

# 5.1.3 The Ecological Correlation Between Poor Health and Measures of Deprivation

## Analysis

In this chapter selected scatter graphs are used to show the relationships which exist at electoral division level between the various indicators contained within this profile. The scatter graphs also show trend lines (shown as black lines) which help to illustrate the linear relationship between the indicators shown. Outliers, that is, electoral divisions which do not follow the pattern exhibited by the majority, are highlighted. It is important to point out that the relationships shown are ecological. That is, they refer to areas rather than individuals within areas. Tables showing all rank correlation coefficients together with statistical significance levels are shown in Appendix 1. The analysis includes the 25 electoral divisions which have not experienced boundary changes since 1991.

## Deprivation as measured by Townsend index and measures of income

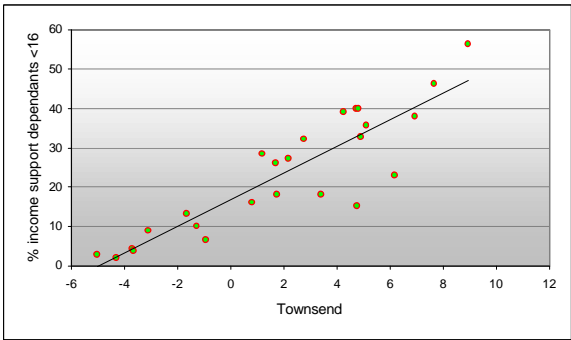
The Townsend index of deprivation is considered to be amongst the best measures of deprivation. However, as stated earlier in this report, the data from which it is calculated are now over ten years out of date. Therefore, this analysis is designed to test whether it may still be appropriate to use this measure by correlating it with up to date measures of income gathered from the Department of Work and Pensions and Cardiff Council and also the Wales index of multiple deprivation.

The Townsend index of deprivation was correlated with the following indicators:

- % persons 15 to 59 claiming Income Support
- % persons 60 and over claiming Income Support
- % children age <16 who are dependants of Income Support claimants
- % households in Council Tax bands A or B
- % households in Council Tax bands G or H
- % households in receipt of Housing Benefit
- % households in receipt of Council Tax Benefit
- Wales index of multiple deprivation

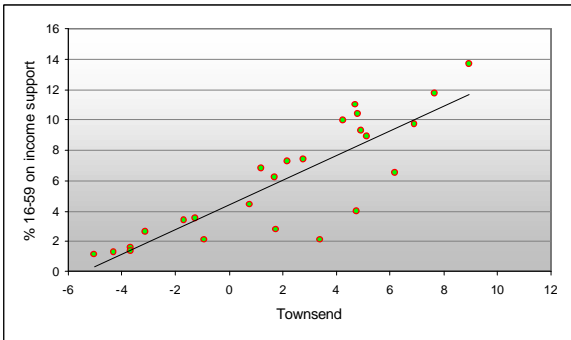
In all cases, the degree of correlation was remarkably high. Figures 1 to 5 show a selection of the relationships graphically.

Figure 1. Townsend index and % children age <16 who are dependants of Income Support claimants (child poverty index)



