Ministry of Housing, Communities & Local Government

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OCSI

The English Indices of Deprivation 2025

Technical Report

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Preface

The English Indices of Deprivation are the official means for identifying the most deprived areas in England. The Indices are used widely by the Ministry of Housing, Communities and Local Government (MHCLG) and other government departments. Local policy makers and communities can also use this tool to ensure that their activities prioritise the areas with greatest need for services.

The English Indices of Deprivation 2025 is the seventh release in the series of statistics produced to measure multiple forms of deprivation at the small spatial scale. Following formal user consultation, engagement with key user groups and data providers, and a significant programme of work by the research team, the Indices of Deprivation 2025 introduce a number of key enhancements to data and methodologies, whilst retaining the same overall conceptual model as the earlier Indices of Deprivation 2019, 2015, 2010, 2007, 2004 and 2000.

This report outlines the theory underpinning the model of multiple deprivation, the methods that were used, and describes the domains and indicators that make up the Indices of Deprivation 2025. A number of changes to the suite of indicators have been made, with the inclusion of 20 new indicators, significant enhancements to a further 14 indicators, and 21 indicators being updated without major enhancements. This report discusses all the component indicators and constituent methodologies in detail.

In addition to the technical details presented in this report, the Statistical Release produced by MHCLG contains information on how to use and interpret the Indices. There is also an accompanying Research Report which provides analyses of the results, plus a further supplemental report on deprivation in rural areas. MHCLG has also produced short, accessible guidance and responses to frequently asked questions. All of these documents, and the datasets underpinning the Indices of Deprivation 2025, can be accessed at: www.gov.uk/government/statistics/english-indices-of-deprivation-2025

Acknowledgements

The English Indices of Deprivation 2025 were developed by a joint research partnership led by Deprivation.org and Oxford Consultants for Social Inclusion (OCSI).

David McLennan (Deprivation.org) and Stefan Noble (OCSI) were the joint principal investigators.

The core research team comprised David McLennan, Michael Noble, Helen Barnes, Gemma Wright and Katrin Gasior from Deprivation.org, and Stefan Noble, Katie Leach, Ben Mason and Emma Plunkett from OCSI.

Bowie Penney oversaw the work on behalf of the Ministry of Housing, Communities and Local Government, and played a vital role in securing access to key datasets and coordinating the input from a wide range of stakeholders.

Karen Bloor, Adrián Villaseñor, Nils Gutacker and Veronica Dale at the University of York played an integral part in the development of the Health Deprivation and Disability Domain. Jon Fairburn at the University of Staffordshire advised on the development of the Living Environment Deprivation Domain and produced the air quality indicator. Glen Bramley at Heriot-Watt University advised on the development of the Barriers to Housing and Services Domain and produced the housing affordability and core homelessness indicators. Chris Dibben from the University of Edinburgh and Chris Lloyd from Queens University Belfast undertook a thorough review of the core statistical methods employed across the project, while Chris Lloyd also performed independent external quality assurance on the key data processing steps and resultant outputs. The Building Research Establishment (BRE) produced an updated version of the housing in poor condition indicator, and Noise Consultants Ltd produced noise exposure data that fed into the construction of the noise pollution indicator.

David Avenell undertook geographic information systems work and produced the thematic maps for the accompanying Research Report, while Luke Murray at OCSI provided additional project support.

The research team would also like to thank all the suppliers of data. Particular thanks are extended to those analysts who helped to shape the design of the new or enhanced deprivation indicators, as this often required extensive data development work. This includes analysts at the Ministry of Housing, Communities and Local Government; the Department for Work and Pensions; the Home Office; the Department for Transport; the Office for National Statistics; Ordnance Survey; the Department for Environment, Food and Rural Affairs; the National Police Chiefs Council; and each of the 39 police forces across England. The project team and MHCLG would like to extend special thanks to Lancashire Constabulary for hosting a research team member for a number of months during the construction of the Crime Domain.

Chapter 1. Introduction

1.1 Introduction

1.1.1 The Ministry of Housing, Communities and Local Government (MHCLG) commissioned Deprivation.org and Oxford Consultants for Social Inclusion (OCSI) to produce the English Indices of Deprivation 2025 (IoD 2025). The project remit was to review, update, enhance and develop the Indices of Deprivation from its previous 2019 release, with particular consideration of recent changes to the policy and data landscapes, such as changes to the benefits system due to the roll out of Universal Credit, the impacts of the pandemic, the current cost-of living pressures, and deprivation in rural areas. This update addresses all lead actions from the Indices Futures: Updating the English Indices of Deprivation consultation (MHCLG, 2022)[1].

1.1.2 From the consultation, it was clear that the user community wished to retain the general model and conceptual framework of multiple deprivation used in the IoD 2019. However, there was an appetite to fundamentally review the underlying indicators, drawing on the latest developments in data and policy to ensure that the best available small area measures were incorporated into the Indices.

1.1.3 Consequently, there have been notable enhancements to the basket of indicators and methodology used to construct the IoD 2025. However, the overall domain structure and conceptual framework have remained unchanged.

1.2 Overview of the Indices of Deprivation 2025

1.2.1 The IoD 2025 provide a set of relative measures of deprivation for small geographical areas across England. The Indices are based on the 2021 Lower-layer Super Output Area (LSOA) geography[2].

1.2.2 There are seven different domains of deprivation:

- Income Deprivation
- Employment Deprivation
- Education, Skills and Training Deprivation
- Health Deprivation and Disability
- Crime
- Barriers to Housing and Services
- Living Environment Deprivation

[1] Ministry for Housing Communities and Local Government (MHCLG) (2022) Indices Futures: Updating the English Indices of Deprivation (IoD) consultation - https://www.gov.uk/government/consultations/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation/outcome/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation-government-reponse

[2] LSOAs are homogenous small areas of relatively even size. The Indices of Deprivation 2015 and 2019 used the 2011 LSOA geography. The Office for National Statistics has since produced an updated version of the LSOA geography using population data from the 2021 Census. The changes made between the 2011 and 2021 versions were minimal: the boundaries of approximately 6% of the 2011 LSOAs were modified. For more information see Census 2021 geographies - Office for National Statistics

1.2.3 Each of these domains is based on a basket of indicators used to explicitly measure that type of deprivation. As far as is possible, each indicator is based on data from the most recent time point available.

1.2.4 The Index of Multiple Deprivation 2025 combines information from the seven component domains to produce an overall relative measure of deprivation. The Index of Multiple Deprivation 2025 is often referred to as the IMD 2025. The domains are combined according to their respective weights as described in Section 3.7 of this report. In addition to the overall IMD and its seven constituent domain-specific indices, there are two further supplementary indices: the Income Deprivation Affecting Children Index (IDACI) and the Income Deprivation Affecting Older People Index (IDAOPI).

1.2.5 A range of summary measures are available for higher-level geographies including Local Authority District (LAD) level, upper tier Local Authorities, Built Up Areas, Local Enterprise Partnerships, Local Resilience Forums, and Integrated Care Boards. These summary measures are produced for the overall IMD 2025, each of the seven domains and the supplementary indices.

1.2.6 The IMD 2025, domain indices and the supplementary indices, together with the higher area summaries, are collectively referred to as the IoD 2025.

1.3 About this Technical Report

1.3.1 This report presents the conceptual framework of the IoD 2025; the methodology for creating the domains and the overall IMD 2025; the component indicators and domains and the quality assurance carried out to ensure reliability of the data outputs.

1.3.2 The headline analytical findings from the IoD 2025 are presented in the MHCLG Statistical Release[3], while an accompanying IoD 2025 Research Report[4] gives a fuller account and includes examples of how to use the Indices.

1.3.3 The reports produced for the IoD 2025 follow the same broad structure and content as the respective reports from the IoD 2019.

1.3.4 All project outputs are available to download from www.gov.uk/government/statistics/english-indices-of-deprivation-2025.

[3] Ministry of Housing, Communities and Local Government (2025). The English Indices of Deprivation 2025, Statistical Release.
[4] Ministry of Housing, Communities and Local Government (2025). The Indices of Deprivation 2025. Research Report.

Chapter 2. Measuring deprivation at the small area level: The conceptual framework

2.1 Overview

2.1.1 The IMD 2025 is a measure of multiple deprivation at the small area level and is the official measure of deprivation in England. The model of multiple deprivation which underpins the IMD 2025 is the same as that which underpinned its predecessors[5] and is based on the idea of distinct dimensions of deprivation which can be recognised and measured separately.

2.1.2 These dimensions (or domains) of deprivation are experienced by individuals living in an area. The overall IMD 2025 is a measure of multiple deprivation based on combining together these specific dimensions of deprivation.

2.2 Poverty, deprivation and multiple deprivation

2.2.1 In his 1979 account of *Poverty in the United Kingdom*, Townsend sets out the case for defining poverty in relative terms: 'Individuals, families and groups can be said to be in poverty if they lack the resources to obtain the types of diet, participate in the activities and have the living conditions and amenities which are customary, or at least widely encouraged or approved in the societies to which they belong'[6]. Townsend further argues that 'people can be said to be *deprived* if they lack the types of diet, clothing, housing, household facilities and fuel and environmental, educational, working and social conditions, activities and facilities which are customary …'[7]

2.2.2 Though 'poverty' and 'deprivation' have often been used interchangeably, many have argued that a clear distinction should be made between them[8]. People are in *poverty* if they lack the financial resources to meet their needs, whereas people can be regarded as *deprived* due to a lack of resources of all kinds, not just income. 'Deprivation' thus refers to people's unmet needs, whereas 'poverty' refers to the lack of resources required to meet those needs. The Index of Multiple Deprivation framework follows Townsend, in defining deprivation in a broad way to encompass a wide range of aspects of an individual's living conditions.

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[5] The previous versions consist of the Index of Multiple Deprivation 2019, 2015, 2010, 2007, 2004 and 2000. See McLennan, Noble et al. (2019) https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019; Smith et al. (2015) https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015; McLennan et al. (2011) https://www.gov.uk/government/statistics/english-indices-of-deprivation-2010; Noble et al. (2008) http://webarchive.nationalarchives.gov.uk/+/http:/www.communities.gov.uk/communities/neighbourhoodrenewal/deprivation/deprivation07/; Noble et al. (2004) http://webarchive.nationalarchives.gov.uk/20100410180038/http://www.communities.gov.uk/archived/general-content/communities/indicesofdeprivation/216309/ and Noble et al (2000) http://webarchive.nationalarchives.gov.uk/20100410180038/http:/www.communities.gov.uk/archived/general-content/communities/indicesofdeprivation/indicesofdeprivation/.

[6] Townsend (1979), *Poverty in the United Kingdom*, p.31.

[7] Townsend (1987), *Deprivation*, p.125-126, our italics.

