

# **Scottish Index of Multiple Deprivation 2006 Technical Report**

**Office of the Chief Statistician  
Scottish Executive  
October 2006**

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## 1. Summary

The Scottish Index of Multiple Deprivation (SIMD) 2006 defines small area concentrations of multiple deprivation across all of Scotland in a consistent way. It consists of seven different domains or groups which each use the most appropriate and up to date information that was available at the time of compilation. The seven domains are Current Income, Employment, Health, Education Skills and Training, Geographic Access to Services, Housing and Crime. The latter is a new domain added since the SIMD 2004. The other major addition is the inclusion of new public transport sub-domain within the Geographic Access to Services domain. SIMD 2006 has National Statistics status.

The SIMD uses the 6,505 data zones across Scotland as its geographical base. It is a *relative* measure of deprivation which means the ranks can be used to compare data zones, the smaller the rank the more deprived the data zone. The data zone ranked one by the SIMD 2006 is the most deprived and the data zone ranked 6,505 is the least deprived. However the SIMD cannot be used to determine 'how much' more deprived one data zone is than another e.g. it is not possible to say that data zone X, ranked 50, is twice as deprived as data zone Y, ranked 100. However it is possible to say that X is more deprived than Y.

The SIMD can be used to identify Scotland's most deprived small areas on the overall index and each individual domain, commonly by applying a cut off such as 10%, 15% or 20%. The cut off should be informed by whether it aims to target areas with the very highest concentrations of deprivation or to be wider ranging. Users should consider applying sensitivity analysis to determine the effects of a slight change in cut off.

SIMD 2006 is an update with improvements on SIMD 2004 and uses the same geographical base as the SIMD 2004 of data zones. Each data zone's geographic size and boundaries have remained constant between SIMD 2004 and 2006 although the population size, gender or age distribution of a data zone may have changed. The SIMD 2004 represented information from 2001/2002 for most domains and used 2001 census based population estimates, whereas the majority of the SIMD 2006 data is from 2004/2005 and uses 2004 small area population estimates provided by the General Register Office for Scotland. The population size of each area should be taken into account before making direct comparisons between areas or over time.

Due to changed data sources and improvements to indicators and methodology, the overall SIMD and most domains are not directly comparable in absolute terms with those in the SIMD 2004.

Any decisions on changes to the methodology used to create the SIMD, and the indicators included in it, have been made in conjunction with data providers and the SCOTSTAT Measuring Deprivation Advisory Group (MDAG). The MDAG is made up from users and analysts in local authority areas and other bodies (e.g. voluntary sector), experts in particular issues (e.g. access) and analysts within the Scottish Executive. The MDAG provides the Executive with advice on measuring deprivation as it works to implement the long term strategy for measuring deprivation. Advice covers: the needs of users; development priorities; methodological options; quality of outputs; dissemination and guidance on the use of outputs. Minutes and papers from all meetings with the MDAG are published on the Scottish Executive's website (see references in Annex C).

The major methodological improvements are listed in the methodology section. Some of the 37 indicators which are used to make up the domains are available as absolute measures through the Scottish Neighbourhood Statistics website and the SIMD background data, such as the changing pattern of health deprivation. Some indicators such as those contributing to

the current income domain are not available individually due to confidentiality constraints and are subject to disclosure control. Details on comparing individual indicators over time are given within each relevant domain in this report.

Only the current income, employment and crime domains are based on absolute values and can therefore be used to identify the proportion of the population who are affected by these types of deprivation. Other domains are not straightforward summations of counts but are weighted scores so can only be used to compare the relative position of a data zone using the data zone rank.

The SIMD has been produced at data zone level and therefore cannot be used to compare levels of deprivation within local authority areas. The local authority area share of deprived data zones should not be used as a measure of a local authority area share of overall deprivation.

The SIMD can determine the national spread of deprived areas by showing the proportion of the most deprived data zones in Scotland which are in each local authority area. So for example; the national share of the 15% most deprived data zones by local authority area is the number of data zones in the 15% most deprived in Scotland in the local authority area as a proportion of the total number of data zones in the 15% most deprived in Scotland in total.

The SIMD can also be used as a measure of concentration of deprivation in a local authority area by showing the proportion of an authority's areas which are in the most deprived data zones in Scotland. So for example; the local share of the 15% most deprived data zones in Scotland is the number of data zones in the 15% most deprived in Scotland in the local authority area as a proportion of the total number of data zones in the local authority area.

### ***1.1. Dissemination of the SIMD***

Alongside this technical report the Scottish Executive have also published:

- A general report with summary analysis which is available on the SIMD website and in hard copy.
- Maps which show the spread of relative deprivation in Scotland across each local authority area for both the SIMD 2004 and SIMD 2006 are available from an interactive mapping website. The maps can be used to identify Scotland's most deprived areas and their location within each local authority area and to see how each authority's share of the most deprived areas in Scotland has changed between the two indices.
- Data behind the indicators have been published where possible, subject to confidentiality constraints, along with a statistical compendium containing tables, charts and other maps analysing the SIMD 2006 and change since SIMD 2004.
- A guidance leaflet providing information on how the SIMD can and cannot be used.
- In addition more detailed analysis of the SIMD 2006 can be carried out through comparison of the results with hundreds of socio-economic indicators on the Scottish Neighbourhood Statistics website.

## 1.2. Population Denominators

A number of the indicators included in the SIMD are rates or proportions of the population within a data zone and each domain uses the appropriate population denominators or weights in its construction. The SIMD 2004 used Census 2001 population information for such indicators and the SIMD 2006 used the latest population estimates available at the time of construction, which are from the General Register Office for Scotland's 2004 mid year small area population estimates (SAPEs). For details on the methodology used to construct the estimates, see the GROS website (see Annex C). Population estimates are published at data zones level on Scottish Neighbourhood Statistics.

A small number of data zones have experienced large changes in the population size between SIMD 2004 and SIMD 2006. Generally such changes are due to either demolition or redevelopment within the data zone area. The SIMD takes into account absolute population change but not change in the population structure.

Some of the SIMD 2004 indicators were based on 2001 Census household populations which do not include communal establishment populations. More recent population estimates include communal establishment populations. Hence, for consistency, when calculating rates for indicators based on the household population, the population denominators were adjusted for those data zones which include a communal establishment.

## 1.3. Urban Rural Classification

The Scottish Executive Urban Rural Classification 2005-2006 updates the 2003-2004 version with the latest available population settlement and drive time estimates. The definitions of urban and rural areas underlying the classification are unchanged. Two main criteria have been used to produce the Scottish Executive urban rural classification: *settlement size* as defined by the General Register Office for Scotland (GROS) and *accessibility based on drive time* analysis to differentiate between accessible and remote areas in Scotland. The changes between the 2003-2004 and the 2005-2006 classifications stem from settlements whose population fluctuates around the 10,000 and 3,000 marks as these are the population thresholds used to distinguish between urban and rural areas. More details are available in the Scottish Executive Urban Rural Classification 2005-2006 which can be found at <http://www.scotland.gov.uk/Publications/2006/07/31114822/0>.

*Change in number of data zones in each of the six- fold classifications between 2003/2004 and 2005/2006:*

	2003/2004	2005/2006	Change
Large Urban Areas	2,432	2,456	24
Other Urban Areas	1,892	1,982	90
Accessible Small Towns	666	608	-58
Remote Small Towns	189	256	67
Accessible Rural	930	771	-159
Remote Rural	396	432	36

In 2005-2006 compared to 2003-2004, there are more data zones classified as being in remote rural, remote small towns and other urban areas and fewer data zones in less accessible rural and accessible small town areas. Reasons for the changes include: changes in population estimates, a change in the drive time software that altered a few on the edge of classifications, and changes to some settlement areas (for more detail see the 05/06 publication).

## 2. METHODOLOGY

### 2.1. Overall methodology

In 2005, the Robertson Centre for Biostatistics at Glasgow University formally evaluated the methodology used in the SIMD 2004. The methodology passed its 'health check' and was approved as fit for identifying areas of concentrated multiple deprivation. A full report of the evaluation, which includes an Executive Summary and Glasgow University's recommendations, along with the Scottish Executive's response were published online on 3 November 2005 (see Annex C).

The Scottish Executive accepted Glasgow University's recommendation to remove shrinkage from the methodology and, where indicators are age-sex standardised, to change from the *Direct* to *Indirect* Standardisation method. Further information on these methodological changes and their impact on the SIMD are given below.

Aside from removing shrinkage and changing the standardisation method, the overall methodology for the 2006 SIMD remains the same as the 2004 index. Within each domain, the data source or methodology for creating individual indicators has changed for a number of indicators. These changes have been kept to a minimum, however changes are inevitable due to improvements in data quality or indicator availability, these are described in full in the relevant chapters of this technical report.

A full technical report for the SIMD 2004 was published in October 2003 (see Annex C). The individual methods for creating the domains and overall index are described fully in the 2004 technical report. Changes and additions to this methodology for the SIMD 2006 are described below.

The statistical techniques used to compile the SIMD are carried out using SAS statistical software. Codes to run the programmes were adapted from those created by the Scottish Executive in the calculation of the SIMD 2004. After the SIMD 2006 had been calculated, the SAS codes were independently reviewed by Alex McConnachie at the Robertson Centre for Biostatistics at Glasgow University. The SAS codes were found to be fit for purpose although some recommendations for improving the codes were made. The Scottish executive will consider these recommendations in time for the next SIMD update. The evaluation of the SAS codes has been published on the Scottish Executive website (see Annex C).

### 2.2. Shrinkage

Shrinkage has not been applied to any indicators included in the SIMD 2006. In the SIMD 2004, shrinkage was applied to indicators in the health and education domains. This procedure was used with the intention to improve the quality of the small area data in indicators where populations were small. Shrinkage involves 'borrowing strength' from a more robust value, in this case the Local Authority mean. Briefly, it can be thought of as a weighted average of the data zone score and the mean of the data zone scores in the same local authority. Thus the shrinkage procedure moves data zone scores towards their local authority mean score. The degree of movement depends on the size of the weight.

Glasgow University, in their evaluation of the SIMD 2004 methodology, recommended that shrinkage should be removed in the SIMD 2006. From their analysis, shrinkage was shown to have little effect on the resultant indices and, by shrinking towards local

authority means, introduces a very small bias against data zones in otherwise less deprived areas. Glasgow University also felt that the application of shrinkage within some domains but not others did not constitute a consistent approach, and that the use of Factor Analysis results implicitly in a degree of shrinkage. Removing shrinkage has considerably simplified the methodology used to construct the SIMD.

### 2.3. Age-sex standardisation

The aim of standardisation is to provide a summary 'adjusted' rate to take into account underlying differences (age, sex, deprivation etc) of a study population relative to a 'reference' population (in the case of the SIMD this is Scotland).

A minor recommendation made by Glasgow University was to change the age-sex standardisation method used in the *Comparative Illness Factor, Comparative Mortality Ratio*<sup>1</sup> and the *Working age adults with no qualifications* indicators from the direct to the indirect method.

A *Directly Age Standardised Rate* is a theoretical rate, which would have occurred if the age-sex specific rates in the actual study (data zone) population were applied to a 'reference population'. A disadvantage of direct standardisation is that it can be influenced by unstable/unreliable rates due to small numbers. This is not the case with indirect standardisation.

The *Direct* method used in the SIMD 2004 was calculated using the formula:

$$= \frac{\text{Expected number of events}}{\text{Observed number of events}}$$

$$= \frac{\sum(\text{Scotland pop} * \text{data zone rate}) \text{ for each age-sex group}}{\text{Scotland rate}}$$

*Indirect Age standardisation* is a comparison of observed to expected numbers of cases by applying age-sex specific rates from a 'Standard Population' i.e. Scotland to the population of interest (data zone).

The *Indirect* Standardisation which has been used in SIMD 2006 uses the formula:

$$= \frac{\text{Observed number of events}}{\text{Expected number of events}}$$

$$= \frac{\text{Data zone rate}}{\sum(\text{data zone population} * \text{Scotland rate}) \text{ for each age-sex group}}$$

Indirectly standardised ratios are of the observed numbers of events to the expected numbers in each data zone, given the national age-sex distribution of events. This is a more widely used summary of event rates, and was found to have limited impact on the resultant SIMD 2004 ranks compared with the direct standardisation methodology used in 2004. For example, the working age adults with no qualifications indicators produced by the two different methods are highly correlated (Pearson Correlation coefficient of 0.99).

