.⁷² Low-skilled and younger workers suffer the most from business redundancies (if they occurred from financial difficulties from relocation) as they are usually the first to be dismissed.⁷³ Overall, young people displaced may find it harder to get back into the labour market, leading to the adverse health outcomes associated with unemployment.
- 8.3.50 Relocation might be particularly hard for children of parents who are forced to relocate due to the displacement of commercial businesses. Relocation may be coupled with

⁶⁹ Ibid

⁷⁰ JRF, 2003. The effects on families of job relocations

⁷¹ Powdthavee and Veroit, 2013. Parental unemployment and children's happiness: a longitudinal study of young people's well-being in unemployed households

⁷² Vancea, M. and Utzet, M. 2016. How unemployment and precarious employment affect the health of young people: A scoping study on social determinants

⁷³ OECD, 2015. Back to work: Sweden – improving the re-employment prospects of displaced workers

moving residential locations, in which case the child's education may suffer⁷⁴, having adverse health effects such as cognitive decline and decrease in mental wellbeing. Education is key as it improves access to good jobs, leads to higher wages, and leads to financial security.⁷⁵ For young adults who place a higher value on their support networks, they may not have the financial resources to relocate or commute longer distances.⁷⁶

Older people

- 8.3.51 For those aged above 50, unemployment caused by job losses is associated with greater difficulties in regaining employment.⁷⁷ Older people sometimes find it harder to get back into the labour market due to age discrimination⁷⁸, and this worsens as age increases. Furthermore, only 1 in 10 of those older workers who experience an involuntary job loss (which could be caused by displacement) ever earn as much per week after the job loss.⁷⁹ As a consequence, this demographic is more likely to suffer from long-term negative health outcomes as a result of the displacement.
- 8.3.52 Job relocation may cause a need to relocate closer to the place of work, which can be particularly stressful for older people.⁸⁰ Relocation at older age has been linked to a decline in physical and cognitive functions, as well as the need for increased support from surrounding networks or family.⁸¹

Low-income groups and the unemployed

- 8.3.53 Individuals from disadvantaged socio-economic backgrounds on lower incomes are hit hardest in the event of commercial displacement and job losses. For example, in the coronavirus-related shutdown of the American economy, households under \$40,000 were disproportionately more affected by the associated job losses than households in higher income brackets.⁸² Individuals from low-income backgrounds are also less likely to have the money saved up to allow for an extended period of time out of work, and as a result may experience adverse health outcomes if commercial displacement were to occur.
- 8.3.54 A study on the associations between job losses and unmet health care needs by income was conducted and showed that job loss was associated with the increased risk of unmet

⁷⁴ JRF, 2003. The effects on families of job relocations

⁷⁵ The Health Foundation, 2020. Will Covid-19 be a watershed moment for health inequalities?

⁷⁶ Ibid

⁷⁷ Marmot et al., 2010. Fair society, healthy lives: strategic review of health inequalities in England post-2010

⁷⁸ Urban Institute, 2018. How secure is employment at older ages?

⁷⁹ Ibid

⁸⁰ Schulz, R. and Brenner, G., 1977. Relocation of the aged: a review and theoretical analysis

⁸¹ Wu et al., 2015. Relocation at older age: results from the cognitive function and ageing study

⁸² Federal Reserve, 2020. Report on the economic well-being of U.S. Households in 2019, Featuring supplemental data from April 2020

health care needs, adversely affecting the health of individuals.⁸³ The proportion with unmet needs was highest for the lowest-income unemployed, displaying the disproportionate impact of commercial displacement on those from the lowest income backgrounds. Also for the unemployed, commercial displacement would reduce the opportunities for employment, making them worse off.

- 8.3.55 As detailed previously, job relocation may cause financial difficulties in the form of increased costs to commute to the new location, lost time in the new commute, and potential for redundancies as businesses have to lay off staff. This would lead to the possibility of hitting those from the lower socio-economic backgrounds harder due to their difficulty in not being able to afford the new costs.
- 8.3.56 Commercial displacement may cause workers from more professional occupations to have to work remotely, much like was the case during the Covid-19 pandemic. Lower income, unskilled workers are usually less able to work from home, as only one in ten of lower half earners said they had the option of working from home during the global pandemic, compared to over half of the highest earners.⁸⁴ In this case, displacement is more likely to affect the incomes and likelihood of the lowest earners in society.

Ethnic minority groups

- 8.3.57 Individuals from ethnic minority backgrounds may find it harder to gain access back into the workplace in the event of commercial displacement due to discrimination. There are large bodies of evidence on the clear ethnic minority penalty present in the labour market which has been persistent over time.⁸⁵ Unemployment rates for ethnic minorities are higher than they are for their white counterparts, and thus they are often under-represented in the labour market. Individuals from ethnic minorities who do lose jobs in the commercial displacement may therefore struggle to find another job, and suffer the adverse health effects associated with unemployment.
- 8.3.58 Traditionally, BME-owned enterprises tend to be concentrated within their own communities and focus on easily accessible markets.⁸⁶ Displacement is therefore a concern for the minority owned or ethnic businesses in the area which cater to a local client base. In this case, separation from their core client base may 'jeopardize the existence of that business'.⁸⁷ In other words, some businesses owned by ethnic groups rely on the local community for the survival of their business, and relocation to another area might lead to the loss of business and unemployment.

⁸³ Huang et al. 2014. Job Loss and Unmet Health Care Needs in the Economic Recession: Different Associations by Family Income

⁸⁴ The Health Foundation, 2020. Will Covid-19 be a watershed moment for health inequalities?

⁸⁵ JRF, 2015. Ethnic minority disadvantage in the labour market

⁸⁶ LDA, 2005. Redefining London's BME-owned businesses

⁸⁷ Center for Urban Transportation Research, (no date). Chapter 9: Relocation and displacement

Potential health effects from displacement of residential dwellings

- 8.3.59 As a result of the land take, there may be involuntary relocation of residents within the area, which may, similarly to the displacement of commercial uses, lead to disturbances in the community. This may cause negative health effects for some groups in particular, such as children and young people, and older people who are already established within their community. However, relocation may also be associated with some positive health benefits in the form of better living conditions or lower rents.

Effects on the general population

- 8.3.60 Generally, involuntary residential relocation may cause adverse mental health outcomes due to loss of ties with the community, lost social ties with friends, or higher rents.⁸⁸ However, residential relocation has also been associated with positive physical health outcomes due to the possibility for better living conditions or better community ties in the new location, in addition to the possibility of lower rents.
- 8.3.61 The characteristics of an area can have impacts on the health of individuals. Residents relocating to less deprived areas may experience lower levels of crime and anti-social behaviour, which could lead to higher levels of confidence in their environment and overall happiness (mental health) within their community, in addition to reductions in obesity.⁸⁹ Contrastingly, a move to a more deprived area may cause the reverse, and lead to increased levels of stress and fear for their safety, causing negative health outcomes.
- 8.3.62 A longitudinal study in Glasgow analysed how health outcomes were altered from residents of disadvantaged urban neighbourhoods due to largescale development projects causing neighbourhood demolition. Some participants described how the moves to new homes caused positive health outcomes and was beneficial to wellbeing, whereas some reaffirmed that the move led to negative health outcomes and experiences.⁹⁰ Thus, the extent to which positive health outcomes might be realised would depend on how improved the living conditions are for the particular residents relative to the previous location.
- 8.3.63 Based on a review of the literature, the evidence linking the displacement of residents and health outcomes is considered to be **weak**. There exist numerous theories on how housing-led regeneration projects and displacement may positively or negatively affect human health, such as through changes in living conditions or rents, but many studies varied in their findings and few long-term or definite results were found. Therefore, definitive links between health outcomes and residential relocation are weak.

⁸⁸ McCartney et al., 2017. Regeneration and health: a structured, rapid literature review

⁸⁹ Gibson et al., 2011. Housing and health inequalities: a synthesis of systematic reviews of interventions aimed at different pathways linking housing and health

⁹⁰ Egan et al., 2015. Neighbourhood demolition, relocation and health. A qualitative longitudinal study of housing-led urban regeneration in Glasgow, UK

Children and young people

- 8.3.64 Residential displacement may adversely affect children, as previously described in ‘**potential health effects from displacement of commercial uses**’. It was found that relocation may cause the child’s education to suffer⁹¹, having adverse health effects such as cognitive decline and decrease in mental wellbeing. Involuntary relocation may cause disturbances in key social networks for children and young people, at a time when development of these social networks is key for cognitive development and personal growth.
- 8.3.65 A study into children from lower socio-economic backgrounds found that despite relocating to lower-poverty neighbourhoods, health outcomes were not drastically improved.⁹² This was due to the continued pre-existing effects from growing up in a more deprived neighbourhood, coupled with the stress of relocation.

Older people

- 8.3.66 For older people, the evidence is less clear on the direct health effects from displacement. Older residents within the community are generally less mobile and have lived within their community longer than the average person.⁹³ Due to this, the social ties that older people may have with their community may cause a strong reluctance to leave the area and upset this group, causing negative mental health effects. Generally, the stronger the ties older people have with their local community, the more dissatisfied they are with their new neighbourhood, and the more severe is their grief reaction.⁹⁴
- 8.3.67 The loss of friends or ties can not only cause loneliness, but may create insecurity as they rely on social networks they have formed in their neighbourhood in the event of an emergency. Older people have been found to be the most vulnerable to the adverse negative health effects associated with involuntary reaction.⁹⁵

Disability and long-term illness

- 8.3.68 Individuals living with dementia are more sensitive to the adverse health effects associated with a change in environment caused by involuntary relocation. Resulting effects from relocation for these individuals include declines in mental health caused by stress, and loss of important social and community ties. ‘Transfer trauma’ describes the

⁹¹ JRF, 2003. The effects on families of job relocations

⁹² Byck et al., 2015. Effect of housing relocation and neighbourhood environment on adolescent mental and behavioral health

⁹³ Kasl, S., 1972. Physical and mental health effects of involuntary relocation and institutionalization on the elderly – a review

⁹⁴ Ibid

⁹⁵ Key, H., 1967. When people are forced to move.

stress that a person with dementia experiences when they change living environments, which can cause severe declines in mental health outcomes.⁹⁶

- 8.3.69 In general, those less mobile living with disabilities would find relocation harder for them, causing stress and adverse health outcomes. Those with disabilities face risks in the new areas they are relocated to relating to violence and abuse, as well as barriers to accessing assistance, healthcare, and other services.⁹⁷

Potential health effect of changes to local traffic and transport and changes in the use of active travel modes

- 8.3.70 During the construction phase, there may be temporary changes in traffic and transport around the site (e.g. reduced access to roads), as well as changes in access to active travel modes through and around the site (e.g. removal of a pedestrian path). The Transport chapter will identify how the changes in traffic could impact upon traffic accidents and increases in delay, resulting in changes in stress for drivers following guidance set out within WebTag and the Design Manual for Roads and Bridges (DMRB).

