Spring (Talywain) Ltd

The British Reclamation Scheme

Health Impact Assessment

April 2008
Spring Urban Regeneration

The British: *HIA Report*

April 2008

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1 THE BRITISH HEALTH IMPACT ASSESSMENT

1.1 INTRODUCTION TO THE HEALTH IMPACT ASSESSMENT

1.1.1 Background

Spring (Talywain), who own the British Site, have prepared a Masterplan for a residential, commercial and employment redevelopment of the site in line with the Torfaen Local Plan.

There will be two planning applications in relation to the site, one for reclamation of the site to alleviate former mining hazards, followed by a second application for development of the site in accordance with the Masterplan. The Masterplan is under development but is to include residential developments, commercial areas and employment opportunities.

In keeping with other assessments on The British Masterplan, the geographical scope of the area considered in this health impact assessment (HIA) is:

- the inner impact area – Abersychan Ward
- the outer impact area – Torfaen Borough; and
- the broader impact area – Heads of the Valleys (HoV) area.

There is no statutory requirement to carry out an HIA for this development; however, the Welsh Assembly Government, hereafter referred to as WAG, does require a HIA for all new developments, as per best practice.

“The Welsh Assembly Government is committed to developing the use of the health impact assessment in Wales as a part of its strategy to improve health and well being to reduce health inequalities.” (2004)

The aim in undertaking this work has been to provide all interested parties with an overview of the schemes implications for health. This HIA has been undertaken as a ‘rapid HIA’ (1) and, as a consequence, the issues relating to health have been examined broadly, however undertaking a HIA of any level is still considered best practice.

(1) A rapid or “mini” HIA, as the name suggests, is done quickly. It may be a “desk top” exercise, reliant on information which is already available already available “off the shelf” (Parry and Stevens, 2001), or through a half day or one day workshop with key stakeholders (Barnes et al., 2001). In either case, there is usually a minimum quantification of the potential health impacts which are identified. (WHO - http://www.who.int/hia/about/glos/en/index2.html)
1.2 DEFINING HEALTH AND HEALTH IMPACT ASSESSMENT

1.2.1 What is ‘Health’?

Health, or more importantly what constitutes good health, is difficult to define and measure in all its aspects for a population, not least because perceptions regarding health and expectations of good health vary. Any definition of health applied in HIA will influence the overall content and focus of the assessment.

Following best practice, this HIA takes the World Health Organization’s (WHO) definition, which states that health is

“a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity” (1).

1.2.2 A Socioeconomic Model of Health

The basis of the HIA is a broad socio-economic model of health. For any individual, health is determined by a multitude of factors. Most obviously, there are factors that relate to age and genetics, which cannot be changed for that individual. Next there are lifestyle factors that relate to an individual; choices are made with regard to physical exercise, alcohol consumption, tobacco smoking, etc. Beyond these factors, a multitude of external factors play a significant part in determining health. These reflect the wider environment and encompass many aspects of the socio-economic context in which members of a community live and work.

A common way of summarising these factors is shown in Figure 2.1, which illustrates a model of the so-called ‘determinants of health’. These determinants can be related to the individual or the wider environment. The core determinants are specific to an individual, whilst the outer determinants are a function of the socio-economic status of an individual. Subsequent to lifestyle factors, social and community networks are considered to be important for a person’s health and wellbeing. If these networks are strong, evidence suggests that health is improved. Isolated individuals, on the other hand, have poorer health (see Annex B).

The outer layer in the diagram represents the socio-economic, cultural and environmental background. The physical environment (eg air quality) is one determinant that has some part to play in the health of populations, but is only one influence. Good housing, access to medical services, transport and being employed in a stress-free job are also important.

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Determinants of health are generally well understood and can be defined with some confidence, although no list can be completely comprehensive, especially where the definition of health includes wellbeing, as in this HIA.

In conducting an HIA, the effect of the proposed development under consideration on these determinants has to be considered. This is done by defining health ‘pathways’. A health pathway can be described as any activity that influences a known determinant of health. These pathways are discussed further in Section 3.

1.2.3 Models for HIA

HIA is a developing field, but there is an extensive and growing body of knowledge and guidance. However, no statutory guidance exists and HIAs tend to employ different methodologies to meet individual project requirements.

This HIA employs guidance and methods set by the National Institute of Clinical Excellence (NICE), formally the NHS Health Development Agency. Contributions from the World Health Organization are also applied.

As defined by the Health Development Agency (2002):

“HIA is a process designed to identify and consider the potential – or actual – health impacts of a proposal on a population. Its primary output is a set of evidence-based recommendations geared to informing the decision making process. These recommendations aim to highlight practical ways to enhance the positive aspects of a proposal, and to remove or minimise any negative impacts on health, wellbeing and health inequalities that may arise or exist.”

By convention, HIA is categorised as ‘rapid’, ‘intermediate’ or ‘comprehensive’, depending on the time taken to complete the assessment and the degree of community consultation undertaken. Further categorisation is sometimes made according to the timing, relative to the project considered, ie does the assessment precede or follow the project? Based on these criteria this HIA is ‘prospective’ and ‘rapid’.

1.3 AIMS AND OBJECTIVES

1.3.1 Aim of HIA

The aim of the HIA is:

- to determine the potential health impacts of the proposed reclamation scheme on local residents;

- to identify ways to maximise positive and minimise negative impacts; and

- to inform the planning process.

1.4 SCOPE OF THE HIA

The scope of the HIA is dictated by the aims and objectives listed above, along with the methodology adopted, the geographical area and the fact that this is a rapid HIA and therefore comprehensive community consultation on health issues has not occurred. However, it should be noted that wider consultation including two public liaison meetings, the first of which was attended by over 40 people and the second by over 70, as well a public exhibition and feedback forms was undertaken to inform the development and to take local peoples concerns into account.

1.4.1 Structure of the HIA Report

The remainder of this report is structured as follows:

- Section 2: Methodology;
- Section 3: Project profile
Section 4: Community profile;
Section 5: Stakeholder engagement;
Section 6: Impact assessment; and
Section 7: Conclusions and Options for Mitigation and Monitoring.

This is supported by the following Annexes:

Annex A: Literature Review; and
Annex B: Community profile data.
2 METHODOLOGY

2.1 INTRODUCTION

The overarching methodology applied in this HIA to meet the objectives of the assessment includes the compilation of an evidence base and a community profile, stakeholder engagement, analysis and the conclusions on impacts resulting from this process.

The methodology used is shown in *Figure 3.2.1*.

*Figure 3.2.1* HIA Methodology

In order to develop a clear indication as to potential health outcomes for the community, a profile on aspects of the regeneration has been developed. This is complemented by a profile of the communities that will be influenced by the development.

2.2 PROJECT PROFILE

The project profile investigates the various stages and processes involved during construction and operation of the reclamation scheme. It defines the project footprint, the extent of activities that may result in potential health outcomes, and the influence they may have upon a range of determinants of health. In this way the project profile identifies the potential health pathways.
Once activities and their associated impacts have been outlined they can be applied to the community profile. This will determine how such pathways might act on the relative susceptibilities of communities, using the HIA evidence base to identify a range of possible social, physical, mental and community health outcomes.

The purpose of the project profile is to identify those relevant features associated with the proposed development that are potential influences on the determinants of health, introduced in Section 1.2, such as:

- environment (noise, air quality, visual);
- employment and income;
- education;
- housing;
- lifestyle;
- physical activity;
- access to services, amenities and social networks;
- community severance or cohesion;
- transport;
- social networks and connectivity;
- community identity;
- access and accessibility; and
- wellbeing.

The potential of these determinants to be influenced by the proposed development has been considered by the ERM team, using the knowledge provided by the evidence base, ie the literature review, the community profile and the views of stakeholders.

2.3 COMMUNITY PROFILE

The community profile has been developed through the application of national statistics such as the National Census 2001 and local level health data. The community profile is supplemented by surveys of local and regional health, education and lifestyle.

The combination of statistics and available survey information develops a picture of existing community susceptibilities and inequalities.

2.4 EVIDENCE BASE

A literature review has been performed to collect evidence on the potential health impacts; based on reviews of the literature on health effects associated with the project activities. The effects on health of the following topic areas are considered:
• noise;
• air quality;
• employment;
• social capital;
• transport;
• the visual environment; and
• the physical environment.

The literature review was carried out by reviewing information and data that was mostly already available to ERM, in keeping with the rapid nature of this HIA.

2.5 **STAKEHOLDER CONSULTATION**

Stakeholder consultation is a key stage and inherent principle within HIA, as associated health outcomes are largely dependent on the particular circumstances of communities, lifestyle, inequality and subsequent relative susceptibility. Though national statistics can be applied to profile community health and susceptibility this will not uncover the concerns, perceptions and circumstance that may prove invaluable to the success of such regeneration projects.

Consultation is therefore crucial in gaining local knowledge and insight, alongside the particular concerns of actual, perceived health impacts and benefits, assisting in more health conscious decision-making.

Stakeholder engagement was also undertaken through one to one interviews by telephone and e-mail communication, as preferred by the client. Engagements and Outputs arising from such engagement are detailed within Chapter 5 of this report.

This was separate to and in addition to the wider consultation that was undertaken to inform the development.

2.6 **ANALYSIS**

The analysis stage investigates and appraises potential outcomes and benefits, incorporating environmental and health data to identify populations at risk. It assesses the maximum theoretical impacts with a view to developing measures that reduce or avoid negative impacts/inequalities and enhances opportunities to improve health.

This has been achieved by identifying project activities with known health pathways and outcomes and applying them to the community profile to express exposure and sensitivity.
The potential receptors were identified based on the criteria used within the EIA which identified 3 impact areas, the immediate area which covers Abersychan ward, the outer impact area which of Torfaen Borough and the broader area covering the Heads of the Valleys (HoV) area. Potential impacts were identified based on the findings of the EIA, evidence base including a review of previous HIA assessments and the findings of the stakeholder engagement process.

The analysis also provides a qualitative judgment as to the likelihood, magnitude and significance of the potential health outcomes.

A key element of an HIA is the definition and evaluation of significance for identified impacts. The identification of potentially ‘significant’ impacts maintains the focus of the HIA, since it is these impacts that require the most attention in the design of the project.

2.6.1 Mitigation

This section aims to identify means of avoiding unnecessary damage to a community’s health, healthcare services and social services etc and to promote and maximise any benefits associated with the development. Thus, mitigation measures are developed to avoid, minimise, reduce, remedy or compensate for the negative impacts identified, and to create or enhance health benefits.

2.7 SUMMARY OF IMPACTS AND MITIGATION MEASURES

A summary of perceived and actual risks and benefits of the proposal for The British, offering recommendations as to mitigation and health maximisation options, is also presented.
3 PROJECT PROFILE

3.1 THE PROPOSED DEVELOPMENT

This section provides a description of the proposed regeneration, from the perspective of its implications for determinants of health.

The British is located within Abersychan Ward within the administrative district of Torfaen District Council within the Heads of the Valleys in South Wales. Many of the direct implications for health would arise principally for communities within Torfaen Borough, although there may also be indirect effects outside of these districts in the HoV area.

3.1.1 Site Location

The site as shown is Figure 3.1 known as ‘The British’ is one of the largest Brownfield sites in South Wales occupying approximately 71 hectares of land at Talywain, approximately 6km northwest of Pontypool, Gwent. It lies just off the B4246. To the north and east, the site adjoins the linked communities of Golynos, Castle Wood, Garndiffaith, Talywain and Abersychan. A disused railway embankment, up to 14m in height, crosses the Cwm Sychan valley, isolating the south-east part of the site from Abersychan. To the south of the site is the settlement of Pant Glas and to the south-east is a rugby field.

Figure 3.1 Aerial Photo of the British Site and Surrounding Area
3.1.2 Topography

The site lies on the western, lower slopes of the Llwyd valley. The existing landform of the site is varied. At present, much of this change in level takes place via steep tip faces between an upper and lower plateau. There are several industrial ruins of heritage value on the Site, and the railway embankment is a linking feature with the World Heritage Site at Blaenavon.

3.1.3 Historic Land Use

A major ironworks producing pig iron was built on the site in 1826 by the British Iron Company. After approximately 30 years of gradually increasing output, it was sold in 1852 to the owners of the Ebbw Vale Ironworks. Until the mid 1870s, the ironworks produced mainly rolled, wrought-iron rails. From 1877 until 1883, the works produced Spiegel-eisen (a white iron, containing upwards of 5% manganese, used in steel-making as a late addition to the smelt). Steel-making was not undertaken. Closure in 1883 was due to exhaustion of local ores, the cost of manganese imports and the consolidation of steelmaking at the neighbouring Ebbw Vale Victoria Works.

More, recently the south eastern area of the site (1964-1968) was occupied by a Pontypool Urban District Council Municipal tip. A small area in the southern area of the site was also used as a scrap yard, for car breaking. Underground mining took place at the site from at least 1826 until 1984. The Griffin and Big Arch licensed drift mines worked or re-worked the primary seams, leaving shallow underground voids and numerous mineshafts and adits.

Numerous relevant mine plan records are held by the Coal Authority, however, the mining record is undoubtedly incomplete due to deposition of abandonment plans not becoming a legal requirement until the 1870s. Years of coal/ironstone mining and industrial activity, therefore, have substantially altered the natural landform and the original topography is obscured by residual shale and spoil mounds.

3.1.4 Existing Land Use

Currently, much of the site has no beneficial use. Although the original organic soil cover has been lost from the extensive derelict areas of the site, Castle Wood meadow, in the north of the site, is used for pony grazing and the adjacent meadows have a history of management for hay cutting. There is some sheep grazing of other parts of the site.

Parts of the site have recreational usage, since a number of rights of way exist within the site and adjoining it, and a cycle path on the railway embankment is part of the Celtic Trail. In addition motorcycle scrambling occurs on the site and it is used for fly tipping.

A high voltage overhead electricity line on steel lattice supports also crosses the eastern part of the site from north to south. There are no occupied
properties on the reclamation site but a number of scattered dwellings are close to its boundaries including:

- cottages and bungalows along the northern perimeter at Castle Wood;
- a terrace of former industrial cottages known as Elizabeth Row adjacent to the south west boundary; and
- Brook Cottage, New Cottage and Bracken Lodge, at Pant Glas, on the southern perimeter of the site.

On higher ground, to the north west of Farm Road, are small scale industrial premises, for sale at the time of writing but formerly occupied by ETM Steel Fabrication. The bulk of the settlement of Abersychan/Talywain lies to the east of the line of the former railway and B4246.

3.2 THE PROJECT

3.2.1 Project Overview

There will be two planning applications in relation to the site, one for reclamation of the site to alleviate former mining hazards, followed by a second application for development of the site in accordance with the Masterplan. The coal will provide financing towards reclamation restoration following the excavation works.

The aim of the reclamation works is to generate land, suitable in profile, stability and safety, to accommodate future development on the British site. A series of high quality coal seams sit beneath the northern plateau of the site. Where the coal is sufficiently close to the surface, it will be extracted as part of the reclamation process. It is anticipated that 350,000 tonnes of coal will be extracted in this way. Reclamation of the site will take place in three phases, further details of which can be found in the ES:

- Phase One: Set Up – This phase will last one month and will include fencing of the site, earth works to move ecological important soils, stripping of the top soil and construction of screening and bunds.
- Phase Two, Three and Four A: Bulk Excavations- This phase will last for 41 months (3 years 5 months). Coal will be excavated in a North to South Direction with material stored on site until needed to backfill excavated strips.
- Phase Four B and Five: Return Overburden to Void and Restoration – This phase will last 4 months and will involve compacting the ground to
restore the surface to finished levels to create a landscape suitable for redevelopment.

A key implication of the reclamation scheme is that the working area will ultimately subsume a section of Farm Road, a road that currently provides access to a number of residential properties. The operational and safety practicalities of the scheme mean that Farm Road cannot be retained in its current form throughout the duration of the works. It is therefore proposed to provide a new access road as part of the reclamation scheme that will be retained during subsequent development.

Port-a-cabin type single storey office buildings, together with a steel storage unit will be located within a site compound adjacent to the southern site access as indicated. The layout and content of the office area will be finalised once a contracting company has been appointed. During the reclamation operations, the number of on-site staff will vary, with a maximum workforce at any one time of up to 100 people.

Hours of working would be 08:00 – 18:00 Monday to Friday and 08:00 – 13:00 Saturday with no working on Sundays or Bank Holidays. No operations would take place outside these periods except for maintenance.

The development of the site in accordance with the masterplan will then commence which will be a mixed use development including residential properties, commercial development and employment opportunities the details of which are still under development.

3.2.2 Defining the Project Profile

The purpose of the project profile is to identify those relevant features associated with the proposed development that are potential influences on the determinants of health, introduced in Section 1.2.

The following determinants of health are usually considered in the context of HIA:

- environment (noise, air quality, visual);
- employment and income;
- education;
- housing;
- lifestyle;
- physical activity;
- access to services, amenities and social networks;
- community severance or cohesion; and
- transport.

The potential of these determinants to be influenced by the proposed development has been considered by the ERM team, using the knowledge
provided by the evidence base, ie the literature review, the community profile and the views of stakeholders from public consultation events and engagement with stakeholders undertaken for this assessment.

The proposed regeneration may exert influences on these determinants through ‘health pathways’, which arise from features or consequences of the regeneration proposals. For example, an increase in construction traffic might have an influence on the determinant of physical environment though the pathways of air quality, noise and dust. Once these features and pathways have been identified, they can be evaluated for their potential to produce a range of possible social, physical, mental and community health outcomes.