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<sup>1</sup> The Comparative Mortality Factor has been renamed Standardised Mortality Ratio (SMR) in SIMD 2006

### 3. UPDATES TO SIMD 2004 DOMAINS AND INDICATORS

Following ongoing work to implement recommendations made in the Long Term Strategy and changes to data sources, the SIMD 2006 contains more domains and indicators than SIMD 2004. Considerable improvements have also been made to data quality for many existing indicators. The SIMD 2006 now contains seven domains and 37 indicators, compared with the SIMD 2004, which contained six domains and 31 indicators.

The most recent SIMD 2006 indicators are based on mainly 2005 data, for the income and employment domains, two or three year averages up to 2004 or 2005 for the majority of the health and education data, 2001 for housing, 2006 data for the access to services data and 2004 data for the crime data. Unless otherwise stated in the technical notes for each indicator, population denominators were based on the 2004 mid-year data zone population estimates published by the General Register Office for Scotland.

Changes and additions are explained in full in the relevant sections for each domain; however the main changes are briefly described here.

#### 3.1. New Domains

##### 3.1.1. Crime Domain

The Long Term Strategy recommended that the Scottish Executive should work to develop a Crime and Social Order domain including a combination of crime incidence data, fear of crime measures and incidence of social disorder, incivilities and malicious fires. Until 2006, such data were unavailable at the small area level. For the first time, however, geo-referenced crime records are now available from Scotland's eight police forces and this has allowed the inclusion of a crime domain.

The SIMD crime domain contains indicators which provide the rate per 10,000 population for selected crimes of violence, domestic housebreaking, vandalism, drug offences and minor assault. There are no indicators on fear of crime, incivilities or social disorder. Fear of crime data are available from the Scottish Crime and Victimisation Survey, however, the sample size of the survey is insufficient for use at the data zone level. Data on incivilities and social disorder are unavailable at the small area level.

##### 3.1.2. Physical Environment Domain.

The Scottish Executive intended to introduce a new Physical Environment domain in the SIMD 2006. The indicators considered, due to their availability at the data zone level, were: *Air Pollution Concentrations*, *Proximity to Derelict Land* and *Proximity to Scottish Pollutant Release Inventory Sites*. Considerable work has been undertaken to develop and quality assure these three indicators. The physical environment domain, however, will not be included in the SIMD at this time due to conceptual and methodological issues.

Factor analysis of the three indicators showed that, due to a lack of correlation at the data zone level, no two indicators could be combined to create sub-domains. Consequently, a physical environment domain would have to have been based on three individually weighted indicators. In effect, the physical environment domain would have consisted of three sub-domains, each containing just one indicator.

The work to date on these new and improved indicators, however, has been a significant development in both quality and relevance and add real value in their own right. They will be included in SNS in October 2006 if possible. The SE intend to build on this work and seek to



improve the conceptualisation of the physical environment domain in the SIMD and will look to source and develop more suitable indicators for inclusion in the next update to the SIMD.

## **3.2. Overview of changes to existing domains**

### **3.2.1. Current Income**

Since 2003 there have been a series of changes to the benefits and credits systems which have had a major affect on indicators available for the income domain. As a result, some of the indicators used in the SIMD 2006 income domain are different to those used in the SIMD 2004. Further details on each indicator are included in the income domain chapter.

### **3.2.2. Employment**

All indicators in the SIMD 2006 employment domain have remained the same as the 2004 domain. The domain scores and ranks from 2004 and 2006 are, therefore, directly comparable and can be used for analysis of both relative and absolute change over time.

### **3.2.3. Health**

Several improvements have been made to indicators in the health domain and, as such, it is not directly comparable with the health domain from SIMD 2004. Firstly, as explained in the methodology chapter, shrinkage is no longer applied to any of the health indicators.

The second main difference is the change from direct to indirect age-sex standardisation in the Comparative Illness Factor (CIF) and the Comparative Mortality Factor (CMF). Following discussions with the Measuring Deprivation Advisory Group, the decision has also been made to age-sex standardise three other indicators which have a strong link to the age-sex structure of the population. These indicators are Hospital admissions due to alcohol use, Hospital admissions due to drug use and Emergency admissions to hospital.

Finally, in order to update the CIF, which used 2001 Census data in the SIMD 2004, the SIMD 2006 uses data on claimants of health related benefits from the Department for Work and Pensions.

### **3.2.4. Education**

Several improvements have been made to indicators in the education domain and, as such, it is not directly comparable with the SIMD 2004 education domain. Firstly, as explained in the methodology chapter, shrinkage is no longer applied to any of the education indicators. Changes have also been made to each of the individual education indicators and these are described fully in the Education Chapter.

### **3.2.5. Geographic Access**

This domain was previously known as the Geographic Access and Telecommunications domain; however, after extensive consideration of telecommunications data such as broadband coverage, the Scottish Executive has been unable to find a data source that is suitable at the small area level or for being conceptually appropriate for inclusion in the SIMD.

Following discussions with users and the Measuring Deprivation Advisory Group, several improvements have been made to the Geographic Access domain, including revising the list

of services for the drive times and including public transport travel times to selected services where appropriate. The 2006 Geographic Access to Services domain consists of two sub-domains: drive times and public transport times.

### *3.2.6. Housing*

The housing domain remains exactly the same as that in the SIMD 2004, which used 2001 Census data. Suitable housing data to replace Census indicators have not yet been developed. The housing domain has been retained, although it's weighting in the overall SIMD has been reduced. The housing domain is expected to be updated in future indices.

## 4. SIMD DOMAINS AND INDICATORS

### 4.1. Overall SIMD

The procedure for combining the final domains is described only briefly here. A full description of the procedure and all of the techniques involved can be found in the SIMD 2004 technical report (see Annex C).

The overall index is a weighted sum of the seven domain scores. Prior to weighting, the domains are standardised by ranking the scores. The ranks then undergo exponential transformation to avoid high ranks in one domain 'cancelling out' low ranks in another.

#### *Weights applied to each of the domains in the SIMD 2004 and SIMD 2006*

Domain	2004	% of overall weight 2004	2006	% of overall weight 2006
Current Income	6	29	12	28
Employment	6	29	12	28
Health	3	14	6	14
Education	3	14	6	14
Geographic Access	2	10	4	9
Housing	1	5	1	2
SIMD Crime	-	-	2	5

The weighting for each domain or sub domain is based on the robustness of the data, the time lag between data collection and the production of the SIMD and the relative importance of the domain in measuring multiple deprivation. The domain weightings were subject to sensitivity analysis to assess the effects of any changes in weights on the overall index ranks. The domain weights used in the SIMD 2006 are very similar to those used in the SIMD 2004. A proportion of the SIMD 2004 housing domain weight has been allocated to new SIMD 2006 crime domain. This is because the housing domain is based on 2001 Census data which is now out of date, however, the housing domain has been retained at a lower weight in anticipation of improved data sources in the future. The weighting of the new SIMD crime domain was selected after sensitivity analysis of the effect of adding the new domain into the SIMD and reflects data quality and the fact it is previously unpublished small area data.

The following section details each domain, its construction and the methodology and data behind each indicator. Where changes have been made to data sources and methodology, these are detailed in under the relevant domain and indicator in the following sections.

## 4.2. Current Income Domain

<i>SIMD 2006 income indicators</i>	<i>SIMD 2004 income indicators</i>
<i>Number of Adults (aged 16-59) claiming Income Support (Department for Work and Pensions (DWP) April 2005)</i>	<i>Adults in Income Support households (DWP April 2002)</i>
<i>Number of Adults (aged 60 plus) claiming Guaranteed Pension Credit (DWP May 2005)</i>	
<i>Number of Children (aged 0-15) dependent on a claimant of Income Support (DWP April 2005)</i>	<i>Children (aged 0-19) in Income Support households (DWP April 2002)</i>
<i>Number of Adults claiming (all) Job Seekers Allowance (DWP April 2005)</i>	<i>Adults in Income Based Job Seekers Allowance households (DWP August 2001)</i>
<i>Number of Children (aged 0-15) dependent on a claimant of Job Seekers Allowance (all) (DWP April 2005)</i>	<i>Children in (aged 0-19) Income Based Job Seekers Allowance households (DWP August 2001)</i>
	<i>Adults in Working Families Tax Credit Households below a low income threshold (DWP / Inland Revenue (IR) April 2002)</i>
	<i>Children in Working Families Tax Credit Households below a low income threshold (DWP / IR April 2002)</i>
	<i>Adults in Disability Tax Credit households below a low income threshold (DWP / IR April 2002)</i>
	<i>Children in Disability Tax Credit households below a low income threshold (DWP / IR April 2002)</i>

The current income domain is a simple sum of the indicator counts divided by the total population. There is no overlap between the indicators and so the resulting domain score is the percentage of the total population affected by current income deprivation.

Since 2003 there have been a series of changes to the benefits and credits systems which have had a major affect on indicators available for this domain, these changes are summarised below:

- In October 2003 Pension Credits were introduced to replace Income Support for people aged 60 and over (Minimum Income Guarantee). There are two types of pension credits available Guarantee Pension Credit and Savings Pension Credit, the Guaranteed Pension Credit is available to people whose income is below the income threshold, similar to the Minimum Income Guarantee. Consequently just claimants of Guarantee Pension credit have been included in the 2006 income domain. This change will have a positive impact on the number of income deprived people in Scotland as the number of people claiming Guaranteed Pension Credit (GPC) is approximately 20 per cent higher than the number of people who received the Minimum Income Guarantee, this is due to increased eligibility and an increase population aged 60 and over.
- In April 2003 the Disability Tax Credit and Working Families' Tax Credit were replaced by the Working Tax Credit and Child Tax Credit. HM Revenues and Customs are currently unable to provide data at data zone level for either of the new tax credits. Alternative indicators were considered, including the use of historic data, but as the contribution of these indicators to the number of income deprived people is

relatively low it was decided that tax credit related indicators would not be included in the 2006 SIMD.

- As part of the changes to the Tax Credit system child premiums paid to recipients of Income Support and Job Seekers Allowance are now paid through the Child Tax Credit system. Consequently the Department for Work and Pensions (DWP) do not hold complete data on the number of dependents of Income Support and Job Seekers Allowance claimants. To create the indicators used in the 2006 income domain DWP matched claimants of these benefits to their dependents using information from the Child Benefit system. To allow DWP to match the data, claimants of both income based and contributions based Job Seekers Allowance had to be included. Consequently the 2006 income domain includes all Job Seekers Allowance claimants, this will have a small positive impact on the number of income deprived people in Scotland. The age range of dependents was changed from 0 to 19 in the 2004 income domain to 0 to 15 (inclusive) in the 2006 income domain due to inconsistencies in the way dependents aged 16 to 19 are counted.

Despite the differences between the indicators used to construct the 2004 and 2006 income domains the two domains are highly correlated with a Pearson's correlation coefficient of 0.97. This indicates that although the indicators used are not identical the distribution of income deprived people in the two indices is very similar. However, the number of income deprived people within a data zone may be quite different.

Due to the changes to the indicators used, absolute counts of income deprived people from the SIMD 2004 and SIMD 2006 cannot be fairly compared and only change in rank between the SIMD 2004 and SIMD 2006 income domains, which measures relative change, should be examined. It is possible to analyse change over time for some individual indicators used in the 2006 income domain using data available from Scottish Neighbourhood Statistics.