Effects on the general population

- 8.3.71 Good transport allows the movement of people and goods between places, enabling better access to employment and other economic opportunities.⁹⁸ Similarly, beneficial active travel modes for individuals can lead to positive health outcomes, such as improved mental health, more physical activity and decreased obesity.⁹⁹
- 8.3.72 The scale of the London Resort may lead to changes to routes and active travel modes in areas surrounding the site throughout the construction phase. This has the potential to disrupt lives and change how transport moves through the area, as well as change the use of active travel modes around the site. If access were disturbed to the extent where transport options were reduced, this could cause isolation in some extreme cases¹⁰⁰, which may lead to depression, poor sleep quality, and poor cardiovascular function¹⁰¹, amongst other adverse health outcomes.
- 8.3.73 It has also been found that transportation barriers created may lead to missed healthcare appointments or delayed care, which can cause poorer management of chronic illness and therefore adverse health outcomes.¹⁰² Additionally, poor transport can lead to

⁹⁶ Crisis Prevention Institute, 2015. How to reduce transfer trauma for a person with dementia

⁹⁷ UNHCR, 2019. Working with persons with disabilities in forced displacement

⁹⁸ Thomson et al. 2008. Assessing the unintended health impacts of road transport policies and interventions: translating research evidence for use in policy and practice

⁹⁹ Vernon, 2014. Road safety and public health

¹⁰⁰ Schalkwyk, M. and Mindell, J., 2018. Current issues in the impacts of transport on health

¹⁰¹ American Psychological Association, 2019. The risks of social isolation

¹⁰² Syed et al., 2013. Travelling towards disease: transportation barriers to health care access

mental health problems such as anxiety and decreased wellbeing.¹⁰³ Delays caused by worsening road traffic conditions have also been linked to risk-taking behaviours in groups. Driving for extended periods of time (due to delays) has been linked to physical effects such as joint stiffness and muscle tightness¹⁰⁴, as well as increased stress levels.¹⁰⁵ The increased stress levels may increase risk-taking behaviour when driving¹⁰⁶, increasing the potential for crashes and accidents.

- 8.3.74 Good pedestrian and cyclist access around and through the site is important because of a multitude of physical health benefits, as outlined in '**potential health effect of displacement or change in access to open spaces**'. As a result of the construction site, access for cyclists may be reduced, for example, which could lead to a reduction of physical activity, something which cycling routes encourage. Better pedestrian access around the site may encourage walking, which can lead to more physical activity amongst the population, as well as other health benefits such as reduced risk of heart disease, improved management of health conditions such as hypertension or high cholesterol, and better mental health.¹⁰⁷ Studies have shown that walking for just 30 minutes per day enables the realisation of these benefits. Generally, active travel allows people the opportunity to be physically active as part of their daily routine, contributing to the prevention of many chronic and mental illnesses.¹⁰⁸
- 8.3.75 Other benefits of cycling such as improved cognitive function and reduced risks of mental health issues would be less likely to be realised given a reduced access to active travel modes.¹⁰⁹ Conversely, adverse mental health outcomes may result due to poor transport or lack of suitable active travel due to social isolation. Refer to '**potential health effect of displacement or change in access affecting public services and community facilities**' for the potential for adverse health effects associated with social isolation, such as damage to mental health, and increased likelihood of premature mortality.
- 8.3.76 Based on a review of the existing literature, the link between changes to local traffic and transport, as well as changes to the use of active travel modes, is judged to be **strong**. This is a reasonable body of evidence linking poor transport access to adverse health outcomes (such as isolation, depression, and stress) and increased risk-taking behaviour, but the evidence is particularly strong regarding the link between reduced active travel methods and positive health outcomes which aren't realised, such as increased physical activity.

Older people

- 8.3.77 Changes to routes and transport access has already been established to lead to social

¹⁰³ NatCen, 2019. Transport, health and wellbeing: an evidence review for the Department for Transport

¹⁰⁴ Chevin Fleet, 2019. Long hours behind the wheel of a vehicle can impact on the health of drivers

¹⁰⁵ Antoun et al., 2017. The acute physiological stress response to driving: a systematic review

¹⁰⁶ Zhang, T. and Chan, H., 2016. The association between driving anger and driving outcomes

¹⁰⁷ Better Health, (no date). Walking for good health

¹⁰⁸ Kent County Council, 2016. Benefits of active travel

¹⁰⁹ Gotschi et al., 2015. Cycling as a part of daily life: a review of health perspectives

isolation, which can be particularly harmful for older people as they are more susceptible to social isolation due to being cut off from society.¹¹⁰ The removal of established routes (transport and pedestrian) may cause issues for older people in the form of preventing them from accessing usual amenities, leading to the adverse health outcomes associated with social isolation (refer to **‘potential health effect of displacement or change in access affecting public services and community facilities’**) and physical inactivity.¹¹¹

Disability and long-term illness

- 8.3.78 Poor planning and transport infrastructure (which may arise from the construction activity) may create an unsafe environment which would be particularly harmful for those with cognitive impairments, which could increase the risk of traffic-related injuries.¹¹²
- 8.3.79 Those with mental health problems are more vulnerable to the mental health issues associated with social isolation caused by a lack of good transport access. Refer to **‘potential health effect of displacement or change in access affecting public services and community facilities’** for the adverse health effects associated with social isolation, such as damage to mental health, and increased likelihood of premature mortality.

Low-income groups and the unemployed

- 8.3.80 Those from lower socio-economic backgrounds may be disproportionately affected by a reduction in access to transport routes due to a heavier reliance on public transport. Those on lower incomes take up to two times more bus trips than those on higher incomes¹¹³. Furthermore, those on low incomes are more likely to turn down jobs due to transport issues¹¹⁴, possibly brought about by the onset of connectivity problems in the construction phase of the London Resort.

Potential health effect of increased flooding

- 8.3.81 Risks of flooding may be increased due to changes in land use affecting the river and groundwater environment, which can in turn lead to multiple adverse human health effects on affected groups.

Effects on the general population

- 8.3.82 Due to the scale of the London Resort, there is potential to be an increased risk of the

¹¹⁰ NHS, 2018. Loneliness in older people

¹¹¹ Webb et al., 2017. Crossing the road in time: inequalities in older people’s walking speeds

¹¹² Schalkwyk, M. and Mindell, J. 2018. Current issues in the impacts of transport on health

¹¹³ The Health Foundation, 2018. Transport and health

¹¹⁴ NatCen, 2019. Transport, health and wellbeing: an evidence review for the Department for Transport

occurrence of flooding in areas surrounding the site. The prevalence of flooding has the potential to affect both people's physical and mental health through increased stress levels (which persist even after the flooding has receded), disease, and increased risk of drowning or injury.¹¹⁵ In extreme cases, carbon monoxide poisoning can occur throughout the process of flood clear-ups, leading to death.

- 8.3.83 In areas following flooding, individuals have been found to experience higher levels of mental health disorders such as post-traumatic stress disorder (PTSD), depression, and anxiety disorders.¹¹⁶ Furthermore, drinking water supplies from both surface water and ground water sources are at risk of being contaminated as a result of flooding events.¹¹⁷
- 8.3.84 Based on the reviewed literature, the causal relationship between the increased risk of flooding and health is judged to be **moderate**. There doesn't exist much evidence surrounding the health adversities of flooding, but evidence that does exist is particularly strong with regard to adverse mental health outcomes, such as individuals from areas of flooding being found to experience higher levels of PTSD, depression, and anxiety disorders.

Older people

- 8.3.85 Older people are disproportionately affected by the occurrence of flooding due to decreased levels of mobility, particularly those with dementia or those who are seriously unwell who would find it hard to navigate and understand the seriousness of flooding should it occur.¹¹⁸ Additionally, there are indications that older people suffer PTSD after flooding at a greater prevalence than adults of working age.¹¹⁹

Disability and long-term illness

- 8.3.86 Due to the mental health problems posed by an increase in the risk of flooding, those with existing mental health problems would therefore be at greater risk of deterioration should flooding occur. Poor mental health status or existing physical health problems in disabled people before the flood is associated with reduced post-flood mental health also.¹²⁰
- 8.3.87 Those with poorer self-rated levels of mental health who suffer financial losses as a consequence of flooding are at greater risk of adverse health outcomes due to a higher

¹¹⁵ UK Public Health Register, 2016. Health impacts of flooding

¹¹⁶ Fernandez et al. 2015. Flooding and mental health: a systematic mapping review

¹¹⁷ Andrade et al. 2018. Surface water flooding, groundwater contamination, and enteric disease in developed countries

¹¹⁸ Age UK, 2019. Floods and safeguarding older people during crises

¹¹⁹ Stanke et al. 2012. The effects of flooding on mental health

¹²⁰ Fernandez et al. 2015. Flooding and mental health: a systematic mapping review

level of disruption to daily routines.¹²¹

¹²¹ Ibid

CONSTRUCTION ACTIVITY

Potential health effect of construction resulting in changes in noise and vibration

8.3.88 Increases in exposure to noise has been linked to adverse health outcomes. Through the large scale of construction activity needed for the London Resort, there are noise concerns which must be considered. Some groups are more affected by noise disturbance than others.

Effects on the general population

8.3.89 There is a significant amount of evidence linking higher levels of noise to adverse health outcomes. The WHO note that “excessive noise seriously harms human health and interferes with people’s daily activities at school, at work, at home and during leisure time. It can disturb sleep, cause cardiovascular and psychophysiological effects, reduce performance and provoke annoyance responses and changes in social behaviour”.¹²²

8.3.90 A publication from the European Commission in 2015 notes that ‘living in a quiet area has a positive impact on health’.¹²³ This study assessed the quality of life for people living in quiet and noisy locations and found that those who lived in quiet locations had a better quality of life. The report finds that long-term exposure to environmental noise can affect people’s health in other ways too, notably how stress hormones are released, and sleep is disturbed.

8.3.91 Because of its role in sleep disturbance, some studies suggest that night-time noise has a greater impact on health than day-time noise¹²⁴, which may be particularly harmful for residents at homes surrounding the London Resort. In accordance with the WHO, noise levels, both in the day and night, that exceed 55dBA increase the risk of adverse health effects occurring, and many people have to adapt their lives to cope with the noise at night.¹²⁵

8.3.92 Noise may be created during the construction phase through the movement of machinery, the operation of heavy goods vehicles, or the communication between construction workers. Any demolition works carried out would be expected to cause temporary noise. The noises created as a result of construction activity have the potential to create physical or psychological stress for neighbouring residents or workers, contributing to reduced productivity and even workplace accidents and injuries due to not being able to hear possible warning signals.¹²⁶ However, any noise pollution created during the construction phase would be temporary in nature for the length of the construction period, and therefore noise exposure is not prolonged, which many of the

¹²² World Health Organisation, 2017. Noise

¹²³ European Commission, 2015. Noise impacts on health

¹²⁴ Munzel et al., 2014. Cardiovascular effects of environmental noise exposure

¹²⁵ World Health Organisation, 2011. Burden of disease from environmental noise

¹²⁶ US Occupational Safety and Health Administration, (no date). Occupational noise exposure

identified adverse health effects relate to.