The proposed development has been described in considerable detail within the planning application and the ES. It is not the aim of the project profile to replicate or reassess the findings of the EIA, but rather take the key points and data for consideration in this HIA.

3.3 INFLUENCES ON HEALTH

Potential health pathways created by features of the proposed development largely reflect:

- Increased employment opportunities, with implications for improved socio-economic wellbeing. Reductions in unemployment and the potential for local procurement policies and skills development in line with the HoV procurement strategy.

- Short term worsening of the physical environment associated with the extraction of coal, resulting in changes in air quality, noise and the visual environment.

- Increased surface transport movements, with implications for increased air pollution, noise emissions, road safety, community severance and accessibility.

- Changes to access, as a result of work on the site leading to annoyance, increased travel times and decreased wellbeing.

- Long term improvements due to regeneration of the site via restoration with the opportunity for improved housing, economic benefits and improved health and wellbeing.

The wide ranging definition of health, along with varying perceptions, means that the proposed development may influence a number of additional health pathways that are not associated with physical changes but reflect intangible and/or perceived effects. It is not always possible to outline such pathways
through a review of available literature. Such pathways can emerge through engagement with key stakeholders and reflect potential influences on:

- social networks and connectivity;
- community identity; and
- wellbeing.

Evidence on health effects associated with these project factors or influences can be found in the evidence base in Annex A.

A summary of the features of the proposed development and the potential implications for influence on health determinants, as formulated by the ERM team, is presented in Table 4.1.

The features selected are those that might reasonably be anticipated to have implications for health and which therefore should be evaluated later in the assessment phase.

Details on the potential health outcomes listed are explained in the evidence base in Annex A.

Phase one (set up) is a short period of time and for this reason, together with the nature of the work involved in this phase, it has been included in the discussion of phase two, three and four a (bulk excavations) impacts. It is unlikely that local residents will distinguish between the phases or that phase one will have any unique health impacts. Phase four b and 5 (return overburden to void and restoration) has been integrated for similar reasons.
### Table 4.1  Project Profile and Health Pathways

<table>
<thead>
<tr>
<th>Project Feature</th>
<th>Health Pathway</th>
<th>Health Determinant</th>
<th>Potential Health Outcome or Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Landworks</strong></td>
<td>Dust</td>
<td>Living environment</td>
<td>Respiratory effects</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>Living environment</td>
<td>Annoyance</td>
</tr>
<tr>
<td></td>
<td>Community disruption</td>
<td>Social capital</td>
<td>Decrease in general community health</td>
</tr>
<tr>
<td></td>
<td>Road Closures</td>
<td>Social Capital</td>
<td>Wellbeing</td>
</tr>
<tr>
<td></td>
<td>Decreased air quality</td>
<td>Living Environment</td>
<td>Respiratory effects</td>
</tr>
<tr>
<td></td>
<td>Changes to visual landscape and lighting</td>
<td>Living environment</td>
<td>Annoyance</td>
</tr>
<tr>
<td><strong>Increased Vehicles movements</strong></td>
<td>Traffic movements</td>
<td>Transport</td>
<td>Injury and death (from accidents)</td>
</tr>
<tr>
<td></td>
<td>Potential disruption to road network</td>
<td>Living environment</td>
<td>Annoyance</td>
</tr>
<tr>
<td></td>
<td>Emissions from construction vehicles</td>
<td>Air quality</td>
<td>Respiratory effects</td>
</tr>
<tr>
<td></td>
<td>Employment and procurement</td>
<td>Socio-economic Issues</td>
<td>Improved health and wellbeing</td>
</tr>
<tr>
<td></td>
<td>Increased demand on local level health care due to presence of the workforce</td>
<td>Access to services and amenities</td>
<td>Decrease in general community health</td>
</tr>
<tr>
<td><strong>Potential presence of non local workforce</strong></td>
<td>Employment</td>
<td>Socio-economic Issues</td>
<td>Improved health</td>
</tr>
<tr>
<td></td>
<td>Increased demand on local level health care due to presence of the workforce</td>
<td>Access to services and amenities</td>
<td>Improved wellbeing</td>
</tr>
<tr>
<td><strong>Local workforce employment/procurement</strong></td>
<td>Employment</td>
<td>Socio-economic Issues</td>
<td>Reduced access for local people leading to worsening health outcomes</td>
</tr>
<tr>
<td><strong>Work force</strong></td>
<td>Accidents</td>
<td>Access to health care</td>
<td></td>
</tr>
<tr>
<td><strong>Site Security</strong></td>
<td>Illegal access to site</td>
<td>Living Environment</td>
<td>Accidents and injury</td>
</tr>
<tr>
<td><strong>Presence of the site</strong></td>
<td>Reduction in housing value</td>
<td>Housing</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Project Feature</td>
<td>Health Pathway</td>
<td>Health Determinant</td>
<td>Potential Health Outcome or Impact</td>
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<tr>
<td><strong>Post reclamation: Regeneration</strong></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
| Opportunity to provide Green spaces | Increased exercise | • Living environment  
• Physical activity | • Improved wellbeing  
• Increased social capital with associated health benefits  
• Potential increased fitness levels and associated health benefits such as reduction in diabetes, obesity and heart disease |
| Opportunity to Increase physical activity through provision of leisure facilities, cycle paths and green routes | Increase in exercise and potential increase in community interaction  
Employment opportunities | • Living environment  
• Physical activity  
• Social capital  
• Socio-economic status | • Decreased mortality  
• Improved wellbeing  
• Increased social capital with associated health benefits  
• Potential increased fitness levels and associated health benefits such as reduction in diabetes, obesity and heart disease |
| **Commercial Development opportunities** | Employment Opportunities | • Socio-economic status | • Decreased mortality  
• Wellbeing  
• Decreased mortality |
| **Residential development opportunities** | Provision of good quality housing of varying cost and size  
Increase in qualifications and educational levels thereby increasing employment opportunities  
Employment opportunities | • Housing  
• Living environment  
• Education  
• Socio-economic status | • Improved health  
• Improved wellbeing  
• Wellbeing  
• Social capital  
• Decreased mortality  
• Decreased health inequalities |
| **Opportunities for Education and training** | Access to services, amenities and employment opportunities | • Transport | • Accidents  
• Wellbeing |
| **Opportunities for improved transport links (including bus links)** | | | |
4 COMMUNITY PROFILE

4.1 OVERVIEW

A community profile is required because evidence suggests that different communities have varying susceptibilities to health impacts and benefits as a result of ethnicity, social and demographic structure and relative deprivation. The community profile therefore provides an insight into how potential health pathways identified by the project profile might act disproportionately upon some communities and sensitive receptors.

Communities subject to inequality and consequent health susceptibilities can be found in most areas, even in relatively affluent ones. Hence, the community profile addresses this by mapping ‘hot spot’ areas of high inequality and existing levels of poor health at the community level.

4.2 KEY DATA

4.2.1 Introduction

The community profile (presented in Annex B) has been compiled through an examination of key demographic data for the local population relative to national statistics, as appropriate.

The key findings are summarised below; these findings relate to the Borough of Torfaen. The Ward of Abersychan, where The British site is located, has also been considered in Annex B. The data gathered for this Ward follows a similar pattern to that of the Borough as a whole. The data, however, highlight that the Ward of Abersychan is slightly more deprived than the Borough it lies within.

4.2.2 The Population

The age structure of the population in Torfaen is generally similar to that of the rest of Wales and England. The age structure of a population dictates the requirements of an area with regard to planning for services; any activity that alters the demographics of an area will therefore alter these requirements and cause adjustments to be necessary in planning for the needs for the population.

The Borough of Torfaen has a very low percentage (less than one percent) of people in religious and ethnic minority groups. (Minority groups are more likely to be subject to feelings of exclusion and isolation as well as experiencing barriers to health care.). Any activity that isolates or excludes minority groups in relation to the development will have a negative impact on this small but potentially vulnerable population.
4.2.3 **Education, Skills and Training**

Education is an important determinant of health and influences almost every aspect including lifestyle, coping skills, future employment prospects and subsequent income, quality of housing and healthcare. Improving the quality and level of education is therefore imperative.

The skills base of Torfaen Borough is relatively poor with more than 45 percent of 16 to 74 year old with no qualifications compared to 29 percent in England and 33 percent in Wales. However Torfaen has a higher than average percentage of 16 to 74 year olds attaining levels 1 and 2 qualification.

4.2.4 **Employment and Income**

Income and employment influence a range of factors including access to housing, education, services and social networks as well as diet, lifestyle and coping skills. These, in turn, are key determinants of a range of physical and mental health impacts and ultimately health and wellbeing.

Levels of employment and unemployment in Torfaen Borough are both in line with average in Wales and England.

4.2.5 **Transport**

Transport plays a vital role in the health and wellbeing of communities by providing access to a range of services and amenities required to treat illness and to manage and promote healthy living. Any activity that promotes a modal shift to public or green transport will contribute to a healthier lifestyle and environment and promote physical activity.

Car ownership roughly correlates with housing ownership and is also an indicator of wealth for many areas in the country. However, rural communities are often less well served by public transport than their urban counterparts as these routes are seen as unprofitable. Therefore, this increases the reliance on the use of cars in these communities.

In Torfaen the percentage of households with one car is slightly (more than 1%) higher then the England and Wales average. Therefore, there are few households with multiple vehicles, arguably reflecting the Borough’s lack of wealth relative to other parts of Wales.

4.2.6 **Housing**

Housing is not only required to provide shelter, security and a family base, but the quality of housing is also associated with economic, social, mental and
physical wellbeing (1). Home ownership and the type of household are good indicators of wealth in an area with detached households being consistently more expensive than terraced households. Torfaen’s housing market is dominated by low cost terraced accommodation.

The percentage of people that own their homes outright or with a mortgage in Torfaen Borough in 2001 was lower than the Wales average (71.32%). A higher proportion of the population (23%) in Torfaen rent from the council in comparison to England and Wales.

4.2.7 Crime and Health

A recent study called ‘Exploring the Impacts of Crime on Health and Health Services: A Feasibility Study’ (2) concludes that crime has serious health impacts, both direct and indirect as well as having a substantial impact on the demand for health services. Violent crime results in physical and psychological injury, which can require emergency treatment and long-term intervention. Theft and burglary can materially affect living standards and have psychological effects for the people involved, with consequences for health. The fear of crime can lead to a wide range of psychological disorders and self-limited mobility. Exposure to crime may also increase the incidence of health-damaging behaviour, such as smoking or excessive alcohol consumption (3). In the Borough of Torfaen the rate of crime is generally lower than in Wales and England.

4.2.8 Deprivation

The index of multiple deprivation provides a ranking of small areas in Wales using a range of information across a number of subject domains covering: income;

- employment;
- health;
- education;
- skills and training;
- housing;
- physical environment; and
- geographical access to services by bus and walking.

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4.2.9  

Health

The 2001 Census asked people to describe their self perceived health over the preceding 12 months as ‘good’, ‘fairly good’ or ‘not good’, as well as recording those with a long term illness. Although self rated health is subjective and an indication of general health rather than recorded health events it is a useful tool in obtaining local community perceptions of health.

A lower proportion of local residents in the Borough of Torfaen consider their health conditions as ‘good’ (62%) compared to the average for England and Wales; around 13 percent of the population in Torfaen Borough area believe their health is ‘not good’.

The life expectancy in Wales is slightly higher than that in England generally and the Borough of Torfaen has a better life expectancy still, at 77.4 for men and 81.30 for women.

Deaths from coronary heart disease for people under 75 years of age are often used as a quality of life indicator. The levels of coronary heart disease in Torfaen Borough and Wales as a whole are higher than the average in England; this shows that the quality of life for the population of Torfaen is likely to be lower than average.

4.2.10  

Conclusion

The Borough of Torfaen is relatively deprived, with the Ward of Abersychan in which ‘the British’ site is located being more affected.

In terms of educational performance and qualifications the Borough of Torfaen performs below the average with a poor skills base. Health in the borough is also poor with more people reporting ‘not good’ health than in England and Wales. However Torfaen does not suffer from high unemployment or crime rates.

The population that lives in Torfaen Borough generally performs worse than the Wales and England average for a variety of indicators, including self rated health, lifestyle indicators and education. Those living in the Ward of Abersychan perform worse on the indicators mentioned above than the Borough of Torfaen, highlighting that Abersychan is likely to be one of the more deprived Wards in the Borough.

The communities within Torfaen Borough are deprived in terms of the major health related indicators and by ‘traditional’ measures, eg of low socioeconomic status, suffering from the negative effects associated with deprivation. The Ward of Abersychan within Torfaen Borough suffers from higher levels of deprivation.
5 STAKEHOLDER ENGAGEMENT

5.1 INTRODUCTION

This chapter examines the findings from the consultation that was undertaken addressing perceptions of potential health risks and benefits of the proposed regeneration within The British.

Stakeholder consultation is a key stage and inherent principle of HIA as a means to uncover the concerns, perceptions and circumstances of the local population which can not be found through quantitative methods (such as assessing national statistics and reviews of the scientific literature).

It should be noted that the outcomes of the consultations that are reported here are based upon the views of the participants of the consultation and do not necessarily reflect the opinions of ERM.

5.2 APPROACH

5.2.1 Methods

The principal methodology employed for gauging local concerns and perceived health effects was through a select number of one to one interviews. Due to the rapid nature of the HIA, an extensive programme of stakeholder engagement was not undertaken, and instead, a small number of discussions were had with organisations identified as having a particular link to local health issues. In order to preserve the anonymity of participants, organisations are not named here, however groups approached included:

- Local Public Health Representative;
- Local Health Facility;
- General Practitioner/Practice Manager;
- Educational Establishment;
- Local Housing Representative; and
- Local Environmental Health Representative.

These groups were selected as key informants who would have knowledge of health issues in Abersychan Ward, Torfaen Borough or the HoV area and therefore would be able to highlight local health issues and concerns.
5.3 STAKEHOLDER ENGAGEMENT FINDINGS

5.3.1 Overview

The following section describes the key points raised during consultation, reflecting participant views on:

- potential health benefits;
- potential negative health impacts; and
- participant suggestions for health impact mitigation and health maximisation.

5.3.2 Potential Health Benefits

The general perception from those who participated was that the redevelopment was likely to have a significant positive impact on health in the long term, due to the social, economic and environmental benefits of the redevelopment, but that there would be a short-term negative impact on the health of the local community, which would need to be properly assessed and managed.

Positive health benefits highlighted by stakeholders included the following issues:

Open Cast Mining Phase:

- Employment of local people during open cast mining phase.

Redevelopment Phase:

- People will be attracted to the area following redevelopment.

- Improved community spirit, since there is increasing disruption of community links and information transfer at present as a result of schools closing etc.

- Positive impacts on the landscape and general environment (the area of the site itself isn’t currently attractive).

- Provision of more local jobs, so local people will be able to work closer to their homes.

- New housing provision of various priced housing – there is currently an overcrowding problem in the area.

- Additional influx of people to the area due to extra housing and benefits to the landscape and community or the redevelopment.
• Removal of current problems with fly tipping and off-road motorbike nuisance.

5.3.3 Potential Negative Health Impacts

Concern was expressed over a number of health issues. These included:

Open Cast Mining Phase:

• Potential for large significant negative impacts on health.

• Increased road traffic.

• Heavy traffic likely to damage the roads in the Abersychan area which are already of poor quality.

• Concern over close proximity of local houses to the site of the open cast mining.

• Concern over particulates and other air pollutants from traffic and mining activities.

• Noise and vibration from the open cast mining are the biggest perceived potential problems, given that some houses are extremely close to the proposed mining area.

• Dust nuisance likely to be a big health problem (coal dust viewed as being very damaging).

• Particular concern over how noise and vibration from traffic and open cast mining would affect local residents.

• Housing prices perceived as likely to go down during the open cast mining phase – not good for attracting people to the area in the short term.

Redevelopment Phase:

• Redevelopment will mean increased demand on services.

• Local GP practices currently operating at maximum capacity; would struggle to provide appointments if patient list increased significantly.
5.3.4 Health Impact Mitigation and Health Maximisation

Respondents provided a series of suggestions to maximise health benefits and minimise harm.

Health maximisation

Suggested health maximisation measures included:

Open Cast Mining Phase:

- No specific measures were recommended by participants

Redevelopment Phase:

- Provision of new services such as leisure facilities (there are none in Abersychan at present) and schools as part of the redevelopment plans, to improve social networking

Health Mitigation

Measures to minimise negative impacts included:

Open Cast Mining Phase:

- Close consultation with the Local Health Board.

- Address recommendations in the Consultation on Coal Planning Advice – Coal Mineral Technical Advice Note (MTAN), on which Torfaen County Borough Council commented.

- Prioritisation of site security issues.

- Assessment of risk perception amongst locals is assessed, to establish their concerns and attitudes and manage any sense of dread.

- Particulate monitoring at key housing areas.

- Ensuring all mining or construction works are carried out in line with best practice.

Setting up a liaison group, with the developers and local people, possibly chaired by representatives of the Local Authority. Dialogue should be open, and a single point of contact given for residents who have concerns \(^1\).

\(^1\) A liaison group has been established and the council will elect the chair and the vice chair of this group shortly
Redevelopment Phase:

- Increase in resources for local services to meet increased demand.
- Providing housing in accordance with the recommendations made in the recent Housing Needs Assessment.