[8] See for example the discussion in Nolan and Whelan (1996).

2.2.3 Townsend also lays down the foundation for articulating multiple deprivation as an accumulation of several types of deprivation. This formulation of multiple deprivation is the starting point for the model of small area deprivation which is presented here.

2.3 Dimensions of deprivation

2.3.1 The approach allows the separate measurement of different dimensions of deprivation. Seven main types of deprivation are considered in the IMD 2025 – income, employment, education, health, crime, access to housing and services, and living environment – and these are combined to form the overall measure of multiple deprivation.

2.3.2 There is a question as to whether low income or the lack of socially perceived necessities (for example adequate diet, consumer durables, ability to afford social activities etc) should be one of the dimensions[9]. To follow Townsend, within a multiple deprivation measure, only the types of deprivation resulting from a low income would be included. So low income itself would not be a component, but lack of socially perceived necessities would. However, there is no readily available small area data on the lack of socially perceived necessities, and therefore low income is an important proxy for these aspects of material deprivation.

2.3.3 Despite recognising income deprivation in its own right, it should not be the only measure of area deprivation. Other dimensions of deprivation contribute crucial further information about an area. However, low income remains a central component of the definition of multiple deprivation used here. As Townsend writes 'while people experiencing some forms of deprivation may not all have low income, people experiencing multiple or single but very severe forms of deprivation are in almost every instance likely to have very little income and little or no other resources'[10].

2.4 Combining dimensions of deprivation into a multiple deprivation measure

2.4.1 Measuring different aspects of deprivation and combining these into an overall multiple deprivation measure raises a number of questions. Perhaps the most important one is the extent to which area deprivation in one dimension can be *cancelled out* by lack of deprivation in another dimension. Thus, if an area is found to have high levels of income deprivation but relatively low levels of education deprivation, should the latter cancel out the former and if so to what extent? The IMD 2025 is essentially based on a weighted cumulative model and the methodology is designed to ensure that cancellation effects are minimised[11].

2.4.2 Another question concerns the extent to which the same people or households are represented in more than one of the dimensions of deprivation. The position taken

[9] Gordon et al. (2000).
[10] Townsend (1987), *Deprivation*, p.131.
[11] See Appendix E for details of how the Indices of Deprivation 2025 methodology minimises cancellation effects across the domains.

in the IMD 2025 is that if an individual, family or area experiences more than one form of deprivation, this is 'worse' than experiencing only one form of deprivation. The aim is not to eliminate double counting *between* domains – indeed it is desirable and appropriate to measure situations where deprivation occurs on more than one dimension.

2.4.3 On the other hand, it is desirable to eliminate double counting of people or households *within* domains. So, for example, the Income Deprivation Domain, Employment Deprivation Domain and the Adult Skills Sub-Domain, are each constructed from non-overlapping counts of people experiencing such deprivation. However, in practice, it is not always possible to avoid double counting in the indicators within domains, as people can legitimately be captured in multiple indicators which reflect different aspects of what a domain is intending to measure. For example, a school pupil may be registered as persistently absent and may also have low attainment at Key Stage 4; or a person may experience an emergency admission to hospital and also be in receipt of a disability benefit. The domain construction methodologies adopted are designed to accommodate different indicators and bring them together into overall domain scores in appropriate ways.

2.5 An area-based model of multiple deprivation

2.5.1 The IMD model of multiple deprivation is based on the idea of separate dimensions of deprivation which can be recognised and measured separately. These are experienced by individuals living in an area, and an area-level measure of deprivation for each of the dimensions (or domains) can in principle be measured.

2.5.2 An area can be characterised as deprived *relative to other areas* on a particular dimension of deprivation, on the basis that a higher proportion of people in the area are experiencing the type of deprivation in question. In other words, the experience of the people in an area gives the area its deprivation characteristics.

2.5.3 The area itself is not deprived, though the presence of a concentration of people experiencing deprivation in an area may give rise to a compounding deprivation effect, but this is still measured by reference to those individuals. Having attributed the aggregate of individual experience of deprivation to the area, it is possible to say how deprived an area is, relative to all other areas in the country, on that particular dimension.

2.5.4 Having measured specific dimensions of deprivation, these can be understood as separate domains of multiple deprivation. The overall IMD 2025 is constructed by combining together these specific dimensions to produce an area-level measure of multiple deprivation. As with the individual dimensions of deprivation, an area can be characterised as deprived relative to other areas but is not in itself deprived.

2.5.5 The overall aim of the IoD 2025, and specifically the IMD 2025, is to provide a robust and consistent measure of deprivation at small area level across England.

2.5.6 The following chapters outline how the IoD 2025 and IMD 2025 have been designed and developed based on the conceptual model of multiple deprivation outlined in this chapter.

Chapter 3. Methods

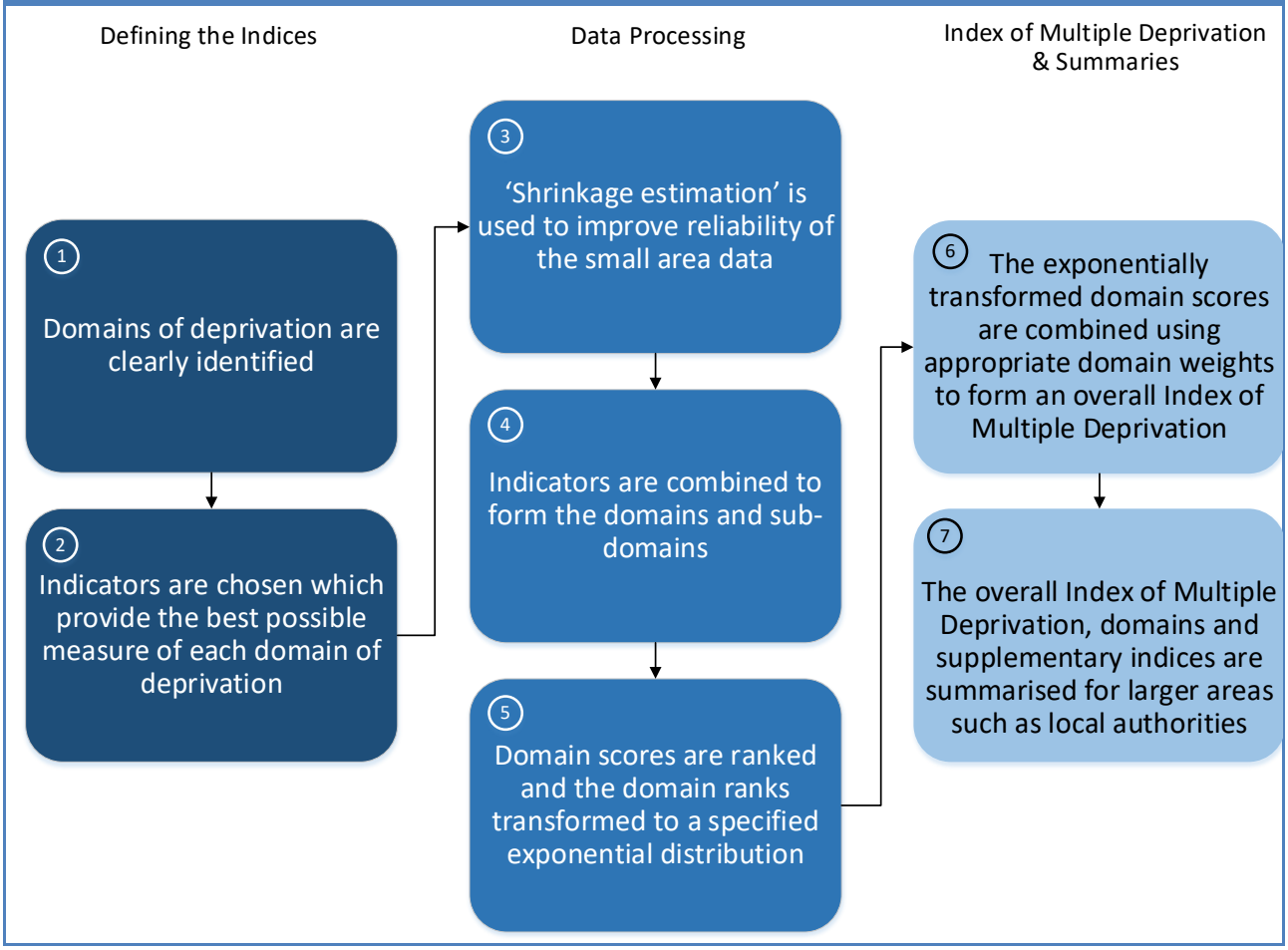
3.1 Overview of the methodology used to construct the Indices of Deprivation 2025

3.1.1 The construction of the IoD 2025[12], including the IMD 2025, broadly consists of the seven following stages. As shown in Figure 3.1, these stages fulfil the purposes of defining the Indices, data inputs and data processing procedures, and producing the IMD 2025 and summary measures. Each stage is described in the following sections. Figure 3.3 summarises how these stages are applied in producing each of the domain indices and the IMD.

1. Dimensions (referred to as domains) of deprivation are identified.
2. Indicators are chosen to provide the best possible measure of each domain of deprivation.
3. 'Shrinkage estimation' is used to improve reliability of the small area data[13].
4. Indicators are combined to form the domains, generating separate domain scores. These can be regarded as indices in their own right – the domain indices[14].
5. Domain scores are ranked, and the domain ranks are transformed to a specified exponential distribution[15].
6. The exponentially transformed domain scores are combined using appropriate domain weights to form an overall IMD at small area level[16]. This stage completes the construction of the IoD 2025 at LSOA level.
7. The overall IMD, the domains and the supplementary indices are summarised for higher level geographical areas such as LADs.

[12] The Index of Multiple Deprivation 2025 (IMD2025), domain indices and the supplementary indices, together with the higher area summaries, are collectively referred to as the Indices of Deprivation 2025 (IoD2025).
[13] See Section 3.4 and Appendix C for description of the shrinkage technique.
[14] In domains where there are sub-domains, this stage involves first combining the indicators into a sub-domain score. The sub-domain scores are then ranked and transformed to an exponential distribution before being combined into their respective domain scores. The supplementary indices are also created at this stage as a subset of Income Domain scores.
[15] See Section 3.6 and Appendix E for description of the exponential transformation.
[16] See Section 3.7 and Appendix F for description of the domain weights.

Figure 3.1. Overview of the methodology used to construct the Indices of Deprivation 2025



Robustness of the methods and datasets

3.1.2 The methods used to construct the IoD 2025 have been carefully designed to ensure the robustness and reliability of the output datasets at a national level. Chapter 5 describes how the design of the Indices contributes to this, along with many other quality management actions and quality assurance checks.