#### 4.2.1. Adults receiving Guarantee Pension Credit

General description of indicator	The number of adults aged 60 and over claiming Guarantee Pension Credit
Indicator type	Count
Time period	May 2005
Data source	DWP
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	The Department for Work and Pensions (DWP), Work and Pensions Longitudinal Study (WPLS) which is a 100% data source that is not subject to any sampling error.
Key decisions on methodology	N/A
Comparison with 2004 indicator	This indicator was not included in the 2004 income domain, because Pension Credits were not available They were introduced in October 2003 to replace the Minimum Income Guarantee (MIG) element of Income Support and it is possible to compare the pension credit indicator against a sub-set of the 2004 indicator 'Adults in Income Support households'.
Implications of comparing this indicator with the one used in SIMD2004	It is possible to compare the 2006 indicator with the number of MIG claimants aged 60 and over. However, it is important to note that eligibility criteria for the two different benefits are slightly different. The actual data used to construct the 2004 income support indicator is not available however similar data is available from Scottish Neighbourhood Statistics.
Other data quality issues	N/A
Disclosure control	The data publicly available has been adjusted using rounding to base 5. Any counts that are shown as zero may have been rounded.
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	Data zone level data are available from Scottish Neighbourhood Statistics ( <a href="http://www.sns.gov.uk">www.sns.gov.uk</a> ) and the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ).

#### 4.2.2. Job Seekers Allowance Claimants

General description of indicator	The number of people claiming Job Seekers Allowance.
Indicator type	Count
Time period	April 2005
Data source	The Department for Work and Pensions (DWP), 100% Sure Start data set.
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	The data were extracted from the Sure Start data set and the domain constructed at DWP. The indicator used to construct the domain is not held by the Scottish Executive
Key decisions on methodology	Data were used from the Sure Start data set rather than the Work and Pension Longitudinal Study to ensure consistency with the number of children dependent on a claimant of Job Seekers Allowance indicator.
Comparison with 2004 indicator	The 2004 Job Seekers Allowance indicator was based on income based Job Seekers Allowance Claimants only. The 2006 indicators is based on all Job Seekers Allowance claimants, this was to ensure consistency with the number of children dependent on a recipient of Job Seekers Allowance indicator.
Implications of comparing this indicator with the one used in SIMD2004	Not comparable with SIMD 2004. The data used to construct the 2004 domain has not been published, therefore, it is not possible to compare the indicators.
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	The data used to construct the domain are not available, however, counts of all Job Seekers Allowance claimants are available at data zones level for May 2005 and August 2001 from the Work and Pensions Longitudinal Study on the Scottish Neighbourhood Statistics ( <a href="http://www.sns.gov.uk">www.sns.gov.uk</a> ) and the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ).

### 4.2.3. Dependents of Job Seekers Allowance Claimants

General description of indicator	The number of children (aged 0-15) dependent on a claimant of Job Seekers Allowance.
Indicator type	Count
Time period	April 2005
Data source	The Department for Work and Pensions (DWP), 100% Sure Start data set and Child Benefit Scan.
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	JSA claimants taken from 100% Sure Start data set and dependents matched from the Child Benefit Scan
Key decisions on methodology	Accurate data on dependents of JSA claimants are no longer available. DWP matched claimants of JSA to Child Benefit claimants to provide a count of dependent children for each claimant. The dependent age range was lowered to 15 as child benefit is only paid out for children aged 16 and over who are in full time further education (or approved training).
Comparison with 2004 indicator	The 2004 indicator was based on dependents aged 0-19 of only Income based Job Seekers Allowance claimants. Data on income based JSA claimants is no longer available, so all dependents of all JSA claimants were used.
Implications of comparing this indicator with the one used in SIMD2004	The two indicators are very different and should not be compared. No dependents data is publicly available at data zone level for either indicator.
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	This indicator is not available at data zone level. A limited amount of data on dependents is available at LA level from the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ). This data is from a different source (the WPLS) to the data used to construct the income domain.



#### 4.2.4. Adults (aged 16-59) receiving Income Support

General description of indicator	The number of people aged 16 to 59 claiming Income Support.
Indicator type	Count
Time period	April 2005
Data source	The Department for Work and Pensions (DWP), 100% Sure Start data set.
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	The data were extracted from the Sure Start data set and the domain constructed at DWP. The indicator used to construct the domain is not held by the Scottish Executive.
Key decisions on methodology	Data were used from the Sure Start data set rather than the Work and Pension Longitudinal Study to ensure consistency with the dependents indicator.
Comparison with 2004 indicator	The 2004 income support indicator included people aged 60 and over receiving the Minimum Income Guarantee, which has been replaced by the Guarantee Pension Credit, which is included in the income domain as a separate indicator.
Implications of comparing this indicator with the one used in SIMD2004	Not comparable with SIMD 2004 indicator. It is possible to compare the SIMD 2006 indicator with a sub-set of the indicator used in the SIMD 2004.
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	The data used to construct the domain are not available, however, counts of income support claimants are available at data zone level for May 2002 and 2005 from the Work and Pensions Longitudinal Study on the Scottish Neighbourhood Statistics ( <a href="http://www.sns.gov.uk">www.sns.gov.uk</a> ) and the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ).

#### 4.2.5. Dependents of Income Support (IS) Claimants

General description of indicator	The number of dependents (aged 0 -15) of claimants of Income Support.
Indicator type	Count
Time period	April 2005
Data source	The Department for Work and Pensions (DWP), 100% Sure Start data set and Child Benefit Scan.
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	Income Support claimants were taken from 100% Sure Start data set and dependents were matched to claimants from the Child Benefit Scan
Key decisions on methodology	Accurate data on dependents of Income Support claimants are no longer available. DWP matched claimants of Income Support to Child Benefit claimants to provide a count of dependent children for each claimant. The dependent age range was lowered to 15 as child benefit is only paid out for children aged 16 and over who are in full time further education.
Comparison with 2004 indicator	The 2004 indicator was based on dependents aged 0-19.
Implications of comparing this indicator with the one used in SIMD2004	No dependents data are publicly available at data zone level for either indicator.
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	This indicator is not available at data zone level. A limited amount of data on dependents are available at LA level from the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ).

### 4.3. Employment Domain

<b>SIMD 2006 employment indicators</b>	<b>SIMD 2004 employment indicators</b>
<i>Working Age Unemployment Claimant Count averaged over 12 months (NOMIS 2005)</i>	<i>Unemployment Claimant Count averaged over 12 months of those men aged under 65 and women aged under 60 (ONS 2002)</i>
<i>Working Age Incapacity Benefit claimants, men aged under 65 and women aged under 60 (DWP August 2005)</i>	<i>Incapacity Benefit recipients, men aged under 65 and women aged under 60 (DWP April 2002)</i>
<i>Working Age Severe Disablement Allowance claimants (August 2005 DWP)</i>	<i>Severe Disablement Allowance recipients, men aged under 65 and women aged under 60 (April 2002 DWP)</i>
<i>Working Age Compulsory New Deal participants — New Deal for the under 25s and New Deal for the 25+ not included in the unemployment claimant count (DWP August 2005).</i>	<i>Compulsory New Deal participants — New Deal for the under 25s and New Deal for the 25+ not included in the unemployment claimant count (DWP April 2002).</i>

The employment domain is a simple sum of the indicator counts divided by the working age population. The working age population includes men aged 16 to 64 (inclusive) and women aged 16 to 59 (inclusive). There is no overlap between the indicators and so the resulting domain score is the percentage of the working age population affected by employment deprivation.

There have been no changes to the indicators used in the employment domain.

**4.3.1. Unemployment Claimant Count averaged over 12 months of those men aged under 65 and women aged under 60 (ONS 2005)**

General description of indicator	The Unemployment Claimant Count records the number of people claiming Jobseekers Allowance (JSA) and National Insurance credits at Jobcentre Plus local offices. This includes working age people only (men 16 to 64 and women 16 to 59). This is not an official measure of unemployment, but is the only indicative statistic available for areas smaller than Local Authorities.
Indicator type	Count
Time period	Jan 2005 – Dec 2005 averaged
Data source	NOMIS (a web-based database of labour market statistics, managed by Durham University on behalf of the Office for National Statistics. <a href="http://www.nomisweb.co.uk">www.nomisweb.co.uk</a> )
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	The data were downloaded from the NOMIS website and then averaged over the 12 month period for each data zone.
Key decisions on methodology	Different methods of calculating an annual claimant count such as using the median value of the 12 months, the maximum value for the 12 months and a truncated average were explored and compared. For consistency with published unemployment claimant count data, the same method was used to calculate the 2006 indicator as was used in 2004.
Comparison with 2004 indicator	The method used is identical to the method used in the 2004, except in the 2004 the data were not publicly available.
Implications of comparing this indicator with the one used in SIMD2004	The data used to construct the 2004 domain have not been published.
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	Monthly data zone level counts are available from NOMIS <a href="http://www.nomisweb.co.uk/">www.nomisweb.co.uk/</a>

**4.3.2. Incapacity Benefit claimants, men aged under 65 and women aged under 60 (DWP August 2005)**

General description of indicator	The number of working age Incapacity Benefit (IB) claimants.
Indicator type	Count
Time period	August 2005
Data source	The Department for Work and Pensions (DWP), Work and Pensions Longitudinal Study (WPLS) which is a 100% data source that is not subject to any sampling error.
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	The data were extracted from the WPLS and the domain was constructed at DWP.
Key decisions on methodology	N/A
Comparison with 2004 indicator	In 2004 the WPLS data were not available. The WPLS is now the preferred source for all DWP benefits data.
Implications of comparing this indicator with the one used in SIMD2004	The equivalent data used to construct the 2004 employment domain are no longer available. However, data for May 2002 are available from the WPLS and can be used to compare.
Other data quality issues	N/A
Disclosure control	For data available publicly all counts have been adjusted using rounding to base 5. Any counts that are shown as zero may not be a real zero. Unprotected data were used to construct the domain.
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	Data zone level data are available from Scottish Neighbourhood Statistics ( <a href="http://www.sns.gov.uk">www.sns.gov.uk</a> ) and the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ).

**4.3.3. Severe Disablement Allowance claimants, men aged under 65 and women aged under 60 (DWP August 2005)**

General description of indicator	The number of working age Severe Disablement Allowance (SDA) claimants.
Indicator type	Count
Time period	August 2005
Data source	The Department for Work and Pensions (DWP), Work and Pensions Longitudinal Study (WPLS) which is a 100% data source that is not subject to any sampling error.
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	The data were extracted from the WPLS and the domain constructed at DWP.
Key decisions on methodology	N/A
Comparison with 2004 indicator	In 2004 the WPLS data were not available, this is now the preferred source for all DWP benefits data.
Implications of comparing this indicator with the one used in SIMD2004	The data used to construct the 2004 domain have not been published.
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	Data are not available for this subset. The total number of SDA claimants aged 16 and over is available at data zone level from Scottish Neighbourhood Statistics ( <a href="http://www.sns.gov.uk">www.sns.gov.uk</a> ) and the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ). Data are available at data zone level for all working age recipients of both incapacity benefits (incapacity benefit or severe disablement allowance) from the above sources.

**4.3.4. Compulsory New Deal participants — New Deal for the under 25s and New Deal for the 25+ not included in the unemployment claimant count (DWP August 2005).**

General description of indicator	Includes a small number of New Deal claimants who are not already counted in the employment domain under the claimant count.
Indicator type	Count
Time period	August 2005
Data source	Department for Work and Pensions (DWP)
Denominator used	N/A
Data source of denominator	N/A
Method of construction of indicator	Data are extracted at an individual level by DWP and used at DWP to construct the overall employment domain.
Key decisions on methodology	N/A
Comparison with 2004 indicator	This indicator is the same indicator as used in the 2004 index.
Implications of comparing this indicator with the one used in SIMD2004	The data used to construct the 2004 and 2006 domain have not been published.
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	Data for this particular subset are not available. Counts of people on the new deal scheme at data zone level are available from the Scottish Neighbourhood Statistics ( <a href="http://www.sns.gov.uk">www.sns.gov.uk</a> ) and the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ).