- 8.3.93 Based on the literature, the relationship between changes in the levels of noise and vibration during the construction phase and health outcomes is judged to be **moderate**. The evidence is strong with regard to increased levels of noise adversely affecting health, with those living in quiet locations judged to have a better quality of life, but a range of health problems refer to exposure to ‘prolonged’ or ‘excessive’ noise. The construction phase may lead to temporary increases in exposure to noise, but these aren’t permanent. Negative health outcomes that can arise as a result of increased noise exposure include sleep disturbance and psychological stress, with particular adverse effects on children, older people, and disabled people.

Children and young people

- 8.3.94 Children are one of the vulnerable groups disproportionately at risk from increased levels of noise. The most common health effects for children have been found to be annoyance, sleep disturbance, cardiovascular disease, and cognitive effects.¹²⁷ The effects on cognitive development are exacerbated as cognitive progression and educational attainment are significantly more important at earlier stages of life.
- 8.3.95 Children are particularly susceptible to construction noise impacts in the form of loud and constant noise. Those living near the site may be exposed to heavy goods vehicles and other construction-related noise on a regular basis, which may go on to affect their reading attention, problem-solving, and memory.¹²⁸ Studies have found that environmental noise may cause hearing loss, impacting a child’s speech development as well.¹²⁹ In extreme cases, noise may contribute to the prevalence of non-intentional lesions as well¹³⁰ (damage or abnormal change in tissue).

Older people

- 8.3.96 Older people may be more susceptible to the impact of noise pollution due to lower mental processing and sensory changes that take place throughout the ageing process.¹³¹ Older people who are living with onsets of dementia are particularly susceptible because of their inability to process their immediate environment and the risks posed by the noise exposure.
- 8.3.97 Studies have found that living in neighbourhoods with louder road traffic increased the risk of stroke in older people as well as decreasing life expectancy¹³², which may be

¹²⁷ Van Kamp, I. and Davies, H. 2013. Noise and health in vulnerable groups: a review

¹²⁸ UPMC, 2016. Limit noise to boost your child’s brain power

¹²⁹ Ibid

¹³⁰ World Health Organisation, (no date). Noise and children

¹³¹ Ageucate, 2018. Noise pollution and older adults – a real health hazard

¹³² Halonen et al., 2015. Road traffic noise is associated with increased cardiovascular morbidity and mortality and all-cause mortality in London

relevant in the construction phase due to the increased prevalence of heavy goods vehicles travelling to and from the site.

Disability and long-term illness

- 8.3.98 Changes in noise exposure can have disproportionate impacts on those living with epilepsy through acting as an additional trigger which may cause a seizure.¹³³ Some seizures for epileptic people are triggered by noise exposure which may have adverse effects on health such as loss of consciousness.¹³⁴
- 8.3.99 Loud and prolonged exposures to noises can be particularly harmful for those with mental health issues due to the increased levels of stress it brings about. Studies show that excessive noise can create mental fatigue that both impairs judgement and reduces morale.¹³⁵ Furthermore, those with anxiety may feel stress about the increased levels of noise pollution.

Potential health effect of construction resulting in changes in air quality

- 8.3.100 Changes in air quality can affect human health. The scale and nature of the construction activity required for the London Resort may lead to adverse effects on the general population, but would disproportionately affect certain groups, such as children, older people, and those with pre-existing medical conditions.

Effects on the general population

- 8.3.101 There exists an extensive range of literature on the link between worsening air quality and adverse health outcomes. The WHO recognises that outdoor air pollution is a major environmental health problem for all countries in the world.¹³⁶ Air Quality England defines outdoor air pollution as ‘a mixture of gases and particles that have been emitted into the atmosphere by man-made processes’ which can have a negative impact on human health.¹³⁷
- 8.3.102 The main pollutants causing adverse changes in air quality are particulate matter (PM) and nitrogen dioxide (NO₂). Both PM and NO₂ were found to be associated with adverse health effects at concentrations that were ‘at or below the current EU limit values’.¹³⁸ Air pollution causes an estimated 40,000 deaths a year, with the social and health costs of

¹³³ The Catholic University of America, 2014. Seizure Disorders

¹³⁴ Genetics Home Reference, 2019. Autosomal dominant partial epilepsy with auditory features

¹³⁵ Health Assured, 2019. Noise levels at work & mental health

¹³⁶ WHO Topic Sheet, 2018. Ambient (outdoor) air quality and health

¹³⁷ Air Quality England, (no date). Air pollution

¹³⁸ European Commission, 2019. Air quality standards

air pollution predicted to rise to £18.6bn by 2035.¹³⁹ The primary diseases that are associated with rises in air pollution are child asthma, coronary heart disease, strokes, and lung cancer¹⁴⁰, highlighting the severity of the associated cardiovascular and respiratory effects.

- 8.3.103 The main pollutants which may cause decreases in air quality as a result of the construction phase of the London Resort would come from off-road machinery and static engines such as power generators, associated with activities such as demolition and earthworks.¹⁴¹ Adverse health outcomes could also be expected from heavy goods vehicles traveling to and from the site, as transport is a major cause of air pollution¹⁴², making up 12% of PM emissions in the UK.¹⁴³ Air quality changes from the construction period may cause annoyance to residential dwellings surrounding the site, in addition to commercial premises that may have a particular sensitivity to dust impacts.¹⁴⁴
- 8.3.104 According to Cancer Research UK¹⁴⁵ air pollution is linked to lung cancer. Both PM10 and PM2.5 particles are connected to the disease. It is also noted that while an estimated 1 in 10 lung cancer cases in the UK are caused by air pollution, other factors such as smoking have a far higher influence on the risk of developing lung cancer.
- 8.3.105 Based on the reviewed literature, the relationship between changes in air quality during the construction phase and human health outcomes is judged to be **strong**. The evidence is clear that pollutants (such as PM and NO₂) created from air quality changes have negative health impacts on individuals, such as coronary heart disease, lung cancer, and annoyance. As identified with noise impacts however (see paragraph 8.3.93), a range of health problems relating to air quality refer to the length / persistence of exposure. The construction phase may lead to temporary adverse air quality impacts, but these aren't permanent.

Children and young people

- 8.3.106 Children surrounding the construction site or passing by may be exposed to pollutants created in the construction and demolition phase. Changes in air quality may have a disproportionate impact on children because their lung function doesn't finish

¹³⁹ UK Health Alliance on Climate Change, 2018. Moving beyond the air quality crisis – realizing the health benefits of acting on air pollution

¹⁴⁰ World Health Organisation, (no date). Ambient air pollution: health impacts

¹⁴¹ London Low Emission Construction Partnership, (no date). Health impacts from construction emissions: sources and health impacts of construction generated pollution

¹⁴² UK Health Alliance on Climate Change, 2018. Moving beyond the air quality crisis – realizing the health benefits of acting on air pollution

¹⁴³ DEFRA, 2018. Clean air strategy 2018

¹⁴⁴ Institute of Air Quality Management, 2011. Guidance on the assessment of the impacts of construction on air quality and the determination of their significance

¹⁴⁵ Cancer Research UK, (no date). How can air pollution cause cancer? [available at: <https://www.cancerresearchuk.org/about-cancer/causes-of-cancer/air-pollution-radon-gas-and-cancer/how-can-air-pollution-cause-cancer>]

developing until they mature into adulthood. Children are therefore more sensitive to respiratory illness, as children are more vulnerable to breathing polluted air than adults are¹⁴⁶, as well as inhaling more air per unit of bodyweight than adults.¹⁴⁷

- 8.3.107 The WHO note that children are less able to metabolize, detoxify, and excrete the toxicants contained in air pollution.¹⁴⁸ Furthermore, children's brains are still in a process of development and therefore the neurotoxic compounds found in air pollution can be harmful to their cognitive development.¹⁴⁹

Older people

- 8.3.108 Older people (especially those with pre-existing respiratory conditions) are likely to be particularly affected by changes in air quality. Guidance published by the Department for Environment, Food and Rural Affairs (DEFRA) states that older people are more likely to suffer from cardiovascular and respiratory conditions than the general population¹⁵⁰, making them more susceptible to poor air quality impacts. Similarly, people who have pre-existing health conditions may be at increased risk of becoming ill or needing treatment.¹⁵¹

Disability and long-term illness

- 8.3.109 Individuals with pre-existing lung conditions would be disproportionately at risk from the increased levels of pollutants created by construction activities. Increasing levels of PM are damaging to those with lung problems and those whose lungs are not functioning at a healthy capacity.¹⁵²

Potential health effects of the presence of the construction workforce

- 8.3.110 The scale of construction required for the London Resort means that there will be an immediate and large increase in the amount of construction workers in and around the site. This has the potential to cause a range of health effects on the surrounding communities. Many of these relate to perception, and can be negated by better construction management processes.

¹⁴⁶ British Lung Foundation, 2016. How air pollution affects your children's lungs

¹⁴⁷ World Health Organisation, (no date). Children and air pollution

¹⁴⁸ Ibid

¹⁴⁹ Ibid

¹⁵⁰ DEFRA, 2013. Effects of air pollution

¹⁵¹ Department for Environmental Food and Rural Affairs (DEFRA), 2013. Guide to UK air pollution information resources

¹⁵² London Low Emission Construction Partnership, (no date). Health impacts from construction emissions: sources and health impacts of construction generated pollution

Effects on the general population

- 8.3.111 The presence of a large number of new construction workers in an area may not always be welcomed by local residents, sometimes causing them to feel unsettled, particularly those located closer to the construction site. Angel looks at ways in which transitory workers are portrayed in North America.¹⁵³ She describes the stereotype that transient construction workers are young and consume large amounts of alcohol and drugs, whilst also contributing to increased levels of sexual assault. Angel actually finds that construction workers are family-oriented and hardworking, and contrast the stereotype. However, some groups may believe the stereotype, creating feelings of intimidation due to the presence of such a workforce.
- 8.3.112 Many groups of society may associate a construction workforce with anti-social behaviour, as per the somewhat unproven stereotype mentioned above. Antisocial behaviour may deter individuals from travelling past the site due to increased feelings of intimidation. Intimidation of particular groups may in turn lead to social isolation/exclusion and possibly a reduction in physical activity.
- 8.3.113 An emerging body of evidence suggests that it is conceivable that a construction workforce may influence risk-taking behaviours in individuals in surrounding communities, influencing health outcomes. ‘Risky’ health behaviours such as smoking, an unhealthy diet, physical inactivity and alcohol misuse may increase via an influx of individuals (construction workers) to an area, as surveys have shown that adults often engage in two or more of these risk behaviours at any one time.¹⁵⁴ In a worst-case scenario, these behaviours may be copied by individuals in the community, for example observing smoking has occasionally been associated with perceiving smoking as acceptable, and may increase the prevalence of it.¹⁵⁵ Whilst this research found the link between construction workers and increases in risk-taking behaviour, it is a difficult causal link to establish and the evidence may not be the most robust. Therefore this link is judged to be very weak.
- 8.3.114 The evidence linking the presence of a construction workforce and human health outcomes is judged to be **weak**. There doesn’t exist an extensive range of literature noting the health impacts of the introduction of a construction workforce, however, there is limited evidence on the effects on anti-social behaviour which may be introduced as a result of the construction workforce, and the attitudes that particular groups have or perceptions they hold towards construction workers.