3.1.3 As will be reiterated when considering the selection of indicators, the robustness of the index methodology is reinforced by the fact that a consistent and uniform methodology is applied across the country. The indices are a *relative* measure of multiple deprivation. The national comparisons that a relative measure enable are only possible if the same methodology is consistently applied irrespective of local conditions. In other words, the Indices can only use data sources and methodologies that are relevant to and can be consistently applied across all types of geographical area in the country.

Changes since the Indices of Deprivation 2019

3.1.4 A key action from the Indices Futures consultation was that the 'Project Team commit to reviewing the methodology and statistical techniques used to construct the Indices' (Action 2)[17].

3.1.5 A thorough review of statistical methods was carried out by academics at the University of Edinburgh and Queen's University Belfast. The review concluded that the overall methodological approach (as outlined in paragraph 3.1.1 above) should remain largely unchanged. However, one recommendation was made: to update the approach to applying shrinkage estimation:

> *'The existing approach shrinks to the local authority (LA) mean to reduce uncertainty in the rates. It is proposed that instead shrinkage is applied to the ONS Output Area Classification (OAC) supergroup within an LA. The justification for this is that shrinkage to the LA mean is often inappropriate, as deprivation within an LA is often highly heterogeneous. With the proposed new approach, the OAC-LA mean is much more representative of deprivation in a given Lower Super Output Area (LSOA).'*

3.1.6 The project team have acknowledged this recommendation and altered the approach to shrinkage to higher areas, to take into consideration area classification. For more details see the Stage 3 Shrinkage Estimation section.

3.1.7 While the domain structure, conceptual framework and overall methodology for constructing the IoD 2025 remain largely unchanged, there have been notable changes to the basket of indicators included in each domain. These are discussed extensively in Chapter 4 under the appropriate domains.

3.2 Stage 1: Domains of deprivation are identified

3.2.1 The central idea of the IMD is that deprivation is multi-dimensional and can be experienced in relation to a number of distinct domains. Multiple deprivation is measured at an area level by combining these domains. It is therefore important that each dimension of deprivation is clearly identified and reflects a particular aspect of deprivation.

3.2.2 The IoD 2025 were reviewed in line with Action 1 of the user consultation. Given the strong support for consistency in approach, they remain the same seven domains used in the previous 2019, 2015, 2010, 2007 and 2004 Indices:

- Income Deprivation
- Employment Deprivation
- Education, Skills and Training Deprivation
- Health Deprivation and Disability
- Crime
- Barriers to Housing and Services
- Living Environment Deprivation.

[17] Ministry for Housing Communities and Local Government (MHCLG) (2022) Indices Futures: Updating the English Indices of Deprivation (IoD) consultation - https://www.gov.uk/government/consultations/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation/outcome/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation-government-reponse

3.2.3 Appendix K on the history of the indices gives a high-level account of the changes to domains and component indicators since the inception of the indices in their current form with the IoD 2000.

3.3 Stage 2: Indicators are chosen which provide the best possible measure of each domain of deprivation

Indicator criteria

3.3.1 For each of the seven domains of deprivation, an assessment has been made about whether the indicators in the IoD 2025:

- are still appropriate measures of deprivation for that domain
- can be updated
- can be strengthened, for example due to better available data.

3.3.2 All IoD 2025 indicators have to meet the same criteria as for the IoD 2019 and its predecessors. Indicators should:

- be 'domain specific' and appropriate for the purpose (as far as possible, being direct measures of that form of deprivation)
- measure major features of that domain of deprivation (not conditions just experienced by a small number of people or areas)
- be up-to-date and (as far as possible) updateable[18]
- be statistically robust at the small area level
- be available for the whole of England at a small area level in a consistent form

3.3.3 The aim for each domain was to include a parsimonious selection of indicators that comprehensively captured the deprivation for each domain, within the constraints of data availability and the criteria listed above.

Indicators used in the Indices of Deprivation 2025

3.3.4 There are 55 indicators in the IoD 2025, an increase from 39 in the IoD 2019. Of the 55 indicators in the IoD 2025, 20 are new indicators, 14 indicators have been updated and significantly modified, while 21 have been updated without significant modifications.

3.3.5 Figure 3.2 summarises the updated, new and modified indicators for each of the domains. Details are given in the appropriate parts of Chapter 4.

[18] Wherever possible, indicators are used that can be regularly updated. However not all indicators can be regularly updated, for example those based on Census 2021. Census data is used only when alternative data from administrative sources is not available.

Figure 3.2. Domains and indicators for the Indices of Deprivation 2025

Income Deprivation 22.5%	Adults and children in Income Support benefit units
	Adults and children in income-based Jobseeker's Allowance benefit units
	Adults and children in income-based Employment and Support Allowance benefit units
	Adults and children in Pension Credit (Guarantee) benefit units
	Adults and children in Universal Credit benefit units 'out of work' conditionality categories: '*No work requirements*', '*Planning for Work*', '*Preparing for work*', '*Searching for work*'
	Adults and children in Universal Credit benefit units 'in work' conditionality categories: '*Working with requirements*' and '*Working no requirements*' with monthly equivalised income of less than 70% median equivalised monthly income after housing costs **
	Adults and children in Housing Benefit claimant benefit units with monthly equivalised income of less than 70% median equivalised monthly income after housing costs ++
	Adults and Children in Tax Credit claimant benefit units with monthly equivalised income of less than 70% median equivalised monthly income after housing costs **
	Asylum seeker adults and children in dispersed accommodation receipt of support **
Employment Deprivation 22.5%	Claimants of Jobseeker's Allowance (both contribution-based and income-based)
	Claimants of Employment and Support Allowance (both contribution-based and income-based)
	Claimants of New Style Jobseeker's Allowance ++
	Claimants of New Style Employment and Support Allowance ++
	Claimants of Incapacity Benefit
	Claimants of Severe Disablement Allowance
	Claimants of Carer's Allowance
	Claimants of Income Support ++
	Claimants of Universal Credit '*Searching for work*' conditionality group
	Claimants of Universal Credit '*No work requirements*' conditionality group
	Claimants of Universal Credit '*Planning for work*' conditionality group ++
	Claimants of Universal Credit '*Preparing for work*' conditionality group ++
Education, Skills & Training Deprivation 13.5%	Key Stage 2 attainment: scaled scores
	Key Stage 4 attainment: average capped points score
	Entry to higher education
	Pupil absence **
	Persistent pupil absence ++
	Adult skills: The proportion of adults aged 25 to 66 with no or low qualifications, or, who cannot speak English or cannot speak English well
Health Deprivation & Disability 13.5%	Comparative Illness and Disability Ratio **
	Years of Potential Life Lost
	Acute Morbidity
	Mental health composite indicator - Suicide
	Mental health composite indicator - Hospital admissions **
	Mental health composite indicator - Prescribing data
	Mental health composite indicator - Health benefits ++
Crime 9.3%	Violence with injury ++
	Violence without injury ++
	Stalking and harassment ++
	Burglary **
	Theft **
	Criminal damage **
	Public order and Possession of weapons ++
	Anti-social behaviour ++
Barriers to Housing & Services 9.3%	Geographical Barriers: Connectivity Score ++
	Housing affordability **
	Household overcrowding **
	Statutory Homelessness
	Core Homelessness ++
	Broadband speed ++
	Patient-to-GP ratio ++
Living Environment Deprivation 9.3%	Housing Energy Performance Score ++
	Housing in poor condition **
	Housing lacking private outdoor space ++
	Air quality **
	Road traffic accidents involving injury to pedestrians and cyclists **
	Noise pollution ++

++ New indicators

**** Modified indicators**

% illustrates the weight of each domain in the IMD 2025

Data time point

3.3.6 As far as possible, each indicator was based on data from the most recent time point available. Using the latest available data in this way means there is not a single consistent time point for all indicators. Details on the data time points used for each indicator are provided in Chapter 4.

3.3.7 As with previous Indices, the IoD 2025 use Census data only when alternative data from administrative sources was not available. Two such indicators were derived from the 2021 Census: adult skill levels and English language proficiency in the Education, Skills and Training Deprivation Domain; and household overcrowding in the Barriers to Housing and Services Domain.

Geography and spatial scale

3.3.8 The IoD 2025 have been produced at LSOA level, using the current 2021 LSOAs[19].

3.3.9 Guidance is provided in Appendix A of the accompanying Research Report on how to aggregate the LSOA data to other geographies such as wards or bespoke local areas, as requested by a number of users.

3.3.10 Summary measures for the IMD 2025, domains and supplementary indices have been produced for the following higher-level geographies: Local Authority Districts, upper tier Local Authorities, Built-Up-Areas, Local Resilience Forums, Local Enterprise Partnerships and Integrated Care Boards.

3.3.11 Whereas the 2021 LSOA boundaries are fixed and not subject to change, the boundaries of the higher-level geographies do undergo periodic revision. For the purpose of constructing the IoD 2025 higher-level summaries, the latest available boundary versions were used:

- 2024 Local Authority Districts (LAD)
- 2024 Upper-tier Local Authorities (UTLA)
- 2022 Built-Up Areas (BUA)
- 2024 Local Resilience Forums (LRF)
- 2022 Local Enterprise Partnerships (LEP)
- 2024 Integrated Care Boards (ICB)

3.3.12 The LSOA to higher-level lookup tables were all sourced from the ONS Geography Portal website.

Denominators

3.3.13 Denominators are an integral and important component of almost all indicators included in the IoD 2025. For each indicator, the denominator seeks to measure the number of people (or households etc.) that are ‘at-risk’ of being defined as

[19] LSOAs are homogenous small areas of relatively even size containing approximately 1,500 people. The Indices of Deprivation 2015 and 2019 used the (2011) Lower-layer Super Out Area geography. The Indices of Deprivation 2010 and earlier versions used the 2001 LSOA geography.

deprived on that particular indicator, in other words that are at-risk of being included in the numerator. The denominator for each indicator is expressed on the same geographical scale as the numerator and is ideally measured for the same year as the numerator[20]. For some indicators, it was necessary to use a denominator for an earlier time point than the numerator, due to lack of available population estimates for the most recent time points.

3.3.14 The majority of the indicators in the IoD 2025 are measured as proportions or rates of the population that are deprived, and therefore use denominators based on population.

3.3.15 Some of the indicators use denominators other than the resident population. For example, some indicators draw denominators from within the same dataset as the numerator (such as pupil attainment datasets); some are expressed as the proportion of households rather than people; and some incorporate special adjustments to better reflect the population at risk.

3.3.16 Details of the exact denominators that are used for each numerator are discussed in the indicator descriptions in Chapter 4, and a full list is given in Appendix A. A more detailed explanation of the denominators used can be found in Appendix B.