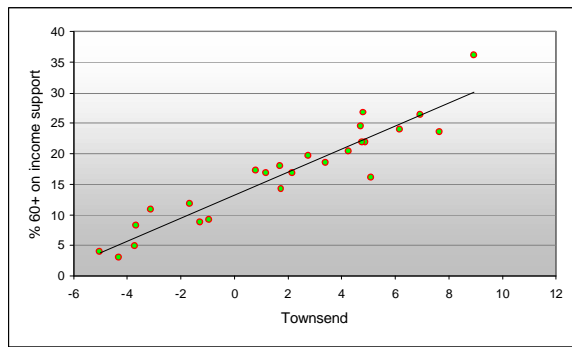
Source: Census 1991; DWP

Figure 2. Townsend index and % persons 15 to 59 claiming Income Support



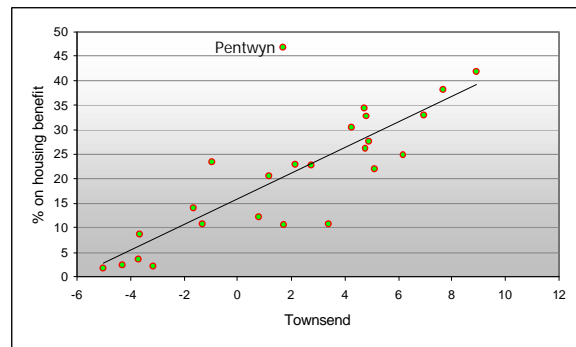
Source: Census 1991; DWP

Figure 3 Townsend index and % persons 60+ claiming Income Support



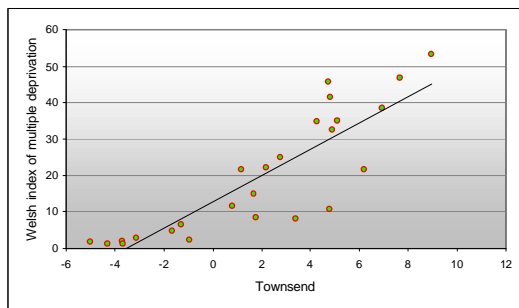
Source: Census 1991; DWP

Figure 4 Townsend index and % households in receipt of Housing Benefit



Source: Census 1991; Cardiff Council

Figure 5 Townsend index and Wales index of multiple deprivation (2000)



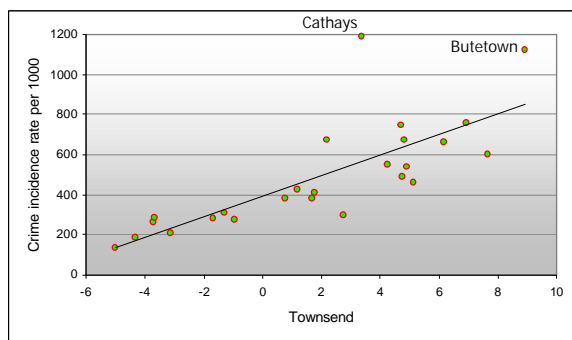
Source: Census, NAFW

The correlations, together with the graphs, indicate that the relationships found are almost certainly not due to chance. The findings show that the areas which were most deprived in 1991 are the areas with the highest rates of uptake of means tested benefits, the lowest value housing and the most deprived as measured by the Wales index of multiple deprivation (2000). This implies that, in general, the pattern of deprivation at electoral division level in Cardiff has changed very little over the past ten years and that therefore the Townsend index is still valid as a measure of deprivation within Cardiff.

## Deprivation as measured by Townsend index and crime

Having established that the Townsend index is still an appropriate measure of deprivation, the Index was correlated with the total incidence of reported crime per 1,000 population. The relationship is shown in figure 6.

Figure 6. Townsend index and total reported crime incidence 2000



Source: Census; CCSP

Figure 6 shows clearly that as deprivation increases, so does the reported incidence of crime per 1,000 population. Two outliers, Cathays and Butetown are identified which include the City Centre and Bay area respectively. The crime rates for these electoral divisions are far higher than any others. This is because the denominator used (total resident population) is inappropriate owing to the large population influxes these areas experience (see also figure 5.3.1).

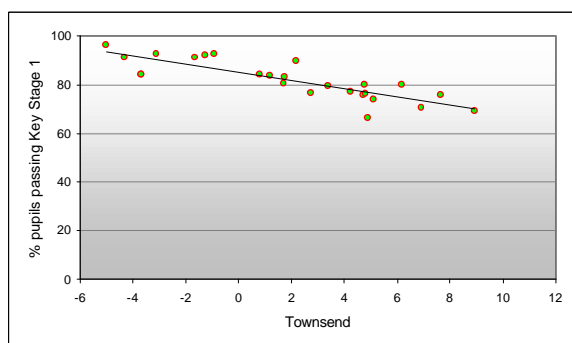
## Deprivation as measured by Townsend index and education