¹⁵³ Angel, C. 2014. Beyond the ‘roughneck’ stereotype: revealing the actual face of mobile workers in the Alberta Oil Sands and North Dakota’s Bakken Oil Region and why it matters to health

¹⁵⁴ King et al., 2015. Characteristics of interventions targeting multiple lifestyle risk behaviours in adult populations: a systematic scoping review

¹⁵⁵ Pearson et al., 2014. Measuring visual exposure to smoking behaviours: a viewshed analysis of smoking at outdoor bars and cafes across a capital city’s downtown area

Older people

8.3.115 Older residents in the area may be disproportionately affected by the presence of a large construction workforce due to the drastic change in the make-up of people in the area. Older people might opt to use community facilities less due to possible feelings of intimidation, and may generally be reluctant to travel past the site during construction hours. NHS research finds that older people are more susceptible to social isolation due to being cut off from society¹⁵⁶, an issue that may be exacerbated with the presence of a construction workforce.

Disability and long-term illness

8.3.116 Disabled people are more susceptible to poorer levels of mental and/or physical health, and so they may be disproportionately affected by the immediate introduction of a large construction workforce because of a change in the make-up of an area. This is because the presence of the workforce may modify how those with disabilities interact with their community, and may go as far as affecting their wellbeing and their access to social networks.

8.3.117 Disabled people have also been found to experience social isolation more, and so the introduction of a construction workforce could mean they are disproportionately impacted further. It has also been found that over half of disabled people report feeling lonely¹⁵⁷, and if the introduction of the workforce deters those with disabilities from travelling around or past the site, this may lead to adverse mental health outcomes.

Potential health effect of work and training opportunities created

8.3.118 The work and training opportunities provided by the London Resort are expected to bring positive health benefits to the local population. A number of positions at the London Resort will be filled locally, as well as opportunities for upskilling and training.

Effects on the general population

8.3.119 Benefits of employment on health outcomes have been outlined in '**potential health effects from displacement of commercial uses**', and include links to better physical and mental health outcomes. Other benefits include better social status and a sense of achievement, as well as material outcomes such as increased incomes and the benefits that accrue from this.¹⁵⁸

¹⁵⁶ NHS, 2018. Loneliness in older people

¹⁵⁷ Jo Cox Commission on Loneliness, 2017. Combatting loneliness one conversation at a time

¹⁵⁸ Olesen et al., 2013. Mental health affects future employment

- 8.3.120 The construction of the London Resort will create training and upskilling opportunities for many local residents. The link between education and health outcomes is strong, as those with better qualifications are more likely to have healthy lifestyles, to be fitter, and to be a healthy body weight.¹⁵⁹ More evidence by the VCU Centre on Society and Health found that education creates opportunities for better health through increased income, healthy behaviours, healthier neighbourhoods and psychological benefits.¹⁶⁰
- 8.3.121 The evidence linking the creation of work and training opportunities to positive health outcomes is considered to be **strong**. There is clear and strong evidence on the positive impact of employment, including better physical health outcomes (such as more money available to provide better services for individuals and healthcare) and better mental health outcomes (such as increased sense of purpose and confidence). In addition, there exists strong and clear literature on the benefits of education and positive health outcomes, as individuals are likelier to have healthier lifestyles and behaviours.

Children and young people

- 8.3.122 Indirect benefits are created for children arising from parental employment from jobs created in the construction phase of the London Resort. Long periods of work from a child's father when the child is around the age of 3 or 4 were found to reduce the child's risk of unemployment later in life (and the associated adverse health outcomes that come with unemployment as outlined in '**potential health effects from displacement of commercial uses**'), and reduce the child's risk of experiencing psychological distresses in young adulthood.¹⁶¹ Naturally, parental employment also generates a larger disposable family income, which could be associated with a plethora of health benefits created for the child.
- 8.3.123 Young people with limited employment history could be particularly benefitted from the construction phase. Apprenticeships allow young adults entering the labour market to earn money alongside educational studies, which may lead to better employment opportunities and better health outcomes in the future.

Low-income groups and the unemployed

- 8.3.124 The unemployed would disproportionately benefit from additional employment and training opportunities through the health benefits associated with employment. Refer to '**potential health effects from displacement of commercial uses**' for these health benefits. These include more income (and hence increased access to better living standards) and better mental health outcomes.
- 8.3.125 Individuals both unemployed and from lower socio-economic backgrounds would

¹⁵⁹ Feinstein et al., 2008. The social and personal benefits of learning

¹⁶⁰ VCU Centre on Society and Health, 2015. Why education matters to health: exploring the causes

¹⁶¹ JRF, 2001. The effect of parents' employment on outcomes for children

benefit from training programmes created in the construction phase. Those with limited skillsets or employment history can benefit from the training offered, improving their careers and employment outcomes later in life which may lead to many positive health benefits.

- 8.3.126 Additionally, children from low income backgrounds reported a health gap relative to teenagers in wealthier and poorer households. A study found that children from lower socio-economic backgrounds reported lower levels of physical activity and higher levels of bodily aches and pains relative to more advanced teenagers.¹⁶²

Ethnic minority groups

- 8.3.127 Ethnic minority groups are under-represented in the labour market, as outlined in **‘potential health effects from displacement of commercial uses’**. Therefore, additional employment opportunities created in the construction phase have the potential to benefit this group even more, creating the health benefits associated with employment.

OPERATIONAL PHASE EFFECTS AT THE LONDON RESORT

NOISE EXPOSURE

Potential health effects associated with changes in noise and vibration

- 8.3.128 As outlined within the discussion of the **‘potential health effect of construction resulting in changes in noise and vibration’**, a strong body of evidence was found linking increases in noise exposure to adverse health outcomes. As a result of the operation of the London Resort, there is potential for increases to the noise levels in and around the site.

Effects on the general population

- 8.3.129 As outlined previously, an increase in noise levels can lead to various negative human health outcomes, such as cardiovascular effects, increased stress, and changes in social behaviour. Refer to **‘potential health effect of construction resulting in changes in noise and vibration’** for the health effects on the general population of increased exposure to noise, such as sleep disturbance, psychophysiological effects, and annoyance.
- 8.3.130 During the operational phase, increases in the noise levels would be expected due to increases in activity in the area. Increases in noise and vibration may arise from rides (e.g. rail noise interactions, hydraulics, screams from people on the rides), operation of the mechanical services plant, and background/theme music played around the site.¹⁶³

¹⁶² Wapner, J., 2015. Money is driving a wedge in teen health

¹⁶³ Mackenzie et al., 2016. Noise and vibration design aspects for an indoor theme park

These noises would be created in the operational phase and hence be long-term/permanent in nature. Long-term exposure to these noises over time, if significant, may lead to the adverse health outcomes outlined previously.

- 8.3.131 A study into the impact of increased noise levels on amusement ride operators in the US found that 18% of rides that were measured had projected noise levels greater than recommendations.¹⁶⁴ This led on the evidence that these operators would be at risk for noise induced hearing loss and would eventually require a hearing conservation programme. Hazardous noise generated by the audio and music systems present in amusement parks has been identified to be a health and safety problem, which can lead to permanent or irreversible hearing loss or damage, e.g. tinnitus.¹⁶⁵
- 8.3.132 Noise increases from rides and amusements in theme parks is an issue that needs addressing due to the high concentration of sounds in small areas, creating complex conditions for exposure to noise.¹⁶⁶ Considerations would have to be in place to ensure that workers are not exposed to prolonged and elevated levels of noise generated by amusements, to avoid these adverse health effects.
- 8.3.133 Based on the literature, the relationship between changes in the levels of noise and vibration during the operation of the London Resort and health outcomes is judged to be **strong**. The evidence is clear that prolonged exposure to increased levels of noise can adversely affect health, with those living in quiet locations judged to have a better quality of life. Negative health outcomes that can arise as a result of increased noise exposure include sleep disturbance and psychological stress, with particular adverse effects on children, older people, and disabled people.

Children and young people

- 8.3.134 Refer to '**potential health effect of construction resulting in changes in noise and vibration**' for the specific human health effects on children and young people of increased exposure to noise. These include sleep disturbance, cognitive effects, and impacts to speech development.

Older people

- 8.3.135 Refer to '**potential health effect of construction resulting in changes in noise and vibration**' for the specific human health effects on older people of increased exposure to noise. These include increased risk of stroke and increased vulnerability due to lower mental processing.

¹⁶⁴ Gilbertson et al., 2017. Noise levels of amusement ride operators

¹⁶⁵ Government of New South Wales, (no date). Controlling hazardous noise in the amusement device industry – fact sheet

¹⁶⁶ Ibid

Disability and long-term illness

- 8.3.136 Refer to **‘potential health effect of construction resulting in changes in noise and vibration’** for the specific human health effects on those with disabilities and long-term illnesses from increased exposure to noise. These include acting as a trigger to those with epilepsy and damage to mental health.

AIR QUALITY**Potential health effects associated with changes in air quality**

- 8.3.137 As outlined within the discussion of the **‘potential health effect of construction resulting in changes in air quality’**, a robust body of evidence was given linking air pollution and changes in air quality to adverse human health outcomes. As a result of the operation of the London Resort, there may be additional changes in the air quality of the area surrounding the site.

Effects on the general population

- 8.3.138 As mentioned previously, detrimental changes in air quality and increases in air pollution (caused by PM and NO₂) can lead to negative human health outcomes, such as lung cancer, coronary heart disease, and disturbances in cognitive development. Refer to **‘potential health effect of construction resulting in changes in air quality’** for the health effects on the general population of increased air pollution, such as coronary heart disease and stroke.
- 8.3.139 During the operation of the London Resort, further changes to the air quality may create adverse human health outcomes. Air pollution could potentially be generated in theme parks by the energy usage needed for the scale of such a development, including to run all the rides, illuminate the entire park, and heat all buildings and areas of the park.¹⁶⁷ The pollutants created from these activities contribute to the adverse health outcomes experienced by both the general population and particular groups in society.
- 8.3.140 Based on the reviewed literature, the relationship between changes in air quality during the operation of the London Resort and human health outcomes is judged to be **strong**. The evidence is clear that pollutants (such as PM and NO₂) created from air quality changes have negative health impacts on individuals, such as coronary heart disease, lung cancer, and annoyance.

Children and young people

- 8.3.141 Refer to **‘potential health effect of construction resulting in changes in air quality’** for

¹⁶⁷ Bizfluent, 2017. What environmental problems come with making a theme park?

the health effects on children and young people as a result of increased air pollution. These include child asthma, other respiratory problems, and cognitive problems.