5.3.5 Stakeholder Engagement Summary

Participants expressed concerns over the open cast mining phase of the redevelopment, with perceived impacts on health through effects on air quality, noise and vibration from the mining itself and associated increase in traffic volume being of primary concern. It was felt however, that the positive benefits of the regeneration of the area, in terms of provision of housing, jobs and services and improvements to the landscape would outweigh the short-term negative effects of the open cast mining phase. Key recommendations included that all mining and construction work should be done in line with best practice, and in consultation with both local people and the Local Public Health Board, and that provision should be made for development of new local services or expansion of existing services to cope with the increased demand from new residents in the area.
6 IMPACT ASSESSMENT

6.1 INTRODUCTION

This section discusses the potential community health impacts of the Masterplan.

Box 6.1 Assumptions made as part of the assessment

- The workforce will be sourced locally, wherever possible.
- Work force health care will mainly be provided by GPs in their home towns with only emergency healthcare being provided in the region.
- Best Practice in relation to Health and Safety will be followed on site.

6.2 AIR QUALITY

6.2.1 Introduction

Baseline

The site is located within a pre-dominantly rural setting, with good air quality. Former coal mining activities on the site have ceased for about 20 years, and currently, most of the site is largely undeveloped with no nearby large industrial air emissions sources. There are no occupied properties on the site, although the site is surrounded on the east side with residential properties. Traffic on the nearby B4246 and other main roads in the vicinity of the proposed scheme will contribute to air emissions.

The ES has shown that air quality at the development site is easily compliant with all relevant air quality objectives. The air quality monitoring data at the nearest UK Automatic Urban and Rural Network (AURN) station at Cwmbran (urban background site) supports this view.

Potential Health Effects

Emissions of particulate matter will mainly occur during the coal extraction phase and they have the potential to affect health in a variety of ways. Dust emissions can irritate the eyes and exacerbate pre-existing respiratory problems, such as asthma. Effects, however, are generally short term and reversible, ie once dust emissions stop, then the irritation will cease. Dust deposition could also lead to annoyance to residents living close to the extraction site, especially if it settles on clothes hung out to dry and cars etc.

Short-term and long-term exposures to ambient levels of particulate matter are associated with a number of health outcomes, as described in the literature
review. These include respiratory and cardiovascular illness and mortality. The associations are believed to be causal. It is not currently possible to discern a threshold concentration below which there are no health effects on the population. The impact of particulate matter depends on the size of the particles. For particles with diameter of 10 microns and below (PM$_{10}$), inhalation and penetration into the thoracic region of the respiratory tract are likely to occur. Recent reviews by the World Health Organization and the Committee on the Medical Effects of Air Pollutants (COMEAP) have suggested exposure to a finer fraction of particles (PM$_{2.5}$) give a stronger association with many of the observed ill-health effects (1).

In the case of this proposal it is the particulate matter that is most likely to cause health effects. For other atmospheric air pollutants, related to traffic exhaust emissions, adverse effects are possible at sufficiently high concentrations, but the ES makes it clear that additional concentrations are very small and any associated health effects can be described as being negligible.

6.2.2 Potential Impacts during the Reclamation Phase

Emissions to atmosphere will be generated from different sources, such as:

- General site preparation, excavation, reclamation and extraction activities;
- Traffic movements; and
- Fuel-combusting equipment.

The pre-dominant air emissions in the coal extraction phase would be particulate emissions (as PM$_{10}$) from site activities and traffic movements. The health effects on the surrounding population depends on the incremental PM$_{10}$ concentrations generated, the location of PM$_{10}$ generation, the location of the receptors, as well as the duration of exposure.

The north-western part of the site immediately borders Castle Wood, with populated areas along Commercial Road, Heol Waun and Church Road on the east of the site. To the south lies Elizabeth Row and Brook Cottage. These are the receptors with residences evaluated for their future air quality in the Environmental Statement.

Assuming an average 2.5 persons per household, there are approximately 420 people living in Castle Wood, Heol Waun, Elizabeth Row, Brook Cottage, and parts of Commercial Road and Church Road near to the site boundary. The main incremental PM$_{10}$ concentrations predicted in the ES will occur during excavation, coal extraction/recovery, backfilling and soil reinstatement.

Increases in PM_{10} concentrations have been predicted from modelling (1). However, the 42 months predicted for coal extraction/ recovery activities takes into account movement of the work southwards for the whole site. Therefore, at each receptor, the actual exposure duration would be less than the whole 48 month period for the coal extraction phase. For the receptors at Church Road, which are the nearest to the construction of the new access road to replace Farm Road, additional PM_{10} concentrations are expected from the re-suspension of PM_{10} from dust deposited on local roads by vehicle movements, but this activity will only last for approximately 6 months.

Emissions from fuel-combusting equipment are not expected to be significant, according to the ES, and hence not likely to have health impacts upon the nearest evaluated receptors.

As the literature review makes clear, there is no convincing evidence for particular health effects associated with airborne emissions from open cast coal mining, but any increase in PM_{10} concentrations would give rise to the potential for the health effects known to be associated with this pollutant. In this case, approximately 420 people would experience increased PM_{10} concentrations of varying magnitudes. The modelling presented in the ES indicates that on some days for some locations, the increases above background could be as high as 70 \mu g m^{-3}. This will be the exception, however, and for most people the increase is much more likely to be 1-2 \mu g m^{-3} as a longer term average. For an affected population of this size, the possibility of a small number of people experiencing some adverse physical symptoms associated with respiratory illnesses cannot be excluded. Such people are most likely to be those with pre-existing symptoms, which are then exacerbated. It is highly unlikely that any new illness in individuals will be initiated.

Dust deposition is also a key concern in particular in the Castle Wood, Hoel Waun, and Church Road area where the levels may be enough to cause a nuisance at various stages due to the activities that would be undertaken. This would result in increased annoyance for the local population leading to decreased wellbeing and impacting on quality of life.

6.2.3 Potential Impacts during Regeneration

The future developments onsite will include residential, commercial and retail activities. Future construction of the site will result in some PM_{10} emissions that could theoretically affect the nearby health of the population, but any increases will be substantially less than those associated with coal extraction.

(1) The British Reclamation Scheme Environmental Statement, Table 12.11, Ove Arup & Partners Ltd, April 2008.
In the longer term, any increase in traffic associated with the residential, commercial and retail activities could possibly have negative health impacts for anyone living or working close to the roads affected.

6.3 NOISE

6.3.1 Introduction

Baseline

A great deal of the area that may be potentially impacted by noise from the proposed development is currently undeveloped. However the town of Abersychan lies directly to the east of the site with vast numbers of existing residential receptors. Noise levels in the area are generally low. The main source of noise in the area is road traffic noise from the nearby B4246 and other main roads in the vicinity of the proposed scheme.

Potential Health Effects

Noise has the potential to affect health in a variety of ways. Some effects can be auditory (damage to the ear) and occur as a direct impact of noise (at levels higher then considered here) whilst others are non auditory; such as annoyance, night time effect and mental health impacts and may be associated with exposure to environmental noise.

Annoyance is the most reported non auditory health effect associated with noise. Vibration can also cause annoyance to those experiencing it. Sleep disturbance associated with noise is also a major issue with certain vulnerable groups more likely to be affected.

6.3.2 Potential Impacts during the Reclamation Phase

Noise will be generated through a variety of site preparation and excavation and reclamation activities, such as

- increased road traffic from coal export;
- staff journeys;
- equipment set up;
- earth moving equipment;
- excavation;
- tractor dozers;
- loading and unloading trucks; and
- stand-by generators.

It is thought that excavation and reclamation traffic at this stage will not occur in significant volumes. Noise associated with road traffic is predicted to only increase by up to 2.8%. Potential noise impacts associated with increased
traffic that may affect health will reflect local level environmental disruption; however, this is not expected to be significant.

During preparation and excavation activities, exposure to noise levels will increase for the adjacent high density population and large number of nearby sensitive receptors in the area. A number of houses within Abersychan border the site and are close to main roads (carrying site related traffic) may experience increased annoyance, anxiety and stress. However, the potential for disruption to sleep at night is minimal, due to the strict working hours that will be enforced. Working hours will be limited to 0800-1800 Monday to Friday and 0800-1300 on a Saturday to ensure annoyance and night time impacts are not of concern. Quiet working practices will also be adopted to minimise noise, such as turning off plant vehicle engines while not in use.

The duration of site preparation and excavation works will be relatively long term, as coal extraction in the north of the site may continue for up to 42 months and therefore noise related health impacts such as disruption and annoyance will be relatively long term. In addition, the area around the potential development is densely populated to the east and it is therefore predicted that the health impacts from noise associated with preparation and excavation are possible.

The final reclamation stage of the project will only last 4 months. The noise impacts associated with this stage will be short term and will not be important for health.

Vulnerable groups in society will be affected mostly by the increased noise levels during the site preparation and excavation phase. Those such as young children, the elderly and especially shift workers (who sleep at irregular times) may experience health impacts such as annoyance and sleep disturbance which can decrease day time efficiency.

Overall, therefore, it can be seen from the ES that the noise impacts will be significant and could influence the health of some members of the population for the duration of the coal extraction phase.

**6.3.3 Potential Impacts during Regeneration**

Once ‘The British’ Site is reclaimed it will accommodate future developments that will support local regeneration. The site will incorporate future residential, commercial and retail activities. The future construction activity on the site will cause increased noise levels that are likely to impact negatively on the current population’s health. Increased traffic and noise in the future following regeneration of the area may cause ‘community annoyance’ to the current population.

Future development of the ‘The British’ site will see large redevelopment, including increased housing and associated population. When considering
the noise health effects it should also be taken into account that these residents will be making the choice to live in the area.

6.4 **TRANSPORT**

6.4.1 **Introduction**

**Baseline**

The site is well served by a series of local, county and strategic roads that connect to further a field destination. The principal road in the area is the A4042, which forms part of the link between the area and the rest of Wales.

The northern part of the site is accessed by the B4246 via Farm Road which bisects the northern part of the plateau and is a public highway giving access to a number of residential areas. Access to the southern part of the site is via the B42426 named Lodge Road, which is via a masonry tunnel through a disused railway embankment.

**Potential Health Effects**

Transport plays a vital role in promoting health and well being. It does so directly by providing communities with access to a range of services and amenities required to treat, manage and promote healthy living and indirectly by improving health through achieving and maintaining social networks.

Transport can also have negative impacts on health by causing injuries and deaths and increasing noise and air pollution.

6.4.2 **Potential Impacts during the Reclamation Phase**

During the set up, excavation and restoration phase there will be additional road traffic. During the excavation phase in particular peak flows of up to 263 daily vehicle movements may potentially occur. Most of these, however, will be staff journeys to and from work rather than exportation of coal by heavy goods vehicles. The large increase in the number of staff related movements will also increase the number of vehicles on the road at peak times, which may increase journey time and cause annoyance.

This increase in vehicle activity on the surrounding road network may result in a higher likelihood of Road Traffic Accidents (RTAs) occurring along the main transport routes being used. Other health impacts associated with the increase in road traffic due to extraction and reclamation include annoyance from increased noise and potential respiratory problems due to air pollution.

Vulnerable groups in society will be affected mostly by the increase in traffic levels. Those such as young children and the elderly may experience negative health impacts. The elderly may experience annoyance from increased noise,
whereas young children are at higher risk of road accidents and health impacts associated with potential air pollution.

Access to the site during the reclamation stage will also require the permanent part closure of Farm Road. This will, however, undergo reprovision. This reprovision may result in temporary disruption and an increased travel time, while work is undertaken which can cause annoyance and potentially affect peoples’ well being. However, once the new road link is available the link may be safer as the current link is prone to flooding and the junction onto the main road is poor quality.

In addition stakeholders have expressed concern about traffic increases both in terms of increased risk of accidents and also in relation to deterioration of the quality of the roads.

### 6.4.3 Potential Impacts during Regeneration

Once ‘The British’ Site is reclaimed it will accommodate future developments that will support local regeneration. The site will incorporate future residential, commercial and retail activities.

It is expected that the future construction activity on the site will cause a temporary increase in road traffic from staff related and heavy goods vehicle movements, which are likely to have associated negative health impacts on the current population.

Once construction has been completed, increased traffic flows are likely to continue. This will result in a higher likelihood of RTAs occurring across the entire road network. As with the excavation and reclamation phases, those most vulnerable to road traffic accidents are young children and the elderly. The number of road traffic movements and speed of the cars may also result in some level of community severance.

### 6.5 Landscape and Visual Effects

#### 6.5.1 Introduction

**Baseline**

The current landscape is highly varied and disturbed with industrial ruins, vegetation, plateaux and peripheral settlements such as Abersychan and Talywain to the east.

The site lies on the lower slopes of the Llwyd valley, covering the former ‘British’ works and a large area of brownfield land. There are no designated landscapes within or close by to the site. A disused railway line runs along
the eastern boundary of the site separating the site visually. The site has a number of industrial ruins that are of heritage value.

*Potential Health Impacts*

Visual disturbances can become a focus for concern and anxiety. The built environment can impact on public health and the way that people utilise their environment. The built environment can influence physical activity and the health impacts associated with this. The natural environment is known to have a restorative function in that it reduces stress and anxiety levels. There is a strong link between the visual environment and people’s mental and physical health.

Light pollution from the built environment can have a negative health impact through annoyance, discomfort and loss of visual performance and visibility. Artificial lighting is considered a statutory nuisance under the Environmental Protect Act 1990; however, this does not apply to artificial light from railway premises.

6.5.2 *Potential Impacts during the Reclamation Phase*

Site preparation, excavation and reclamation activities are limited mainly to within the site boundaries. Visual disturbances during these phases include;

- bulk excavations of former mining features;
- overburden mounds;
- coal storage;
- water treatment areas;
- extraction equipment;
- screen mounds for shielding against noise and dust;
- loss of naturally regenerated scrub;
- increased parked cars; and
- reclamation equipment.

The temporary visual disturbances listed above may have the potential to impact on people’s health. Screening mounds will have the potential to cut off long panoramic views across the valley from a number of nearby residential receptors. This visual disturbance may have the potential to impact quality of life and cause community disturbance, anxiety and concern. This impact will be temporary during these phases and the number of people affected will be small.

Once reclamation is finished there may be beneficial views from residential receptors, with the removal of unsightly workings and the greening of derelict areas, which in turn is thought to improve health.
The reclamation of a large area of disturbed landscape will positively impact the surrounding environment and visual landscape and should therefore improve the health of the current population.

However, for the small number of residents that live very close to the site boundary the short term visual intrusion of bunds for screening could cause annoyance and will serve as a constant reminder of the other potential health impacts.

6.5.3 Potential Impacts during Regeneration

Once ‘The British’ Site is reclaimed it will accommodate future developments that will support local regeneration. The site will incorporate future residential, commercial and retail activities. It is expected that the future construction of the site will cause visual disturbance, which may negatively impact the current population’s health.

Once the future development of the site is completed it is thought there will be no significant detriment to the landscape character and associated negative health impacts. The completed future development may even increase the health of the local population, as without the scheme it is thought that the site would degrade even further.

As the landscape improves, it is expected that the current population’s physical and mental health should improve commensurately.

6.6 SOCIO-ECONOMIC FACTORS

6.6.1 Introduction

Baseline

The area initially developed due to iron and coal industries that dominated South Wales. The closures of mines lead to a decline in the population and high unemployment. However Torfaen has a high rate of economic activity, the number of employed and unemployed is generally in line with the national average. The largest industries for employment currently in the Ward of Abersychan are manufacturing, retail and health and social work. The area of Torfaen has benefited from funding and Council grant schemes to secure high economic activity.

Potential Health Impacts

Employment and income are regarded as the key determinants of health, influencing where an individual lives, the education received, access to healthcare and even lifestyle and behaviour.
Ethnic minorities, young people and disabled generally face the highest levels of unemployment. These groups are likely to be in more insecure employment and poorly paid, therefore having low socio economic status.

Unemployment is directly linked with poorer health (visa versa). Unemployed individuals are more likely to report illness and injury as well as psychological symptoms such as demoralisation. Health outcomes associated with unemployment include physical health effects, mental health effects, suicide, well being, role functioning, poor self reported health and increased mortality.

Increased employment opportunities can have positive influence on health such as social contact, involvement in a collective effort or activity and forming social relationships which all contribute to well being. In addition those in insecure employment are likely to have poorer mental health than those in secure employment. It has also been found that those in least favourable employment conditions (routine occupations) are nearly four times more likely to become ill than those in the most favourable (professional and managerial).

Employment and income together contribute to a person’s socio economic status. The greater the income the better the health however this threshold is not strictly linear. Above a middle threshold, higher income is less proportionally related to improve health.

### 6.6.2 Potential Impacts during the Reclamation Phase

During the reclamation works 100 full time equivalent positions will be created during the period of works. These opportunities will be in civil construction on site and indirect employment opportunities off site, such as administration roles. It is likely that the developer will develop a commitment to recruit locally for all stages of the works to boost local employment in order to benefit the local economy.

The reclamation positions are of a temporary nature and may only bring transient benefits to those who find employment. However key construction jobs often have a related multiplier effect creating additional indirect employment in business that in turn benefit from increase spending by local construction workers.

Overall increased employment opportunities will have associated socioeconomic health benefits. These benefits will be felt most if employment is taken up by those who are currently unemployed or who are in temporary employment.
Potential Impacts during the Regeneration Phase

Once ‘The British’ Site is reclaimed it will accommodate future developments that will support local regeneration. The site will incorporate future residential, commercial and retail activities. It is expected that the future construction of the site will also create further construction jobs, in terms of health benefits the extent of these will be limited to those people who are employed in these positions.