#### 4.4. Health Domain

<i>SIMD 2006 Health Indicator</i>	<i>2006 Weight</i>	<i>SIMD 2004 Health Indicator</i>	<i>2004 Weight</i>
<i>Standardised Mortality Ratio (ISD, 2001-2004)</i>	0.08	<i>Comparative Mortality Factor (ISD, 1998-2002)</i>	0.09
<i>Hospital Episodes Related to alcohol use (ISD, 2001-2004)</i>	0.14	<i>Hospital Episodes Related to alcohol use (ISD, 1998-2002)</i>	0.22
<i>Hospital Episodes Related to drug use (ISD, 2001-2004)</i>	0.06	<i>Hospital Episodes Related to drug use (ISD, 1998-2002)</i>	0.13
<i>Comparative Illness Factor (DWP, 2005)</i>	0.33	<i>Comparative Illness Factor (2001 Census)</i>	0.25
<i>Emergency admissions to hospital (ISD, 2001-2004)</i>	0.32	<i>Emergency admissions to hospital (ISD, 1998-2002)</i>	0.19
<i>Proportion of population being prescribed drugs for anxiety, depression or psychosis (ISD, 2004)</i>	0.05	<i>Proportion of population being prescribed drugs for anxiety, depression or psychosis (ISD, 2002)</i>	0.07
<i>Proportion of live singleton births of low birth weight (ISD, 2001-2004)</i>	0.02	<i>Proportion of live singleton births of low birth weight (ISD, 1998-2002)</i>	0.05

The 2006 health domain was constructed using the same methodology as the 2004 health domain apart from the exceptions listed below. Indicators were ranked, transformed to a normal distribution and then combined using weights generated by factor analysis. The derived weights are shown in the table above.

It is important to note that, although the list of indicators remains unchanged, due to improvements in data and methodology, the SIMD 2004 and SIMD 2006 health domains and indicators are not directly comparable. Specific differences are noted in the technical notes for each indicator below, but the main differences are:

- shrinkage is no longer applied to any of the health indicators following a recommendation from Glasgow University (see methodology chapter)
- a change from direct to indirect age-sex standardisation in the Comparative Illness Factor (CIF) and the Comparative Mortality Factor (CMF).
- the CMF has been renamed as the Standard Mortality Ratio, which is a more commonly used term. The underlying data remain unchanged.
- Indirect age-sex standardisation of three previously un-standardised indicators. These indicators are Hospital admissions due to alcohol use, Hospital admissions due to drug use and Emergency admissions to hospital. This change was implemented following advice from the Measuring Deprivation Advisory Group and NHS Scotland's Information Services Division. The distribution of these three indicators has a strong link to the age-sex structure of the population.
- the CIF, which used 2001 Census data in the SIMD 2004, has been updated in the SIMD 2006 and is now based on 2005 data on claimants of health related benefits from the Department for Work and Pensions.



#### 4.4.1. Standardised Mortality Ratio (ISD, 2001-2004)

General description of indicator	Indirectly standardised ratio of deaths registered from all causes between 2001 and 2004. Data standardised by 5 year age band and sex.
Indicator type	Indirectly standardised ratio: four year period
Time period	2001-2004
Data source	General Register Office for Scotland
Denominator used	Expected Events (calculated from indirect standardisation)
Data source of denominator	General Register Office for Scotland 2004 mid-year population estimates, GROS mortality information
Method of construction of indicator	Observed all cause deaths per data zone were divided by expected all cause deaths per data zone (summary over sex and 5-year age band). For calculation method of the observed and expected frequencies, please see methodology section.
Key decisions on methodology	The Comparative Mortality Factor, used in SIMD 2004, was replaced with an indirectly standardised ratio in SIMD06 and renamed the Standardised Mortality Ratio for consistency with indicators used by Health professionals. No shrinkage was applied to 2006 indicator.
Comparison with 2004 indicator	There is evidence of correlation between SIMD06 ratios and SIMD04 rates (Pearson correlation of 0.68). Comparison of 15% most deprived data zones by council area and urban rural areas show similar trends between the two SIMD indicators.
Implications of comparing this indicator with the one used in SIMD2004	Not directly comparable. Directly standardised rates with shrinkage were used in 2004 compared with indirectly standardised ratios without shrinkage in 2006. General trends may be compared with caution.
Other data quality issues	N/A
Disclosure control	No
Geo-referencing	All postcodes are validated at source. Data excludes people where no match to a data zone was possible e.g. homeless, incomplete postcode information.
Availability of data	Not published elsewhere at this geography level

#### 4.4.2. Hospital Episodes Related to alcohol use (ISD, 2001-2004)

General description of indicator	Indirectly standardised ratio of observed to expected admissions to acute and psychiatric hospitals in Scotland with a diagnosis of alcohol related conditions both sexes, all ages. Excludes discharges relating to transfers within hospital and to other hospitals. The year shown refers to the year of discharge from hospital.
Indicator type	Indirectly standardised ratio: four year period
Time period	2001-2004
Data source	NHS Scotland Information Services Directorate (ISD), Scottish Morbidity Record (SMR)01
Denominator used	Expected Events – calculated by indirect standardisation (see methodology chapter)
Data source of denominator	SMR01 and General Register Office for Scotland
Method of construction of indicator	Observed episodes related to alcohol use per data zone were divided by expected episodes related to alcohol use per data zone (by sex and 5 year age band). For calculation method of the observed and expected frequencies, please see methodology section. Alcohol related conditions are defined using the <i>International Classification of Diseases Volume 10 (World Health Organisation)</i> (F10, R780, Y90, Y91, Z637, Z811, Z864, Z714, Z502, T506, Y573, T510, T519, X45, X65, Y15, O354, Q860, P043, Z721, Z133, G621, G721, K860, I426, K70, K292, G312 & E52).
Key decisions on methodology	The indicator was changed from crude rate to indirectly standardised ratio based on recommendations from ISD and the University of Glasgow (see methodology section for further information). No shrinkage applied to 2006 indicator. SMR04 data were not included in SIMD06 indicator due to data completeness issues.
Comparison with 2004 indicator	There is good correlation between SIMD06 and SIMD04 (Pearson correlation of 0.87) Comparison of 15% most deprived data zones by council area and urban rural indicator shows similar trends between SIMD04 indicator and SIMD06 indicator.
Implications of comparing this indicator with the one used in SIMD2004	Not directly comparable, crude rates (04) with shrinkage applied compared to indirectly standardised ratios. Although general trends may be compared with caution.
Other data quality issues	There were 36 data zones for which there were no hospital admissions related to alcohol misuse and therefore the rates and ranks will be identical in these cases. Caution is necessary when interpreting these figures. The recording of alcohol use may vary from hospital to hospital. Where alcohol use is suspected but unconfirmed it may not be recorded by the hospital.
Disclosure control	No
Geo-referencing	All postcodes are validated at source. Data excludes people where no match to a data zone was possible e.g. homeless, incomplete postcode information.
Availability of data	Not currently available for this time period (or using this standardisation technique)

#### 4.4.3. Hospital episodes related to drug use (ISD, 2001-2004)

General description of indicator	Indirectly standardised ratio of observed to expected admissions to acute and psychiatric hospitals in Scotland with a diagnosis of drugs misuse conditions (based on all 6 diagnoses) both sexes, all ages. Excludes discharges relating to transfers within hospital and to other hospitals. The year shown refers to the year of discharge from hospital.
Indicator type	Ratio
Time period	2001-2004
Data source	ISD, Scottish Morbidity Record (SMR)01
Denominator used	Expected events - calculated during the age-sex standardisation (see methodology chapter for further details)
Data source of denominator	SMR01 and GROS mid year estimates
Method of construction of indicator	Observed episodes relating to drugs misuse per data zone were divided by expected episodes relating to drugs misuse per data zone summary over sex and 5 year age band. For calculation method of the observed and expected frequencies, please see methodology section.... Drug related conditions are defined using the International Classification of Diseases Volume 10 (F11, F12, F13, F14, F15, F16, F18 and F19).
Key decisions on methodology	Decision to change from crude rate to indirectly standardised ratio. No shrinkage applied to 2006 indicator. SMR04 not included in SIMD06 indicator due to data completeness issues.
Comparison with 2004 indicator	There is good correlation between SIMD06 rates and SIMD04 rates (Pearson correlation of 0.80) Comparison of 15% most deprived data zones by council area and urban rural indicator shows similar trends between SIMD04 indicator and SIMD06 indicator.
Implications of comparing this indicator with the one used in SIMD2004	Not directly comparable as the SIMD 2004 used crude rates with shrinkage applied while the 2006 indicator is an indirectly standardised ratio without shrinkage (see methodology chapter). General trends may be compared with caution. As shrinkage was not applied to this indicator, there were 1,762 data zones for which there were no hospital episodes related to drug use and therefore the ratios and ranks will be identical in these cases.
Other data quality issues	Caution is necessary when interpreting these figures. The recording of drug misuse may vary from hospital to hospital. Where drug misuse is suspected but unconfirmed it may not be recorded by the hospital. Further, where drug misuse is recorded, it may not be possible to identify which drugs were involved.
Disclosure control	No
Geo-referencing	All postcodes are validated at source. Data excludes people where no match to a data zone was possible e.g. homeless, incomplete postcode information.
Availability of data	Not currently available for this time period (or using this standardisation technique)

#### 4.4.4. Comparative Illness Factor (DWP, 2005)

General description of indicator	The CIF is a combined count of recipients of the following benefits: Disability Living Allowance (DLA); Attendance Allowance (AA); Incapacity Benefit (IB) (not also receiving DLA); and Severe Disablement Allowance (SDA).
Indicator type	Ratio
Time period	August 2005
Data source	Department for Work and Pensions (DWP), Work and Pensions Longitudinal Study (WPLS).
Denominator used	Expected frequency of claiming the selected benefits, calculated during age-sex standardisation (see methodology chapter for details)
Data source of denominator	GRO(S) Small Area Population Estimates 2004, DWP and WPLS
Method of construction of indicator	The observed number of benefit recipients was divided by the expected number for each data zone to provide a ratio. For further details of the standardisation method see the general methodology chapter.
Key decisions on methodology	The 2004 indicator was based on the 2001 Census. In order to provide more recent data, a new source was identified and claimants of health related benefits used. For SIMD 2006, following recommendations from Glasgow University, shrinkage is no longer used for this indicator and the standardisation method has been changed from direct to indirect standardisation. This change is detailed in the general methodology chapter.
Comparison with 2004 indicator	The 2004 indicator is based on 2001 Census data on limiting long term illness and general health. It is possible to compare the two indicators however it is important to remember the different sources. Census data is based on a persons judgement of their health.
Implications of comparing this indicator with the one used in SIMD2004	There is a strong relationship between the two data types. The correlation coefficient between 2001 DWP data and 2001 Census data is 0.92 (based on un-standardised data).
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	See annex for explanation of geo-referencing of DWP data.
Availability of data	Combined counts are available on SNS and individual benefits data are available from the DWP tabulation tool ( <a href="http://www.dwp.gov.uk/asd/tabtool.asp">www.dwp.gov.uk/asd/tabtool.asp</a> ).