Older people

8.3.142 Refer to '**potential health effect of construction resulting in changes in air quality**' for the health effects on older people as a result of increased air pollution. These include further damage to those with pre-existing respiratory conditions, and increased risk of becoming ill.

Disability and long-term illness

8.3.143 Refer to '**potential health effect of construction resulting in changes in air quality**' for the health effects on those with disabilities and long-term health problems from increases in air pollution. These include damage to those with pre-existing lung conditions.

TRAFFIC AND TRANSPORT

Potential health effects from a change in local traffic and active travel

8.3.144 In the operational phase of the London Resort, there may be effects on human health resulting from increases in local traffic and changes to active travel options, including new pathways through the development, a new road built to serve the development, and a general increased accessibility of the area. The Transport chapter will identify how the changes in traffic could impact upon traffic accidents and increases in delay, resulting in changes in stress for drivers following guidance set out within WebTag and the Design Manual for Roads and Bridges (DMRB).

Effects on the general population

8.3.145 As discussed previously, good transport enables better access to employment, whilst beneficial active travel modes can lead individuals to more positive health outcomes. Refer to '**potential health changes to local traffic and transport and chances in the use of active travel modes**' for some of the benefits of good transport and active travel modes, which include better access to employment and physical health benefits.

8.3.146 Better transport routes brought about by the London Resort (e.g. the addition of new roads) could create access to employment opportunities and community facilities for people.¹⁶⁸ For example, residents in the area may find it easier to travel to the site of the London Resort, leading to employment opportunities and the associated positive health

¹⁶⁸ UNDP, 2010. Benefits of improved road access

outcomes with employment. Better transport may also lead to improved access to social and economic facilities, leading to the positive health outcomes such as happiness and self-confidence.

8.3.147 New active travel modes around the site (e.g. new pedestrian paths or cycle paths) could encourage more cycling or walking. There is a strong body of evidence linking positive health outcomes to cycling, such as improved cardiovascular function, increased mental wellbeing and a reduction of stress, and more physical activity along with reduced obesity.¹⁶⁹ New pedestrian paths, improving the amenity offering of the area, may encourage more walking to, around, and from the site.

8.3.148 Based on a review of the existing literature, the link between improvements in local traffic, transport, and active travel modes is judged to be **strong**. This is reasonable evidence linking better transport access to better health outcomes, such as access to employment opportunities (and associated health benefits) and increased happiness, but the evidence is particularly strong regarding the link between an increase in active travel methods and human health outcomes, such as increased physical activity.

Older people

8.3.149 The creation of new active travel routes may disproportionately benefit older people by encouraging them to walk and cycle. Only 8% of men over 65 and 3% of women over 65 ever chose to cycle,¹⁷⁰ and so new pedestrian routes and cycle paths may encourage more physical activity from older people, which could have many physical health benefits outlined in '**potential health effect of displacement or change in access to open spaces**'. More mobility amongst this group is associated with improvements in mental wellbeing because it allows older people to maintain social connections, increase interaction, and reduce isolation.¹⁷¹

Disability and long-term illness

8.3.150 Improved access to active travel modes has the potential to disproportionately benefit those with mental health issues due to the benefits of increased physical activity associated with this group. Refer to '**Potential health effect of displacement or change in access to open spaces**' for these benefits.

¹⁶⁹ Oja et al., 2011. Health benefits of cycling: a systematic review

¹⁷⁰ Age UK, 2015. The future of transport in an ageing society

¹⁷¹ Ibid

ELECTROMAGNETIC FIELD EXPOSURE

Potential health effects associated with changes in electromagnetic field exposure

8.3.151 The scale of the London Resort introduces considerations for the changes in exposure to electromagnetic fields. The London Resort may result in changes in electrical currents in the area, as well as exposure of the general population to large amounts of industrial equipment. Increased exposure to electromagnetic fields can affect certain groups more than others.

Effects on the general population

8.3.152 Electromagnetic field exposure (EMF exposure) refers to an increased exposure to low-frequency electricity fields that are generated by many things individuals interact with in everyday life, e.g. mobile phones, home appliances, and industrial equipment. Low-frequency electric fields have a small influence on the human body. Exposure at higher frequencies and power levels that go beyond ICNIRP guidelines¹⁷² can cause the stimulation of nerves and muscles in the body, or alter other biological processes.¹⁷³

8.3.153 The main effect from increased exposure to electromagnetic fields (EMF) is a feeling of warmth on the affected area, comparable to that of infrared and ultraviolet radiation from the sun. EMF sources for communication infrastructure are non-ionizing and therefore do not carry the same risk as exposure to x-ray and ultraviolet sources.¹⁷⁴

8.3.154 There are a substantial number of primary sources that consider the effects of exposure of EMF sources and there remains no proven causal effect link to ill health from exposure that is within the ICNIRP guidelines. The World Health Organisation (WHO) investigates agents that might potentially cause cancer and classifies them into five different groups. But the WHO itself stresses that its research is only about the question whether or not a certain substance causes cancer, but not to what extent. Currently EMF exposure is set within Group 2B, Possibly carcinogenic to humans. It should be noted that this is a lower classification than that of smoking, red meat acrylamide and open chimneys.¹⁷⁵

8.3.155 Based on a review of the existing literature, the link between EMF and adverse human health outcomes is judged to be **weak**. A large body of literature exists on the health outcomes associated with exposure to EMF and has been researched for many years, such as headaches, anxiety, nausea and more serious conditions like cancers. The evidence is weak in proving a causal link and conclusions are often inconclusive with follow up studies unable to produce similar results. For communications infrastructure that will be placed at London Resort shall be in line with ICNIRP guidelines and will cause

¹⁷² ICNIRP GUIDELINES FOR LIMITING EXPOSURE TO ELECTROMAGNETIC FIELDS (100 KHZ TO 300 GHZ) 2020

¹⁷³ World Health Organisation, (no date). Electromagnetic fields

¹⁷⁴ Ibid

¹⁷⁵ IARC MONOGRAPHS ON THE IDENTIFICATION OF CARCINOGENIC HAZARDS TO HUMANS

no known health risks from typical EMF exposure.

Children and young people

8.3.156 There has been EMF research to determine if there is a link to childhood leukaemia.¹⁷⁶ Evidence proving the link is weak. Other studies have looked into the link between electrical appliance use and various childhood cancers¹⁷⁷, but these studies have not proved any consistent patterns.

Disability and long-term illness

8.3.157 Increased infrastructure that will increase exposure to EMF, this may be harmful for those with mental health issues brought on by the perception that EMF can affect things such as sleep and mood.¹⁷⁸¹⁷⁹ Those with existing mental health issues may therefore perceive that they will be affected by a large increase in exposure from the London Resort, leading to further adverse health effects to their mental health.

INCLUSIVE DESIGN

Potential health effects associated with inclusive design, site access, and facilities of the London Resort

8.3.158 The way in which the London Resort is designed, including how the site is accessed and specific facilities it contains, may influence health outcomes of particular groups. There are many design factors that must be considered in order to effectively minimise the burden of adverse health outcomes on visitors to the theme park, as well as workers and residents on-site.

Effects on the general population

8.3.159 Our physical and social environment contributes over 50% to the state of our health.¹⁸⁰ The evidence is strong surrounding the influence that the physical environment has on our health, with one factor being the 'built environment' with which we surround

¹⁷⁶ Gye, M. and Park, C., 2012. Effect of electromagnetic field exposure on the reproductive system

¹⁷⁷ Feychting et al., 2005. EMF and health

¹⁷⁸ Heathline, 2018. Should you be worried about EMF exposure?

¹⁷⁹ Stacy Elititi Denise Wallace Riccardo Russo Elaine Fox 2018 Symptom Presentation in Idiopathic Environmental Intolerance With Attribution to Electromagnetic Fields: Evidence for a Nocebo Effect Based on Data Re-Analyzed From Two Previous Provocation Studies

¹⁸⁰ Facilities Net, 2019. How the physical environment affects health and wellness

ourselves, e.g. land use mix, the connectivity, and transportation systems.¹⁸¹ The way in which things are designed may exclude some groups in society if not designed properly, leading to the adverse health effects associated with social isolation. Refer to '**potential health effect of displacement or change in access affecting public services and community facilities**' for the negative health effects associated with social isolation.

- 8.3.160 For good health outcomes, people require well-designed public locations that are insulated, dry and warm, as well as being sufficiently spacious.¹⁸² Several considerations of the design of buildings can negatively influence physical and mental health, such as the air quality in buildings, lighting, noise, and housing design.¹⁸³ Due to the scale of the development, there are many locations and aspects which could present a risk of injury to guests and workers on-site, and so suitably situated first-aid points can help reduce the impacts of injuries when they occur.¹⁸⁴
- 8.3.161 The London Resort should also have suitable emergency procedures/exits on rides or attractions in place should accidents occur or operation of the rides go wrong, ensuring that visitors have the best possible health outcomes in the event of emergencies/breakdowns.¹⁸⁵ The scale of some amusements may mean that guests get lost if they were to breakdown half way through. Similarly, there should be evacuation/fire exit routes situated around the Resort in the event of emergencies, e.g. fire, terrorist attacks. Emergency routes should also come hand in hand with the addition of speaker systems, which allow safety messages to be relayed around the site and to all guests with ease. Signage is also an important consideration in ensuring navigation around the site is easier.
- 8.3.162 Given the size of the Resort, travel distances to and through the Resort will be long. Designated rest points are therefore important considerations in amusement parks as they allow visitors to get away from the loud noises and big crowds to take some time out and recover. This is particularly applicable to older and disabled people, but would also benefit parents of small children.
- 8.3.163 Based on a review of the existing literature, the link between inclusive design features, site access, and facilities on-site and health outcomes is judged as **moderate**. Links between general design and accessibility of the site and health are considered to be moderate, but strong evidence exists in the human health impacts on particular groups of lack of accessibility and design considerations, such as those with sensory impairments. For all groups, first-aid points, suitable fire routes and evacuation procedures, and a communication system are important for good inclusive design.

¹⁸¹ Woolf, H. and Aron, L., 2013. U.S. Health in International Perspective: Shorter Lives, Poorer Health

¹⁸² Glasgow Centre for Population Health, 2013. The built environment and health: an evidence review

¹⁸³ Macdonald, C., and Thompson, H., 2003. Housing improvement and health

¹⁸⁴ RPA, 2005. Assessment of best practices in fairgrounds and amusement parks in relation to safety of consumers

¹⁸⁵ Ibid

Children and young people

- 8.3.164 Considerations for young children are important in ensuring accessibility and safety on-site. For rides such as largescale rollercoasters, park rules and restrictions must be in place to protect the safety of children and ensure they don't get injured.¹⁸⁶ Design considerations for amusements around the park are important for children, such as height requirements and suitable safety equipment (e.g. restraints and seatbelts), as poor design may lead to serious injury, and in extreme cases, death.¹⁸⁷
- 8.3.165 The chances of overcrowding are very strong in a theme park, and so considerations that account for access to families with small children would lead to positive health outcomes. Children are at particular risk of overcrowding and being within a large crowd due to the potential for being separated from their family or in case they lose their direction.¹⁸⁸ Due to being underdeveloped, children are also at risk of being crushed within a large crowd. Considerations must be made for wide enough paths and access around the site in order to mitigate the adverse overcrowding effects associated with some groups, such as children.
- 8.3.166 Changing tables for parents of babies and small children is also important in ensuring that families can enjoy their visit to London Resort. These should be suitably located and easily findable on a map of the amusement park in order to reduce stress-related health outcomes for babies and small children, as well as the parents.
- 8.3.167 Children and younger people who may have limited employment history may be priced out of entering the London Resort, causing social isolation. This problem may be remedied by a tiered pricing system which offers a reduced entrance price to children and students, improving access.