Once the future development of the site is completed it will incorporate further employment opportunities in retail and commercial sectors. Again, the most benefit will be felt if these positions are filled by previously unemployed people. The health benefits will be permanent in nature and therefore are likely to result in delayed mortality and decreased illness, improved wellbeing and mental health. In addition income increases may improve the individual’s quality of life and therefore result in improved mental health.

Young people, local people and those who are disadvantaged will all benefit from the improved access to employment opportunities especially if they are currently disproportionately excluded from employment opportunities.

COMMUNITY EFFECTS

Introduction

Baseline

The site is surrounded by a number of small villages and communities that were first developed to house those working in the iron and coal industries. The loss of an economic centre has resulted in a decline in the population of the area.

Potential Health Impacts

All communities interact and need to coexist this is often referred to as social capital which is a complex and incompletely understood determinant of health. Social capital may affect an individual’s health by disrupting their way of life and therefore their quality of life leading to reductions in wellbeing, anxiety, stress and annoyance.

In addition, changes to road networks and increased traffic flow can result in community severance by creating a physical barrier between people – the young and the elderly are especially affected by any such barrier. Any activity that promotes community cohesion benefits health by promoting social networks, increased physical activity and promotion of social capital and therefore engagement in civic and community life.
6.7.2 Potential Impacts during the Reclamation Phase

No negative community effects have been identified within the ES. In addition, during the reclamation phase most of activities will take place within the site boundary, which is free of community sites and this will minimise any negative community effects.

The closure and reprovision of the Farm Road may increase travel times between communities but this is likely to be minimal due to the size of the site and the fact that the diversion through the site will need to be part of a permanent route for the Masterplan stage.

Detailed mapping of the area in the ES would suggest that there is only one community building in the area that will be affected by the reclamation activities which is the church located to the South of the development on 'British Road'. This church may be subject to increased noise and dust deposition which could impact on events and services taking place within the church such as weddings (which are commonly held on Fridays and Saturday mornings) and groups which may value peace and quiet. Other disturbances to the community are unlikely.

6.7.3 Potential impacts during Regeneration

Once the site has been regenerated then there is the opportunity for change to the community if new people move into the area. This will depend in part on the number of residential units built, cost and size of the units as well as the characteristics of the people that move into the area. In addition the types of services provided and employment provided will also impact on the community.

6.8 Work Site Accidents and Trespass

6.8.1 Introduction

Baseline

At the present time crime in the area is low and the site is not currently a known meeting point for groups or a focus for antisocial behaviour although due to the undeveloped nature of the area and presence of derelict buildings it may be attractive to youths and those wishing to indulge in antisocial behaviour.

Potential Health Impacts

Evidence suggests that construction sites can be a focus for anti social behaviour (such as drinking, drug taking and fighting) and a meeting point for youth gangs. This can lead to accidents on the site resulting in injuries, including fatal injuries. In addition, there can also be an increase in crime
resulting in increased fear of crime, stress and anxiety which can decrease in social capital.

Worker accidents and injuries result of sufficient severity require immediate attention and hospital treatment possibly via ambulance transfer. Any such accidents divert services from local use leading to decreased quality of care for the local population as well as increased pressure on existing health care capacity in the area.

6.8.2 Potential Impacts during Reclamation Phase

The likelihood of an incident occurring involving a community member is low; especially as the majority of activities will take place within site boundaries with limited access to non-project employees. However, due to the duration of the project and the proximity of the project site to the existing communities, the potential for local residents to be affected exists, even if this is a result of site trespass. In addition opportunities for trespass will be further minimised by the 24hr site security that is planned for the site. Activities which take place outside the site boundary, such as road improvement works etc, may result in higher risks of accidents to communities and road users than at the present time.

Additionally, as the project is scheduled to last for approximately 4 years this may result in a culture of antisocial behaviour and crime as such sites are known to be attractive to youth groups. As this site has previously been used as an off road motorcycle track this remains a particular risk. Again this is likely to be minimised by fencing of the site and the provision of site securing mentioned above. This will have a negative impact on the health of the local population and especially those in close proximity to the excavation and extraction who may also be suffering from a variety of other impacts such as noise and dust.

Finally the risk of an accident involving a worker throughout the initial three phases is high due to the duration of the works and the nature of the work undertaken. However, while this will have a negative effect on the individual in terms of population health the effects will be minimal as the additional pressure on the health services and diversion of services from the local community will be insignificant.

6.8.3 Potential Impacts during Regeneration

Once the reclamation phase is completed then regeneration of the area is scheduled to commence. This will require a construction phase with many of the same risks identified in the initial phases.

Accidents in the workforce during the construction phase should be small but the site could remain a focus for antisocial behaviour, especially if this has been the case in the previous phases. In fact, due to the nature of activities
during the construction phase, then the site may be even more tempting if it provides ‘shelter’ and appropriate places to ‘hide’.

However, as with the initial phase due to the existing low level of crime in the area and as the site will be fenced off then the risk of accidents is low.

Once the construction phase is complete the development will no longer be a focus for antisocial or associated behaviour, etc.

6.9

Housing

6.9.1

Introduction

Baseline

The area is dominated by low cost terraced housing and council rented properties with a lower than average percentage of people owning their own homes.

Potential Health Impacts

Housing is an often underrated determinant of health. Poor quality housing is associated with increased respiratory illnesses (due to damp and overcrowding), as well as impacts on mental health and wellbeing. In addition, home ownership provides people with a sense of security – and is an asset which affects the individual’s socio-economic status.

6.9.2

Potential Impacts during the Reclamation Phase

Housing closest to the project site and in particular that which backs on to the project boundary may be affected by a reduction in value due to proximity to the site. They might be considered to be less desirable to live in, due to perceived noise, dust and air quality impacts. This reduction in value or any fear of a reduction in value could lead to stress and anxiety for owners in addition to other health concerns associated with the development. If the decrease in value occurs, and the owner wishes to sell, then there will also be a negative effect on the individual’s socio-economic status. This concern was also expressed by stakeholders.

As the extraction phase is relatively short (4 years) and plans for the site after reclamation are known this should reduce the risk of decreasing price values resulting directly from the project, thereby limiting the risk of any health impacts related to housing.
6.9.3 **Potential Impacts during Regeneration**

Once the construction phase of the regeneration is complete then homes closest to the boundary may increase in value as they become desirable places to live due to their proximity to new services and employment opportunities.

This would remove all previous anxiety and reverse any socio-economic effects of the reclamation stage allowing home owners to maintain their current standard of health or leading to improved health.

However, the availability of new housing within the development may cap changes in house prices of existing homes in the area. However it should be noted that as the development has been allocated for a number of years it will already have influenced current house prices reducing any potential cap.

Overall, the potential health benefits are so small as to be unlikely to have any long term impacts on the population’s health and wellbeing.

6.10 **Regeneration Phase**

The regeneration phase of the development will include the following aspects:

- Residential units;
- Commercial areas; and
- Employment opportunities.

These aspects of the development will be laid out in the Masterplan which has yet to be finalised. Construction will begin after reclamation of the site has been finalised and will continue until physical regeneration of the site is completed.

Regeneration of the area has the capacity to result in long term health benefits for the local population, over a wider area then the negative health impacts.

There may be health benefits associated with the scheme:

- Due to increased accessibility. Increased mobility may lead to a more enjoyable life for vulnerable groups such as the elderly and young. Therefore these groups of the population may see an improvement in self rated mental and physical health.

- Educational facilities provide opportunities for the population to receive training and qualifications which will assist in finding employment in the area or additional educational facilities are provided.

- Promotion of active transport and travel modes that involve physical activity, such as walking and cycling and use of public transport, will lead
to increased physical activity and associated health benefits and promotion of wellbeing

- Provision of good quality housing of varying cost and size allowing people to remain in the area, own their homes and potentially free up council housing in the area.

- Increased employment opportunities with associated socio-economic status benefits and improved wellbeing.

- Increased access to the green spaces with associated benefits for restoration and relaxation.

Negative health effects could also occur and many of these might be associated with gentrification of the area, leading to marginalisation of existing communities and reduced opportunities for members of the existing community to access employment opportunities associated with the regeneration. The negative result of this would be a community which is socially divisive, leading to declining social capital and widening health inequalities. In addition concern was expressed over pressure on health services in the area as a result of a potential increase in the population. These services are already seen as being stretched.
7 CONCLUSIONS AND OPTIONS FOR MITIGATION AND MONITORING

7.1 SUMMARY OF HEALTH IMPACTS

The period of extraction and reclamation would result in some limited health impacts for residents living close to the site boundary, mostly related to annoyance and a consequent reduction in wellbeing.

Understandably, there will be some anxiety felt by residents in relation to emissions of particulate matter and the potential this has for exacerbating respiratory illness. The evidence that open cast coal mining will have a specific and measurable effect on the health of local population of Abersychan is not convincing, but it is undoubtedly true that increases of PM$_{10}$ concentrations of whatever kind will have associated health impacts for people exposed to the additional concentrations. For the development proposed at the British, the extent of any health impact resulting from PM$_{10}$ emissions is likely to be small for two reasons:

- the number of people exposed to substantially higher concentrations of PM$_{10}$ is small; and
- the duration of the exposure for any individual is limited to approximately 40 months.

It cannot be concluded that there will no health impact as a consequence of the airborne emissions and this HIA does not reach such a conclusion. To understand better the extent to which health impacts, or to provide quantitative estimates of these health impacts, would require a longer and more thorough investigation based on the detailed analysis of the airborne emissions presented in the ES.

In addition to the air quality concerns, negative health effects will also result from dust deposition, which will cause annoyance with its consequent effects on wellbeing. Noise will also cause increased annoyance, as well as sleep disturbance for anyone resting in working hours. The associated traffic will increase the possibility of road traffic accidents. House prices will be negatively impacted over the short term. In addition, changes will occur to the landscape; however, due to the low quality of the area at the present time the effects of this will be minimal.

While there is the potential for accidents and injuries to occur either in the workforce or due to trespass this is unlikely to put considerable additional pressure on the local health care infrastructure.
It can therefore be seen that during the reclamation phase there is the potential for a number of negative health impacts; however, most of these will not be permanent and persist beyond this phase. Once regeneration begins there is the potential for a number of positive health impacts related to improved wellbeing and quality of life. Indeed, the regeneration phase has the potential to catalyse a step change in the economic and health prospects of the local area if managed correctly. However, the regeneration phase will need to be carefully managed in order to achieve these benefits.

### 7.2 Mitigation and Monitoring

ERM makes the following recommendations to maximise the health benefits and mitigate against any health concerns.

A **construction code of conduct** should be developed with measures to minimise dust production. Additionally, the project should ensure that residents are able to submit complaints.

The project will need to ensure that **emissions are reduced** to As Low As Reasonably Possible (ALARP) by the application of Best Available Technologies (BAT) and management procedures. Emissions should be monitored and reported on by the developers and local authority. Measures suggested in the ES to reduce emissions should be adopted to achieve this.

Adopt all **dust suppression** and mitigation measures suggested in the ES.

Specific measures that may be employed to prevent and reduce the impact of **noise** in addition to those described in the ES are described below:

- Identify sensitive daytime periods for minimising HGV traffic (eg while children are walking to and from home to school) and incorporate them into the project traffic management plan.

- Noise should be minimised during times when community facilities are needed for sensitive uses.

- Any fixed noise sources (eg generators for lighting) should be located as far away as is reasonably practicable from communities in close proximity to project locations.

- The project will evaluate appropriate noise abatement measures around the site such as noise barriers to screen local housing from site construction noise.
A communication policy should be developed with the local community to provide information on closures, disruptions to services, etc and a forum for complaints via a formal grievance procedure.

Health and safety policy. The project and its contractors should manage potential health and safety issues in line with best practice ensuring that all employees are thoroughly trained in all health and safety issues (driving, handing machine safely etc).

Site access. In combination with the health and safety policy the site should be secure to prevent trespassing and hence potential accidents in the construction area during working and non working hours. In addition, sites should be cleared of any equipment which could be stolen or used for vandalism during non-working hours. Police and emergency services should also be kept informed of any issues related to site safety and access.

Implementation of a Traffic Management Plan is critical in minimising RTAs during construction. The project and its contractors should work closely with Torfaen Borough Council to take forward the implementation of such a plan. To minimise road traffic accidents, the traffic management plan should include the following where possible:

- setting suitable speed limits to be observed by project vehicles and trucks;
- measures for managing project traffic during peak times;
- development of alternative routes for avoiding traffic hotspots or areas of high local resident activity/sensitivity;
- procedures for vehicles travelling in convoy and abnormal loads;
- procedures for liaison with the local emergency services for issues such as project – related road closures, etc;
- development of monitoring and surveillance systems for project related traffic; and
- HGV movements: Identify sensitive daytime periods for minimising HGV traffic (eg while children are walking to and from home to school) and incorporate them into the project traffic management plan.

Local employment and procurement should be encouraged, through social clauses and incentives or penalties in agreements with contractors and developers as well as training opportunities. Training should be provided to local residents to ensure that they are able to access the new employment opportunities.
**Antisocial behaviour** can be reduced by a variety of other measures including CCTV, adequate lighting, and recreational activities and partnering with police as well as provision of additional police.

A **second HIA** should be carried out on the Masterplan nearer to commencement of the regeneration stage, which will be able to take into account the changes in the health of the population during the reclamation stage.

The Developer and council should seek **ongoing interaction with the PCT** and local GPs to ensure that the project is not having unexpected health effects and to assist with the minimisation of health risks.
Annex A

Literature Review
A1

INTRODUCTION

A1.1 CONTENT

This Annex presents the summary of the literature review, which forms the evidence base for research relating to changes in health determinants and consequent health effects.

The Annex is presented in sections:

- Air Quality;
- Dust;
- Transport;
- Noise;
- Visual Environment;
- Socioeconomics;
- Social Capital;
- Physical Activity;
- Housing; and
- Education.
A2 AIR QUALITY

A2.1 INTRODUCTION

Air pollution is not characteristic of a single source; for example, in recent years there has been a fall in industrial emissions and a rise in vehicular air pollution. According to the WHO (1) key or classical air pollutants consist of the following:

- sulphur dioxide;
- nitrogen dioxide;
- carbon monoxide;
- ozone;
- suspended particulate matter; and
- lead.

A2.2 THE AVAILABLE EVIDENCE

A2.2.1 Overview

A considerable amount of knowledge has been accumulated on the subject of air pollution and its effects on human health. The last fifteen to twenty years in particular have seen great strides made in understanding this relationship and in the gathering of evidence to further this understanding. Much of this burst of activity has been attributable to a series of landmark epidemiological studies, which have shown clear associations between exposure to particulate matter and both mortality and morbidity. Revealing this association has, in turn, stimulated further research on the causal mechanisms.

The extent of current knowledge on the effect particulate matter has on human health is summarised well in the statements and reports issued by the Department of Health advisory body, the Committee on the Medical Effects of Air Pollutants (COMEAP). Its most recent report, issued as a draft for comment in August 2007, examines the long term effect air pollution has on mortality. (2) This, and earlier COMEAP reports, represent a balanced and persuasive view of the current evidence for the relationship between all air pollution and health effects.

Emissions of particles from open cast coal mining are not precisely the same as those in urban areas upon which most of the wider epidemiological studies are based, where road traffic is a dominant source. Nevertheless, the broad body of knowledge on air pollution and health effects could provide a useful commentary on the health effects of a population exposed to particulate matter emissions from a coal mine, in the absence of specific literature.

(1) WHO Guidelines for air quality Geneva 2000
In fact, some limited research on the response of a local populations’ health to open cast coal mining has been undertaken. The most prominent example is the work done by Tanja Pless-Mulolli of the University of Newcastle. Several papers have been published by her team in the scientific literature, arising from a series of studies carried out in the 1990s and funded by DoH and the (former) Department of the Environment, Transport and the Regions. This work is considered below.

A2.2.2 Research carried out by the University of Newcastle

The primary report resulting from this work was published in 1999, although it is not currently easily accessible. The Executive Summary is still available via the COMEAP web site. The study examined the possible effect of open cast coal mining on the health of local populations by taking ten sites in north east England, as five paired communities, with one set near coal mines and one set removed, but such that each pair was matched socio-economically. At four of the five sites, PM$_{10}$ concentrations were measured continuously with a TEOM instrument for six weeks, while for the remaining pair of sites the measurement period was extended to 24 weeks.

The findings of the study were commented on by COMEAP and the resulting Statement is reproduced below as Box A2.1.
### COMEAP Statement on Open Cast Coal Mining Operations

1. The Committee on the Medical Effects of Air Pollutants has considered a report of a research study undertaken by Dr Tanja Pless Mulloli and colleagues into the effects of open cast coal mining on the respiratory health of children in five pairs of matched communities, one of each pair being close to and one distant from open cast mining sites. The study is of a high standard.

2. The Committee agreed with the findings of the authors of the report that:

   (i) Open cast coal mining was associated with a small increase in the mean concentration of airborne particles measured as PM$_{10}$ in areas close to open cast sites. This was due to an increased concentration of shale; and

   (ii) The respiratory health of children living in communities close to open cast sites was very similar to that of children living in communities distant from such sites.