3.3.17 The core set of population denominators are published as part of the IoD 2025 package of outputs, as they were for the IoD 2019.

3.4 Stage 3: 'Shrinkage estimation' is used to improve reliability of the small area data

3.4.1 Where a rate or other measure of deprivation for a small area is based on small numbers, the resulting estimate may be unreliable, with an unacceptably high standard error. The technique of shrinkage estimation is used to 'borrow strength' from larger areas to avoid creating unreliable small area data; the impact of shrinkage may be to move an LSOA's score towards more deprivation or towards less deprivation.

3.4.2 Without shrinkage, some LSOAs might have scores which do not reliably describe the deprivation in the area due to chance fluctuations from year to year. Such scores occur most commonly where numbers or counts are small at LSOA level and the event is thus relatively rare. This may be the case for the indicator as a whole or only for particular LSOAs. In shrinkage estimation the score for a small area is estimated as a weighted combination of that small area's score and the mean value for a larger grouping of areas. The smaller areas borrow strength from the larger grouping of areas of which they are part, such as an LSOA within an LAD.

3.4.3 There have been some changes to the shrinkage methodology relating to the composition of larger areas used in the calculation. In previous Indices, the larger areas used for shrinkage were LADs. However, this has been refined to also take into consideration the socio-demographic characteristics of the LSOA, based on

[20] Almost all the numerators and denominators are at LSOA level, except for the two homelessness indicators which are at LAD level.

the Office for National Statistics (ONS) LSOA Classification[21]. The approach taken was to shrink the results for an individual LSOA, so that it moved closer to the average of all LSOAs in the same LSOA Super Group Classification category within the LAD [22]. In other words, the 'parent area' used in the calculation is the average of the LSOA Super Group (to reflect shared socio-demographic characteristics) within the parent LAD area. This approach allows for LSOAs to borrow strength from similar types of areas within the LAD, reflecting that LSOAs within a given LAD may share issues relating to local governance and possibly to economic sub-climates, whilst offering a more spatially nuanced approach than simply using the overall LAD average. This enhancement to the shrinkage methodology for the IoD 2025 was the key recommendation from the review of methods undertaken at the outset of this project.

3.4.4 In the IoD 2025 the shrinkage technique is applied to the majority of indicators. Those which are not subjected to shrinkage include the Patient-to-GP ratio, Broadband speed, the Connectivity score, the Air quality indicator and the indicators supplied at LAD level (Core Homelessness and Statutory Homelessness). In addition, where there was only a single LSOA in an LSOA Super Group within a LAD, it was not possible to apply shrinkage to that area. Specific information about the indicators to which shrinkage is applied is given in the indicator descriptions in Chapter 4. Further details about the shrinkage technique are given in Appendix D.

3.5 Stage 4: Indicators are combined to form the domains, generating separate domain scores

3.5.1 For each domain of deprivation, the aim is to obtain a single measure which is straightforward to interpret in that it is, if possible, expressed in meaningful units (for example the proportion of people or of households experiencing that form of deprivation). This was achieved in the Income and Employment Domains, and supplementary indices, but was not possible in the other five domains[23].

3.5.2 The Income Deprivation Domain and Employment Deprivation Domain are constructed as simple rates of the population at-risk. Separate indicators in these domains are constructed as non-overlapping counts and are simply summed together to identify the total at-risk population for the domain.

3.5.3 In the other domains the indicators are based on different metrics and therefore it is not possible to calculate a simple rate. The indicators are standardised by ranking and transforming to a standard normal distribution based on their ranks, before combining with selected weights to form the domain score:

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[21] UK LSOA / DZ / SDZ Classification (2021/2 LSOAC) (2025) Geographic Data Service Authored by: Jakub Wyszomierski, Paul A Longley, Alexander D Singleton, Christopher Gale, Oliver O'Brien, Jen Hampton https://data.geods.ac.uk/dataset/lsoac

[22] Note, for a small number of indicators: Key Stage 2 attainment, Key Stage 4 attainment, pupil absence, persistent absence, years of potential life lost, acute morbidity, suicide mortality, mental health admissions, self harm and GP prescriptions, Local Authorities were used as the parent area in shrinkage calculations. This is because these were constructed in secure environments, prior to the development of the UK LSOA / DZ / SDZ Classification (2021/2 LSOAC) classification.

[23] Although the Adult Skills Sub-Domain of the Education, Skills and Training Domain is also constructed as a simple proportion of at risk population.

- In three domains – the Children and Young People sub-domain of the Education, Skills and Training Deprivation Domain; the Health Deprivation and Disability Domain; and the Crime Domain – maximum likelihood factor analysis is used to generate appropriate weights for combining the standardised indicators into a single score per domain, or sub-domain. Factor analysis is described in Appendix D.
- In the Indoors Living Environment, Outdoors Living Environment and Wider Barriers, equal weights have been applied to all component indicators within their respective sub-domains.

3.5.4 In domains where there are sub-domains, this stage involves first combining the indicators into sub-domain scores. The sub-domain scores are then ranked and transformed to an exponential distribution for the reasons given in Section 3.6 before being combined into their respective domain scores.

3.5.5 Details of the specific steps taken to arrive at the domain scores are given in the appropriate places in Chapter 4. This approach to combining the indicators into the domains replicates that taken in the IoD 2019 and earlier Indices, albeit the sub-domain weights in the Living Environment Domain have been updated for the IoD 2025.

3.5.6 The domain scores and ranked indices that are generated as a result of this stage, and the sub-domain scores *before* ranking and transforming to an exponential distribution, are published outputs (see Appendix L for details of the published data and spreadsheets). These domain indices can be used in their own right by users interested in particular dimensions of deprivation rather than the overall IMD 2025.

3.6 Stage 5: Domain scores are ranked and the domain ranks transformed to a specified exponential distribution

3.6.1 When combining the domains to form the overall IMD 2025, it is important that the scores of each domain are comparable and that the weighting of domains is not distorted by the fact that the domains may have very different distributions. It is also important to select a method of combination that does not result in deprivation on one domain being cancelled out by lack of deprivation on another domain. It is fundamental to the model of deprivation employed in the Indices that deprivations are cumulative.

3.6.2 In order to combine the domains, a number of steps are necessary. First the domain scores must be standardised, that is converted in such a way that they are measured on the same metric. This is achieved by ranking the LSOAs from least deprived LSOA to most deprived LSOA, separately for each of the seven domains. Second, the set of seven resultant domain ranks must each be transformed to the same specified distribution. Without undertaking standardisation and transformation the different domain score distributions would distort the impact of the explicit weights used in the final stage to combine the domains into the overall IMD 2025.

3.6.3 There are a number of different statistical techniques that can be employed to standardise and transform the domain scores to prepare them for combination. The

method which has been employed since the IoD 2000 – exponential transformation of the ranked domain score – was explicitly designed to reduce 'cancellation effects'. So, for example, high levels of deprivation in one domain are not completely cancelled out by low levels of deprivation in a different domain. Also, the exponential transformation applied puts more emphasis on the deprived end of the distribution and so facilitates identification of the most deprived areas.

3.6.4 The property of the exponential distribution which effectively emphasises the most deprived part of the distribution means that the Indices are specifically constructed to identify deprivation and *not* affluence. Put another way, the Indices discriminate well between deprived neighbourhoods but not so well between those areas in the less deprived part of the distribution.

3.6.5 The IoD 2025 uses exponential transformation of the ranks, as in the previous Indices. A more extensive account of the exponential transformation procedure is given in Appendix E.

3.6.6 In order to allow users to combine domains using alternative weights for specific purposes, the exponentially transformed scores are made available in File 9 (see Appendix L for details of the published data and spreadsheets).

3.7 Stage 6: The exponentially transformed domain scores are combined using appropriate domain weights to form an overall Index of Multiple Deprivation

3.7.1 Combining the different domains into an overall index always involves weighting the domains, whether the weights are set explicitly or not. A greater weight given to a specific domain gives greater importance to that domain in the overall index. Weights may be set explicitly, as they were in the IoD 2000 and subsequent updates. If domain scores were simply added together (after standardisation), this explicitly gives each domain an equal weight. Conversely, if domains are not standardised to lie on the same scale or distribution, weights are set implicitly by the domain distributions.

3.7.2 The weights used for the IoD 2000 were derived from consideration of the academic literature on poverty and deprivation, as well as consideration of the levels of robustness of the indicators. This resulted in a decision to give the greatest weight to the Income Deprivation Domain and Employment Deprivation Domain. A fuller account of this is given in Appendix F.

3.7.3 The weights employed in the construction of the IMD 2025 are shown in the table below. These weights are unchanged since the construction of the IMD 2004 when the Crime Domain was introduced and the seven current domains established.

Table 3.1. Domain weights used to construct the Index of Multiple Deprivation 2025	
Domain	Domain weight (%)
Income Deprivation Domain	22.5
Employment Deprivation Domain	22.5
Health Deprivation and Disability Domain	13.5
Education, Skills and Training Deprivation Domain	13.5
Barriers to Housing and Services Domain	9.3
Crime Domain	9.3
Living Environment Deprivation Domain	9.3

3.7.4 While applying different weights would affect the Index of Multiple Deprivation, the impact may not be large. Research into the issue of weighting was carried out by the University of St Andrews (Dibben et al., 2007)[24]. Sensitivity testing on three different approaches to weighting showed that although a small adjustment could be made to the weights (in effect swapping the weights for the Employment Deprivation Domain and the Health Deprivation and Disability Domain) it did not have a large impact on the final Index of Multiple Deprivation ranks. This work is described in greater detail in Appendix F. Domain weights were revisited in the consultations preceding the release of the IoD 2007[25], IoD 2010[26] IoD 2015[27] and the current Indices[28] (Actions 1 and 2). Those consultations found the vast majority of respondents were in favour of keeping the weights the same. Further consideration was given to the domain weights in the thorough review of methods that was undertaken as part of the IoD 2025 development. Again, the conclusion was reached that re-weighting the domains would not provide a notable improvement to the Indices. In light of the very high level of user support, and the findings from the methods review, the weights used in the IoD 2025 remain as used in the IoD 2019.

3.7.5 Based on these weights, the IMD 2025 will meet most users' needs. But it is recognised that some users may wish to analyse deprivation using only a subset of the deprivation domains or to apply different weights. For example, analysts working in public health may wish to create a combined index that excludes the Health Deprivation and Disability Domain, allowing them to explore other forms of deprivation as a determinant of health outcomes. To facilitate users in applying alternative weights, the exponentially transformed domain scores (from stage 5) are published along with the appropriate population sizes; guidance on how to

[24] Dibben, C., Atherton, I., Cox, M., Watson, V., Ryan, M. and Sutton, M. (2007) Investigating the Impact of Changing the Weights that Underpin the Index of Multiple Deprivation 2004, http://webarchive.nationalarchives.gov.uk/20100410180038/http://www.communities.gov.uk/publications/communities/investigatingimpact.