#### 4.4.5. Emergency admissions to hospital (ISD, 2001-2004)

General description of indicator	Indirectly standardised ratio of observed to expected emergency admissions to non-psychiatric/non-obstetric hospitals in Scotland, both sexes and all ages. Information presented is for patients treated as inpatients or day cases only. Excludes discharges relating to transfers within hospital and to other hospitals. The year shown refers to the year of discharge from hospital.
Indicator type	Ratio
Time period	2001-2004
Data source	ISD, Scottish Morbidity Record (SMR)01
Denominator used	Expected Events
Data source of denominator	SMR01 and GROS mid year population estimates
Method of construction of indicator	Observed emergency admissions per data zone were divided by expected emergency admissions per data zone (summary over sex and 5 year age band). For calculation method of the observed and expected frequencies, please see methodology section.
Key decisions on methodology	Decision to change from crude rates to (indirectly) standardised ratio. No shrinkage applied to 2006 indicator
Comparison with 2004 indicator	There is a good correlation between the SIMD04 and SIMD06 indicators (Pearson correlation of 0.86). Comparison of 15% most deprived data zones by council area and urban-rural areas show similar trends between the two SIMD indicators.
Implications of comparing this indicator with the one used in SIMD2004	Not directly comparable. In SIMD 2004, crude rates with shrinkage applied were used as opposed to the indirectly standardised ratios used in SIMD 2006. General trends may be compared with caution.
Other data quality issues	
Disclosure control	No
Geo-referencing	All postcodes are validated at source. Data excludes people where no match to a data zone was possible e.g. homeless, incomplete postcode information.
Availability of data	Not currently available for this time period (or using this standardisation technique)

**4.4.6. Proportion of population being prescribed drugs for anxiety, depression or psychosis (ISD, 2004)**

General description of indicator	This indicator is the estimated proportion of patients being prescribed anxiolytic, antipsychotic or antidepressant drugs in 2004 (drugs for anxiety, depression or psychosis defined from BNF 4.1.2 (Anxiolytics), BNF 4.2 (Antipsychotics) and BNF 4.3 (Antidepressants)). This information is derived from prescriptions data at practice level (by patient postcode) and Community Health Index (CHI) populations.
Indicator type	Proportion
Time period	2004
Data source	ISD General Practitioner Prescription data, CHI extract
Denominator used	Data zone population (estimated from the CHI extract)
Data source of denominator	CHI extract and GP Prescription data
Method of construction of indicator	<p>The Prescribing Team within ISD maintains a detailed database of all NHS prescriptions dispensed in the community in Scotland. The information is supplied to ISD by Practitioner Services Division (PSD) who are responsible for the processing and pricing of all prescriptions dispensed in Scotland. Anxiolytic, antipsychotic and antidepressant drugs can be identified through the British National Formulary (BNF) Codes:</p> <p>BNF 4.1.2 is Anxiolytics          BNF 4.2 is Antipsychotics          BNF 4.3 is Antidepressants</p> <p>An average daily quantity (Defined Daily Doses - a World Health Organisation standard) for each drug was used to calculate, from the weight of the total prescriptions, an average count of people being prescribed any one of these drugs. The one year of data was treated as a sample from time. If, for example, a person was given a daily prescription by their GP they should appear 365 times within the year. Each prescription would therefore be counted as 1/365 of a person. By summing the whole year one person would be counted.</p> <p>In this way the number of patients being prescribed anxiolytic, antipsychotic or antidepressant drugs for each practice can be calculated along with the rate. The number of patients in each data zone being prescribed anxiolytic, antipsychotic or antidepressant drugs can be estimated using the practice rates and the population of each practice living in each data zone. The source for this data is an extract from the CHI. The final indicator is calculated by summing the estimated number of patients being prescribed the various drugs and presenting this as a proportion of the data zone population estimated from the CHI extract.</p>
Key decisions on methodology	Shrinkage was applied to the 2004 indicator, whereas no shrinkage applied to 2006 indicator.
Comparison with 2004 indicator	There is evidence of some correlation between SIMD06 rates and SIMD04 rates (Pearson correlation of 0.61) Comparison of 15% most deprived data zones by council area show similar trends between the two SIMD indicators,

	<p>although in Scottish Borders the number of deprived data zones has decreased (from 25 to 2), in Clackmannanshire the number has also decreased (from 34 to 9) and in Inverclyde there is an increase (from 22 to 82)</p> <p>Comparison of 15% most deprived data zones by urban-rural indicator show similar trends between the two SIMD indicators</p>
Implications of comparing this indicator with the one used in SIMD2004	Caution should be exercised when comparing the 2004 and 2006 indicators as shrinkage was not applied to the 2006 indicator.
Other data quality issues	N/A
Disclosure control	N/A
Geo-referencing	All postcodes are validated at source. Data excludes people where no match to a data zone was possible e.g. homeless, incomplete postcode information.
Availability of data	This data is not published.

**4.4.7. Proportion of live singleton births of low birth weight (<2,500g)(ISD, 2001-2004)**

General description of indicator	Proportion of live singleton births of low birth weight (Low birth weight is defined as a birth weight of less than 2,500 grams), where birth figures exclude home births and births at non-NHS hospitals and a singleton is a baby from a pregnancy resulting in only one live or still birth. The year shown refers to the year of discharge from hospital
Indicator type	Proportion
Time period	2001-2004 (four year average)
Data source	ISD SMR02
Denominator used	All live singleton births
Data source of denominator	SMR02
Method of construction of indicator	Low birth weight singleton live births per data zone / singleton live births per data zone.
Key decisions on methodology	No shrinkage applied to 2006 indicator
Comparison with 2004 indicator	There is poor correlation between SIMD06 rates and SIMD04 rates (Pearson correlation of 0.42) Comparison of 15% most deprived data zones by council area show similar trends between the two SIMD indicators, although in both North Lanarkshire and Glasgow City the number of deprived data zones has decreased (in Glasgow City from 229 (24%) to 158 (16%) and in North Lanarkshire from 74 (8%) to 50 (5%)). Comparison of 15% most deprived data zones by urban-rural indicator show similar trends between the two SIMD indicators although there are marginal changes in large urban areas. Poor correlation could be the effect of small numbers over small-level geography. Stronger correlations are indicated at higher geography levels (i.e. intermediate geography and council areas).
Implications of comparing this indicator with the one used in SIMD 2004	Some comparison can be made, although shrinkage was not applied to this latest indicator so caution should be exercised. There were 1,657 data zones for which there were no low birth weight births, and therefore the proportions and ranks (SIMD06) will be identical in these cases.
Other data quality issues	N/A
Disclosure control	No
Geo-referencing	All postcodes are validated at source. Data excludes births where no match to a data zone was possible e.g. homeless, incomplete postcode information.
Availability of data	Data is not publicly available at data zone level for this time period.



#### 4.5. Education Skills and Training Domain

<i>SIMD 2006 Education Indicator</i>	<i>2006 Weight</i>	<i>SIMD 2004 Education Indicator</i>	<i>2004 Weight</i>
<i>School pupil absences (2003/4-2004/5)</i>	<i>0.21</i>	<i>Secondary level absences (2001/2)</i>	<i>0.05</i>
<i>Pupil performance on SQA at stage 4 (2002/3-2004/5)</i>	<i>0.31</i>	<i>Pupil Performance on SQA at Stage 4 (2001/2)</i>	<i>0.21</i>
<i>Working age people with no qualifications (2001 Census)</i>	<i>0.24</i>	<i>Working age adults with no qualifications (2001 Census)</i>	<i>0.34</i>
<i>17-21 year olds enrolling into higher education (HESA (2002/3-2004/5)</i>	<i>0.16</i>	<i>Proportion of the 17+ population not applying successfully to HE (UCAS 2000-2002)</i>	<i>0.32</i>
<i>People aged 16-18 not in full time education (DWP 2005, HESA 2004/5)</i>	<i>0.07</i>	<i>Pupils age 16+ not in full time education (DWP 2002)</i>	<i>0.08</i>

The 2006 education domain was constructed using the same methodology as the 2004 education domain apart from the exceptions listed below. Indicators were ranked, transformed to a normal distribution and then combined using weights generated by factor analysis. The derived weights are shown in the table above.

Several improvements have been made to the data and methodology and, as a result, the SIMD 2004 and SIMD 2006 education domains and indicators are not directly comparable. Specific differences are noted in the technical notes for each indicator below, but the main differences are:

##### *Shrinkage*

None of the education indicators now undergo shrinkage, based on a recommendation by Glasgow University (see methodology chapter)

##### *Absence rates*

The SIMD 2004 included attendance rates for secondary schools only. The Long Term Strategy recommended that we improve the indicator on absence rates by taking advantage of new pupil-level data on this area when it became available. Attendance rates at the pupil level are now available through ScotXed for secondary, primary and special schools and, for completeness, all three types of school are now included. The methodology has also improved as ScotXed is now able to provide attendance data by data zone, rather than the method used previously of producing a weighted average of the school attendance rates.

##### *Secondary performance at SQA stage 4*

The SIMD 2004 used data averaged over a number of years, because the very small number of S4 pupils per data zone per year meant that unusual individual scores could have a disproportionate influence on the final rankings. At that time, there were only two years of data available and these were both included. The Long Term Strategy recommended that we use three years of data if possible and we now have access to three years of this information. Averaging over the latest three years does blur some of the trends over time; however, the recommendation of the Education Department Analytical Services Division is that this disadvantage is out-weighed by the extra information that can be gained by including these additional pupils. In SIMD 2006 indicator has, therefore, been based on a three year average for 2002/3, 2003/4 and 2004/5. Minor adjustments have also been made to the way in which independent and special school pupils are included. These changes are explained more fully in the technical note for this indicator.

### *Working age adults without qualifications*

It has not been possible to update this indicator as the Census remains the most comprehensive source of data at the small area level on lack of qualifications. The Labour Force Survey also provides information on qualifications, however, due to small sample sizes, it is not possible to use this source in the SIMD. In the absence of a suitable alternative, this indicator continues to use the same Census data that was used in the SIMD 2004. Following recommendations from Glasgow University, shrinkage is no longer used for this indicator and the standardisation method has been changed from direct to indirect standardisation. This change is detailed in the methodology chapter.

### *Higher education*

This indicator now contains data for entrants to higher education from the Higher Education Statistics Agency (HESA) rather than applications to higher education from the Universities and Colleges Admissions Service (UCAS), which were used in SIMD 2006. Following a comparison of the two data sets by the Analytical Services Division in ETLLD, the change to HESA data has been recommended for the following reasons:

- Coverage is more complete, for example some nursing, computing, business studies, social and creative arts students do not apply through UCAS.
- The additional number of 17–21 year olds that are included by the HESA data gives more accurate and credible results that enable more informed decisions to be made.
- Data relate to actual entry and so measure more directly the dimension in question – some UCAS applicants may defer or change their mind.
- Successful application to UCAS is a function of school exams, course choice, and wish to study. Actual entry takes this another step further. Pupil performance is already covered in another indicator. It can be argued that actual entry would provide a new dimension of the education domain in a clearer way than successful application.

### *School leavers not in full time education*

The indicator used in the 2004 domain did not take into account people aged 17 and 18 who were in non-compulsory full time education, i.e. university. The indicator used in the 2006 domain takes this into account.

#### 4.5.1. School pupil absences (2003/4-2004/5)

General description of indicator	This indicator provides the average absence rate of pupils who attend publicly funded primary, secondary and special schools, for each data zone in Scotland.
Indicator type	Percentage of half days absence over a two year period
Time period	School years 2003/04 and 2004/05
Data source	Attendance returns.
Denominator used	Number of half days possible attendance
Data source of denominator	Attendance returns.
Method of construction of indicator	Individual level data zone information was obtained for each pupil in Scotland through the pupil census. This data was linked with attendance data received at the end of the year. The average attendance rate was calculated for each data zone. Data is aggregated over two years, with the intention of reducing the impact of fluctuations from one year to the next due to a small number of pupils per data zone.
Key decisions on methodology	The main difference from the 2004 indicator is that absence data has not undergone shrinkage and is now available for pupils by data zone. Previously school level absence rates had been attributed to data zones as a weighted average using the distribution of pupils. Using actual data makes the data much more reliable. It was decided to aggregate over two years to stabilise the data, there being only two years of data available. Primary and special school pupils were included in SIMD2006. The inclusion of special schools negates any affect of differential approaches to mainstreaming in different areas.
Comparison with 2004 indicator	The 2004 and 2006 indicators are not comparable. See above.
Implications of comparing this indicator with the one used in SIMD2004	See above. Methodological improvements will have a considerable affect, and hence comparisons are not recommended.
Other data quality issues	N/A
Disclosure control	Disclosure control has been applied to the data published on the SIMD website by swapping the data zones for a small percentage of records before producing the aggregate results. This has a negligible effect on the overall trends, but ensures that the confidentiality of individual records are maintained. Unadjusted data were used in the calculation of the SIMD.
Geo-referencing	Pupil home post code is one of the indicators collected for each pupil in the annual school census. Postcodes were submitted for about 99% of pupils in publicly funded schools. Data used in the formulation of this indicator do not include pupils with a missing or invalid postcode.
Availability of data	National data is published in SEED annual statistical publication <a href="http://www.scotland.gov.uk/Publications/2005/12/0681732/17347">http://www.scotland.gov.uk/Publications/2005/12/0681732/17347</a> and at school level <a href="http://www.scotland.gov.uk/stats/aasc.xls">http://www.scotland.gov.uk/stats/aasc.xls</a>