This section reports on the relationship between educational achievement and deprivation. The Townsend index was correlated with the following indicators:

- ❑ % pupils achieving level at Key Stage 1 (age 7 years)
- ❑ % pupils achieving level at Key Stage 2 (age 11 years)
- ❑ % pupils achieving level at Key Stage 3 (age 14 years)

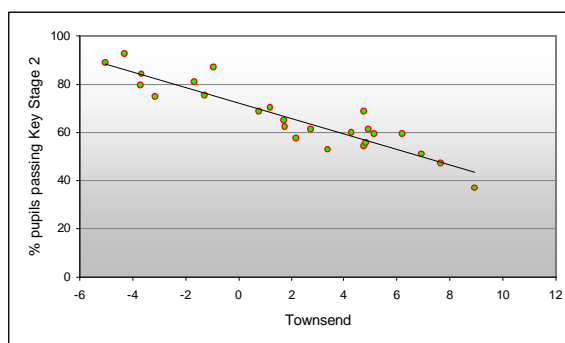
Figures 7 to 9 show the correlation graphically.

Figure 7 Townsend index and Key Stage 1 achievement rate



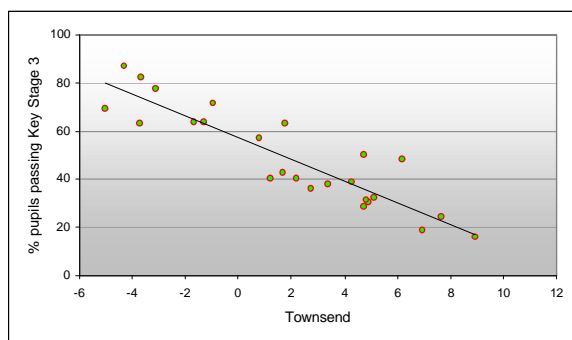
Source: Census; Cardiff Council

Figure 8 Townsend index and Key Stage 2 achievement rate



Source: Census; Cardiff Council

Figure 9 Townsend index and Key Stage 3 achievement rate



Source: Census; Cardiff Council

Figures 7 to 9 show the inverse relationship which exists between deprivation and achievement rates. That is, achievement rates fall as deprivation increases. The graphs also indicate that the gap between the highest and lowest pass rates between areas increases with the age of the pupil.

These findings tend to support the view that educational outcomes are not simply a product of school performance, but are affected by factors which lie beyond the influence of teachers. This has important implications in terms of improving the life-chances of children living in deprived areas.

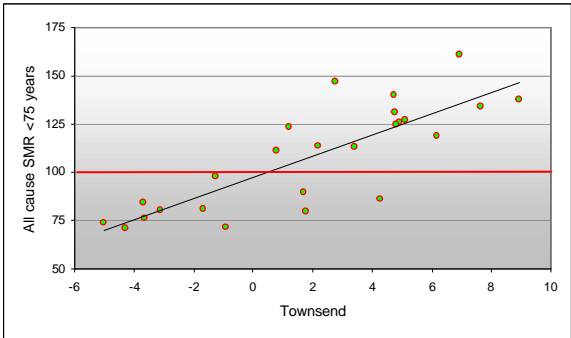
# Deprivation as measured by Townsend index and health

This section reports on the relationship between health indicators and deprivation. The Townsend index was correlated with the following health indicators (see Appendix 1 Table 5):