Older people

- 8.3.168 Good accessibility to and around the site is important for older people to reduce the adverse health effects that are associated with travelling, such as stress or the potential for physical accidents. A lack of step-free access around the site, for example, can lead to negative customer experiences, which may lead to physical health concerns or stress and anxiety. Thus, those who are older and have mobility issues are at increased risk of injury.¹⁸⁹
- 8.3.169 The rest points previously mentioned would be particularly applicable to older people who may require more rest than the general population. Furthermore, older people may be disproportionately affected by entrance prices for the London Resort, pricing them out and causing social isolation. This may be remedied by a tiered pricing system which

¹⁸⁶ Firstcry Parenting, 2018. 10 tips to keep your kids safe at the amusement park

¹⁸⁷ Time, 2017. A growing list of accidents is putting safety at amusement parks under the spotlight

¹⁸⁸ HSE, 1996. Managing crowds safely

¹⁸⁹ Waterson et al., 2015. Probing deeper into the risks of slips, trips and falls for an ageing rail passenger population: applying a systems approach

accounts for seniors and offers a reduced price as a result.

Disability and long-term illness

- 8.3.170 Good accessibility for a leisure destination such as a theme park is an important issue for disabled people, as they may encounter additional challenges in the normal process of booking tickets for and accessing the park.¹⁹⁰ One such issue is allowing those with disabilities to access the site comfortably, including the use of blue badge parking spaces and quiet areas/entrances which won't cause disabled people to feel overwhelmed.¹⁹¹ Accessing such a large scale theme park with lots of other people may serve to be overwhelming for those living with disabilities, so important consideration must be taken to prevent additional stress. Another issue is designing the park in such a way that those in wheelchairs can access a variety of attractions and amusements, increasing inclusivity. The aforementioned resting points situated around the Resort would also be useful for those with disabilities in helping them move away from the loudness of the attractions and find a quiet retreat.
- 8.3.171 Another issue for those with disabilities is suitably located accessible disabled toilets, as well as Changing Places facilities. Maps used at theme parks should also note the locations of rest points, disabled toilets, and changing places facilities so that those with disabilities can readily access them.¹⁹²
- 8.3.172 Another barrier to entry which may cause social isolation in particular for disabled people is entrance prices.¹⁹³ Pricing suitably for those with disabilities (and of course their carers, family members, and/or personal assistants) would improve the accessibility of the park for this group, reducing the potential for social isolation. This may involve separate prices for disabled people within a tiered price system. Other theme park specific considerations include ride access and navigation around the park. Important considerations must be taken in accessing specific rides, such as dedicated disabled and accessible (for those with wheelchairs) entrances, in order to make the experience easier and less overwhelming for those with disabilities.
- 8.3.173 Bluetooth Low Energy Beacon Systems (BLEBs) could be used for blind or partially sighted people, helping them to gain confidence when navigating unfamiliar areas.¹⁹⁴ These work by emitting a medium range, medium intensity Bluetooth signal that can be detected by a smartphone app, helping disabled people to navigate the park, leading to better health outcomes. QR codes may also be used with mobile phones in helping direct disabled people around the London Resort. These help individuals access information both quickly

¹⁹⁰ Woodcock, K., 2018. Disability and participation in amusement attractions

¹⁹¹ Enable Magazine, 2018. Access the thrill: theme park tips for disabled people

¹⁹² Ibid

¹⁹³ Ibid

¹⁹⁴ Tech Crunch, 2014. Can iBeacons be used to help the visually impaired navigate public transport?

and easily.¹⁹⁵

- 8.3.174 Individuals with sensory disorders may not be able to partake in all of the events that the theme park has to offer, causing social isolation. Those hard of hearing may not be able to get the full experience with certain attractions and may be excluded. Also, those with an aversion or sensitivity to sounds (e.g. someone who might have hyperacusis) might find it painful or uncomfortable to tolerate certain pitches of sounds¹⁹⁶, which may influence their overall experience. Therefore, it should be a consideration to have a selection and wide choice of amusements accessible to all groups in order to improve accessibility and inclusivity for disabled people. A small selection of attractions that won't cause any sensory overloads allows those with disabilities to feel more included.
- 8.3.175 Another solution to help towards accessibility for those with disabilities is information points for deaf and disabled people in order to fully enjoy the attractions.¹⁹⁷ Readily available information is important in guiding those with disabilities around the Resort, ensuring they receive the best possible experience. Just as important as on-site information is information offered to disabled people before they travel to the London Resort, including elements of the park they should be aware of and specific considerations which would improve their overall experience.
- 8.3.176 In addition to this, those hard of hearing will require a suitable communication system as speaker systems in use around the London Resort may not be effective. In this instance, audio-visual aids and sign-language support should be readily available around the park in order to provide assistance to this group and lessen the potential for the occurrence of adverse health outcomes as much as possible.¹⁹⁸

EXISTENCE OF THE LONDON RESORT

Potential health effects relating to changes in access to work and skills

- 8.3.177 Through operation of the London Resort, employment and skills opportunities will be created, which may serve to benefit certain groups in particular.

Effects on the general population

- 8.3.178 As discussed previously, improved access to employment and opportunities to upskill have been linked to numerous positive health outcomes. Refer to '**potential health effects from displacement of commercial uses**' and '**potential health effect of work and training opportunities created**' which summarises the majority of the literature relevant for this effect.

¹⁹⁵ Disabled World, 2016. QR Codes: uses and accessibility for persons with disabilities

¹⁹⁶ Tinnitus.org, 2019. Hyperacusis

¹⁹⁷ Arts Professional, 2016. How to... make a festival disability-friendly

¹⁹⁸ LA Times, 1997. Disney agrees to better meet needs of deaf

8.3.179 Due to the scale of the London Resort, there are likely to be a large amount and wide range of types of jobs offered once operational. The large amount of workers on-site would create a sense of community or belonging for those choosing to work there, which may lead to positive health effects such as a lower prevalence of mental health issues, lower rates of unhealthy behaviours, and lower risk of cardiovascular disease mortality.¹⁹⁹ Furthermore, jobs created at the London Resort would be more permanent in nature relative to those created in the construction phase. Permanent employment may include other benefits, such as health insurance and retirement/pension plans, increasing the employees peace of mind and health outcomes²⁰⁰

8.3.180 From a review of the available evidence, the link between changes in access to work and skills and human health effects is judged to be **strong**. There is a large and robust body of evidence linking employment to positive health outcomes, including better physical health outcomes (such as more money available to provide better services for individuals and healthcare) and better mental health outcomes (such as increased sense of purpose and confidence). There is also a strong body of evidence linking education to positive health outcomes, as individuals are likelier to have healthier lifestyles and behaviours.

Children and young people

8.3.181 Refer to '**potential health effects from displacement of commercial uses**' for the positive health effects on children and young people, resulting from indirect benefits created by parental employment and upskilling opportunities for young people with limited employment history.

Low-income groups and the unemployed

8.3.182 Refer to 'potential effects from displacement of commercial uses' and 'potential effect of work and training opportunities created' for the health benefits associated with employment for those from lower socio-economic backgrounds, such as those with limited skillsets benefitting from permanent opportunities at the London Resort and the resulting health benefits of employment: such as income and social status. Also, children from lower socioeconomic backgrounds reported poor health levels, and thus disproportionately benefit.

Ethnic minority groups

8.3.183 Refer to '**potential health effects from displacement of commercial uses**' for the health benefits on ethnic minority groups of employment. This is due to ethnic minority groups finding it hard to get into the workplace due to discrimination, and so employment has

¹⁹⁹ Community Health and Wellbeing, (no date). The belonging guide: exploring the importance of belonging to good health

²⁰⁰ Chron, 2020. Advantages of permanent employment

the potential to benefit an under-represented group in the labour market.

Potential health effects from a change in the demand for health services

8.3.184 There is likely to be an increase in the demand for local health services due to the increased number of workers, residents, and visitors. These increases in demand may lead to reduced access for others.

Effects on the general population

8.3.185 The scale of the London Resort may lead to an increase in the demand for health services, which may reduce the access to health services for the general population. The demand for healthcare could be increased as a result of the magnitude of visitors to the site, the increased number of workers on-site, and those resident on-site. Reduced access to healthcare may have a disproportionate impact on some groups in particular, such as older people, those with disabilities and pre-existing medical conditions, and those from ethnic minority backgrounds (this group historically has poorer health outcomes and experiences systemic barriers to accessing healthcare services).

8.3.186 Good accessibility and availability are important determinants in primary healthcare systems, and adverse health outcomes are typically associated with longer wait times, leaving some patients to rely on urgent care.²⁰¹ It has been found that when wait times are too long, patients' adverse health outcomes may be exacerbated. In addition to decreased satisfaction from increased wait times²⁰², longer wait times are 'significantly associated' with a deterioration in patient outcomes for those with wait times that span over a few months (effects are strongest when waiting times are longer than 3 months).²⁰³

8.3.187 In general, barriers to accessing health services in a timely manner have the potential to result in unmet health needs, delays in receiving appropriate care (in which time the condition may deteriorate), financial burdens (which may lead to further adverse health outcomes), and the inability to get suitable preventive services.²⁰⁴

8.3.188 Based on a review of the existing literature, the link between human health outcomes and the accessibility of healthcare services is judged to be **moderate**. Reduced access may lead to the exacerbation of health outcomes, unmet health needs, and financial burdens. Those groups with pre-existing reduced access to healthcare would be the

²⁰¹ Ansell et al., 2017. Interventions to reduce wait times for primary care appointments: a systematic review

²⁰² Alrasheedi et al., 2019. The association between wait times and patient satisfaction: findings from primary health centres in the Kingdom of Saudi Arabia

²⁰³ Reichert, A. and Jacobs, R., 2018. The impact of waiting time on patient outcomes: evidence from early intervention in psychosis services in England

²⁰⁴ Healthy People, 2020. Access to health services

worst affected from an increase in demand for health care services.

Older people

8.3.189 Older people currently face barriers to accessing healthcare due to a lack of mobility or knowledge in accessing the correct services. As people get older, they typically develop more long-term health conditions and require more health care.²⁰⁵ Due to an increased reliance on healthcare, an increase in demand for local health services may reduce older people's access to healthcare, leaving to the adverse health outcomes associated with longer waiting times.