#### 4.5.2. Pupil performance at SQA Stage 4 (2002/3-2004/5)

General description of indicator	This indicator provides the average tariff score of S4 pupils who attend publicly funded secondary schools, for each data zone in Scotland. S4 pupils would be expected sit Standard Grade or equivalent exams.
Indicator type	Average score (three year average)
Time period	School years 2002/03 to 2004/05
Data source	Attainment data from Scottish Qualifications Authority (SQA), pupil numbers from the school census.
Denominator used	Total number of pupils in S4, as at September each year.
Data source of denominator	School census.
Method of construction of indicator	Individual level data zone information was obtained for S4 pupils in Scotland. These data were linked with attainment data from the SQA using the Scottish candidate number to obtain a total tariff score per pupil. The total scores were averaged for each data zone to create average tariff scores. Data are aggregated over three years, with the intention of reduce the impact of fluctuations from one year to the next due to a small number of pupils per data zone.
Key decisions on methodology	<p>The main changes to this indicator are that it no longer undergoes shrinkage and the decision to aggregate over three years rather than two to further stabilise the data. This was the preferred approach in 2004, but only two years worth of data were available at that time. In 2004, the attainment results of special school pupils were retained in the numerator but not in the denominator. This affects the tariff scores for a small number of data zones. This year a slight improvement to the methodology was made to ensure consistency and instead of including attainment of all pupils, the selection was limited to 15 year olds (equivalent age to S4) and all 15 year old pupils in special schools were included in the denominator.</p> <p>A change has also been made to the methodology regarding pupils in independent schools. There are two shortcomings with the data held for this sector. Firstly, a number of independent schools present pupils for English certificated course rather than SQA courses. Data on the attainment gained via this alternative provision is not collected by the Scottish Executive. In addition, school census information for this sector is not collected at a pupil level, making it impossible to determine population sizes at a data zone level (data zone information for pupil attainment is available from the SQA registration information. In 2004 the following methodology was used:</p> <ul style="list-style-type: none"> <li>• Independent schools with no or very few pupils taking SQA exams were excluded from the analysis;</li> <li>• Independent schools which had high take up rates of SQA but low results were excluded;</li> <li>• In the retained cases, no account was taken of non-exam pupils in independent schools.</li> </ul> <p>In 2006, a more detailed investigation of the data zones for these pupils (as derived from the SQA data) identified that a</p>

	number of schools enter the post code of the school on the registration information, rather than the home post code of the pupil. This information, combined with the fact that no population data is available at data zone level, led to the decision to exclude information relating to this sector from the analysis entirely.
Comparison with 2004 indicator	The 2004 and 2006 indicators are not strictly comparable due to changes in methodology outlined above. The rankings of the 2006 indicator were compared to those from the 2004 indicator, however, and the resulting correlation is high (0.81).
Implications of comparing this indicator with the one used in SIMD2004	As explained above, there have been some slight methodological changes to the indicator and these should be borne in mind when comparisons are being made between the two sets of data. However, the changes impact on a relatively small proportion of pupils and as such the overall effect is thought to be minimal.
Other data quality issues	N/A
Disclosure control	Disclosure control has been applied to the data published on the SIMD website by swapping the data zones for a small percentage of records before producing the aggregate results. This has a negligible effect on the overall trends, but ensures that the confidentiality of individual records are maintained. Unadjusted data were used in the calculation of the SIMD.
Geo-referencing	Pupil home post code is one of the indicators collected for each pupil in the annual school census. Valid postcodes were submitted for about 99% of S4 pupils in publicly funded secondary schools. Data used in the formulation of this indicator do not include pupils with a missing or invalid postcode.
Availability of data	National data is published in Scottish Executive Education Department (SEED) annual statistical publication <a href="http://www.scotland.gov.uk/Publications/2006/03/09080409">http://www.scotland.gov.uk/Publications/2006/03/09080409</a>

### 4.5.3. Working age adults with no qualifications (2001 Census)

General description of indicator	The indicator shows the proportion of working age adults (males aged 25-64 and females aged 25-59) that claimed in the 2001 Census not to have any of the qualifications listed on the form.
Indicator type	Ratio (indirectly standardised)
Time period	2001
Data source	General Register Office for Scotland, 2001 Census
Denominator used	Expected number of people with no qualifications (calculated during indirect age-sex standardisation)
Data source of denominator	General Register Office for Scotland, 2001 Census
Method of construction of indicator	The observed number of people with no qualifications was divided by the expected number for each data zone to provide a ratio. For further details if the standardisation method see the general methodology chapter.
Key decisions on methodology	<p>The official source for data on the proportion of people with no qualifications is the Labour Force Survey (LFS). As the LFS is a survey, reliable data are not available at data zone level. For this reason the only viable source for this indicator at data zone level is the 2001 Census. Using the 2001 Census data does not take into account the changes in the proportion of people with no qualifications which national data indicates. However by investigating trend data at a Local Authority level we see that the proportion with no qualifications had reduced in all but one LA. Although the data showed the change had happened at different rates for each LA it is uncertain whether these different rates are significant as they are based on a relatively small sample sizes. The Scottish Executive has decided, therefore, to continue to use 2001 Census data in the education domain as this indicator is a key measure for this domain. Although there are some concerns that there may have been differing shifts in this indicator for different geographies the evidence is not strong enough to justify removing the indicator.</p> <p>For SIMD 2006, following recommendations from Glasgow University, shrinkage is no longer used for this indicator and the standardisation method has been changed from direct to indirect standardisation. This change is detailed in the general methodology chapter.</p>
Comparison with 2004 indicator	The 2004 and 2006 indicators are highly correlated (Pearson Correlation Coefficient = 0.99) as they use the same data, however, they are not exactly comparable due to the change in the standardisation method and no shrinkage.
Implications of comparing this indicator with the one used in SIMD2004	Although the data are the same, caution should be taken when comparing the indicators due to the change in methodology.
Other data quality issues	
Disclosure control	There has been no disclosure control applied to this indicator
Geo-referencing	No geo-referencing issues
Availability of data	Data are published by GROS and a directly standardised version is available in the SIMD 2004 background data.

#### 4.5.4. *Proportion of 17-21 year olds not entering in to full time higher education (HESA 2002/3 to 2004/5)*

General description of indicator	The indicator considers the number of 17-21 entrants to first degree courses domiciled before the start of their course in each data zone and the total number of 17-21 year olds resident in the data zone over the same period. This allows the percentage of 17-21 year olds who enrolled on a first degree course to be established for each data zone.
Indicator type	Percentage (over a three years)
Time period	2002-03 to 2004-05
Data source	Higher Education Statistics Agency (HESA), Scottish Further Education Funding Council (SFEFC), now Scottish Funding Council (SFC)
Denominator used	Small Area Population Estimates of 17-21 year olds, adjusted to account for large student populations (see methodology)
Data source of denominator	General Register Office for Scotland
Method of construction of indicator	The number of 17-21 year olds who entered a first degree programme between 2002-03 and 2004-05 from each data zone was divided by the total population estimate of 17-21 year olds in the data zone in the same time period. This gives a percentage of 17-21 year olds in each data zone that entered a first degree course.
Key decisions on methodology	Actual enrolments to first degree courses using data supplied to HESA was used as the numerator for SIMD 2006. The SIMD 2004 used UCAS acceptances. However not all acceptances result in study and only about 85% of full time degree students and none of the part-time students have entered through UCAS. Study at degree level has been chosen as this level provides the highest gains in future earning potential and reduces double counting of students that progress from HND to degree.
Comparison with 2004 indicator	2006 indicator corresponds to actual participation in degree level study whereas 2004 indicator corresponded to UCAS acceptances to Higher Education level study.
Implications of comparing this indicator with the one used in SIMD2004	It is not possible to directly compare the 2006 indicator with the SIMD 2004 higher education indicator as they are defining different things. SIMD 2004 refers to applications whereas SIMD 2006 refers to actual enrolments. If the 2006 methodology was used for SIMD 2004 then there would have been a considerable difference in the rankings of each data zone for this indicator. For example, if the 2006 methodology is applied 3502 of the data zone's rankings would lie in a different decile to that obtained using the 2004 methodology.
Other data quality issues	The count of students relates to home address before study, the denominator population includes students at their term-time address which affects a small number of data zones, eg. those containing student halls. These data zones were adjusted to take account of large numbers of 17-21 year olds.
Disclosure control	Data can be modelled using exact counts but rounded to the nearest 5 when reporting counts
Geo-referencing	Not every postcode could be matched. 99% of Scottish records had a valid postcode.
Availability of data	Not available elsewhere.

#### 4.5.5. People aged 16-18 not in full time education (DWP 2005 / HESA 2004/5)

General description of indicator	The indicator shows the proportion of 16, 17 and 18 year olds who are not in full-time education.
Indicator type	Percentage
Time period	2004-05
Data source	Higher Education Statistics Agency (HESA), Department of Work and Pensions (DWP, Child Benefit Scan.
Denominator used	Small Area Population Estimates of 16-19 year olds, adjusted to account for large student populations (see page 5 for more information).
Data source of denominator	General Register Office for Scotland
Method of construction of indicator	The number of enrolments to full time higher education was added to the number of children aged 16-19 for whom child benefit is received; this gave a total number of 16-19 years olds in full time education. This figure was then subtracted from the adjusted population counts at data zone level to calculate the number of people 'not' in full time education. The adjusted population was then used to calculate a rate.
Key decisions on methodology	<p>It was identified that the indicator used in the 2004 domain only included people in non-advanced full-time education i.e. studying higher. This is because child benefit is only available to carers of people aged 16 and over who are in full time further education. Consequently the 2004 indicator was counting people who were in full time higher education (such as degrees and HND course) as not in education. To correct this data on the number of full time enrolments was added to the child benefit data to calculate the number of people in full time education.</p> <p>In line with recommendations, Shrinkage was not used on the data (see methodology chapter)</p>
Comparison with 2004 indicator	The 2006 indicator counts people in full time higher and non-advanced education as in full time education whereas the 2004 indicator only counts people in full time non-advanced education as in full-time education.
Implications of comparing this indicator with the one used in SIMD2004	It is not possible to directly compare the 2006 indicator with the SIMD 2004 higher education indicator as the two indicators are defining different things.
Other data quality issues	The count of students relates to home address before study, the denominator population includes students at their term-time address; this affected a small number of data zones, for example those containing student halls. Affected data zones were adjusted to take account of large numbers of 17-19 year olds.
Disclosure control	Not published in background data due to disclosure issues due to similar data already available in the public domain.
Geo-referencing	See annex for explanation of geo-referencing of DWP data. For HESA data not every postcode could be matched. 99% of Scottish records had a valid postcode.
Availability of data	This indicator is not available. Child benefit data is available at data zone level through the Scottish Neighbourhood Statistics website.



#### 4.6. Geographic Access Domain

2006 Indicator		2006 Weight	2004 Indicator		2004 Weight
<b>Drive time sub-domain. Weight in Access domain =0.75</b>	Drive time to a GP	0.21	Drive time to a GP	0.26	
	Drive time to a Petrol Station	0.13	Drive time to a Petrol Station	0.14	
	Drive time to a Post Office	0.13	Drive time to a Post Office	0.22	
	Drive time to a Shopping facilities	0.27	Drive time to a Primary School	0.17	
	Drive time to a Primary School	0.12	Drive time to a Supermarket	0.21	
	Drive time to a Secondary School	0.14			
<i>Total: 1.00</i>					
<b>Public transport sub-domain. Weight in Access domain =0.25</b>	Public transport time to a GP	0.56			
	Public transport time to a Post Office	0.25			
	Public transport time to Shopping Facilities	0.19			
<i>Total: 1.00</i>					

The 2006 access domain was constructed using a similar methodology as the 2004 access domain, except that there are two sub-domains rather than one domain. Each sub-domain was created independently and then the two sub-domains were combined to create the access domain. To create the sub-domains the indicators for were ranked, transformed to a normal distribution and then combined using weights generated by factor analysis. The derived weights are shown in the table above. The two sub-domains were combined by transforming the sub-domain scores to an exponential distribution and then creating an access domain score using 0.75 of the drive-time sub domain transformed score and 0.25 of public transport sub-domain transformed scores. These new scores were then ranked. The drive time sub-domain scores received a higher weight in the overall access domain because the data is more robust and consistent across Scotland and the domain takes into account access to 6 services whereas the public transport sub-domain only takes into account 3 different services. It was not possible include public transport times to primary and secondary schools as there is not consistent time table information available on school buses.