- ❑ % persons 15 to 59 claiming short term Incapacity Benefit
- ❑ % persons 16 to 64 claiming long term Incapacity Benefit
- ❑ % persons claiming Disability Living Allowance or Attendance Allowance
- ❑ % persons 65 and over claiming Attendance Allowance
- ❑ Standardised mortality ratio all causes persons <75 (standardised to England and Wales)
- ❑ Standardised mortality ratio all cancer persons <75 (standardised to England and Wales)
- ❑ Standardised mortality ratio circulatory disease persons <75 (standardised to England and Wales)
- ❑ Standardised mortality ratio respiratory disease persons <75 (standardised to England and Wales)
- ❑ Standardised incidence ratio all cancer persons <75 (standardised to Bro Taf HA)
- ❑ Standardised incidence ratio lung cancer persons <75 (standardised to Bro Taf HA)
- ❑ Standardised incidence ratio female breast cancer persons <75 (standardised to Bro Taf HA)
- ❑ % uptake for breast screening (3rd round)

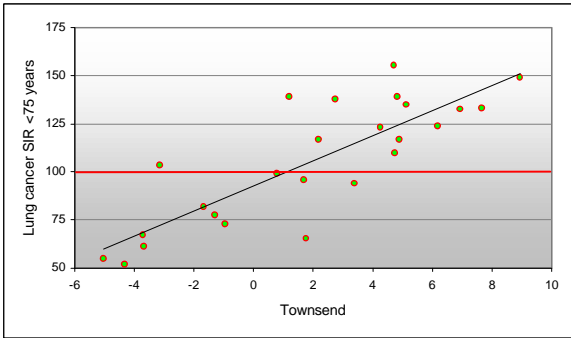
The degree of correlation between deprivation and health was remarkably high with one exception, that is female breast cancer incidence, where no relationship was found (see also figure 5.5.11). Figures 6.4.1 to 6.4.6 show a selection of the relationships graphically. The red line on figure 6.4.1 represents the England and Wales average mortality ratio (100). On figures 6.4.2 and 6.4.3 the red lines represent the Bro Taf average cancer incidence ratios (100).