Disability and long-term illness

8.3.190 Individuals with disabilities and chronic conditions have a greater reliance on and use of healthcare services.²⁰⁶ In general, barriers that those with disabilities face are ignorance from healthcare services towards those with learning disabilities, poor communication, poor continuity of care.²⁰⁷ Additionally, those who have hearing problems have many difficulties in communicating with GPs and making appointments.²⁰⁸ Those with long-term illnesses may also need to frequent health services more often, an issue that would be worsened with increased demand for health care.

Ethnic minority groups

8.3.191 Ethnic minority groups have historically had poorer health and barriers to accessing healthcare services. Some barriers that influence ethnic minorities' access to healthcare include cultural differences, such as religion that may affect access to services or other cultural factors that mean people cannot access services without sufficient support, or differences in language where accurate diagnoses cannot be made.²⁰⁹ Other extrinsic factors may include differential needs, or ignorance as to services available.

8.3.192 Discrimination that is deep-rooted in England has created systemic barriers to the conditions needed to live a healthy life for ethnic minorities.²¹⁰ Those from these backgrounds suffer from poorer health outcomes as a result, and a reduction in access to healthcare would therefore disproportionately affect ethnic minorities.

Potential health effects from a change in the demand for public services and community facilities

²⁰⁵ NHS, (no date). Improving care for older people

²⁰⁶ World Health Organisation, (no date). Disability and health

²⁰⁷ Council for Healthcare and Regulatory Excellence, 2009. Healthcare for people with disabilities

²⁰⁸ Ibid

²⁰⁹ Szczepura, A., 2005. Access to health care for ethnic minority populations

²¹⁰ The Health Foundation, 2020. Will Covid-19 be a watershed moment for health inequalities?

- 8.3.193 As a result of the increased number of residents, visitors, and workers in the area, demand for public services and various community facilities is likely to increase during the operation of the London Resort.

Effects on the general population

- 8.3.194 As discussed previously, public services and community facilities present within the community, such as educational facilities and community centres, bring communities together, increase social interaction, and have a general positive impact on health. Refer to **‘potential health effect of displacement or change in access affecting public services and community facilities’** for the positive health effects of community facilities, such as the meeting of individuals’ social needs and increased self-confidence, and hence happiness.
- 8.3.195 Through an increase in activity in the area and use of community facilities, individuals in the community may socialise more. When individuals communicate with each other, tolerance and resilience is built up to stress factors in the long run, making us happier and contributing to better health outcomes.²¹¹ Additionally, research has shown that social interaction with others motivates individuals and improves memory formation, also preventing the brain from neurodegenerative diseases.²¹²
- 8.3.196 An increase in demand for public services may reduce availability of some essential services for others. For example, evidence suggests that fewer police officers available would tend to lead to a rise in crime.²¹³ If there were to be increases in demand for policing and emergency calls as a result of the London Resort, the local police force may not be able to cope with the increases in demand and there may be shortages of policing in some parts of society that require it, leading to potential negative health consequences.
- 8.3.197 The evidence linking public services and community facilities to positive health outcomes is considered to be **strong**. There is robust evidence on the benefits of social networks and interactions on health for all individuals (as a result of access to these community facilities), in particular children, older people, and ethnic minorities. However, an increased demand for public services may reduce availability for some groups in society requiring them the most.

Children and young people

- 8.3.198 Refer to **‘potential health effect of displacement or change in access affecting public services and community facilities’** for the benefits of public services and community

²¹¹ Medical News Today, 2018. What are the health benefits of being social?

²¹² Ibid

²¹³ Bell, B., 2015. Fighting crime: can the police do more with less?

facilities on the health of children and young people, as a result of increased education.

- 8.3.199 As a result of the London Resort increasing activity in the area and hence use of community facilities such as educational centres, children may experience more social interaction. Positive social interactions for children have a multitude of benefits, such as increased cognitive ability, better mental health, and early development of communication skills and independence.²¹⁴ Early social interaction is beneficial for child development, and a strong environment helps them develop language skills, creativity and confidence.

Older people

- 8.3.200 Older people are prone to becoming lonely and isolated from society. Refer to '**potential health effect of displacement or change in access affecting public services and community facilities**' for the health benefits associated with increased community interaction in older people due to the value they attach to inter-dependence and cohesion.

Ethnic minority groups

- 8.3.201 Ethnic minorities place a large value on the importance of their community. Refer to '**potential health effect of displacement or change in access affecting public services and community facilities**' for the health benefits associated with cohesion and community amongst ethnic groups.

Disability and long-term illness

- 8.3.202 Those with disabilities gain support from community centres and those around them. Refer to '**potential health effect of displacement or change in access affecting public services and community facilities**' for these health benefits, such as relying on these facilities for physical and emotional support.
- 8.3.203 For those living with disabilities, the intensity of their problems rely on the strength of their support networks. Social support networks (created through increased contact with others at the community facilities) create mutual obligations and makes the individual feel cared for and valued.²¹⁵ Other benefits include reducing the pressure they feel, improving their self-esteem, and bettering their social lives.

Potential health effects associated with open space provision and amenity space

²¹⁴ Sandfield Day Nursery, 2019. The importance of social interactions in a child's early years

²¹⁵ Forouzan et al., 2013. Perceived social support among people with physical disability

8.3.204 The London Resort may increase the amenity and open space offering in the area, creating spaces for individuals to use and enjoy. In turn, this creates many positive health benefits.

Effects on the general population

8.3.205 There exists an extensive range of literature linking the benefits of open space to positive human health outcomes. Refer to '**potential health effect of displacement or change in access to open spaces**' for the benefits discussed of open space. These include increased physical activity, better cognition, and reduced obesity, all of which lead to increased happiness.

8.3.206 Additional health benefits associated with the provision of open space include psychological and mental health benefits, reduced stress and increased quality of life, and better self-perception of general health.²¹⁶

8.3.207 Based on a review of the literature, the evidence linking the provision of open spaces to health outcomes is considered to be **strong**. There is clear and strong evidence on the positive impact of the provision of open spaces for all groups, including increased physical activity, better cognition and better mental health outcomes.

Children and young people

8.3.208 Refer to '**potential health effect of displacement or change in access to open spaces**' for the health benefits for children and young people that result from accessing open space. These include improved cognition, better educational attainment, and the promotion of competence and self-discipline.

Older people

8.3.209 Refer to '**potential health effect of displacement or change in access to open spaces**' for the health benefits for older people that result from accessing open space. These include increased physical activity (for a relatively inactive group) and better mental health (due to less chance of social isolation).

Disability and long-term illness

8.3.210 Refer to '**potential health effect of displacement or change in access to open spaces**' for the health benefits for those with disabilities that result from accessing open space. These include feelings of safety, relaxation and happiness, all of which increase self-

²¹⁶ Lee, A. and Maheswaran, R., 2010. The health benefits of urban green spaces: a review of the evidence

esteem.

Potential health effects from changes in community cohesion

8.3.211 There are likely to be changes in the community in the area due to the scale of the Development and the relatively underdeveloped nature of the area. A development of this scale which greatly increases traffic to the area, as well as residents and workers in the area, has the potential to change the cohesiveness of the community, resulting in health benefits. This also needs to be considered alongside the major change planned for the area through the Ebbsfleet Garden City (i.e. cumulative impact).

Effects on the general population

8.3.212 There are likely to be many positive health benefits of a more cohesive community, as discussed previously. Refer to **'potential health effect of displacement or change in access affecting public services and community facilities'** for the health benefits associated with social networks and community cohesion. The London Resort will be located in a relatively underdeveloped area with low rates of traffic and activity. The scale of the development has potential to therefore reinvigorate the community for some individuals, establishing better social connections between workers and residents and increasing footfall to the area and its surroundings.

8.3.213 Community settings have been found to influence health outcomes. The increasing quality of an individual's social networks has been associated with lower rates of coronary heart disease²¹⁷, lower rates of cancer, and lower rates of stress-related ill-health.²¹⁸ Generally, it is thought that a higher level of social integration within a community is linked to reduced mortality.²¹⁹

8.3.214 Collective efficacy describes 'a community's ability to create change and exercise informal social control'.²²⁰ This leads to better self-rated health amongst the community, lower rates of violence, and better access to health-enhancing resources. A more cohesive community spreads positive social capital, and individuals are more likely to receive positive social support, improving mental health outcomes.²²¹

8.3.215 Conversely, the introduction of the London Resort may disturb or disrupt the cohesiveness of the current community, and some individuals may be opposed to the change to a relatively underdeveloped area. It is important that large developments consider the changes they will make to the communal make-up of an area so they can

²¹⁷ Compare et al., 2013. Social support, depression, and heart disease: a ten-year literature review

²¹⁸ Egan et al., 2008. Psychosocial risk factors in home and community settings and their associations with population health and health inequalities: a systematic meta-review

²¹⁹ Mindell, J. and Karlsen, S., 2012. Community severance and health

²²⁰ Healthy People, 2020. Social cohesion

²²¹ Berkman, L. and Glass, T., 2000. Social integration, social networks, social support and health

put appropriate measures in place to deal with the negative impacts.²²² Possible adverse impacts may include disruption to locals who have resided in the area for many years, who appreciate the relatively quiet nature of the community or residents upset about the London Resort attracting a large amount of tourists and visitors to an area, potentially bringing (or being perceived to bring) increases in crime and anti-social behaviour. Large scale land acquisitions (LSLA) in Africa were found to have benefits such as employment creation, but these were offset by inadequate compensations to residents and communities, land conflicts, and environmental degradation²²³, all of which can affect the livelihood of communities.

- 8.3.216 Based on a review of the evidence, the causal link between increases in community cohesion and health outcomes is judged to be **moderate**. There is strong evidence on the positives associated with a more cohesive community, such as reduced mortality and mental health outcomes, but many of the benefits cannot be solely attributed to community cohesion, and may reflect a range of alternative factors. Generally, however, a more cohesive community has positive health benefits on its members. On the other hand, the London Resort may lead to negative impacts on the community for some individuals altering the cohesion of the area.

Children and young people

- 8.3.217 Children have the potential to be disproportionately affected by a more cohesive community as a result of the increased social interaction. Refer to '**potential health effects from a change in the demand for public services and community facilities**' for the health benefits for children associated with increased social interaction.
- 8.3.218 A stronger sense of community in young people is associated with feelings of happiness, better educational attainment, and better mental health.²²⁴ There is also evidence that if a young person feels more engaged in the community, they are less likely to be involved with crime as they grow up.²²⁵

Older people

- 8.3.219 Older people live more inter-dependent lives and place higher value of the importance of the local community. Refer to '**Potential health effect of displacement or change in access affecting public services and community facilities**' for some of the health benefits associated with community cohesion.

²²² Tetteh, K., 2011. Assessing The Socio-Economic Impact of Large-Scale Projects: An Illustrative Case Study of Jumbo Glacier Resort, East Kootenay Regional District, British Columbia, Canada

²²³ Hufe, P., and Heuermann, D., 2014. The local impacts of large-scale land acquisitions: a review of case study evidence from Sub-Saharan Africa

²²⁴ Fabian Society, 2016. How do we engage more young people in their local communities?