Several improvements have been made to the data and methodology and, as a result, the SIMD 2004 and SIMD 2006 access domains and indicators are not directly comparable. The key difference is that public transport travel time data has been included but specific differences are noted in the technical notes for each indicator below, but the main differences are:

- Travel times to supermarkets have been replaced by travel times shopping facilities.
- Improved petrol station location data has been used to calculate drive times.
- Drive times to secondary schools have been included.

#### 4.6.1. Drive time sub-domain

- *Average drive time to a secondary school*
- *Average drive time to a primary school*
- *Average drive time to a GP*
- *Average drive time to a post office*
- *Average drive time to shopping facilities*

General description of indicator	Population weighted average drive time taken to reach key services by driving
Indicator type	Population weighted average drive time - minutes
Time period	2005-2006
Data source	<ul style="list-style-type: none"> <li>• Road network – Ordnance Survey's OSCAR Traffic Manager 2005.</li> <li>• Ferry route data – Ordnance Survey Strategy 2005 and Scottish Executive 2005</li> <li>• Service locations: GP, primary school, shops and post offices - PointX 2006. Shopping Facilities – CACI Retail Centres 2006 and petrol stations – Catalist 2006,</li> <li>• Census output area population weighted grid references – General Register Office for Scotland 2001</li> <li>• Census output areas population figures - General Register Office for Scotland 2001</li> <li>• Number of students per census output area for Primary and Secondary school – Scottish Executive 2005.</li> </ul>
Denominator used	<ul style="list-style-type: none"> <li>• 2001 Total population: GP, Petrol Station, Post Office, Shopping Facilities</li> <li>• 2004 Primary school population: Primary school</li> <li>• 2004 Secondary school population: Secondary School</li> </ul>
Data source of denominator	<ul style="list-style-type: none"> <li>• Census output areas (COA) population figures - General Register Office for Scotland 2001. COA populations are not available for 2004.</li> <li>• Number of students per census output area for Primary and Secondary school – Scottish Executive 2005.</li> </ul>
Method of construction of indicator	See SEGIS (Scottish Executive Geographic Information Service) report on construction of the SIMD drive times (see references in annex).
Key decisions on methodology	<p>Methodology for constructing the drive times is very similar to the one used in 2006, however improvements have been made to the data sources of the service locations and the treatment of ferry times.</p> <p>In SIMD 2004, PointX locations were used for all indicators, however, for SIMD 2006, improved locations data were obtained from Catalist for the petrol station locations. Supermarkets were removed and replaced with shopping facilities, which are areas providing retail choice rather than one shop. Each record in the 'retail centre' dataset from CACI represents a shape of one or more 500 metre squares indicating a retail zone with multiple shops. Further information is available from the SEGIS report on retail centre locations (see references in annex).</p> <p>The SIMD 2004 drive times did not account for waiting times</p>

	<p>at ferry terminals, which can considerably underestimate travel times in the highlands and islands. In SIMD 2006 ferry and waiting times have been incorporated into the drive times. The methodology is explained in detail in the SEGIS report on construction of the SIMD drive times (see references in annex).</p> <p>To relate the services better to their users, primary and secondary school populations were used to weight primary and secondary school drive times, respectively</p>
Comparison with 2004 indicator	There is a significant correlation (Pearson coefficient = 0.94) between the 2006 drive time sub-domain and the 2004 access domain.
Implications of comparing this indicator with the one used in SIMD2004	The 2004 and 2006 indicators are not strictly comparable, due to the changes in methodology described above.
Other data quality issues	
Disclosure control	No disclosure control was applied to the drive time data.
Geo-referencing	There are no geo-referencing issues – all service locations were geo-referenced.
Availability of data	Data are available on the Scottish Neighbourhood Statistics website <a href="http://www.sns.gov.uk">www.sns.gov.uk</a>

#### 4.6.2. Public transport sub-domain

- *Public transport travel time to Shopping Facilities*
- *Public transport travel time to a GP*
- *Public transport travel time to a post office*

General description of indicator	Population weighted average public transport travel times to selected services, using buses, trains, underground, ferries or walking.
Indicator type	Population weighted average public transport travel time - minutes
Time period	2006
Data sources	<ul style="list-style-type: none"> <li>• Service locations: GP and post offices - PointX 2006. Shopping facilities – CACI Retail Centre database 2006. GP locations were quality assured against ISD Scotland records</li> <li>• Census output area population weighted grid references – General Register Office for Scotland 2001</li> <li>• Census output areas population figures - General Register Office for Scotland 2001</li> <li>• Public transport (PT) networks as defined from the electronic data maintained on scheduled services, which is also used to publish public timetables and support Traveline Scotland. This includes ferry services.</li> <li>• The Integrated Transport network (ITN) layer of Ordnance Survey MasterMap network data to identify walk links to and between PT services.</li> </ul>
Denominator used	2001 Total population
Data source of denominator	Census output areas (COA) population figures - General Register Office for Scotland 2001. COA populations are not available for 2004.
Method of construction of indicator	Methodology and key decisions are explained fully in the DHC report <i>Calculation of Scottish Public Transport Accessibility Indicators</i> (see references in annex).
Key decisions on methodology	Methodology and key decisions are explained fully in the DHC report <i>Calculation of Scottish Public Transport Accessibility Indicators</i> (see references in annex).
Comparison with 2004 indicator	N/A
Implications of comparing this indicator with the one used in SIMD2004	N/A
Other data quality issues	<p>For some data zones where a public transport time could not be calculated for all COA areas within the data zone travel times were estimated using drive times.</p> <p>Data zone public transport journey times were allocated a quality score based on their derivation as follows: 100% - all COA based times within the data zone based on actual measured journey times, 0%- All COA based times in the data zone calculated using estimated and interpolated travel times. For the GP indicator 5416 (83 per cent) data zones had a quality score of 100%, for the post office indicator 5668 (87 per cent) data zones had a quality score of 100% and for</p>

	<p>the shopping facilities indicator 4473 (69 per cent) data zones had a quality score of 100%.  See DHC report <i>Calculation of Scottish Public Transport Accessibility Indicators</i> (see references in annex) for more information.</p>
Disclosure control	No disclosure control has been applied to the public transport indicators.
Geo-referencing	See DHC report <i>Calculation of Scottish Public Transport Accessibility Indicators</i> (see references in annex).
Availability of data	Data are available on the Scottish Neighbourhood Statistics website <a href="http://www.sns.gov.uk">www.sns.gov.uk</a>

#### 4.7. Housing Domain

<i>SIMD 2006 housing indicators</i>	<i>SIMD 2004 housing indicators</i>
<i>Persons in households that are overcrowded (2001 Census)</i>	<i>Persons in households that are overcrowded (2001 Census)</i>
<i>Persons in households without central heating (2001 Census)</i>	<i>Persons in households without central heating (2001 Census)</i>

The SIMD 2006 housing domain remains unchanged from the SIMD 2004 which used 2001 Census data. Suitable housing data to replace Census indicators have not yet been developed. The housing domain has been retained, although its weighting in the overall SIMD has been reduced. The housing domain is expected to be updated in future indices.

The housing domain is constructed by simply summing the two indicators together. There is a chance of some overlap between indicators, however, this has been accepted as it was thought that people living in a household with both attributes is more deprived than those with only one.

#### 4.7.1. Persons in households that are overcrowded

General description of indicator	This indicator provides a measure of material living standards and gives the proportion of household population that live in overcrowded housing based on the occupancy rating. This compares the actual number of rooms in the house to the number of rooms which are required by the household, based on the relationships between them and their ages. Overcrowding is defined to mean households with an occupancy rating of -1 or -2 i.e. that there is either 1 or 2 rooms too few in the household.
Indicator type	Percentage of household population
Time period	2001
Data source	General Register Office for Scotland, 2001 Census
Denominator used	2001 Census population of people living in households
Data source of denominator	General Register Office for Scotland, 2001 Census
Method of construction of indicator	The indicator is a simple proportion of the number of people living in overcrowded households, divided by the 2001 household population.
Key decisions on methodology	The indicator is identical to the indicator used in the 2004 SIMD.
Comparison with 2004 indicator	The indicator is identical to the indicator used in the 2004 SIMD.
Implications of comparing this indicator with the one used in SIMD2004	Not applicable – see above
Other data quality issues	There has been some criticism that the Census measure of overcrowding (the occupancy rating) is not as sophisticated as the 'bedroom standard' which is generally used to assess overcrowding, and tends to overstate. For example, on the Census definition a one person household can have an occupancy rating of -1.
Disclosure control	No disclosure control has been applied to this indicator.
Geo-referencing	No geo-referencing issues
Availability of data	The indicators are available at data zone level on the SIMD website. The Scottish Census Results Online ( <a href="http://www.scrol.gov.uk">www.scrol.gov.uk</a> ) also contains overcrowding cross-tabulations.

#### 4.7.2. Persons in households without central heating

General description of indicator	This indicator provides a measure of material living standards and gives the proportion of household population that live in a house that is centrally heated. A household's accommodation is described as 'with central heating' if it has central heating in some or all rooms (whether used or not). Central heating includes gas, oil or solid fuel central heating, night storage heaters, warm air heating and under-floor heating.
Indicator type	Percentage of household population
Time period	2001
Data source	General Register Office for Scotland, 2001 Census
Denominator used	2001 Census population of people living in households
Data source of denominator	General Register Office for Scotland, 2001 Census
Method of construction of indicator	The indicator is a simple proportion of the number of people living in households without central heating, divided by the 2001 household population.
Key decisions on methodology	The indicator is identical to the indicator used in the 2004 SIMD.
Comparison with 2004 indicator	The indicator is identical to the indicator used in the 2004 SIMD.
Implications of comparing this indicator with the one used in SIMD2004	Not applicable – see above
Other data quality issues	The census question on central heating does not distinguish between whole and partial house central heating.
Disclosure control	No disclosure control has been applied to this indicator.
Geo-referencing	No geo-referencing issues
Availability of data	The indicators are available at data zone level on the SIMD website. The Scottish Census Results Online ( <a href="http://www.scrol.gov.uk">www.scrol.gov.uk</a> ) also contains central heating cross-tabulations.



## 4.8. SIMD Crime Domain

### **SIMD 2006 crime indicators:**

*Recorded Crimes of Violence*  
*Recorded Domestic housebreaking*  
*Recorded Vandalism*  
*Recorded Drugs Offences*  
*Recorded Minor Assault*

The Long Term Strategy recommended that the Scottish Executive should work to develop a Crime and Social Order domain including a combination of crime incidence data, fear of crime measures and incidence of social disorder, incivilities and malicious fires. Until 2006, such data were unavailable at the small area level. For the first time, however, geo-referenced crime records are now available from Scotland's eight police forces and this has allowed the inclusion of a crime domain.

Police forces record crimes in a broadly similar manner, and record the location of the incident so that victimisation can be recorded at a neighbourhood level. Data on crimes and offences are routinely published by the Scottish Executive at a police force level, and at a local authority level for standard crime groups.

A subset of all crimes recorded by the police forces to be included as indicators in the SIMD have been agreed through consultation between the Office of the Chief Statistician and the Justice Department Analytical Services Division. The indicators were chosen on the basis of relevance to neighbourhood victimisation or deprivation and availability of data.

Rates are based on police recorded SIMD crime data per 10,000 people. Other information on the prevalence of crime, such as that from the Scottish Crime and Victimisation Survey (SCVS), is not suitable for use at the data zone level because it is based on a small sample size.

### **Indicators**

- *Crimes of Violence* - all crimes in Group 1 (Crimes of Violence), plus the three main crimes types from Group 2 (Crimes of Indecency)
- *Domestic housebreaking* – six crime types from main code 19 (Housebreaking)
- *Vandalism* - all crimes in Group 4 (Fire-raising, Malicious Mischief etc)
- *Drug Offences* – all crimes types from main code 44 (Drugs)
- *Minor Assault* – one crime type from main code 47 (Disorderly Conduct)

The 2004 mid-year estimates for total data zone population published by the General Register Office for Scotland were used as the denominator. More detail on the individual crimes included in these indicators can be found in Appendix B.