Figure 10. Townsend index and all cause SMR <75 years



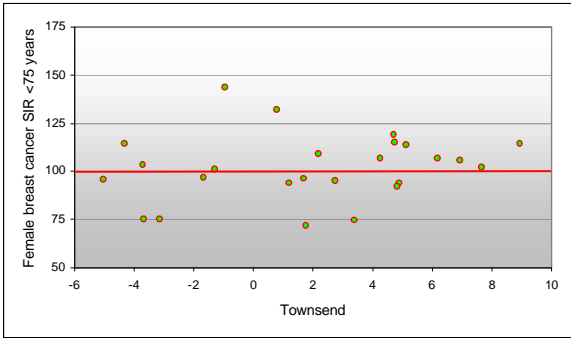
Source: Census; ONS

Figure 11. Townsend index and lung cancer SIR <75 years



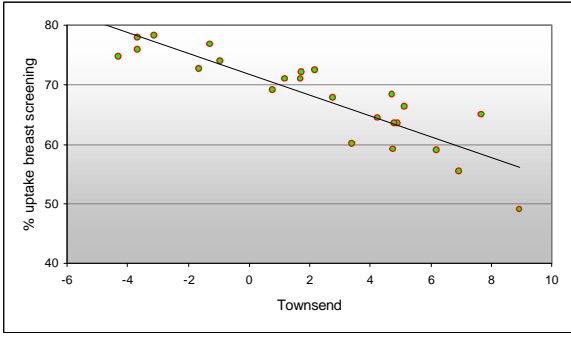
Source: Census; WCISU

Figure 12. Townsend index and female breast cancer SIR <75 years



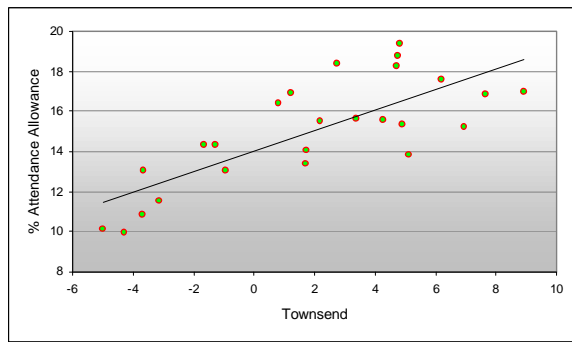
Source: Census; WCISU

Figure 13. Townsend index and female breast cancer screening uptake



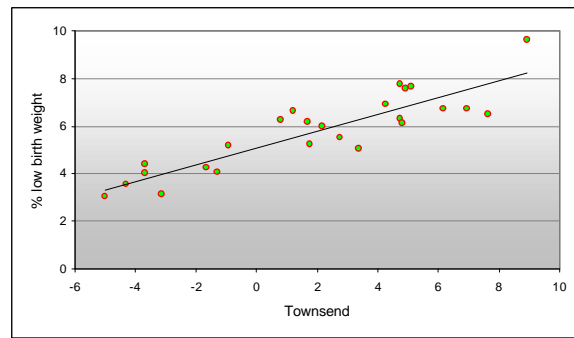
Source: Census; BTW

Figure 14. Townsend index and % 65+ claiming Attendance Allowance



Source: Census; DWP

Figure 15. Townsend index and % single live births <2,500g



Source: Census; ONS

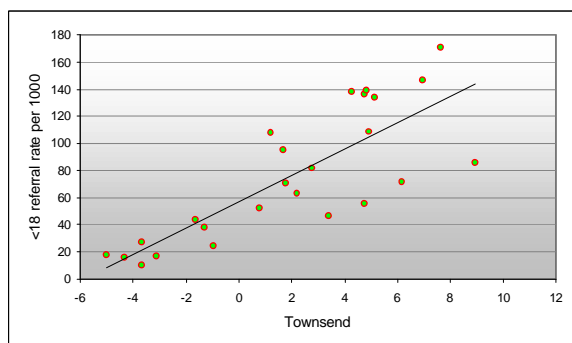
## Deprivation as measured by Townsend index and social service interventions

This section reports on the relationship between the Townsend index of deprivation and social services indicators. The Index was correlated with the following indicators:

- ❑ Referrals <18 per 1,000 population <18
- ❑ Referrals 65+ per 1,000 population 65+
- ❑ Assessments 65+ per 1,000 population 65+
- ❑ Meals-on-wheels recipients per 1,000 population 65+
- ❑ Domiciliary care recipients per 1,000 population 50+

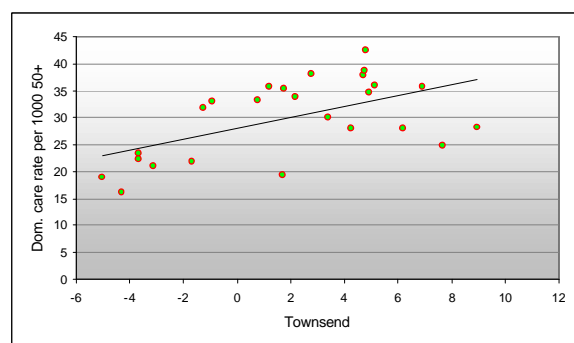
Deprivation was strongly related to <18 referrals, 65+ assessments and domiciliary care recipients, but no relationship was found for 65+ referrals or meals-on-wheels recipients. Figures 6.5.1 and 6.5.2 show the relationships for <18 referrals and domiciliary care respectively.

Figure 16 Townsend index and <18 referral rate per 1,000 population <18



Source: Census; Cardiff Council

Figure 17 Townsend index and domiciliary care recipients per 1,000 population 50+



Source: Census; Cardiff Council

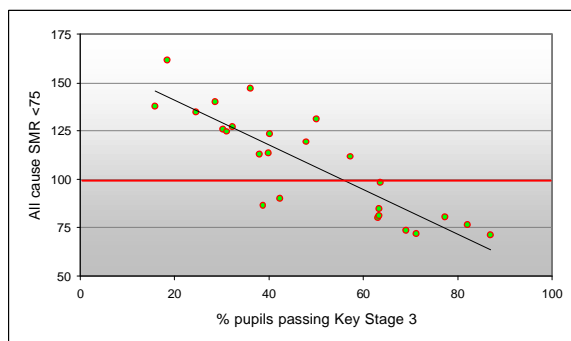
## Educational outcomes and health

The previous section demonstrated the relationship between deprivation and educational outcome. This section shows the relationship between education and health indicators. The Key Stage 3 achievement rate was correlated with the following health data:

- ❑ % persons 15 to 59 claiming short term Incapacity Benefit
- ❑ % persons 16 to 64 claiming long term Incapacity Benefit
- ❑ % persons claiming Disability Living Allowance or Attendance Allowance
- ❑ % persons 65 and over claiming Attendance Allowance
- ❑ Standardised mortality ratio all causes persons <75 (standardised to England and Wales)
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- ❑ Standardised incidence ratio female breast cancer persons <75 (standardised to Bro Taf HA)
- ❑ % uptake for breast screening (3rd round)

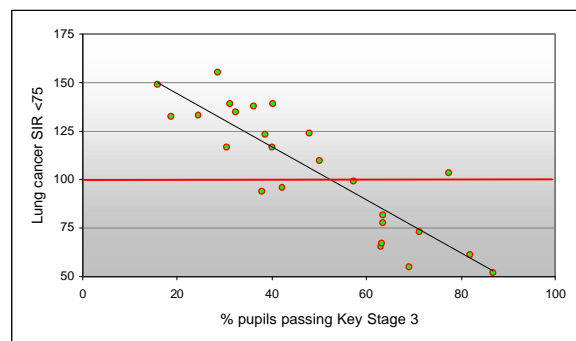
The relationship between Key Stage 3 outcome and health was very strong. As expected, this relationship does not hold in the case of female breast cancer incidence. Figures 6.6.1 to 6.6.3 show a selection of the relationships graphically. The red lines on figures 6.6.1 and 6.6.2 show the England and Wales average mortality ratio (100) and the Bro Taf average lung cancer incidence ratio (100) respectively.

Figure 18 Key Stage 3 achievement rate and all cause SMR <75 years



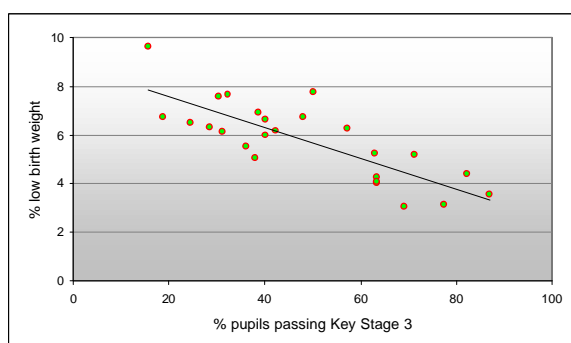
Source: Cardiff Council; ONS

Figure 19 Key Stage 3 achievement rate and lung cancer SIR <75 years



Source: Cardiff Council; WCISU

Figure 20 Key Stage 3 achievement rate and % single live births <2,500g



Source: Cardiff Council; ONS

Figures 18 to 20 show that the electoral divisions with lower Key Stage 3 pass rates also have poorer health outcomes. As mentioned at the beginning of this chapter the relationships shown are ecological, that is they refer to areas and not individuals.

## 6.7 Summary

The analysis of the data contained within this report has highlighted the existence of multiple deprivation at electoral division level within Cardiff. Specifically, deprived areas of the city:

- ❑ experience higher rates of reported incidence of crime;
- ❑ have poorer educational achievement rates at ages 7, 11 and 14;
- ❑ suffer higher premature (age under 75) mortality;
- ❑ suffer higher cancer incidence (age under 75);
- ❑ have higher percentages of low birth weight babies;
- ❑ have lower rates of breast cancer screening uptake;
- ❑ have higher rates of means tested health related benefit uptake;
- ❑ have higher rates of non-means tested health related benefit uptake;
- ❑ and higher rates of referral to social services in under 18 year olds.