3. Overall, the number of consultations made to general practitioners was similar for children who lived close to open cast sites compared to those who did not. However, there was a small increase in consultations for respiratory, skin and eye conditions in those living close to open cast sites in four of the five pairs of communities studied. Though the increase was statistically significant, the average difference in the number of consultations between the communities close to and distant from open cast sites was small. In the absence of other evidence of effects it is not possible to be certain that these differences were due to open cast operations. In the fifth pair of communities consultation rates were lowest in the community close to an open cast site but these data were excluded because of the relatively few records available.

4. The Committee noted that the increase in particle concentrations close to open cast sites was not due to the release of coal particles but was more likely due to earth moving and excavation. From a planning perspective, the composition of the overburden is likely to be important: shale, for example, is less likely to have an effect on health than quartz. However, such increments in exposure to these materials as may occur in local communities as a result of open cast mining operations are most unlikely to have any detectable effects on health. Nevertheless, the Committee recommended that efforts should continue to be made to control the emission of particles from open cast sites.

5. The Committee acknowledges that the short-term effects on children's respiratory health seen in this study are small. From what is known of the long-term effects of coal mining on the health of coalminers, it is most unlikely that open cast sites would have any long-term effects on the health of local communities. However, the Committee recommends that as a precautionary measure, the modifications to the planning process suggested by the authors be considered by the relevant planning authorities and be incorporated in minerals planning guidance.

Further work resulting from the study has been published in the scientific literature, such as Mulolli et al (2001) (1) and Howel et al (2001) (2). Whilst there is a danger in relying too heavily on a single study, it does seem that this particular work is the best structured of any such study and deserves to be allocated considerable weight in assessing the evidence. Definitive conclusions are, however, unwise and the study was limited to relatively short term exposures and it considered a small number of outcomes, chiefly related to respiratory illness and symptoms. The study indicated that PM$_{10}$

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(2) Howel D, Pless-Mulloli T and Darnell R (2001) Consultations of Children Living near Open Cast Coal Mines *Environmental Health Perspectives* 109 (6) 567 -571
concentrations were elevated slightly at communities near open coal mines and this alone would imply some health effect, but the measured health outcomes (as indicated by GP consultations) did not show a convincing and clear relationship for the coal mines’ influence on respiratory health.

A2.2.3 Other Relevant Studies

Well structured studies of health at open cast coal mines in other countries are relatively few and not easily transferable to communities in South Wales in any event. Some additional and relevant research work is being conducted by the University of Cardiff on the composition and toxicology of particles around open cast coal mines (1) (2). This work shows that the PM$_{10}$ at open cast coal mines is complex and heterogeneous in its composition, but not uniquely hazardous. The components included vehicle exhaust and minerals associated with earth moving. In other words, the PM$_{10}$ shares many characteristics with particles in other environments. The work of the Cardiff group on toxicology supports the work of Pless-Mulloli and her team in suggesting that open cast coal mining is not associated with a prevalence of respiratory illness and symptoms in adjacent communities, in comparison with similar communities in other locations.

A2.2.4 Vulnerable groups

Groups that are particularly vulnerable to exposure from air pollution include foetuses, young children the elderly, those with cardio-respiratory disease and the socio-economically deprived.

A2.3 CONCLUSION

The available evidence suggests that particulate matter generated by open cast coal mining is not likely to be responsible for effects on respiratory health in neighbouring communities, above and beyond particulate matter commonly found in the atmosphere. On the other hand, it is highly likely that concentrations of PM$_{10}$ close to open cast coal mines will be elevated above background levels and there is unequivocal evidence that exposure to PM$_{10}$ and PM$_{2.5}$ is associated with a range of adverse health outcomes, including a reduction in life years for long term exposure. For the purpose of HIA in respect of open cast coal mines, the large body of evidence describing the relative risk of various health outcomes through exposure to PM$_{10}$ and PM$_{2.5}$ will be very adequate.


ENVIRONMENTAL RESOURCES MANAGEMENT
A3 TRANSPORT

A3.1 INTRODUCTION

The Acheson report in 1997 (1) stated that,

'The primary function of transport is in enabling people to access goods and services. In doing so it promotes health indirectly through the achievement and maintenance of social networks. Some forms of transport, such as cycling and walking, promote health directly by increasing physical activity and the reduction of obesity. Lack of transport may damage health by denying access to people, goods and services and by directing resources from other necessities. Furthermore, transport may damage health directly, most notably by accidental injury and air pollution'.

This view is supported by the WHO; they propose that transport plays a vital role in the health and well-being of communities by providing access to a range of services and amenities required to treat, manage and promote healthy living. Transport facilitates access to jobs, education and markets and plays a key role in the economy of most countries (2).

However transport policies and infrastructure can also have a negative impact on health in terms of injuries and deaths associated with transport accidents, noise pollution and air pollution, resulting in cardiovascular and respiratory deaths. A more sedentary lifestyle (resulting in non communicable diseases and early mortality) is also associated motor vehicle usage (3).

The pathways by which these health impacts can occur involves complex interactions between various aspects of transport and how this impacts on the health of the population.

The following section outlines the number of ways transport can impact on health (or health pathways) both positively and negatively. These are largely based on the impact of private and public transport systems, as this is most relevant.

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A3.2 **TRANSPORT AND NOISE**

According to the WHO (1) the following health effects are associated with transportation noise:

- impaired communication;
- disturbed sleep;
- difficulties with performance;
- annoyance;
- increased aggression;
- heart disease and hypertension; and
- hearing impairment.

Transportation is the main source of noise pollution in Europe; road traffic is the main noise source for communities, with the exception of those that live by airports or rail lines.

A3.3 **TRANSPORT AND AIR POLLUTION**

The health effects of air pollutants are covered elsewhere in this report. However it is important to note that electric trains are pollutant free at point of use.

A3.4 **TRANSPORT ACCIDENTS AND INJURY**

Unlike exposure to air pollution and noise, changes in rates of injury and death associated with accidents and can be directly attributed to changes in flows.

Road accidents account for the most significant share of all transport accidents both in terms of the absolute number of deaths and the number of deaths per km travelled. In the EU almost 50 times as many people die on the road as in rail accidents (2). In terms of passenger km travelled, death rates are highest by road, then rail, while deaths by air and sea are much lower still (3).

In Great Britain between 1999 and 2003, approximately 201,291 people were killed or seriously injured on roads. Of this figure 21,885 were children (4). In addition, during 1994 the slight casualty (non lethal/serious injury) rate for Great Britain comprised approximately 265,000 individuals.

The number of people killed or seriously injured in 2005 was 33% below the 1994-1998 average and the number of children killed or seriously injured fell by 49% with the slight casualty rate falling by 23%.

Table A3.1  **Killed and seriously injured (KSI) casualties and slight casualty rate: GB 2005**

<table>
<thead>
<tr>
<th>Accident type</th>
<th>Number</th>
<th>2005: % change over:</th>
</tr>
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<tbody>
<tr>
<td>KSI casualties</td>
<td>47,656</td>
<td>37,215</td>
</tr>
<tr>
<td>Child KSI casualties</td>
<td>6,860</td>
<td>4,100</td>
</tr>
<tr>
<td>Rate of slight casualties per 100 million vehicle km</td>
<td>61</td>
<td>51</td>
</tr>
</tbody>
</table>


However, such reductions vary between different road users; in particular the number of motorcycle accidents has risen (however the number of accidents has dropped by 2% between 2004 and 2005), while accidents involving bus/coach users and vulnerable road users including pedal cyclists and pedestrians have experienced the decreases (1).

Traffic accidents can also have an effect on the psychological health of those involved; studies into this have found that some 14% of survivors suffer from post traumatic stress disorders and 25% have some psychiatric problems one year later (2).

### A3.5 WALKING AND CYCLING

Walking and cycling as a form of transport is associated with two important health benefits:

- Reducing the use of motorised transport and therefore noise, air pollution and accident rates; and

- Increased physical activity (3).

The number of walking and cycling trips in Europe remains small with only 5% of all trips in the EU made by bicycle in 1995 (4) and in the UK in 2005 cycles made up just 1% of road traffic in Great Britain (5). The number of walking trips has declined by 20% from the 1970s to the 1990s (6).

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(1) Rashmeeta Singh and David Marrott Review of progress towards the 2010 casualty reduction targets. Transport Statistics: Road safety, Department for Transport.


Increased intensity in road traffic can have a restricting impact on cycling and walking, by reducing the number of access routes and increasing the fear of accidents. This impact has not been quantified, although observers have argued that the impact is similar to that of tobacco on heart disease (1).

Fear of accidents has in part reduced the number of miles that people walk. For example, in the UK there has been a 17% decline in the miles walked between the years 1975/6 and 1994 (2). Transport constrains physical activity – walking and cycling have decreased steadily as shown in Table A3.2 below. Furthermore, parents fear the risk of accidents and therefore are increasingly escorting their children to school.

### Table A3.2  Miles travelled per person per year, cycling and walking, UK

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>255</td>
<td>244</td>
<td>199</td>
<td>192</td>
<td>189</td>
<td>192</td>
</tr>
<tr>
<td>Cycling</td>
<td>51</td>
<td>44</td>
<td>38</td>
<td>39</td>
<td>33</td>
<td>34</td>
</tr>
</tbody>
</table>

Note: 2003 figures are provisional
Source: DfT, 2003

Perception of dangerous road traffic for pedestrians and cyclists can lead to reduced physical activity and therefore reduced fitness.

### A3.6  TRANSPORT AND WELLBEING

#### A3.6.1  Overview

There is a demonstrable link between strong social networks and health, where good social networks can provide emotional, professional and social support vital to good health and wellbeing. Transport, particularly road transport, can disrupt such social networks through the creation of barriers preventing or reducing community interaction. This may be as a consequence of new roads separating communities or through an increase in road traffic though existing areas. This can also occur when new rail corridors or airport runways are built which alter community interaction by placing a physical barrier in communities.

Regular exposure to traffic and congestion can impair health and satisfaction with life. Congestion constrains movement and leads to increased stress and frustration, and aggression, which in turn can lead to increased likelihood of a crash or accident (3). Traffic noise can also cause nervousness, depression, sleeplessness and irritability.

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A3.6.2 Community Severance

Community severance is the separation of different areas within a community by the flow of traffic and can break networks leading to the changes in support networks affecting social capital.

Rail tracks and roads can form a physical barrier between communities which can result in community severance and the breakdown of community networks.

The risk and severity of health effects from community severance is relative, dependent upon a number of additional factors and can only be appraised qualitatively.

Several studies have shown that outdoor space for children to use shrinks significantly as road traffic increases. This has an impact on the extent to which children are exposed to physical activity, and this can have longer-term effects on their physical wellbeing as well as academic performance (1) and mental health (2).

A3.6.3 Social Inclusion

Access to transportation allows for social inclusion; if people are unable to access transport due to a lack of public transport, cost or difficulties in access then social exclusion can result. This lack of access to transport options is referred to as transport poverty and as a consequence people have a lack of choice of destinations, activities and access to amenities, jobs and health care facilities.

A3.6.4 Transport and Vulnerable Groups

Those in lower socio-economic groups are also are at a higher risk of being involved in a traffic accidents, especially children. This can be explained in part by higher traffic volumes and speeds in poorer areas, as well as increased exposure if families do not have cars. Children are a particularly vulnerable group with one in every three accidents involving a person under 25 (3).

It can therefore be seen that poorer socio-economic groups, children, women and the elderly are most likely to suffer from negative health effects of transport, especially if they are frequent pedestrians or cyclists.

A4 NOISE

A4.1 Health Effects of Noise

Noise has the potential to affect health in a variety of ways; some of the effects can be auditory and occur as a direct impact of the noise. Direct auditory effects usually result in damage to the ear and, in particular, damage to the inner ear. Acoustic limiting values are recommended to avoid inner ear damage.

There are also a wide range of non auditory health effects that may be associated with exposure to environmental noise, although the pathways and strength of association for these are not fully understood. Examples of non auditory health effects include:

- Annoyance;
- Night time effects;
- Effects on children;
- Mental Health;
- Cognitive performance;
- Cardiovascular and physiological; and
- Foetal effects.

Many of these health effects have been associated with environmental noise, although some are more obviously associated with occupational noise exposure, such as the cardiovascular effects.

A4.2 Speech Interference

Speech is subject to masking by noise; it is possible to measure the amount of interference that noise has on speech both subjectively and objectively. Environmental noise, especially varying and intermittent noise, can interfere with activities involving speech. Above 45-55 dB $L_{Aeq}$ for the elderly or impaired and 55-65 dB $L_{Aeq}$ for all others it has been suggested that speech may be disturbed (WHO Guidelines 1999).

A4.3 Annoyance

Annoyance is the most investigated non auditory health effect of noise and is defined as the feeling of resentment, displeasure, discomfort, dissatisfaction or offence which occurs when noise interferes with thoughts, feelings or activities.

The concept of ‘community annoyance’ was developed to provide one comprehensive term to describe the overall community response to noise including both degradation of outdoor activities and interference with indoor
activities. As it is generally assumed that the population will habituate to noise exposures, community annoyance is an aggregate community response to long term steady state exposure conditions (1).

The following factors associated with noise are thought to generate more annoyance (2):

• loudness, frequency and duration;
• increasing intensity;
• increased frequency;
• duration of noise; and
• high frequency.

The extent of an adverse response to noise, however described or reported, is also influenced by numerous non-acoustic factors such as:

• Demographic;
• Attitudinal; and
• Situational factors.

These factors are able to work in both directions either in favour or against the relationship between noise and the outcome variable. Miedema and Vos have also noted that:

“Persons, who experience fear related to the transportation that causes the noise, report higher annoyance compared to persons who do not experience such fear. ……The effect of fear on annoyance is found for all three modes of transportation, but it appears that only few persons associate high fear with railway traffic. "

Annoyance was also found to increase slightly if the person’s educational and occupational status is higher and if the dwelling is owned rather then rented, if a person does not depend on the noise source, and if the use of the transportation that causes the noise is low.

The contemporary technical rationale for assessing the effects of transportation noise on communities rests on a dose response relationship as proposed by Schultz in 1978. The curve has since been updated to include new studies (3) (4). The curve is a descriptive relationship between noise exposure and community annoyance and uses $L_{DN}$, which is an indicator of noise levels based on a weighted day-night average.

The curve predicts shows that for every decibel increase in noise on the graph there is increase of between 1 and 3% more people who are highly annoyed.

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(2) The health effects of environmental noise- other than hearing loss, May 2004 enHealth Council Australia
Limitations of the curve include that is applied equally to rural and urban settings despite noise being created differently in these environments. Other limitations of the curve include the fact that the composition and character of community noise is variable and curve assumes that all types of noise causes the same amounts of annoyance.

Evidence cited by Miedema suggests that trains are the least annoying source of transportation noise, as shown by the % highly annoyed value shown in Figure A4.1. with aircraft noise being the most annoying source.

**Figure A4.1** *Exposure -effect relationships for the association between noise (expressed as L_{den}) from different sources and annoyance.*

![Graph showing exposure-effect relationships](source)

Most of the annoyance was associated with decreased power of concentration and there was no evidence of habituation, as residents of over 10 years were just as annoyed as those who had lived in the area for less than 10 years.

Noise mitigation measures were found to have an impact on the level of annoyance, as among those with treble glazing only 24% reported annoyance which rose to 41% among those with double glazing or less. (1)

### A4.4 NIGHT TIME EFFECTS

The WHO guidelines conclude that sleep disturbance is a major effect of environmental noise and that exposure may cause primary effects during sleep and secondary effects after the exposure. Certain groups are more likely to be effected by sleep disturbance according to the WHO such as the elderly, newborn, shift workers and persons with physical or mental disorders.

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Sleep is necessary to restore biological processes and sleep disturbances can result in decreased day time efficiency and long term health impairment. The effects of sleep disturbance may manifest themselves in a number of ways: in sleep behaviour (time spent awake), structure of sleep, increased body movement, physiological responses such as cardiovascular responses or as effects in the period after sleep (mood and performance the next day).

Noise at certain levels can cause awakening and above these levels it can induce sleep changes disturbing the slow wave sleep (SWS) which is thought to be the most restorative part of sleep. Any loss of SWS is thought to be detrimental to health and may impact on the immune system.

Sleep deprivation is known to affect any individual’s performance the next day and ability to function. Repeated arousals (which may not lead to complete consciousness) during sleep can also systematically reduce day time awareness, depending on the frequency of the arousals and the age of the subject, as well as disrupting circadian rhythms (the daily cycle).

Evidence from various studies suggests that rail noise causes the least sleep disturbance of all sources of transport noise in line with annoyance.

These figures are based on a number of field studies into sleep disturbance in relation to noise and represent best estimates for $L_{night}$ which were available at the time taking into account no other factors.

Evidence from the HEAT study showed that inadequate sleep was reported to a high degree in noise exposed group, a much higher degree of sleep problems was observed when the bedroom window was positioned towards the exposed side (ie facing the railway track). Amongst those whose bedroom window faced the railway track, 35% reported problems compared to 9% amongst those whose bedroom windows faced in other directions (1).

### A4.5 PHYSIOLOGICAL AND CARDIOVASCULAR FACTORS

The WHO guidelines consider that the evidence in relation to prolonged exposure to environmental noise impacting on long term stress hormones is too inconsistent to draw conclusions either way.

Internationally, evidence from epidemiological studies suggests that the impact of noise on long term stress is limited, although sensitive receptors such as children may be affected differently.