[25] Ministry of Housing, Communities and Local Government (2007) Updating the English Indices of Deprivation 2004: Stage Two 'Blueprint' Consultation Report – Summary of Responses. http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/publications/communities/indicesdeprivationresponses

[26] Ministry of Housing, Communities and Local Government (2011) English Indices of Deprivation consultation: summary of responses. https://www.gov.uk/government/consultations/english-indices-of-deprivation.

[27] https://www.gov.uk/government/consultations/updating-the-english-indices-of-deprivation

[28] Ministry for Housing Communities and Local Government (MHCLG) (2022) Indices Futures: Updating the English Indices of Deprivation (IoD) consultation - https://www.gov.uk/government/consultations/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation/outcome/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation-government-reponse

combine the domains together using different weights is provided in Appendix B of the Research Report.

3.8 Stage 7: The overall Index of Multiple Deprivation and domains are summarised for larger areas such as Local Authority Districts

3.8.1 The previous stages produce the LSOA data for the IoD 2025. In this final stage, these LSOA statistics are summarised for larger areas such as LADs.

3.8.2 For larger areas, a single deprivation score (or rank) may not be adequate to accurately describe levels of deprivation across the area. For instance, LADs can vary enormously in both geographic and population size and may have very different patterns of deprivation. Some areas may be relatively deprived but contain little variation in deprivation across their constituent neighbourhoods; whilst other places may contain concentrated pockets of severe deprivation rather than deprivation being more evenly spread.

3.8.3 To summarise the level of deprivation in larger areas, a range of summary measures of the IMD 2025, the domains and the two supplementary indices (IDACI and IDAOPI) have been created[29], see table below. No single summary measure is the 'best' measure. Each measure highlights different aspects of deprivation, and comparison of the different measures is needed to give a fuller description of deprivation in a large area. All the summary measures should be considered, as no single measure is more important or more 'true' than another in describing the distribution of deprivation at this level. In addition, it is important to remember that the higher-area measures are *summaries*; the LSOA level data provides more detail than is available through the summaries.

3.8.4 The origins of the higher-level summaries produced for the IoD 2025 pre-date even the IoD 2000: early versions of higher-level summaries were derived for the Department of Environment's ward-based '1998 Local Index of Deprivation', and were further refined, developed and expanded upon for the IoD 2000. For example, the 1998 Local Index of Deprivation contained a 'degree' measure which summarised average ward ranks at LAD level. A modified version of this 'degree' measure was included in the IoD 2000 as the 'Average Rank' higher-level summary measure. The 1998 Local Index of Deprivation also contained early versions of the higher-level summary measures that were termed 'Extent' and 'Local Concentration' in the IoD 2000. The 'Average Score' higher-level measure was introduced as a new measure in the IoD 2000 following responses to the consultation process. The aim in including the 'Average Score' measure was to provide an additional summary measure of deprivation that took into account all small areas within the LAD, but which placed greater emphasis on those LADs that contained small areas with the very highest levels of deprivation. The 'Income Scale' and 'Employment Scale' higher-level summaries were also introduced for the first time in the IoD 2000. In each iteration of the Indices from 2000 onwards,

[29] For the Indices of Deprivation 2010 and previous versions, the majority of summary measures published were for the Index of Multiple Deprivation only. In response to demand from users, additional summary measures for the domains and supplementary indices were published as part of the Indices of Deprivation 2015 and 2019, and these are also published for the Indices of Deprivation 2025.

the guidance to users has consistently stressed the importance of considering all higher-level summary measures in order to obtain a comprehensive overview of the levels and patterns of deprivation within the higher-level area. The guidance has also consistently emphasised that no one higher-level summary measure is better than the others.

Table 3.2. The higher-area summary measures

Summary measure	Description
Average rank	The average rank measure summarises the average level of deprivation across the higher-level area, based on the ranks of the LSOAs in the area. As all LSOAs in the higher-level area are used to create the average rank, this gives a measure of the whole area covering both deprived and less-deprived areas. The measure is population-weighted, to take account of the fact that LSOA population sizes can vary. The nature of this measure – using all areas and using ranks rather than scores – means that a highly polarised local authority or other higher-level area would not tend to score particularly highly, because extremely deprived and less deprived LSOAs will 'average out'. Conversely, a higher-level area that is more uniform in being highly deprived will tend to score highly on the average rank measure.
Average score	The average score measure summarises the average level of deprivation across the higher-level area, based on the scores of the LSOAs in the area. As all LSOAs in the higher-level area are used to create the average score, this gives a measure of the whole area covering both deprived and less-deprived areas. The measure is population-weighted, to take account of the fact that LSOA population sizes can vary. The main difference with the average rank measure described above is that more deprived LSOAs tend to have more 'extreme' scores than ranks[30]. So highly deprived areas will not tend to average out to the same degree as when using ranks; highly polarised areas will therefore tend to score relatively higher on the average score measure than on the average rank measure.
Proportion of LSOAs in most deprived 10 per cent nationally	The proportion of LSOAs that are in the most deprived 10 per cent nationally. By contrast to the average rank and average score measures, which are based on all LSOAs in the higher-level area, this measure focuses only on the most deprived LSOAs. Higher-level areas which have no LSOAs in the most deprived 10 per cent of all such areas in England have a score of zero for this summary.

[30] Note, this distinction between the average score and average rank applies most clearly to the overall IMD, which follows an approximately exponential distribution due to the weighted combination of exponentially transformed domain scores. For the individual domains, however, this relationship is less consistent. It broadly holds for the Income and Employment domains, which naturally display exponential-type distributions, and to some extent for Education and Living Environment, where the underlying sub-domains are also exponentially scaled. In contrast, it is less applicable to the Health and Crime domains, which are derived from normally distributed indicators, and to Barriers to Housing and Services, where the two exponentially transformed sub-domains tend to counterbalance one another due to low levels of correlation.

Table 3.2. The higher-area summary measures	
Summary measure	Description
Extent	The extent measure is a summary of the proportion of the local population that live in areas classified as among the most deprived in the country. The extent measure uses a weighted measure of the population in the most deprived 30 per cent of all areas: • The population living in the most deprived 10 per cent of LSOAs in England receive a 'weight' of 1.0; • The population living in the most deprived 11 to 30 per cent of LSOAs receive a sliding weight, ranging from 0.95 for those in the most deprived eleventh percentile, to 0.05 for those in the most deprived thirtieth percentile.
Local concentration	The local concentration measure is a summary of how the most deprived LSOAs in the higher-level area compare to those in other areas across the country. This measures the population-weighted average rank for the LSOAs that are ranked as most deprived in the higher-area, and that contain exactly 10 per cent of the higher-area population.
Income scale and employment scale (two measures)	The two scale measures summarise the number of people in the higher-level area who are income deprived (the income scale) or employment deprived (the employment scale).

3.8.5 Further guidance is provided on how to use and interpret these measures in the Research Report Section 3.3.

3.8.6 The table below sets out which summary measures have been published for the IMD 2025, the domains and supplementary indices.

Table 3.3. The summary measures published for the Index of Multiple Deprivation, the domains and supplementary indices						
	Average rank	Average score	Proportion of LSOAs in most deprived 10 per cent nationally	Extent	Local concentration	Scale
IMD	x	x	x	x	x	
Income	x	x	x			x
Employment	x	x	x			x
Education	x	x	x			
Health	x	x	x			
Crime	x	x	x			
Living	x	x	x			
Barriers	x	x	x			
IDACI	x	x	x			
IDAOPI	x	x	x			

3.8.7 The higher-level geographical areas at which the Indices have been summarised are as follows: Local Authority Districts, upper tier Local Authorities, Local Enterprise Partnerships, Local Resilience Forums, Built-up Areas and Integrated Care Boards. These are published in accompanying data files 10 - 15 (see Appendix L for details of the data and spreadsheets that have been published).

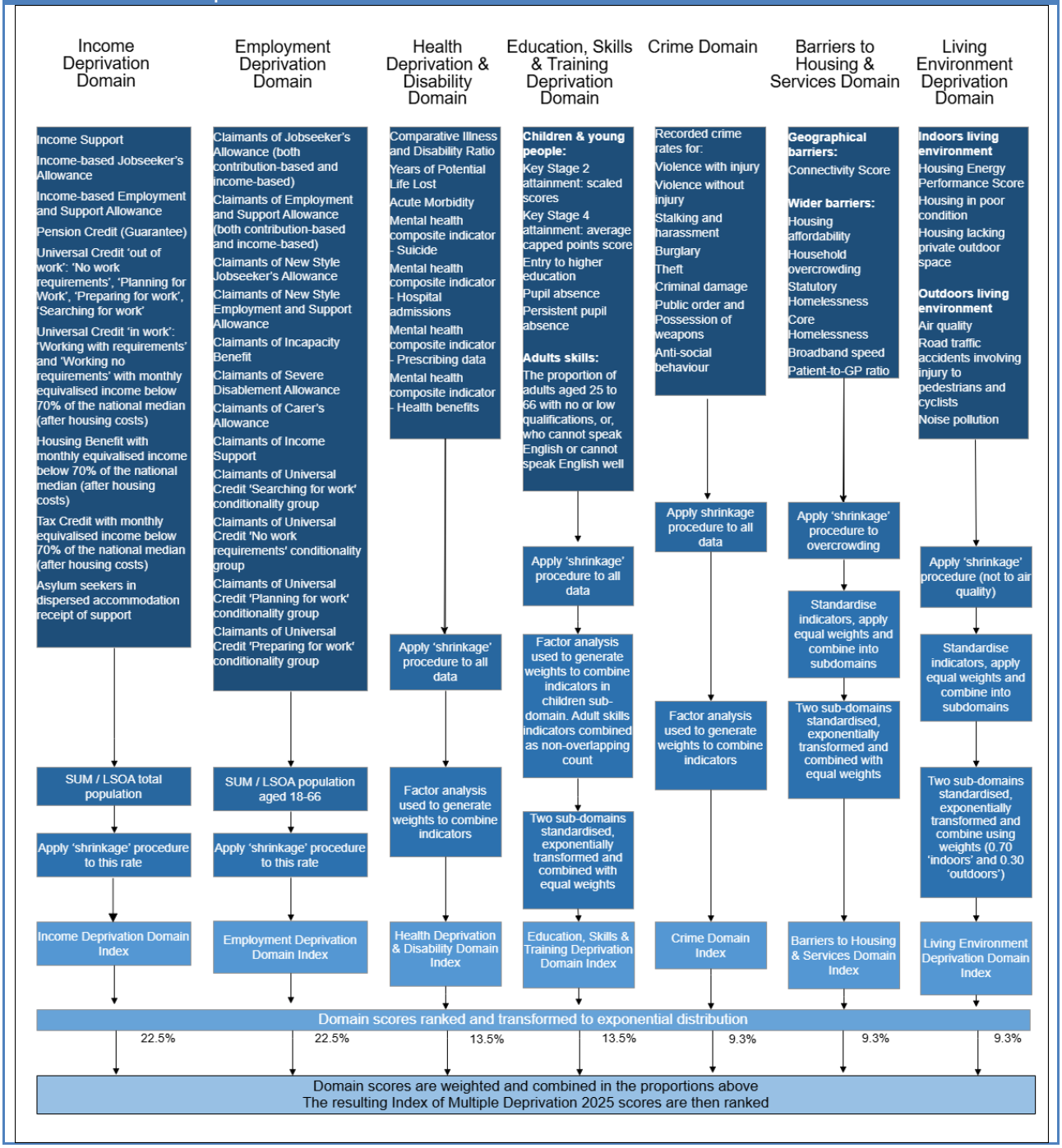
3.8.8 The population estimates used to weight the LSOA level data in the construction of the higher-level geographies for the IMD 2025 and all domains other than the Employment Deprivation Domain are the mid-2022 LSOA population denominators that were provided by ONS for the purpose of the IoD 2025. For the Employment Deprivation Domain, the working-age population aged 18 to 66 for mid-2022 was used, also provided by ONS for this purpose. For the IDACI and IDAOPI supplementary indices, the appropriate age group population estimate for mid-2022 was used, again provided by ONS for this purpose. These population denominators are published in accompanying data file 6; see Appendix L for details of the published data and spreadsheets. The mid-2022 population denominators were used for the LSOA weighting purpose as these were the most up-to-date estimates produced by the ONS at the time of Indices finalisation during the summer of 2025.