²²⁵ Ibid

8.3.220 Social interaction (as a result of a more cohesive community) in older adults leads to a lower risk of cardiovascular problems, some cancers, osteoporosis and arthritis.²²⁶ It also leads to a lower risk of Alzheimer's disease, lower blood pressure, and better overall mental health. Older people living in the current relatively quiet area may see more people and interact with the community more given the scale of the development, leading to these positive health outcomes. The more social community would also alleviate the risks associated with social isolation and a lack of community interaction, outlined in '**Potential health effect of displacement or change in access affecting public services and community facilities**'.

8.3.221 Conversely, older people who have resided in the area for many years may feel negatively about the influx of tourists, visitors, infrastructure and (actual or perceived) crime that comes with the addition of a large-scale tourist destination. Some older people may feel intimidation (and hence social isolation) due to the change in the make-up of the area, leading to adverse health outcomes.

Ethnic minority groups

8.3.222 As discussed in '**Potential health effect of displacement or change in access affecting public services and community facilities**', ethnic minorities place a high value of importance on their community and support systems with others of the same backgrounds. Ethnic minorities (as described in '**Potential health effects from a change in demand for health services**') face systemic barriers to the conditions needed to live a healthy life, and therefore a large influx of tourists and visitors to the area may cause community changes which disturb the cohesiveness of their community, on which they place a high value.

Disability and long-term illness

8.3.223 A strong community is important for those living with disabilities, as outlined in "Potential effect of displacement or change in access affecting public services and community facilities".

8.3.224 Those living with mental health issues, such as anxiety and depression, who may suffer from social isolation may be particularly benefitted from a more inclusive community due to the associated mental health benefits from interacting with the community.

Potential health effects from changes in crime and community safety (including fear of crime)

8.3.225 The increase in activity as a result of the London Resort may change crime levels in and around the Project Site. Changes in crime and fear of crime can result in adverse health outcomes.

²²⁶ St Joseph Health, (no date). Older adults and the importance of social interaction

Effects on the general population

- 8.3.226 There is a moderate body of evidence linking the fear of crime to human health outcomes. One study identified that those with a higher fear of crime would be restricted from leaving their homes, consequently reducing the number of opportunities that the individual has to form social ties and participate in social activities.²²⁷ Refer to '**potential health effect of displacement or change in access affecting public services and community facilities**' for the benefits of social interaction.
- 8.3.227 Crime and fear of crime has a significant indirect impact on health, and is influenced by environmental factors, e.g. poor design or quality may increase crime, affecting wellbeing.²²⁸ Areas with a higher prevalence of crime also lead to lower self-reported quality of life amongst residents in the area.²²⁹
- 8.3.228 Increases in crime have also been associated with mental distress and adverse mental health outcomes for residents in the local vicinity.²³⁰ Effects have been found to be strongest for females, and the effects tend to revolve around depression and anxiety. Another study found that an individual suffered a decrease in mental wellbeing in the immediate three months after violent crime victimization.²³¹
- 8.3.229 In some cases, theme parks have also been linked to increased risks of crime. According to findings in 2019, crime rates are likely to be higher in neighbourhoods near theme parks which are major tourist attractions²³², putting the local residential areas at risk of higher crime. Offence rates were found to be 198% higher in neighbourhoods within a mile of the theme park in question, Universal Studios in Florida. Security is an important issue in the leisure industry due to the 'continuous and unrestricted flow of people in and out of a facility', highlighting the need for increased surveillance and access control (restricted areas where only authorised personnel may enter).²³³ This finding highlights the need for a Security Strategy as part of the operation and management of a major theme park, in order to mitigate this possible adverse impact.
- 8.3.230 The study also highlights a need for 'more active policing strategies' for tourists and residents in order to combat the adverse crime impacts that are associated with theme parks. Other recommendations included within the report include reducing the number of places near to theme parks that attract crime, such as hotels, and extending the policing strategies to nearby neighbourhoods that are 'under the influence of the theme park'. Links have been made in other studies on crime rates at establishments such as hotels near theme parks, as thieves target those on holiday and who might be taking less precaution with their safety and belongings. Theme parks, without appropriate mitigation measures in place, are sometimes considered 'attractors' of crime, as crime

²²⁷ Stafford et al., 2007. Association between fear of crime and mental health and physical functioning

²²⁸ Lorenc et al., 2012. Crime, fear of crime, environment, and mental health and wellbeing

²²⁹ Cohen, M., 2008. The effect of crime on life satisfaction

²³⁰ Dustmann, C. and Fasani, F., 2016. The effect of local area crime on mental health

²³¹ Cornaglia et al., 2014. Crime and mental wellbeing

²³² Taylor & Francis Group, 2019. Theme parks linked to increased crime risk

²³³ IFSEC Global, 2016. Sector spotlight: running security in the leisure/hospitality industries

rates can be up to 19% higher in surrounding areas.

- 8.3.231 Due to the link between theme parks and higher levels of crime in some of the existing evidence, routine bag checking and searching should take place upon entry to the site to prevent anyone entering the park with weapons.
- 8.3.232 In ensuring the safety of guests visiting the park, crowd control is important to ensure no injuries occur. Ensuring there is no more than the maximum allowed visitors to a park is important in controlling the flow.²³⁴ Video analytics tools may also be used for this, with intelligent video analysis, that can be used to gather crowd information and park operators can be informed in real-time when crowds in particular areas of the park are too large.²³⁵ This is important in preventing visitor injuries and protecting the safety of groups such as children, older and disabled people.
- 8.3.233 Based on a review of the existing literature, the causal relationship between changes in the levels of crime and safety and health outcomes is judged to be **strong**. Theme parks and surrounding amenities and communities have been linked to higher occurrences of crime, in addition to the need for additional measures to ensure the safety of visitors. Crime and the fear of crime can lead to many adverse health outcomes, such as reduced physical activity and obesity, social isolation in older people, and more generally reduced feelings of safety causing mental distress for individuals.

Children and young people

- 8.3.234 Children have been found to be less physically active when they were in an environment not judged as safe, leading to higher levels of childhood obesity.²³⁶ Children that have been exposed to violent or traumatic acts may become fearful of further crime, restricting their behaviour.²³⁷ Children that have been exposed to violent acts may also be caught up in the 'cycle of violence' whereby they learn to resolve their own personal conflicts with violence in the future.²³⁸
- 8.3.235 In a report by the Children's Society, 40% of 10-17-year olds worry about crime, and particularly fear theft or assault²³⁹, showing the disproportionate impact that fear of crime has on this demographic.
- 8.3.236 In terms of community safety, disproportionate impacts of overcrowding would be felt by children and young people. Refer to '**potential health effects associated with inclusive design, site access, and facilities of the London Resort**' for the adverse health effects associated with overcrowding. Crowd control procedures must be in place to

²³⁴ Asmag, 2018. Turning security into useful management tools at amusement parks

²³⁵ Ibid

²³⁶ An et al., 2017. Influence of neighbourhood safety on childhood obesity

²³⁷ Health Children, 2016. Childhood exposure to violence

²³⁸ Ibid

²³⁹ Children's Society, 2017. The Good Childhood Report

control the flow of pedestrians and reduce the prevalence of injury.²⁴⁰

- 8.3.237 Due to the large number of children and young people at theme parks, they may be a hotspot for child abductions/kidnappings²⁴¹, something which must be considered when looking at safety concerns on-site. To counter this, 24-hour manned CCTV should be in place to keep track of the whereabouts of children on-site. Additionally, security/emergency points should be located and easily identifiable throughout the park for children to return to should they get lost or don't feel safe.²⁴² These provide secure areas that children recognise and can turn to should they feel in danger.
- 8.3.238 Children are also at a high risk of getting lost in such a large-scale theme park. A study found that 1 in 5 parents don't talk to their kids about safety issues such as this, and no procedure is in place if it were to happen.²⁴³ Considerations to counter this may include speaker systems throughout the park in order to direct those lost to secure points, training ride operators to be aware of lost children and offer assistance where they can, and reminding parents and carers who visit the park to establish a back-up plan if this were to occur. In one study, 87% of parents said it was both the parents and ride operators responsibility to ensure the safety of children²⁴⁴, highlighting the importance of ride operators and theme park staff in ensuring child safety.

Older people

- 8.3.239 Older people are at greater risk of crime and fear of crime due to a higher prevalence of social isolation. One review found that higher levels of safety caused higher levels of physical activity amongst older people²⁴⁵, something that would be worsened with a higher fear of crime. Crime-related safety was also associated with better mental health and more walking, as individuals were more assured of their safety when going outdoors.
- 8.3.240 The issue of crime is amplified for older people whose participation in society is lower, and loneliness and lack of participation in social life has been shown to have a strong relationship with fear of crime.²⁴⁶ In the American population, older people are more anxious and fearful of crime than any other age group²⁴⁷, and this causes undesirable changes in behaviour which may lead to social isolation.

²⁴⁰ ISSM, (no date). Amusement parks emphasize private security: top 6 reasons why

²⁴¹ Ibid

²⁴² Herman Law, 2016. How can I protect my children from predators at theme parks?

²⁴³ Reuters, 2018. Parents often lack amusement-park safety plans

²⁴⁴ Ibid

²⁴⁵ Won et al., 2016. Neighbourhood safety factors associated with older adults' health-related outcomes: a systematic literature review

²⁴⁶ De Donder et al., 2005. Fear of crime and elderly people: key factors that determine fear of crime among elderly people in West Flanders

²⁴⁷ Skogan, W., 1978. The fear of crime among the elderly

Ethnic minority groups

8.3.241 1 in 5 individuals from BAME backgrounds were found to be victims of crime in a recent study (compared to 15% for those from a white background), while black people were found to be three times more likely to be arrested than their white counterparts²⁴⁸, highlighting the disproportionate impact of crime on those from ethnic minorities, which can be partly attributed to racial profiling.

LGBTQ+

8.3.242 Individuals from LGBTQ+ backgrounds may experience more crime relative to the general population. A recent report has highlighted that one in five (21%) of LGBTQ+ people have experienced hate crime due to their sexual orientation/gender identity in the 12 months leading up to the survey,²⁴⁹ highlighting the disproportionate impact of crime on this group. This figure rises to 41% for transgender people. Furthermore, some 17% of LGBTQ+ people who visited a café, restaurant, bar, or nightclub in the 12 months preceding the survey were discriminated against because of their sexual orientation or gender identity.

8.3.243 Another report shows similar findings, in that 4 in 5 LGBT people have experienced hate crime related to their gender identity or sexual orientation in their lifetime (79%).²⁵⁰

²⁴⁸ Independent, 2017. Ethnic minorities most likely to be both victims and suspects of crime, UK race report finds

²⁴⁹ Stonewall, 2017. LGBT in Britain – Hate Crime

²⁵⁰ Galop, 2016. The Hate Crime Report