In the Tyrol study (2) children exposed to higher levels of road and rail traffic noise ($L_{dn} >60\text{dB(A)}$) had an elevated heart rate compared to children exposed

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to noise levels below $L_{dn} 50$dB(A). For diastolic blood pressure however a decrease was observed.

In the HEAT study there was no evidence of a higher prevalence of hypertension or ischemic heart disease amongst those exposed to higher noise levels \(^{(1)}\).

The NaRoMI study found no association between rail noise and risk of myocardial infarction for either males or females in the home environment \(^{(2)}\).

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\(^{(2)}\) Babisch et al (2004) The impact of annoyance from different noise sources on the risk of myocardial infarction- results from the NaROMI Study, the 33rd international congress and exposition on noise control engineering
A5 VISUAL ENVIRONMENT AND HEALTH

A5.1 INTRODUCTION

People attach considerable importance to the quality of their surroundings and the prosperity of an area can be influenced to a considerable degree by its image.

The presence of a visual disturbance increases the perceived risk to health, as it is a constant reminder and provides a focus for concerns. Visual presence is linked to the level of risk that people perceive and can become a focus for concern and anxiety.

A5.2 NATURAL ENVIRONMENT

Natural environments are associated with greater restorative advantage (e.g., less anger) and physiological advantage (e.g., blood pressure) after administration of stressors (1). The mechanism for these outcomes is not fully understood. Maller et al (2), in their paper on nature and healthy people, state that initial findings indicate that nature plays a vital role in human health and wellbeing.

A5.3 BUILT ENVIRONMENT

The built environment impacts on public health and the way that people utilise their environments. As environments deteriorate, then so does the physical and mental health of the people that live in them (3). Health benefits can result when people live and work in accessible, safe and well-designed environments. The built environment influences physical activity; positive environmental determinants of activity, including enjoyable scenery, encourage participation in physical activity. Additionally, people are more likely to use parks and paths that are easy to get to and are well maintained (4).

According to Frumkin ‘transportation infrastructure forms the connective tissue that links these places together and represents an integral part of the built environment.’ Transportation infrastructure results in equity concerns as they tend to locally undesirable use of land and poor people disproportionately live near them and are affected by any health consequences (5).

(3) Richard Jackson and Chris Kochitizky, Creating a healthy environment: the impact of the built environment on public health, Centre for Disease Control and Prevention.
(5) Frumkin et al Environ Health Perspectives 2005 May; 113(5): A290-A291- Editorial
**A5.4 LIGHT POLLUTION**

Evidence suggests that people are becoming more sensitive to the stray light that is being directed towards their property and windows (1).

Light trespass can be described as the effects of light or illuminance that strays from its intended purpose allowing some of the light to fall on lawns, houses, etc, resulting in annoyance and upset due to stray light on property or windows. Probably the most annoying aspect of light pollution is glare. Glare, which can be described as unwanted source of luminance can cause annoyance, discomfort, or loss of visual performance and visibility. For some people any amount of obtrusive lighting is considered an annoyance. This is subjective, however, and depends on the individual (2).

From April 2006 artificial lighting has become subject to the criminal law of statutory nuisance, this is defined as "artificial light emitted from premises so as to be prejudicial to health or a nuisance". It constitutes a statutory nuisance under the Environmental Protection Act 1990 (provision added by the Clean Neighbourhoods and Environment Act 2005). However, this does not apply to artificial light from the following:

- airports;
- harbour premises;
- railway premises;
- tramway premises;
- bus stations and any associated facilities;
- public service vehicle operating centres;
- goods vehicle operating centres;
- lighthouses; and
- prisons.

**A5.5 ENVIRONMENTAL PREFERENCES**

Studies have shown that adults consistently prefer environments which can be classified as natural with a predominance of trees, water etc, regardless of how spectacular the environment is. When structures are put into predominantly natural environments then preference for the landscape tends to be greater when structures are congruent (fit in) with the natural environment. Structures which are incongruent with the landscape reduce liking of the landscape or area in which they are placed (3).

(1) Carl Shaflik, Environmental effects of roadway lighting, Technical Paper prepared at University of British Columbia, Department of Civil Engineering
(2) Carl Shaflik, Environmental effects of roadway lighting, Technical Paper prepared at University of British Columbia, Department of Civil Engineering
(3) Faschier et al (1999): Public Health Impact of Large airports, RIVM
A6.1 INTRODUCTION

Evidence suggests that those who are unemployed have poorer health than those in employment (1) and overwhelmingly the literature looks at the association between unemployment and health. There is no direct evidence of the health benefits of moving from unemployment to employment. It has often been assumed, however, that the relationship between unemployment and poor health is reversible (therefore becoming employed and employment is associated with good health).

Unemployment falls unevenly on different population subgroups, ethnic minorities and young people face the highest rates of unemployment (2). Those who are disabled and older workers are also likely to have lower employment status. These groups are also more likely to be in insecure employment and poorly paid employment. For those involved in manual work then poor health is more likely to have an adverse effect on employment then for those involved in none manual work (3).

A6.2 EMPLOYMENT AND UNEMPLOYMENT

A6.2.1 Health Effects

Unemployed individuals are more likely to report illness and injury as well as psychological symptoms such as demoralisation. Health outcomes that have been associated with unemployment or unfavourable employment include:

- Physical health effects;
- Mental Health effects;
- Suicide;
- Well Being;
- Role functioning;
- Poor self reported health;
- Increased mortality; and
- Life expectancy.

Conversely, the WHO identifies a number of ways in which employment can have a positive effect on mental health including:

- Structuring time – the absence of which can be a psychological burden;
- Social contact – with colleagues and friends;
- Involvement in a collective effort or activity; and

• Regular activity.

Employment is also thought to help define an individual’s role in society and help form social relationships.

A6.2.2  Relationship between Employment and Health

Individual unemployment and mortality

• Unemployed middle aged men in England are less healthy and have higher mortality then employed men.(3).

• Men who became unemployed or retired for reasons other than ill health had a significantly raised risk of dying compared to continuously employed men which suggests that non-employment even in apparently healthy men was associated with increased mortality and that there is a causal relationship between unemployment and mortality.

• Evidence for causality is further strengthened by the fact that neither health related behaviour nor social factors explained the differences in mortality that were seen and that relative risks were similar in non-manual and manual workers (2).

• Gerdtham et al (3) found that being unemployed significantly increases the risk of death by 46% with no significant difference based on gender. Unemployment was not associated with deaths from cancer or deaths due to external causes such as accidents and homicide. A non-significant association between unemployment and cardiovascular disease was seen and unemployment was significantly associated with deaths due to suicide and “other causes”.

A6.2.3  Neighbourhood Unemployment and Mortality

• Studies have shown that living in deprived neighbourhoods is related to higher mortality rates independent of individual socio-economic characteristics. However, the mechanism of action is not understood (4).

• A pattern of increasing hazard ratios of mortality with increasing neighbourhood unemployment rates was found in samples of six countries.

• There was no evidence that the association between neighbourhood unemployment and mortality was substantially modified by country context among the six countries studied.

• Improving health of populations in general and reducing socio-economic inequalities in health requires targeting on both people and places.

A6.2.4 Social Context - Level of Unemployment

Studies from a variety of European countries have compared the mortality risk in relation to employment status during different levels of unemployment, by comparing time periods and areas with different levels of unemployment. The findings from these studies are inconsistent; however, evidence does suggest that individuals who are unemployed when unemployment rates are low may special characteristics, which make them more vulnerable to poor health.

A6.2.5 Employment Status and Conditions

Research has shown the importance of unemployment, job security and employment conditions on health and in particular on chronic disease aetiology. A study by Bartley et al concluded that:

“Having secure employment in favourable working conditions greatly reduces the risk of healthy people developing limiting illness. Secure employment increases the likelihood of recovery.”

This conclusion was based on the finding that men and women in the least favourable employment conditions (routine occupations) nearly four times more likely to become ill then those in the most favourable (professional and managerial).

Those who found insecure re-employment was also associated with poorer mental health outcomes then those in secure employment. These results cannot be explained by changes in financial strain, psychosocial factors or health related behaviours (1).

When a person has high demands and low control in their work, they are more likely to suffer poor health. There are cases when unemployment has a positive effect on health: for those in stressful jobs and for individuals that work in unhealthy environments.

A6.3  INCOME

A6.3.1  Introduction

It is widely accepted that income affects health, with increased income often cited as being beneficial to health. There are many studies that show that those with low incomes have poorer health than those in high income groups (1).

A6.3.2  Population Income

Evidence shows that income inequalities across countries or regions are not strongly associated with life expectancy as differences seen in life expectancy and mortality can be explained away by individual level factors (2) such as individual income and lifestyle risk factors such as smoking. This is supported by the following studies:

- A Danish study (3) where income inequality did not predict mortality for any level of individual income;
- A Japanese study (4) where income inequalities did not predict self rated health; and
- An American study (5) where income inequalities did not predict common mental or physical health disorders.

A6.3.3  Individual Income

- There is a well established inverse relationship between individual income levels and mortality (6).
- The relationship between income and health is graded: the greater the income, the better the health. The relationship is not strictly linear though. Above a middle threshold, higher income is less proportionately related to improved health.

(3) Osler et al (2002) Income inequality, individual income and mortality in Danish Adults: analysis of pooled data from two cohort studies BMJ 324 13-17
(6) Osler et al (2002) Income inequality, individual income and mortality in Danish Adults: analysis of pooled data from two cohort studies BMJ 324 13-17
• Long-term income may be more important for health than short-run income and that income change has a smaller effect on health than income level (1).

• Decreases in income seem to be related to declining health but increases in income are less clearly related to health improvement (2). Reversibility of the relationship cannot therefore be assumed. Data on increases in income and health change have not been published.

A6.4 SUMMARY

The evidence linking employment or income to health has many limitations. However, suitable estimates for use in a modelling framework are available for income and mortality and employment and mortality. For other health effects, such as long term illness, depression etc, the body of evidence on the observed relationship is much smaller and therefore not suitable for quantification.

It should be noted that the impacts of unemployment and impacts of income can not be added together as this will result in double counting of any effects as income is both a mediator and a confounder of the effect of employment status on mortality and employment also mediates and confounds income.

A7

SOCIAL CAPITAL AND HEALTH

A7.1 INTRODUCTION

The concept of social capital and the controversies surrounding its definition, determinants, outcomes and measurement are presented in the literature review. Research findings supporting a link between social capital and health and others challenging such a link are then presented, as well as possible explanations as to why making a link between social capital and health can be problematic.

A7.2 DEFINITIONS

Many different definitions of social capital exist. At its broadest, social capital represents the degree of connectedness in communities and the quality and quantity of social relations in a given population. It refers to the processes between people that establish networks, norms and social trust, and facilitate coordination and cooperation for mutual benefit.

The OECD describes social capital as “networks together with shared norms, values and understandings that facilitate co-operation within or among groups” (1). This definition is commonly used in the UK and has been adopted by the Office for National Statistics.

The three key authors that have developed the concept of social capital have approached the concept in the following ways:

- as people’s sense of belonging to their community, community cooperation, reciprocity and trust, and positive attitudes to community institutions that include participation in community activities or civic engagement. (2)

- in terms of networks and connections: the individual’s contact with these networks and connections results in exchange, obligations and shared identity that provides potential support and access to resources. (3)

- as a resource of social relations between families and communities. (4)

Szreter and Woolcock warn against the importance of overplaying the concept of social capital: “Social capital is not a magic wand for improving society, nor is it a self contained comprehensive theory. It is a useful concept which

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focuses our attention on an important set of resources inherent in relationships, networks, associations and norms”.

A7.3 **DIFFERENT TYPES OF SOCIAL CAPITAL**

Three types of social capital have been distinguished:

- **Bonding social capital** refers to trusting and co-operative relations between members of a network who are similar in terms of social identity (e.g. ethnicity);

- **Bridging social capital** refers to connections between those who are unlike each other “yet are more or like each other in terms of their status and power” (e.g. horizontal ties in society; and

- **Linking social capital** refers to “the norms of respect and networks of trusting relationships between people who are interacting across explicit, formal, or institutionalised power or authority gradients in society” (e.g. vertical ties in society).

One of the Key debates is whether bridging or bonding social capital is more important as bridging supports links across communities. However, bonding social capital provides a protective role in communities especially for minority groups and while bridging social capital is important and should be aimed for this should not be achieved at the expense of bonding social capital.

A7.4 **DETERMINANTS OF SOCIAL CAPITAL**

There is no consensus as to what are the determinants of social capital, with some research identifying individual characteristics such as marital status as the key determinants, and others adopting a much broader view, and including elements such as television and the welfare state as determinants.

Halpern distinguishes correlates and determinants of social capital:

- Correlates cannot be altered and may therefore help in predicting levels of social capital in a community, e.g., sex and age; and;

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(1) Health by association? Social capital, social theory, and the political economy of public health, Szreter et al., Volume 33, no. 4, International Epidemiological Association, 2004
(2) Reconciling the three accounts of social capital, Kawachi et al., International Epidemiological Association, Volume 33, no.4, 2004
(3) Szreter and Woolcock, cited in Reconciling the three accounts of social capital, Kawachi et al., International Journal of Epidemiology, Volume 33, no.4, 2004
(4) Szreter and Woolcock, cited in Reconciling the three accounts of social capital, Kawachi et al., International Journal of Epidemiology, Volume 33, no.4, 2004
Determinants are factors that can be altered and therefore offer ways of building social capital and a guide for policy, e.g. education, cultural activities and social organisations.

He also distinguishes micro, meso and macro levels of causes of social capital:

- **Micro**: biology and personality, culture, age, inequality, family, trends, class, education, work, religion, personalised consumption;

- **Meso**: schools and communities, ethnic and social heterogeneity, mobility, transport, physical environment; and;

- **Macro**: history, economics, labour market, welfare state, individual values (1).

**A7.5 MEASURING SOCIAL CAPITAL**

In 2003, the National Statistics Office published a paper recommending measuring social capital around the following five areas:

- Civic participation: the propensity to vote, to take action on local or national issues;

- Social networks and support: contacts with friends and relatives;

- Social participation: involvement in groups and voluntary activities;

- Reciprocity and trust: giving and receiving favours, trust of other people and institutions such as the government and police; and

- Views about the area: not strictly a measure of social capital, but required for the analysis and interpretation of the social capital measures, and includes satisfaction with living in the area and problems in the area. (2)

The questionnaire included questions on perception of crime in the area, perception of the extent people from different backgrounds get along, perception of whether lost property would be returned or stolen in the area, perception of whether the respondent was in a situation to influence local decisions. (3)

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(1) Social Capital, Polity Press, Halpern, 2005
(2) Office for National Statistics 2005 Measurement in social capital in the UK
(3) http://www.statistics.gov.uk/socialcapital/downloads/harmonisation_steve_5.pdf
A7.6 THE LINK BETWEEN SOCIAL CAPITAL AND HEALTH

A7.6.1 Modelling the Link between Social Capital and Health

The model below, from the HDA, conceptualises the link between structural factors and social capital, social capital and health, and structural factors and health. In this model, the HDA uses factors such as age, sex, marital status and household social class.

Figure A7.1 Link between Social Capital and Health (1)

The model shows that:

- Social capital may have its own direct effect on health;
- Social capital may mediate or moderate the effects of structural factors on health;
- structural factors can be both a determinant of social capital and of health; and
- structural factors can impact on health independently of social capital.

This latter point means that there is a possibility for social capital to act as a moderator or mediator linking or structural factors and health. High levels of social capital for individuals in otherwise structurally disadvantaged positions may reduce the risk of ill health, and, conversely, low levels of social capital for those in otherwise structurally advantageous positions may increase the risk of ill health. Moreover, the erosion of social capital within a community thus leaves the more structurally disadvantaged community members in a more vulnerable position with regards to health. (2)

A7.6.2 Evidence base supporting the Link between Social Capital and Health

Much of the research undertaken in this field recognises a link between social capital and health, albeit often tentatively.

The concept of social capital has been recognised as useful in helping to understand health in its complex social context (3). Moreover, the concept

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(1) Investigating the links between social capital and health using the British Household Panel Survey, HDA, 2004
(2) Investigating the links between social capital and health using the British Household Panel Survey, HDA, 2004
allows for the examination of how networks and connections can act as a buffer against deprivation, providing access to health resources, support and information (1).

Social and civic participation are linked with better health chances (2). This is particularly true for older people, as research has found significant links between social participation and health in older people (3). Moreover, social and civic participation can affect health independently of other structural socioeconomic indicators, for example, lower levels of smoking were found in people most actively engaged in community life. This however, is only true for some indicators of social capital (4).

Trust and reciprocity: The higher the level of trust within the community, the lower the probability of reporting poor self-rated health among trusting individuals (5).

Social networks and support may have physiological effects through the hormonal system on the body’s response to stress and functioning of the immune system (6). Social networks and support are also associated with reduced risk of cardiovascular disease, and once ill, people with good social support have better prognoses. For example, social support is associated with reduced levels of mortality from cardiovascular disease (7).

Some research suggests that social capital can explain a proportion of life expectancy, infant mortality rate, heart disease, violent crime and self-rated health (8).

Social capital and mental health

With regards to mental health, research has found a link between low levels of social capital and common mental illness. It has been hypothesised that social capital could reduce the effects of negative life events (eg loss of job) and long term difficulties (eg poor physical health).