3.8.9 In order to construct these high-level geographical summaries, look-up tables were constructed to indicate which LSOAs nest within each of the high-level geographies. This nesting was precise except in the case of the Built Up Areas and Local Enterprise Partnerships, where "best fit" LSOA lookups were obtained from the Office for National Statistics.

3.9 Summary of the domains, indicators and methods used to construct the Indices of Deprivation 2025

3.9.1 Figure 3.3, overleaf, summarises the domains, indicators and methods used to construct the LSOA level IoD 2025:

Figure 3.3. Summary of the domains, indicators and statistical methods used to create the Indices of Deprivation 2025



Chapter 4. The domains and indicators

4.1 Introduction

4.1.1 This chapter describes the 55 component indicators in the IoD 2025 and how these were combined to create each domain. Appendix A lists the data sources used for each indicator and Appendix B describes how denominators for indicators were selected.

4.1.2 In this chapter, a section at the end of each domain summarises changes made to indicators since the IoD 2019. This summary covers new or modified indicators (and briefly describes the modifications).

4.2 Domains

4.2.1 The IoD 2025 are a relative measure of deprivation for LSOAs across England. The overall IMD 2025 combines together indicators under the seven different domains of deprivation, detailed in the following sections:

- Income Deprivation
- Employment Deprivation
- Education, Skills and Training Deprivation
- Health Deprivation and Disability
- Crime
- Barriers to Housing and Services
- Living Environment Deprivation.

4.2.2 In addition, there are two supplementary indices: the IDACI and the IDAOPI. These are described under the Income Deprivation Domain, since they are subsets of this domain.

4.3 Income Deprivation Domain

4.3.1 The Income Deprivation Domain measures the proportion of the population in an area experiencing deprivation relating to low income. In line with Peter Townsend's conceptualisation of deprivation as being related to people's unmet needs (e.g. lack of socially perceived necessities)[31], the Income Deprivation Domain is arguably a proxy for people's experience of material deprivation due to having low income.

4.3.2 The definition of income deprivation used here includes people who are dependent upon the state for some form of means-tested benefit, and includes both people that are out-of-work, and those that are in work but who have low earnings and are claiming a means tested benefit.

[31] Townsend, P. (1979) Poverty in the United Kingdom, London: Penguin Books

4.3.3 A major change to the policy and data landscapes since the IoD 2019 relates to the roll out of Universal Credit (UC) as the principal means tested benefit for people of working age.

The indicators

- Adults and children in Income Support benefit units.
- Adults and children in income-based Jobseeker's Allowance benefit units.
- Adults and children in income-based Employment and Support Allowance benefit units.
- Adults and children in Pension Credit (Guarantee) benefit units.
- Adults and children in Universal Credit benefit units 'out of work' [32] conditionality categories:
    - No work requirements
    - Planning for Work
    - Preparing for work
    - Searching for work
- Adults and children in Universal Credit 'in-work' conditionality groups with monthly equivalised income below 70% of the national median (after housing costs):
    - Working with requirements
    - Working – no requirements
- Adults and children in Housing Benefit claimant benefit units with monthly equivalised income below 70% of the national median (after housing costs).
- Adults and Children in Tax Credit benefit units with monthly equivalised income below 70% of the national median (after housing costs).
- Asylum seeker adults and children in dispersed accommodation in receipt of support[33]

Indicator details

Adults and children in Income Support benefit units

Adults and children in income-based Jobseeker's Allowance benefit units

Adults and children in income-based Employment and Support Allowance benefit units

Adults and children in Pension Credit (Guarantee) benefit units

Adults and children in Universal Credit benefit units 'out of work' conditionality categories: 'No work requirements', 'Planning for Work', 'Preparing for work', 'Searching for work'[34]

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[32] Note that DWP stipulated which UC conditionality groups should be regarded as 'out of work' and 'in work'.
[33] Note that we exclude Home Office-support asylum seekers who are living in 'temporary accommodation', and only include those who have been 'dispersed'.
[34] Note that benefit units consisting of two Universal Credit claimants (i.e. Universal Credit couple) are only be classed as 'out of work' for our purpose if both claimants are out of work. In couples where one claimant is in work and one claimant is out of work, the entire benefit unit are classed as ''in work' and dealt with in the Adults and children in Universal Credit benefit units in 'in work' conditionality categories below.

4.3.4 These five indicators comprise a non-overlapping count of the number of adults and children in an LSOA living in benefit units claiming Income Support, income-based Jobseeker's Allowance, income-based Employment and Support Allowance, UC 'out of work' conditionality groups ('Searching for work', 'No work requirements', 'Planning for work' and 'Preparing for work') or Pension Credit (Guarantee). Data for March 2024 was sourced from databases held by the Department for Work and Pensions (DWP).

4.3.5 Each of these benefits are means-tested social security benefits. The benefits are mutually exclusive so there is no double counting involved. To be eligible for these benefits, claimants must be able to demonstrate that their income and savings are below specified thresholds.

4.3.6 For the purpose of the Income Deprivation Domain, these benefits are regarded as 'out of work' benefits.

4.3.7 The LSOA level count was constructed by selecting relevant claimants from the relevant DWP databases, matching in information on dependent partners and dependent children, then aggregating to LSOA level.

Adults and children in Universal Credit 'in-work' conditionality groups ('Working with requirements' or 'Working – no requirements') with monthly equivalised income below 70% of the national median (after housing costs)

4.3.8 These are benefit units in receipt of UC where one or more working age adult is in work, but where the equivalised household income is below the specified low income threshold.

4.3.9 The LSOA level count was constructed by selecting relevant claimants, partners and dependents from the DWP's UC administrative database for the end-of-March 2024 time point.

4.3.10 The benefit unit income was calculated for the month of March 2024, as reported by the claimant for the purpose of UC assessment, including earnings from employment and/or self-employment and UC benefit payments. However, any health/caring-related UC entitlements (Limited Capability for Work (LCW), Limited Capability for Work-Related Activity (LCWRA), Carer Entitlement, Disabled Child Entitlement) and/or money received from Disability Benefits (Disability Living Allowance / Personal Independence Payments or Attendance Allowance), were excluded from this total, as these components of benefit income are for specific health/caring-related purposes. The benefit unit's actual housing costs as reported to the UC administrative system were then deducted, to leave an 'After Housing Costs' adjusted income value. This adjusted income value was then compared against an income deprivation threshold of 70% of national median income after housing costs. The income threshold value was computed separately by DWP using their Households Below Average Income (HBAI) data source, for the specific purpose of the IoD 2025. Any benefit unit with an adjusted income value that fell below the 70% of national median income deprivation threshold was identified as income deprived and included in the domain numerator.

Adults and children in Housing Benefit claimant benefit units with monthly equivalised income below 70% of the national median (after housing costs)

4.3.11 This includes all Housing Benefit claimants (and associated partners and dependent children) who do not receive any out of work legacy benefits[35], Pension Credit Guarantee or UC, and whose benefit unit median equivalised income (after housing costs) is below the 70% of national median After Housing Costs income deprivation threshold. The income assessed here is composed of estimated income from employment, self-employment, State Pension, Tax Credit, Child Benefit, Pension Credit Savings Credit and Housing Benefit, but minus any Disability Benefits (Disability Living Allowance / Personal Independence Payments or Attendance Allowance) and minus the actual housing costs. Actual housing costs were derived from the Single Housing Benefit Extract (SHBE)[36].

Adults and Children in Tax Credit claimant benefit units with monthly equivalised income below 70% of the national median (after housing costs)

4.3.12 This includes all Tax Credit claimants, partners and dependents who are not in receipt of out of work legacy benefits, UC or Housing Benefit, and who have an equivalised benefit unit income below the 70% of national median income deprivation threshold, after housing costs.

4.3.13 The income assessed here is composed of estimated income from employment, self-employment and Tax Credit, but subtracting any Disability Benefits (Disability Living Allowance / Personal Independence Payments or Attendance Allowance) and estimated housing costs[37]. As actual housing costs are not available in the administrative data for Tax Credit benefit units[38], estimated housing costs were imputed by drawing upon housing cost data contained within the UC administrative database. The UC data were used to compute an extensive set of average housing costs according to the LSOA and the composition of the benefit unit. These were then used to impute housing cost estimates for Tax Credit benefit units. For instance, a Tax Credit benefit unit composed of an adult couple plus one dependent child would be assigned the average housing cost recorded in the UC database for the same type of benefit unit (adult couple plus one dependent child) living in that same LSOA. As such, the imputation takes into account the likely housing needs of the benefit unit (in terms of house type and size) and the local geographic variations in housing costs.

4.3.14 **Asylum seeker adults and children in dispersed accommodation receipt of support**

4.3.15 The indicator is the number of asylum seekers (adults and children) in an LSOA who were in dispersed accommodation and in receipt of Section 95[39], Section 98[40] and Section 4[41] support. Data for March 2024 was supplied by the Home Office.