The SIMD Crime domain score is constructed as a simple sum of the selected SIMD crime indicator counts, divided by the total population and multiplied by 10,000 to create a total SIMD crime rate per 10,000 people.

## *Issues in the Construction of the Crime Domain*

### *Consistency with published sources*

The chosen methodology involves calculating a rate of total SIMD crime (by summing the crimes included in the indicators) per 10,000 population. Total SIMD crimes are based on geo-referenced data provided by police forces grossed up to local authority level based on the 2004 recorded crime totals held by the Scottish Executive Justice Department.

### *Police station bias*

In order to reduce bias against areas that include a police station, crimes which have been identified as being recorded within 50 metres of the centre of a police station have been excluded.

### *Weighting of crime types*

There is no official methodology to differentiate between the severity of different types of crimes, therefore, we have not applied weights and have added SIMD crimes together for each data zone and divided by the total population.

### *Under-recording of crime and fear of crime*

It is widely recognised that not all crimes and offences are reported to or recorded by the police. The extent of under-reporting may vary by type of crime, and also by geographical area. However, although survey results may pick up some unreported crimes, they are based on too small a number of respondents to be suitable for use in SIMD. It is clear from the analysis of the data and the maps included with this letter, that the crime domain is detecting issues that impact on neighbourhoods and is, therefore, suitable for this purpose. In addition, the *Social Focus on Deprived Areas 2005*, using data from the Scottish Household Survey and Scottish Crime Survey, showed that fear of crime was not necessarily related to prevalence of crime in the same area.

### *Crimes excluded from the Crime domain*

The SIMD crime domain does not include all types or crime or offence recorded by the police. Certain crimes have been excluded because of data quality issues, or because they are less meaningful in terms of deprivation at a neighbourhood level.

For example, some crime types were excluded because they are directed at businesses and/or concentrated in centres of retail activity rather than neighbourhoods – examples include shoplifting and non-domestic housebreaking. Other crime types are harder to locate geographically – examples include fraud and speeding offences.

An example of exclusion due to data quality issues is that different police forces had very different coverage of a particular crime. For example, Breach of the peace was left out of the analysis because three forces recorded fewer than 50% of locations for this crime (two recorded 10% or less) while the other five forces recorded over 90% of locations.

Other crimes might be thought suitable for exclusion, but where such crimes formed part of a recognised group (e.g. violence, vandalism) and accounted for very small numbers, they were not explicitly excluded.

### *Geographical coverage*

Police forces were requested to provide all available geographical/ address information, in particular postcodes for each crime recorded. Where possible, forces provided postcodes plus map references and address details. The exact postcode is not necessarily required to geo-reference a crime as long as there is sufficient information to allocate the crime to a data zone. Where a force could only provide address details, the Scottish Executive imputed

postcodes and/ or map references so that data zones could be identified for the majority of the crimes.

*Population denominators*

There may be some bias in data zones that fall in town centres, where the resident population may be small compared with the daytime or night time populations. Day and night populations are not available at the small area level and so total resident population was used for the construction of these indicators. Also special events such as music festivals or sporting events may occur in an area with the accompanying temporary increase in population which is not reflected in the small area resident population estimates. Such changes to the population of a data zone should be considered when comparing SIMD crime rates in different areas.

**4.8.1. Recorded SIMD Crime Rate:**  
*Recorded Crimes of Violence*  
*Recorded Domestic housebreaking*  
*Recorded Vandalism*  
*Recorded Drugs Offences*  
*Recorded Minor Assault*

General description of indicator	Recorded SIMD crime rate of selected crimes of violence, domestic housebreaking, vandalism, drug offences and minor assault. The overall indicator is a sum of each SIMD crime divided by the total population.
Indicator type	Rate per 10,000 population
Time period	2004
Data source	Scottish Police Forces: Central, Dumfries and Galloway, Fife, Grampian, Lothian and Borders, Northern, Strathclyde and Tayside.
Denominator used	Total Population 2004
Data source of denominator	General Register Office for Scotland 2004 mid year population estimates.
Method of construction of indicator	The total SIMD crime rate was constructed by summing the selected crime counts and dividing the total by the total data zone population.
Key decisions on methodology	<ul style="list-style-type: none"> <li>▪ Crimes were chosen for inclusion based on data quality and relevance to neighbourhood deprivation.</li> <li>▪ Crimes recorded inside, or within 50 metres of, a police station were excluded so as not to bias data zones containing a police station, as recording is expected to be higher in a police station than in the surrounding area, particularly for drug crimes.</li> <li>▪ A total rate per 10,000 population was used instead of weighting using factor analysis. Rates are more easily understood and will allow the analysis of change over time in the future.</li> <li>▪ It was decided not to weight the individual indicators based on their severity as there is currently no official accepted methodology to differentiate between them.</li> <li>▪ SIMD crime totals have been adjusted to be consistent with published local authority crime rates. Data that could not be geo-referenced to an exact location were allocated a data zone using information available to ensure consistency with local authority totals.</li> </ul>
Comparison with 2004 indicator	N/A
Implications of comparing this indicator with the one used in SIMD2004	N/A
Other data quality issues	See text in general crime domain section above.
Disclosure control	Hierarchical disclosure control has been applied to the published data after calculation of the crime domain. Data zones with total SIMD crime count of 3 or less were suppressed along with modular secondary suppressions.
Geo-referencing	There was a lack of full address information for some crimes/offences. In these cases, partial addresses were matched to

	postcodes or data zone using MatchCode. Address information was available for 93% of SIMD crimes. Crimes that could not be geo-referenced were allocated to a data zone within the police force based on the information provided. The remaining SIMD crime count was grossed up to the published LA total.
Availability of data	Not published elsewhere.

## 5. Annex A

### *DWP data Geo-referencing*

A large scale exercise has been carried out by Department for Work and Pensions to produce a single address for every individual at any point in time. This single address (DWP) is based on the latest address that has been notified to the department in respect of any of the key benefits within WPLS.

Geographic referencing was carried out by the DWP using the ONS Official Neighbourhood Statistics (NeSS) Address Matching and Reference Tool (Matchcode) and where applicable the relevant Post Code Directories as well. In accordance with NeSS Geography Policy each record was allocated to a fixed geographical area, namely Census Output Area and then all other higher geographies built up from this building block. Assigning a record to a 2001 Census Output Area (COA) is done in a number of iterative stages:

*Stage 1* – The NeSS Address Matching and Reference Tool (Matchcode) allocates an address to a COA, or the full 7-character postcodes (e.g. ZZ11 0ZZ) are matched against the geographic reference data to obtain a COA.

*Stages 2, 3 and 4* – Where postcodes are partially completed, if the first 4, 5 or 6 characters of the postcode matched and were wholly contained within the same COA, then they were allocated to that COA.

*Stages 5 and 6* – Remaining cases were allocated to Local Authority (LA) to aim to get them in the right area and then randomly, but proportionally, assigned to a COA in that LA. Care is taken to exclude cases that are resident overseas as some benefits can be claimed by people who are now resident abroad. The COA counts were then aggregated up into caseloads at Data Zone levels.

## 6. Annex B

### Crime Indicator Details

The Crime Domain consists of categories of recorded crimes or offences which are grouped into five indicators. Certain crimes which form part of recognised groups such as violence and account for very small numbers are included for ease of comparison with published totals, even though they may not seem entirely relevant to SIMD.

	SE Crime Code	Crime/Offence name
<b>Violence</b> <i>Group 1</i> <i>(Crimes of violence)</i>	1/000	Murder
	2/000	Attempted murder
	3/001	Culpable homicide (common law)
	3/002	Causing death by dangerous driving
	3/003	Death by careless driving under the influence of drink or drugs
	4/000	Serious assault
	6/000	Robbery and assault with intent to rob
	7/000	Threats and extortion
	8/001	Cruelty to and unnatural treatment of children
	8/002	Child stealing (plagium)
	8/003	Exposing child under 7 to risk of burning
	9/000	Abortion
	10/000	Concealment of pregnancy
	11/001	Possess a firearm with intent to endanger life, commit crime etc.
	11/002	Abduction
	11/003	Ill treatment of mental patients
	11/004	Cruel and unnatural treatment of an adult
	11/005	Drugging
	11/006	Chemical weapon offences
<i>Group 2</i> <i>(Crimes of indecency)</i>	13/001	Illegal homosexual acts
	13/002	Bestiality
	13/003	Assault to commit unnatural crimes
	14/000	Rape
	15/000	Assault with intent to rape or ravish
<b>House-breaking</b>	19/004	Theft by housebreaking domestic property (dwelling)
	19/005	Theft by housebreaking domestic property (non-dwelling)
	19/007	Housebreaking with intent to steal domestic property (dwelling)
	19/008	Housebreaking with intent to steal domestic property (non-dwelling)
	19/010	Attempted housebreaking with intent to steal domestic property (dwelling)
	19/011	Attempted housebreaking with intent to steal domestic property (non-dwelling)
<b>Vandalism</b>	32/001	Fire-raising excluding muirburn
	32/002	Muirburn
	33/001	Vandalism, reckless damage and malicious mischief
	33/002	Reckless conduct with firearms
	33/003	Flying aircraft to the danger of life or property
	33/004	Endangering rail passengers
	33/005	Reckless driving at common law
	33/006	Culpable neglect of duty
	33/007	Endangering ship by breach of duty, obtain ship by misrepresentation
	33/010	Computer Misuse Act 1990
	33/011	Culpable and reckless conduct (not with firearms)
<b>Drugs Offences</b>	44/001	Illegal importation of drugs
	44/002	Production, manufacture or cultivation of drugs
	44/003	Supply, possession with intent to supply etc of drugs
	44/004	Possession of drugs
	44/005	Drugs, money-laundering offences
44/099	Drugs, other offences	
<b>Minor Assault</b>	47/001	Minor assault

## APPENDIX C

### References

SIMD website (including links to reports, data, mapping and SIMD 2004 outputs)  
[www.scotland.gov.uk/simd](http://www.scotland.gov.uk/simd)

SIMD 2006 General Report  
[www.scotland.gov.uk/simd2006report](http://www.scotland.gov.uk/simd2006report)

SIMD 2006 Statistical Compendium  
[www.scotland.gov.uk/simd2006compendium](http://www.scotland.gov.uk/simd2006compendium)

SIMD 2006 Guidance Leaflet  
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SIMD 2004 Technical Report  
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Scottish Executive report on construction of the SIMD drive times  
[www.scotland.gov.uk/simd2006drivetimes](http://www.scotland.gov.uk/simd2006drivetimes)

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*Social Focus on Deprived Areas 2005*  
[www.scotland.gov.uk/SocialFocusOnDeprivedAreas](http://www.scotland.gov.uk/SocialFocusOnDeprivedAreas)

Indices of deprivation across the UK  
[www.neighbourhood.statistics.gov.uk/dissemination/Info.do?page=Indices\\_of\\_deprivation.htm](http://www.neighbourhood.statistics.gov.uk/dissemination/Info.do?page=Indices_of_deprivation.htm)

Closing the Opportunity Gap  
[www.scotland.gov.uk/closingtheopportunitygap](http://www.scotland.gov.uk/closingtheopportunitygap)



Regeneration Outcome Agreements and the Community Regeneration Fund  
[www.communitiesscotland.gov.uk/stellent/groups/public/documents/webpages/cs\\_008070.hcsp](http://www.communitiesscotland.gov.uk/stellent/groups/public/documents/webpages/cs_008070.hcsp)

Data zone population estimates  
[www.gro-scotland.gov.uk/statistics/library/small-area-population-estimates/index.html](http://www.gro-scotland.gov.uk/statistics/library/small-area-population-estimates/index.html)

Scottish Neighbourhood Statistics  
[www.sns.gov.uk](http://www.sns.gov.uk)

Scottish Executive Urban Rural Classification  
[www.scotland.gov.uk/Publications/2006/07/31114822/0](http://www.scotland.gov.uk/Publications/2006/07/31114822/0)

NOMIS  
[www.nomisweb.co.uk](http://www.nomisweb.co.uk)

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