Social participation: has been found to reduce the likelihood of an onset of common mental illness and, it has been associated with higher chance of recovery for those with poor self-rated health. However, it has also been suggested that social capital play only minor roles in the processes leading to

(2) Wolf and Bruhn cited in Poor people, poor places, and poor health: the mediating role of social networks and social capital, Cattell, Social Science and Medicine, Volume 52, 2001
(5) Social Capital Community Benchmark Survey in the US, 2002, cited in Reconciling the three accounts of social capital, Kawachi et al., International Epidemiological Association, Volume 33, no.4, 2004
(6) Health Impact Assessment for Regeneration Projects, Volume 2, Selected Evidence Base, Cave et al., Queen Mary University and Breaking the Cycle, East London and the City Health Action Zone
(7) Health Impact Assessment for Regeneration Projects, Volume 2, Selected Evidence Base, Cave et al., Queen Mary University and Breaking the Cycle, East London and the City Health Action Zone
(8) Cited in Measuring social capital within health surveys: key issues, Harpham et al, Health Policy and Planning, Volume 17, Oxford University Press, 2002
the onset of and recovery from common mental illness and poor self-rated health (1).

Social networks and support: may have a direct effect in promoting a sense of control in one’s life and self-worth (2). Better social support is associated with lower levels of anxiety and depression, reduced likelihood of common mental illness and increased likelihood of recovery from mental illness (3). There may be gender differences in the importance for health of social support (4).

A7.6.3 Evidence Base Challenging the Link between Social Capital and Health

Although the majority of the research reviewed recognises the link between social capital and health, these ideas are nonetheless heavily contested. Even supporters of a link often offer their findings tentatively. Many critics of the research into social capital and health believe that social capital links to health outcomes are either non-existent, negligible, insufficiently based on evidence, or of little relevance. In particular:

- Some research suggests that social capital measures have little or no effect on health indicators (5).
- There is a lack of evidence that health was higher in the “community golden ages” of the past (6).
- The direction of the relationship between social capital indicators and health is not always consistent, indicating that the positive health advantages of high levels of social capital cannot always be assumed.
- The socioeconomic structural factors which determine levels of social capital are far greater than the moderator or mediator effect social capital can introduce. Consequently, social capital has less power to predict health than some other more familiar indicators of socioeconomic status (7).
- Some research suggests that neighbourhood social cohesion and individual social support are not highly correlated, and, in the context of health, social support at the individual level may matter more than social cohesion (8).

(1) Investigating the links between social capital and health using the British Household Panel Survey, HDA, 2004
(2) Health Impact Assessment for Regeneration Projects, Volume 2, Selected Evidence Base, Cave et al., Queen Mary University and Breaking the Cycle, East London and the City Health Action Zone
(3) Investigating the links between social capital and health using the British Household Panel Survey, HDA, 2004
(4) Health Impact Assessment for Regeneration Projects, Volume 2, Selected Evidence Base, Cave et al., Queen Mary University and Breaking the Cycle, East London and the City Health Action Zone
• The direction of causation between social capital and health is not always clear: it could be that high levels of social capital are influenced by the levels of health in the community \(^{(1)}\).

There is concern that the current research on social capital related to healthcare is overstretching the concept and its relevance to health \(^{(2)}\).

**A7.7 CONCLUSIONS**

As suggested by the literature review, the current body of research tentatively suggests that there is a link between social capital and health outcomes, with regards to both physical and mental health. The existence of a causal relation between enhancement or erosion of social capital and health outcomes is contested. Moreover, there is no consensus that particular social capital indicators can be linked to particular health outcomes. The conclusion as to whether a relationship or causal link exists may depend on definitions of social capital and health, the methodology, the context and the particular health outcome.

\(^{(1)}\) Morgan and Swann (2004) cited in Investigating the links between social capital and health using the British Household Panel Survey, HDA, 2004

\(^{(2)}\) Portes (1998) cited in Investigating the links between social capital and health using the British Household Panel Survey, HDA, 2004
A8 PHYSICAL ACTIVITY

A8.1 INTRODUCTION

Evidence shows that regular physical activity provides people of all ages and conditions with a wide range of physical, social and mental health benefits. Appropriate regular daily physical activity is a major component in preventing chronic disease. Low levels of physical activity are a major risk factor for ill health and mortality from all causes. Physical inactivity is estimated to cause 2 million deaths worldwide annually. The benefits from physical activity are transient; therefore exercise is needed throughout life in order to minimise the risk of developing disease.

A8.2 DISEASE RISK

In the UK 7 out of 10 adults do not take enough regular physical activity. People who do not do sufficient physical activity have a greater risk of cardiovascular disease, colon and breast cancers, Type 2 diabetes and osteoporosis. Being physically active improves mental and musculoskeletal health and reduces other risk factors such as obesity, high blood pressure and high blood cholesterol. Adults who are physically active have 20-30% reduced risk of premature death, and up to 50% reduced risk of developing a chronic disease.

Physical activity interacts positively with strategies to improve diet, discourages the use of tobacco, alcohol and drugs, helps reduce violence, enhances functional capacity and promotes social interaction and integration.

In general, physical activity improves glucose metabolism, reduces body fat and lowers blood pressure; thereby reducing the risk of CVD and diabetes. Physical activity may also reduce the risk of colon cancer by its effects on prostaglandins, reduced intestinal transit time, and higher antioxidant levels. Participation in physical activity can also improve musculoskeletal health, control body weight, and reduce symptoms of depression.

A8.3 INDIRECT BENEFITS OF PHYSICAL ACTIVITY

Increasing physical activity through an integrated programme, including transportation and urban planning policy, makes other broader contributions, increasing social inter-action throughout the life course, providing recreational enjoyment, and reducing violence, urban traffic congestion and pollution.


**A8.4 PHYSICAL ACTIVITY IN DAILY LIFE**

According to the WHO opportunities for people to be physically active exist in four major domains of their day:

- At work (whether or not the work involves manual labour);
- For transport (walking or cycling to work, to shop etc);
- During domestic duties (housework, gathering fuel etc); and
- In leisure time (sports and recreational activities).

Physical activity declines with age, falling off from adolescence, and physical activity and physical education is also declining in schools. Inactivity is generally higher amongst girls and women than men in the UK, especially in those who work.

**A8.5 VULNERABLE GROUPS**

**A8.5.1 Children**

Physical activity in children has the advantage of reducing the effects of risk factors for disease (e.g. raised blood pressure), avoiding weight gain, achieving high peak bone mass and increasing self-esteem and mental well-being. There is also some evidence that active children are less likely to become regular smokers.

Only one in 10 UK children now walk to school (1) while the number of pupils who are driven to school has doubled in 20 years. Twenty per cent of traffic in the morning and afternoon rush hour is now generated by the school run.

**A8.5.2 Social class**

In men, overall activity levels are higher in manual groups than in non-manual groups. Half of those employed in unskilled jobs meet the recommended levels of activity (30 minutes a day) compared with under a third of those employed in professional jobs.

In women, there is no clear pattern according to social class. The type of activity varies by socioeconomic group. People of higher socio-economic status take part in more physical activity in their leisure time. Rates of walking are two-thirds higher in professional classes compared with unskilled manual groups.

**A8.5.3 Ethnicity**

South Asian and Chinese men and women are less likely to participate in regular physical activity than the general population, with the lowest levels found among the Bangladeshi community. Black Caribbean men and women

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(1) Transport Trends: 2005 edition published by the Department of Transport
are more likely to be physically active at the recommended level than the general population.

**A8.5.4 Elderly**

The Elderly need to remain active in order to remain mobile and improve muscle strength, thereby reducing illness and injury and remaining independent. This group has very high percentages of people that are inactive.

**A8.6 SUMMARY**

Activities that promote physical activity either through recreation, sport or as a means of transport, will improve the health and wellbeing of the communities, encourage social interactions contribute to improved physical and mental health.
**A9**

**HOUSING**

**A9.1**

**INTRODUCTION**

Housing deprivation is a significant explanatory variable in terms of health even after controlling for a range of other factors that included standard of living and genetic, social, and behavioural indices. Poor housing environments contribute to ill health through poor amenities, shared facilities and overcrowding, inadequate heating or energy inefficiency. The highest risks to health in housing are attached to cold, damp and mouldy conditions.

**A9.2**

**HOUSING HISTORY**

The report 'Home Sweet Home: The Impact of Poor Housing on Health' (1), stated that Housing history matters those who have experienced adverse housing are more likely to become ill regardless of their current housing quality. Those who had experienced overcrowded housing conditions in childhood had a higher likelihood of infectious disease, notably tuberculosis, as adults. In adulthood, overcrowding was also linked to increased likelihood of respiratory disease.

In addition, cold homes:

- Reduce resistance to respiratory infections in the elderly; and
- Increase the likelihood of respiratory problems, diarrhoea and vomiting in the young

Dampness and mould in homes contributes to, and exacerbates, respiratory illness and increases the risk of children developing wheezing and chest problems.

Evidence suggests the defective housing particularly effects children's health with aches and pains, nerves, diarrhoea and headache and significantly more respiratory problems among children in damp housing compared to children in non damp housing (2). Asthma sufferers are also three times more likely to be found in a damp home than in non damp homes (3).

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(2) Martin C., Platt S. and Hunt S., Housing conditions and poor health. London: BMJ 294; 1987

A9.3 **HOUSING NEED AND HOMELESSNESS**

Those in housing need and those who are homeless are at increased risk of (1):

- suffering from mental illness including stress;
- alcohol/drug problems;
- respiratory disease (including tuberculosis); and
- poor perinatal health (such as low birth weight, infant mortality)

In addition, those in very poor housing, such as homeless hostels and bedsits, are more likely to suffer from poor mental and physical health than those whose housing is of higher quality

A9.4 **HOUSING AND MENTAL HEALTH**

Mental health issues such as depression and anxiety have also been associated with:

- Dampness;
- poor quality housing;
- neighbourhood noise; and
- housing structural problems.

High rise structures are also known to increase the likelihood of poor mental health (2).

A9.5 **AVAILABILITY OF HOUSING**

Low housing availability increases demand and cost of housing thereby reducing levels of expendable income as well as increasing usage of low quality and temporary housing. Conversely in areas with high housing availability demand may decrease and house prices fall resulting in stagnation of the housing market making it difficult for people to move and thereby creating an economic burden and increase stress and poor health.

A9.6 **GENTRIFICATION**

Gentrification is a term with inherent class connotations, and was coined by the sociologist Ruth Glass in London in 1964 in relation to changes in London;

“One by one, many of the working-class quarters of London have been invaded by the middle-classes - upper and lower. Shabby, modest mews and cottages - two rooms up and two down - have been taken over, when their leases have expired, and have become elegant, expensive

(1) New Policy Institute for the GLA Estimating the numbers of people in housing need and at risk of homelessness in London.
(2) Wilkinson D 1999 poor housing and ill health A summary of research evidence the Scottish office Central research unit
Once this process of 'gentrification' starts in a district it goes on rapidly until all or most of the original working-class occupiers are displaced and the whole social character of the district is changed.”

Many authors have written of the ill-effects of gentrification, primarily in terms of its ability to displace poorer households through price and rent increases in the area.

Negative effects of gentrification include:

- household displacement;
- increased rent and property prices;
- community conflict;
- racial tension;
- landlord harassment;
- lower population densities; and
- a greater take on local spending by incoming affluent households.

However gentrification can also be seen as a force for social change revitalising the physical environment and increasing revenue in the area. There is little evidence for these positive effects but this is not the same as saying that they do not exist.

Positive impacts include:

- boost to tax revenues;
- increased property values;
- increased social mix;
- improvements to local services; and
- Improvements to the physical environment

Based on this information Atkinson (1) argues that:

“there is a danger that gentrification and private sector investment are seen as solutions to the problems of deprived neighbourhoods when the research evidence suggests this has primarily had socially divisive and inequitable results in the past”

It can therefore be seen that gentrification has a negative impact on the area and while it is traditionally linked to existing housing there is no reason why new housing developments may not also lead to gentrification.

(1) Dr Rowland Atkinson June 2002 Does Gentrification Help or Harm Urban Neighbourhoods? An Assessment of the Evidence-Base in the Context of the New Urban Agenda www.neighbourhood centre.org.uk
Levels of education influence a range of additional determinants of health including employment opportunities, levels of income, housing, lifestyle and coping skills. Any activity that improves access to, or provides options of, training, education and personal development will improve the ability of individuals to make better health and life decisions and contribute to improving control and quality of life.

The significance of education during childhood and its links to health throughout life, influencing employment, income, quality of housing and lifestyle, are well known. However, the subsequent effect on offspring and childhood development are only now being investigated. The National Healthy School Standard (NHSS) supports the view that healthier children perform better academically, and education plays an important role in promoting health, particularly among those who are socially and economically disadvantaged.

Disadvantaged communities exhibit a higher level of still birth rates and low birth weights, which in turn have been shown to influence childhood development and future health. Evidence from the youth cohort study 2004 (1) shows that 36% of children aged 15 with health problems or disabilities achieved 5 or more GCSE’s A*-C compared to 52% without.

There is therefore a relationship between poor health at a young age and poor educational achievements. Individuals who receive a poor education due to poor health are subsequently more likely to remain disadvantaged in the job market and to continue to suffer socio economic and subsequent health impacts then their healthy peers.

This vicious circle is further compounded as social class is closely related to educational attainment, 77% of children with professional parents achieved 5 or more GCSE’s compared to 32% of children from routine occupational backgrounds (2).

Although access to education and training at later stages in life is possible, it may be hindered by responsibilities and lack of child care. Disadvantaged communities are therefore not only more likely to suffer lower academic achievements, influencing future socio economic opportunities and health, but also more likely to pass on such disadvantages to their offspring.

Any activity that breaks this cycle improving access to education, training and employment opportunities will play a significant role in reducing inequality and improving the health and wellbeing of deprived communities.

(2) DfES. 2003
Annex B

Community Profile
B1 COMMUNITY PROFILE

The site known as ‘The British’ is located in Talywain, South Wales. The site is within the Abersychan Ward and the borough of Torfaen. Information on both Abersycham and Torfaen has been gathered to be able to assess the communities that would be impacted by the devolvement and their susceptibilities to health impacts and benefits as a result of ethnicity, social and demographic structure and relative deprivation.

B1.1 POPULATION

B1.1.1 Size and Age Distribution

The table below (Table B1.1) shows the breakdown of the population with Torfaen Borough and Abersychan Ward by gender. The Borough and Ward both mirror Wales and England gender ratio.

Table B1.1 Population Data by Gender

<table>
<thead>
<tr>
<th>Area</th>
<th>Males (%)</th>
<th>Females (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abersychan Ward</td>
<td>48.84</td>
<td>51.16</td>
<td>6,826</td>
</tr>
<tr>
<td>Torfaen Borough</td>
<td>48.39</td>
<td>51.61</td>
<td>90,949</td>
</tr>
<tr>
<td>Wales</td>
<td>48.35</td>
<td>51.65</td>
<td>2,903,085</td>
</tr>
<tr>
<td>England</td>
<td>48.68</td>
<td>51.32</td>
<td>49,138,831</td>
</tr>
</tbody>
</table>

The age structure of a population indicates both the current and strategic (future) requirements of an area, where a younger population may require additional access to schools, safe recreation play facilities and development of future employments opportunities, while aging populations are likely to require a greater focus on health care, living support, accessibility and social networks. The age structure of the Ward and Borough which the The British site is situated is shown below in Table B1.2.

Table B1.2 shows that broadly speaking the age structure of the population in Torfaen and then broken down again into the Ward of Abersychan is very similar to that of Wales and England.

Table B1.2 Population Data by Age (percentage)

<table>
<thead>
<tr>
<th></th>
<th>0-14</th>
<th>15-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-59</th>
<th>60-69</th>
<th>70+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abersychan Ward</td>
<td>20.69</td>
<td>11.44</td>
<td>12.44</td>
<td>14.64</td>
<td>19.62</td>
<td>9.80</td>
<td>11.38</td>
</tr>
<tr>
<td>Torfaen Borough</td>
<td>19.90</td>
<td>11.44</td>
<td>12.51</td>
<td>14.53</td>
<td>19.82</td>
<td>9.82</td>
<td>11.97</td>
</tr>
</tbody>
</table>
B1.1.2 Ethnicity

Epidemiological evidence suggests that minority groups often experience fewer socio-economic and physical health benefits; this may be a result of discrimination, levels of education, or even language barriers (1).

Table B1.3 shows that the population around The British Site is dominated by white people with less than one percent of the population being black and minority ethnic. This is slightly lower than the value for the whole of Wales, where 97.9 percent of the population are white and England where 90.92 percent are. Those of other ethnic minorities are therefore more likely to experience feelings of isolation and exclusion.

Table B1.3 Ethnicity

<table>
<thead>
<tr>
<th>Area</th>
<th>White (%)</th>
<th>Asian or Asian British (%)</th>
<th>Mixed (%)</th>
<th>Black or Black British (%)</th>
<th>Chinese or Other Ethnic Group (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abersychan Ward</td>
<td>99.59</td>
<td>0.22</td>
<td>0.00</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td>Torfaen Borough</td>
<td>99.06</td>
<td>0.38</td>
<td>0.26</td>
<td>0.09</td>
<td>0.21</td>
</tr>
<tr>
<td>Wales</td>
<td>97.88</td>
<td>0.61</td>
<td>0.88</td>
<td>0.24</td>
<td>0.39</td>
</tr>
<tr>
<td>England</td>
<td>90.92</td>
<td>1.31</td>
<td>4.58</td>
<td>2.30</td>
<td>0.89</td>
</tr>
</tbody>
</table>

B1.1.3 Religion

The concept of a minority group can also be applied to religions, as with ethnicity. Those in minority religions may experience feelings of exclusion and a loss of social networks and support that comes from shared religious celebrations and worship.