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[35] Income Support, Income-based Jobseekers Allowance, Income-based Employment and Support Allowance
[36] This is the Local Authority Housing benefit returns of individual Housing Benefit claimants and is the most comprehensive administrative DWP dataset for Housing Benefit.
[37] Housing costs were imputed for Tax Credit benefit units by creating an estimate of 'average true housing costs' per family type (e.g. single person; couple no children; single with children; couple with children) and per LSOA from the Universal Credit administrative dataset, and then assigning the appropriate value to the Tax Credit benefit unit.
[38] Unless they are also claiming Housing Benefit, in which case they would form part of the Housing Benefit component of this domain.
[39] For those awaiting a decision, providing accommodation and living expenses
[40] Temporary support for those awaiting a Section 95 decision
[41] For those who have been refused asylum but can't leave the UK due to Human Rights Act grounds

4.3.16 Asylum is protection given to someone fleeing persecution in their own country under the 1951 United Nations Convention Relating to the Status of Refugees. In the UK, asylum seekers who are homeless or without money to buy food and other essentials ('destitute') can apply for subsistence and accommodation support while their application is being considered[42].

4.3.17 Following consultation with the asylum seeker statistics team at the Home Office, a decision was taken to exclude asylum seekers housed in temporary accommodation from the numerator of the Income Deprivation Domain. Temporary accommodation includes hostels and other locations that are often used for short durations, and therefore are not representative of the true underlying level of income deprivation in the LSOA. For instance, the Bibby Stockholm Barge was operational in March 2024 and housed a large concentration of asylum seekers in temporary accommodation, yet this was decommissioned in November 2024. An analytical judgement was therefore taken to exclude asylum seekers housed in such temporary accommodation from the numerator of this domain. Furthermore, concentrations of asylum seekers in temporary accommodation such as this would not be included in the domain denominator (which is based on 'resident population') therefore it would not be appropriate to include them in the numerator.

Combining the indicators to create the domain

4.3.18 The counts for each of these indicators at LSOA level were summed to produce a non-overlapping overall count of income deprived individuals. This overall count was then expressed as a proportion of the total resident population of the LSOA for mid-2022. As noted in Appendix B, the ONS provided a special bespoke series of small area population estimates for the purpose of the IoD 2025.

4.3.19 Note, as part of the quality assurance of the Income Deprivation Domain, some instances were identified where the LSOA numerator exceeded the LSOA resident population denominator from ONS.

4.3.20 It is likely that this is partially attributable to the different timepoints covered by the numerator and the denominator. The numerator is based on DWP benefits data and Home Office asylum seeker data for the end of March 2024, while the latest ONS population denominator available was for mid-2022.

4.3.21 A further likely reason is that there is an acknowledged difference in what is measured as 'population' by DWP and ONS. As part of the IoD 2025 development and quality assurance process, DWP identified a number of LSOAs where the population counts according to their internal administrative database (RAPID[43]) were higher than in the mid-2022 ONS population estimate data. The primary explanation for this is that there will legitimately be a number of people who are eligible for benefits (and therefore captured in the DWP administrative systems) who would not be expected to be included within the ONS population estimates. For example, people who have recently moved into the local area and who have therefore been resident for less than a year will be eligible to claim benefits in that area, while the ONS population estimates measure resident population as being those who have been resident for 12 months or more. Although this cohort may not

[42] See www.gov.uk/browse/visas-immigration/asylum for further details on asylum support in the UK.
[43] Registration And Population Interaction Database (RAPID)

have been captured in the mid-2022 population estimates, they may well be included in the mid-2024 population estimates, when these are published by the ONS.

4.3.22 To account for the discrepancies between the numerator and denominators, the approach for the Income Deprivation Domain has been to first set the indicator denominator at the value of the numerator for any LSOAs where the original denominator was smaller than the numerator. This is standard practice across all such indicators in the IoD 2025, and indeed has been applied in all earlier iterations of the Indices. Shrinkage estimation was then applied[44] to generate the final domain score. It is acknowledged that there are some LSOAs where the final income deprivation score is very close to 100%, and that these areas may be affected by the factors noted above.

Changes since the Indices of Deprivation 2019

Key policy and data related issues

4.3.23 The primary change to the policy landscape since the IoD 2019 has been the expansion of UC. In the mid-2015 timepoint used for the IoD 2019, the majority of UC claimants were single jobseekers. At the time of the IoD 2019, it was therefore agreed with DWP that it was not necessary to apply an income threshold to UC claimants for the IoD 2019, so all UC claimants except those in the 'working no requirements' conditionality category were included in the IoD 2019 Income Deprivation Domain. However, since December 2018, all new claimants of means-tested benefits including legacy benefits and Tax Credits (regardless of geographic location) now receive UC when they make a new benefit claim or if their circumstances change[45]. This has brought in a larger number of claimants receiving UC. However, there are a still a notable number of people claiming legacy means-tested benefit (including legacy Tax Credit claimants), with the timetable for moving all remaining claimants on to UC currently scheduled for March 2026[46]. It was therefore necessary to include a combination of legacy benefits and UC claimants in the IoD 2025 Income Deprivation Domain.

4.3.24 This has necessitated a reassessment of the design of the domain, with consideration required as to how best to include both legacy benefits and UC in the measure. However, it has also presented an opportunity to make enhancements and harmonise across UK Indices outputs (Action 5).

4.3.25 In addition, new internal administrative databases have been developed to manage and process benefits data. The emergence of DWP's Registration and Population Interaction Database (RAPID) has strengthened data linkages between different benefits. This database brings together a wide range of benefits data (including legacy and UC) as well as data on Tax Credits (previously held separately by HMRC) into one place for the DWP analytical community. RAPID provides a single coherent view of citizen interactions with DWP and HMRC within each tax year.

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[44] Shrinkage is a statistical method used to 'borrow strength' from larger areas (the local authority district) to reduce the impact of unreliable small area data. This is described in Section 3.4 and Appendix C.
[45] House of Commons Library (December 2024) Managed migration: Completing Universal Credit rollout https://commonslibrary.parliament.uk/research-briefings/cbp-9984/
[46] House of Commons Library (December 2024) Managed migration: Completing Universal Credit rollout https://commonslibrary.parliament.uk/research-briefings/cbp-9984/

DWP analysts were able to link in other key datasets, including sources of income and expenditure from a range of internal databases such as the Single Housing Benefit Extract (SHBE), the Universal Credit Monthly Admin Dataset and the General Matching Service (GMS) benefit scans, to provide non-overlapping data from a broader range of benefits. The data also enabled individuals (claimants, partners and children) to be grouped together into their respective benefit units, which was necessary prior to running the income equivalisation calculations. These created a nuanced picture of income and costs to better capture material deprivation. The availability of data on Housing Benefit from RAPID and SHBE databases has enabled the inclusion, for the first time, of Housing Benefit families in the Income Deprivation Domain numerator, if their incomes fall below the specified income deprivation threshold.

4.3.26 A further notable change has been an enhancement to the way the income threshold has been derived and applied. In the previous Indices (most recently, the IoD 2019), an income threshold of 60% of national median equivalised Before Housing Costs (BHC) income was derived by DWP, and any benefit units claiming Tax Credits with equivalised income below this threshold were counted as deprived on this domain. For the IoD 2025 there have been several notable enhancements made to the methodology.

4.3.27 Firstly, following consultation with DWP analysts, the income threshold has been raised to 70% of median national equivalised income to better dovetail with DWP's approach to measuring material deprivation[47]. Secondly, a refined approach has been applied to calculating the component sources of income, drawing upon monthly snapshot income data for UC benefit units, and only using monthly estimates derived from annual data for the Housing Benefit and Tax Credit subsets of this domain. Crucially, this income threshold and assessment is now based on an After Housing Costs (AHC) approach. Whilst efforts had been made in earlier Indices of Deprivation to move to an AHC measure, it has hitherto not been possible due to lack of robust data on housing costs and housing benefit[48]. The recent advances to DWP databases, and the extensive programme of work conducted by the Indices research team in collaboration with DWP analysts, has resulted in the IoD 2025 achieving an AHC measurement approach for this domain.

4.3.28 The 70% of national median equivalised AHC income threshold was calculated by DWP using a bespoke methodology, drawing upon the Family Resources Survey (FRS) data that underpins the Households Below Average Income (HBAI) publication[49].

4.3.29 In addition, as discussed above, there have been changes to the composition of benefits included in the domain: benefit units in receipt of Housing Benefit have been included where they are not in receipt of other legacy benefits and where their income is below the low income threshold (described above); and all UC claimant benefit units classed as 'in work' conditionality groups, with incomes of below the low income threshold, have been included in the Income domain.

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[47] Abigail McKnight, Irene Bucelli, Tania Burchardt and Eleni Karagiannaki (March 2024) Review of the UK Material Deprivation Measures https://www.gov.uk/government/publications/review-of-the-uk-material-deprivation-measures/review-of-the-uk-material-deprivation-measures

[48] With exception of Housing Benefit claimants captured in the Single Housing Benefit Extract (SHBE)

[49] https://www.gov.uk/government/collections/households-below-average-income-hbai--2

4.3.30 The definition of asylum seekers in receipt of support has changed to reflect the way this data is collected administratively by the Home Office, with all cases in dispersed accommodation in receipt of support included in the domain.

4.3.31 Prisoners are now also included in the denominator, as it is possible to receive some of the benefits included in the domain (e.g. Housing Benefit or the housing element of UC) for a limited time during the start of a spell in prison.

Supplementary indices

4.3.32 The two supplementary indices created, which are subsets of the Income Deprivation Domain, are the Income Deprivation Affecting Children Index (IDACI) and the Income Deprivation Affecting Older People Index (IDAOPI):

4.3.33 The IDACI is the proportion of all children aged 0 to 15 living who are counted in the Income Deprivation Domain numerator.

4.3.34 The IDAOPI is the proportion of all those aged 60 or over who are counted in the Income Deprivation Domain numerator.

4.4 Employment Deprivation Domain

4.4.1 The Employment Deprivation Domain measures the proportion of the working-age population in an area involuntarily excluded from the labour market. This includes people who may want to work but are unable to do so due to unemployment, sickness or disability, or caring responsibilities.

The indicators

- Claimants of Jobseeker's Allowance (both contribution-based and income-based).
- Claimants of New Style Jobseeker's Allowance.
- Claimants of Employment and Support Allowance (both contribution-based and income-based).
- Claimants of New Style Employment and Support Allowance.
- Claimants of Incapacity Benefit.
- Claimants of Severe Disablement Allowance.
- Claimants of Carer's Allowance.
- Claimants of Income Support.
- Claimants of Universal Credit in *No work requirements* conditionality group.
- Claimants of Universal Credit in *Searching for work* conditionality group.
- Claimants of Universal Credit in *Planning for work* conditionality group.
- Claimants of Universal Credit in *Preparing for work* conditionality group.