Table B1.4 shows the proportion of individuals professing different types of faith in Torfaen Borough and then Abersychan Ward. The majority of the population is Christian, with the second highest majority stating no religion. The proportions of the population stating no religion or not declaring a religion are amongst the highest in England and Wales. Other religious groups such as Muslims, Jews, Buddhists, Hindus and Sikhs are all below the average for Wales.

Table B1.4 Religion (percentage)

<table>
<thead>
<tr>
<th></th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christian</td>
<td>67.32</td>
<td>70.83</td>
<td>71.90</td>
<td>71.74</td>
</tr>
<tr>
<td>Buddhist</td>
<td>0.07</td>
<td>0.11</td>
<td>0.19</td>
<td>0.28</td>
</tr>
<tr>
<td>Hindu</td>
<td>0.00</td>
<td>0.08</td>
<td>0.19</td>
<td>1.11</td>
</tr>
<tr>
<td>Jewish</td>
<td>0.04</td>
<td>0.02</td>
<td>0.08</td>
<td>0.52</td>
</tr>
<tr>
<td>Muslim</td>
<td>0.06</td>
<td>0.17</td>
<td>0.75</td>
<td>3.10</td>
</tr>
<tr>
<td>Sikh</td>
<td>0.00</td>
<td>0.05</td>
<td>0.07</td>
<td>0.67</td>
</tr>
<tr>
<td>Other religions</td>
<td>0.21</td>
<td>0.19</td>
<td>0.24</td>
<td>0.29</td>
</tr>
</tbody>
</table>

### B1.2 EDUCATION, SKILLS AND TRAINING

Education is an important determinant of health and influences almost every aspect of health including lifestyle, coping skills, future employment prospects and subsequent income, quality of housing and healthcare. Improving the quality and level of education is therefore a national imperative. The percentage of the population of the local Borough and Ward affected by the British site with various levels of qualifications are shown in Table B1.5.

#### Table B1.5 Education and Qualification Levels

<table>
<thead>
<tr>
<th></th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>People aged 16-74 with no qualifications (%)</td>
<td>40.83</td>
<td>36.65</td>
<td>33.02</td>
<td>28.85</td>
</tr>
<tr>
<td>People aged 16-74 who attained level 1 (%)</td>
<td>18.34</td>
<td>17.01</td>
<td>15.46</td>
<td>16.63</td>
</tr>
<tr>
<td>People aged 16-74 who attained level 2 (%)</td>
<td>18.13</td>
<td>20.12</td>
<td>19.78</td>
<td>19.36</td>
</tr>
<tr>
<td>People aged 16-74 who attained level 3 (%)</td>
<td>3.69</td>
<td>5.16</td>
<td>7.12</td>
<td>8.34</td>
</tr>
<tr>
<td>People aged 16-74 who attained level 4/5 (%)</td>
<td>11.43</td>
<td>13.56</td>
<td>17.39</td>
<td>19.9</td>
</tr>
<tr>
<td>People aged 16-74 with other qualifications/level unknown (%)</td>
<td>11.43</td>
<td>13.56</td>
<td>17.39</td>
<td>6.92</td>
</tr>
</tbody>
</table>

Source: Census Data 2001 (National Statistics Online)

Level 1: 1+ O level, GCSE, CSE pass any grade, NVQ level 1 or foundation GNVQ
Level 2: 5+ O levels 5+ CSE’s (grade one) 5+ GCSE’s (A-C), School certificate, 1+ A/AS level, NVQ level 2 or Intermediate GNVQ.
Level 3: 2+A levels, 4+ AS levels, Higher School Certificate, NVQ level 3, Advanced GNVQ.
Level 4/5: First Degree, Higher Degree, NVQ level 4 and 5, HNC, HND, Qualified teacher status, Qualified Medical Doctor, Qualified Dentist, Qualified Nurse, Midwife, Health Visitor. Other Qualifications e.g. City and Guilds, RSA, BTEC or professional qualifications

Abersychan Ward has a relatively poor education profile with a high percentage of people with no qualifications, above England and Wales’s average attaining level 1 and below average for those gaining level 2 and above. Torfaen Borough as a whole reflects a similar profile to that of Abersychan, however is marginally better, having a higher than England and Wales average for those attaining level 1 and 2 qualifications.

### B1.3 EMPLOYMENT AND INCOME

Income and employment influence a range of factors including access to housing, education, services and social networks as well as diet, lifestyle and
coping skills. These in turn are key determinants of a variety of physical and mental health impacts and ultimately health and well-being.

Levels of full time employment, as shown in Table 1.6 are below the Welsh and English average in the ward of Abersychan. However levels of full time employment are above the Welsh average in the Borough of Torfaen as a whole and in line with England average. Unemployment rates in Abersychan Ward and Torfaen Borough are both in line with Wales and England averages. In both Ward and Borough the percentage of people permanently sick/disabled is higher than the Welsh average and significantly higher than the English average.

Table 1.6 Economic Activity of the Population aged 16-74

<table>
<thead>
<tr>
<th></th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time employed</td>
<td>36.08</td>
<td>39.32</td>
<td>36.18</td>
<td>40.81</td>
</tr>
<tr>
<td>Part-time employed</td>
<td>10.59</td>
<td>11.33</td>
<td>11.31</td>
<td>11.81</td>
</tr>
<tr>
<td>Self Employed</td>
<td>5.76</td>
<td>4.93</td>
<td>7.69</td>
<td>8.32</td>
</tr>
<tr>
<td>Unemployed</td>
<td>3.10</td>
<td>3.42</td>
<td>3.49</td>
<td>3.35</td>
</tr>
<tr>
<td>Economically active student</td>
<td>1.19</td>
<td>1.81</td>
<td>2.30</td>
<td>2.58</td>
</tr>
<tr>
<td>Retired</td>
<td>14.53</td>
<td>15.42</td>
<td>14.81</td>
<td>13.54</td>
</tr>
<tr>
<td>Economically inactive student</td>
<td>3.60</td>
<td>3.51</td>
<td>5.12</td>
<td>4.67</td>
</tr>
<tr>
<td>Looking after home/family</td>
<td>8.08</td>
<td>6.68</td>
<td>6.39</td>
<td>6.52</td>
</tr>
<tr>
<td>Permanently sick/disabled</td>
<td>12.98</td>
<td>10.22</td>
<td>9.22</td>
<td>5.3</td>
</tr>
<tr>
<td>Other Economically inactive</td>
<td>4.08</td>
<td>3.36</td>
<td>3.48</td>
<td>3.1</td>
</tr>
</tbody>
</table>

B1.4 TRANSPORT

Transport plays a vital role in the health and well-being of communities by providing access to a range of services and amenities required to treat illness and to manage and promote healthy living.

Any activity that promotes a modal shift to public or green transport will contribute to a healthier lifestyle and environment, reduce the reliance on the use of non renewable fuels, reduce emissions to air, diminish risk from accident and injury, and promote physical activity. Equally those who own cars are more able to access jobs and services outside of their local area and less likely to suffer social exclusion than those who do not. As can be seen from the evidence base, there is a strong correlation between deprivation and road traffic accidents; childhood pedestrian mortality also shows a steep social gradient (1).

Car ownership roughly correlates with housing ownership and is also an indicator of wealth for many areas in the country. Those who own a car are more likely to be able to access jobs and services outside their local area and are less likely to suffer social exclusion than those who do not have access to cars.

(1) Roberts. (1996). Does the decline in childhood mortality vary by social class. BMJ.
Rural communities are often less well served by public transport than their urban counterparts as these routes may not be seen as profitable. This increases the reliance on the use of cars in these communities this is reflected in Table 1.7 although the percentage of households without a car is slightly higher than the Wales average.

**Table 1.7 Car Ownership (percentage of households)**

<table>
<thead>
<tr>
<th></th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>No car or van</td>
<td>27.63</td>
<td>27.17</td>
<td>25.95</td>
<td>26.84</td>
</tr>
<tr>
<td>1 car or van</td>
<td>45.06</td>
<td>46.33</td>
<td>45.54</td>
<td>43.69</td>
</tr>
<tr>
<td>2 or more cars or vans</td>
<td>27.31</td>
<td>26.50</td>
<td>28.50</td>
<td>29.47</td>
</tr>
</tbody>
</table>

**B1.4.1 Housing**

Housing is often an underrated determinant of health. Housing is not only required to provide shelter, security and a family base, but the quality of housing is also associated with economic, social, mental and physical well-being (1). Home ownership is also an indicator of wealth.

Health impacts associated with poor housing can include a range of physical illness brought on from poor shelter and subsequent exposure to cold, damp or pollutants (2). The risk of communicable diseases is increased if there is overcrowding, while stress related and mental illness can be brought about through a lack of affordable housing or high rent (3). As a result, deprived communities, children and the elderly (4) are particularly sensitive to health outcomes associated with poor housing.

The types of households that are available in an area are an indicator of the relative wealth of the area. Factors influencing housing and subsequent health outcomes therefore reflect the quality, distribution, overcrowding, affordability and ownership of homes.

The Borough of Torfaen’s housing market is dominated by terraced accommodation or bungalows as seen in Table 1.8. The percentage of those living in terraced house or bungalows in the Borough of Torfaen and the Ward of Abersychan is significantly higher than that of Wales and England. In relation the percentage in both borough and ward living in detached houses is significantly lower than Wales and England percentages.

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### Table 1.8 Proportion of Different Household Types

<table>
<thead>
<tr>
<th></th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detached house or Bungalow (%)</td>
<td>17.95</td>
<td>16.95</td>
<td>27.07</td>
<td>22.51</td>
</tr>
<tr>
<td>Semi-detached house or bungalow (%)</td>
<td>30.76</td>
<td>27.21</td>
<td>31.70</td>
<td>31.57</td>
</tr>
<tr>
<td>Terraced house or bungalow (including end terrace) (%)</td>
<td>41.91</td>
<td>43.72</td>
<td>29.46</td>
<td>25.84</td>
</tr>
<tr>
<td>Flat; maisonette or apartment (%)</td>
<td>9.29</td>
<td>11.90</td>
<td>11.23</td>
<td>19.66</td>
</tr>
<tr>
<td>Mobile or temporary structure (%)</td>
<td>0.10</td>
<td>0.20</td>
<td>0.39</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Housing tenure is illustrated in Table 1.9 and shows that in Abersychan and Torfaen borough the percentage of people that own their homes outright or with a mortgage is lower than the Wales average. In Abersychan and Torfaen the most common form of tenure is ‘rented from the council’ suggesting that the area is deprived in terms of housing.

### Table 1.9 Tenure Type

<table>
<thead>
<tr>
<th>Tenure Type</th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owns</td>
<td>64.58</td>
<td>68.27</td>
<td>71.32</td>
<td>68.72</td>
</tr>
<tr>
<td>Rented from Council (local authority)</td>
<td>26.95</td>
<td>22.83</td>
<td>13.73</td>
<td>13.21</td>
</tr>
<tr>
<td>Rented from Housing Association/Registered Social Landlord</td>
<td>2.75</td>
<td>3.57</td>
<td>4.17</td>
<td>6.05</td>
</tr>
<tr>
<td>Rented from Private landlord or letting agency</td>
<td>3.66</td>
<td>3.23</td>
<td>7.43</td>
<td>8.8</td>
</tr>
<tr>
<td>Rented from Other</td>
<td>2.06</td>
<td>2.11</td>
<td>3.34</td>
<td>3.22</td>
</tr>
</tbody>
</table>

### B1.5 CRIME

#### B1.5.1 Crime and Health

The study ‘Exploring the Impacts of Crime on Health and Health Services: a feasibility study’\(^{(1)}\) concluded that crime has serious health impacts, both direct and indirect. Violent crime results in physical and psychological injury, which can require emergency treatment and long-term intervention. Furthermore, theft and burglary can materially affect living standards and have psychological effects for the people involved, with consequences for health.

Violence disproportionately affects certain groups in society, including young people and those who are deprived. The British Crime Survey shows that these unequal risks extend to other types of crime, such as burglary and vehicle-related theft. In many ways these inequalities mirror those which are found in health, suggesting that crime is likely to be a contributory factor in

---

the substantial and widening health inequalities that exist in contemporary Britain.

Individuals who have been the victims of violence and other forms of crime often suffer damage to their health beyond immediate injuries. Damage to physical health can result from the stress caused by the experience of victimisation: for example, the heart attack suffered by the elderly victim of burglary or the self-harm induced by abuse.

Fear from crime and antisocial behaviour may also have significant effects on health. In particular, older people, women and children may become constrained in their use of public spaces and make more use of car transport. They may withdraw from social life, including interaction with neighbours, and avoid going out at night. They may take protective or defensive action which can in itself pose a threat to health; for example, carrying a weapon, or barricading themselves in their homes (1).

The figures presented in Table 1.10 only include crime that has been reported under reporting, particularly for domestic crime, is common. The effects of domestic crime are therefore underestimated especially if people are victims multiple times. The health impacts of crime also extend beyond the victims to witnesses and relatives.

<table>
<thead>
<tr>
<th>Table 1.10 Crime - Rate per 1000 resident population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Violence Against the Person</td>
</tr>
<tr>
<td>Robbery</td>
</tr>
<tr>
<td>Burglary in a Dwelling</td>
</tr>
<tr>
<td>Theft of a Motor Vehicle</td>
</tr>
<tr>
<td>Theft from a Vehicle</td>
</tr>
</tbody>
</table>

Source: Notifiable Offences to the police 2006/07

It can be seen that within Torfaen the rate of crime is slightly lower than in Wales and England. Therefore the Torfaen borough can be considered a relatively safe place to live and relatively free from the fear of crime.

Crime results in physical and psychological injury, which can require emergency treatment and long-term intervention. Fear of crime can lead to a wide range of psychological disorders and self-limited mobility, while exposure to crime may increase the incidence of health-damaging behaviour, such as smoking or excessive alcohol consumption (2).

The British Crime Survey suggests that crime is likely to be a contributory factor in the substantial and widening health inequalities that exist in Britain.


today (1). From these data it can be seen that this community is not being subjected to poor health due to crime.

### B1.5.2 Health of the community

The 2001 Census asked people to describe their self perceived health over the preceding 12 months as ‘good’, ‘fairly good’ or ‘not good’, as well as recording those with a long term illness. This is subjective and an indication of general health rather than recorded health events. It is however, a useful tool in obtaining local community perceptions of health and is shown for the Ward and the Boroughs affected by the development in Table B1.11 below.

#### Table B1.11 The Proportion of the Residents rating themselves in Different Health Categories

<table>
<thead>
<tr>
<th></th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Health</td>
<td>60.39</td>
<td>62.16</td>
<td>65.06</td>
<td>68.76</td>
</tr>
<tr>
<td>Fairly Good Health</td>
<td>23.89</td>
<td>23.91</td>
<td>22.49</td>
<td>22.21</td>
</tr>
<tr>
<td>Not Good Health</td>
<td>15.72</td>
<td>13.92</td>
<td>12.45</td>
<td>9.03</td>
</tr>
<tr>
<td>Limiting long term illness</td>
<td>27.69</td>
<td>24.84</td>
<td>23.27</td>
<td>17.93</td>
</tr>
</tbody>
</table>

Source: Census Data 2001 (National Statistics Online)

A lower proportion of local residents in Abersychan consider their health conditions as ‘good’ compared to the average for England and Wales; around 15.72 percent of the population in Abersychan and 13.29 percent of the population in the area of Torfaen believe their health is ‘not good’.

Further to this poor self rated health assessment a substantial percentage of the population in Abersycahn rate themselves as having a limiting long term illness, over a quarter of the population.

The health of people in the area can also be assessed using estimates of life expectancy. Areas with a life expectancy lower then the national average tend to have poorer health then areas with higher levels of life expectancy.

#### Table B1.12 Life Expectancy at Birth

<table>
<thead>
<tr>
<th></th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Expectancy (Males)</td>
<td>-</td>
<td>77.40</td>
<td>76.64</td>
<td>76.55</td>
</tr>
<tr>
<td>Life Expectancy (Females)</td>
<td>-</td>
<td>81.30</td>
<td>80.98</td>
<td>80.91</td>
</tr>
</tbody>
</table>


Cardiovascular disease can develop through a number of physical and 'lifestyle' risk factors such as raised blood lipid levels, smoking, raised blood pressure, diabetes, obesity and physical activity that effect. Coronary Heart Disease is one of the main health problems associated with cardiovascular disease. Coronary Heart Disease includes angina (chest pain on exertion), heart attacks (myocardial infarction) and heart failure. Table B1.13 shows the mortality levels from coronary heart disease in Torfaen.

**Table B1.13  Mortality from Coronary Heart Disease**

<table>
<thead>
<tr>
<th></th>
<th>Abersychan Ward</th>
<th>Torfaen Borough</th>
<th>Wales</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directly Standardised</td>
<td>-</td>
<td>59.79</td>
<td>59.24</td>
<td>51.98</td>
</tr>
<tr>
<td>Average Annual Years of Life Lost (per 10,000) 2003/05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: http://www.heartstats.org/datapage.asp?id=6799

Torfaen has higher number of lives lost due to coronary heart disease than England; however these numbers are in line with the Welsh average.