Indicator details

4.4.2 Data for the 12 indicators listed above were provided by DWP, constructed from administrative records of benefit claimants in such a way to create a non-overlapping count of claimants aged 18-66 for each indicator. To account for seasonal variations in employment deprivation, 12 separate sequential monthly

timepoints spanning the financial year 2022/23 were taken and the average number of claimants across the 12 monthly cuts calculated for each of the indicators.

Claimants of Jobseeker's Allowance (both contribution-based and income-based).

4.4.3 Jobseeker's Allowance (JSA) is paid to individuals who are out of work, available for work and actively seeking work. JSA has since been phased out for new claimants, with UC replacing income-based JSA from April 2013 and contribution-based JSA being replaced for new claimants from December 2022. However, a small number of existing claimants continue to receive legacy JSA.

Claimants of New Style Jobseeker's Allowance

4.4.4 New Style JSA replaces the contribution-based component of JSA. Introduced in October 2013 alongside UC, it became more widely available from 2016 and replaced contribution-based JSA for new claimants by December 2022. It is payable for up to 182 days to individuals who have paid sufficient National Insurance contributions and is not affected by a partner's income or savings. It can be claimed on its own or with UC.

Claimants of Employment and Support Allowance (both contribution-based and income-based)

Claimants of Incapacity Benefit

Claimants of Severe Disablement Allowance

4.4.5 Employment and Support Allowance, Incapacity Benefit and Severe Disablement Allowance are paid to individuals who are unable to work due to limiting illness or disability. Incapacity Benefit and Severe Disablement Allowance are no longer available for new claimants: Incapacity Benefit replaced Severe Disablement Allowance for new claimants in April 2001 and Employment and Support Allowance replaced Incapacity Benefit and Income Support paid because of an illness or disability for new claimants from October 2008. However, there still are a number of long-term sickness benefit claimants receiving Severe Disablement Allowance and Incapacity Benefit[50].

Claimants of New Style Employment and Support Allowance

4.4.6 New Style Employment and Support Allowance (ESA) replaced the contribution-based component of ESA and was introduced in October 2013, alongside the rollout of UC. While income-based ESA was gradually replaced by UC from 2013, contribution-based ESA was fully replaced for new claimants by December 2022. New Style ESA is available to individuals who are unable to work due to illness or disability and have paid sufficient National Insurance contributions. It is not means-tested and can be claimed alone or alongside UC.

[50] As of February 2016, there were approximately 17,000 Severe Disablement Allowance claimants across England as a whole (which equates to an average of just over 0.5 claimants per LSOA) and 26,000 Incapacity Benefit claimants (which equates to an average of just under 1 claimant per LSOA).

Claimants of Income Support

4.4.7 Income Support (IS) is a legacy benefit for individuals on a low income who are not required to seek work due to caring responsibilities, lone parenthood, pregnancy, or limited capability for work. It has been gradually replaced by UC for most new claimants since October 2013, with full phase-out due by the end of 2024.

Claimants of Carer's Allowance

4.4.8 The Carers Allowance indicator measures those adults who are involuntarily excluded from the labour market due to caring responsibilities. Carer's Allowance is payable to people aged 16 or over who provide unpaid care for at least 35 hours a week to someone who is in receipt of disability or social care benefits, who are not in full-time education or studying, and earn less than £102 a week[51].

Claimants of Universal Credit in the 'no work requirements' conditionality group

4.4.9 People in the UC 'no work requirements' conditionality group are not expected to work at present and are likely to have health or caring responsibilities that prevent them from working or preparing for work. This category has strong overlap in terms of eligibility criteria and conditionality arrangements with a subset of income based-Employment and Support and Carers Allowance.

Claimants of Universal Credit in the 'searching for work' conditionality group

4.4.10 People in the UC 'searching for work' conditionality group are either not working, or alternatively have very low earnings and are required to take action to secure work, or more / better paid work. This category has strong overlap in terms of eligibility criteria and conditionality arrangements with income-based JSA.

Claimants of Universal Credit in the 'planning for work' conditionality group

4.4.11 People in the 'planning for work' conditionality group are not yet expected to prepare for or look for work, but may need to attend occasional meetings to discuss future work plans. This includes lone parents with young children, people with caring responsibilities, or those with temporary barriers to work.

Claimants of Universal Credit in the 'preparing for work' conditionality group

4.4.12 People in the 'preparing for work' conditionality group are expected to take steps toward employment - such as building skills or attending training - but are not yet required to search for work. This group may include people with health conditions, disabilities, or caring responsibilities that limit their ability to work in the short term.

Combining the indicators to create the domain

4.4.13 Twelve sequential monthly non-overlapping counts of claimants of the specified benefits were created for the 12 months of the 2022/23 financial year. Twelve

[51] The eligible disability or social care benefits are: Personal Independence Payment daily living component, Disability Living Allowance middle or highest care rate, Attendance Allowance, Constant Attendance Allowance at or above the normal maximum rate with an Industrial Injuries Disablement Benefit, or basic (full day) rate with a War Disablement Pension or Armed Forces Independence Payment. Full-time studying is more than 21 hours per week. The earnings threshold is after the deduction of taxes, care costs while at work and 50 per cent of pension contributions.

monthly cuts were used in order to account for seasonal variations in employment deprivation. DWP analysts used the RAPID database to identify the caseload receiving at least one of the benefits listed above at each timepoint, and merging this with the DWP Customer Information System (CIS) to identify the geographic location of the claimant at each timepoint. A 12-month averaged count of claimants was calculated to create the Employment Deprivation Domain numerator, calculated as the seasonally-adjusted count of employment deprived people per LSOA.

4.4.14 The denominator was the working-age population (aged 18-66 for both men and women), based on the 2022 mid-year population estimate provided by ONS,

4.4.15 Like for the Income Deprivation Domain, prisoners are now also included in the denominator of the Employment Deprivation Domain, as it is possible to receive some of the benefits included in the domain (e.g. UC) for a limited time during the start of a spell in prison.

4.4.16 The Employment Deprivation Domain numerator was expressed as a proportion of the Employment Deprivation Domain denominator to form the Employment Deprivation Domain score. The score represents the proportion of the working-age population experiencing employment deprivation. Shrinkage was applied to construct the final domain score.

Changes since the Indices of Deprivation 2019

Key policy and data related issues

4.4.17 The primary change to the policy landscape since the IoD 2019 has been the expansion of UC. With the exception of New Style JSA and New Style ESA, all new claimants of means tested working age benefits now receive UC when they make a new benefit claim or if their circumstances change. In addition, between 2023 and 2026 the remaining legacy benefit claimants are being moved onto UC in a process called Managed Migration.

4.4.18 The Managed Migration of legacy benefit claimants presented a number of challenges for producing a comprehensive and nationally consistent Employment Deprivation Domain for the IoD 2025. Firstly, it is not straightforward to identify people in the UC system who are ‘involuntarily excluded from the labour market’ (i.e. it is not possible to perform a straight read-across between legacy benefits and the UC replacement), which could lead to some UC claimants being missed from the numerator count of domain (i.e. false negatives) and other UC claimants being incorrectly included in the numerator count (i.e. false positives). Secondly, there is a geographic dimension to the rollout of Managed Migration which means that people in different parts of the country will be moved onto UC earlier or later, leading to the potential for inconsistent national data. Finally, benefit records are held on a number of different databases with different coding structures within the DWP, which led to challenges in producing a non-overlapping count of claimants.

4.4.19 For the 2025 update, the Employment Deprivation Domain has drawn on a 2022/23 financial year time period, which predates the rollout of Managed Migration. This is to mitigate the challenges around inconsistent geographical coverage of the rollout programme.

Changes to the list of component workless benefits

4.4.20 The Employment Deprivation Domain is measured as a non-overlapping count of people receiving benefits payable to those who are not working (workless benefits). All seven workless benefits that comprised the Employment Deprivation Domain in the IoD 2019 have been retained and updated. In addition, a further five workless benefit components have been incorporated into the domain (see details below).

4.4.21 The following indicators have been retained and updated from the IoD 2019: Jobseeker's Allowance (JSA); Employment and Support Allowance (ESA); Incapacity Benefit (IB); Severe Disablement Allowance (SDA); Carer's Allowance (CA); Universal Credit (UC) claimants in the 'searching for work' conditionality group; Universal Credit (UC) claimants in the 'no work requirements' conditionality group[52].

4.4.22 The following new indicators have been added for the IoD 2025:

- Claimants of New Style Jobseeker's Allowance (JSA). This is essentially a replacement for the contribution-based component of JSA, and so it is a cosmetic but necessary addition to the indicator list.
- Claimants of New Style Employment and Support Allowance (ESA). This is essentially a replacement for the contribution-based component of ESA, and so it is a cosmetic but necessary addition to the indicator list.
- Claimants of Income Support (IS), on the basis that this group may be involuntarily excluded from the labour market due to caring responsibilities, and in order to maximise consistency with the coverage of UC.
- UC claimants in the 'planning for work' conditionality group. This includes those with caring responsibilities, and so broadly aligns with the legacy benefits payable to those involuntarily workless due to caring responsibilities – namely Carers Allowance (CA) / Income Support (IS) which are also included in the measure. This provides both greater coverage and greater consistency across the legacy and replacement benefit regimes.
- UC claimants in the 'preparing for work' conditionality group. This includes those with caring responsibilities whose youngest child is aged under two, and those with limited capability to work (due to health conditions) who have passed their Work Capability Assessment. It therefore overlaps with both the legacy Incapacity Benefits (IB) and Income Support (IS). This provides both greater coverage and greater consistency across the legacy and replacement benefit regimes.

Changes to the methodology

4.4.23 The definition of 'working age' has now been changed from 18-64 for males and 59 for females to 18-66 for both males and females to reflect the change in retirement age. Prisoners are now also included in the denominator, as it is possible to receive some of the benefits included in the domain for a short duration at the start of a spell in prison.

4.4.24 The domain is now based on 12 separate sequential monthly timepoints, compared to the four quarterly cuts used in the IoD 2019. This is to improve the way the

[52] Updated and enhanced to exclude those in full time education.

domain captures seasonality in employment deprivation, as recommended in the public consultation.

4.5 Education, Skills and Training Deprivation Domain

4.5.1 The Education, Skills and Training Domain measures the lack of attainment and skills in the local population. The indicators fall into two sub-domains: one relating to children and young people, and one relating to adult skills. These two sub-domains are designed to reflect the 'flow' and 'stock' of educational disadvantage within an area respectively. That is, the 'children and young people' sub-domain measures the attainment of qualifications and associated measures ('flow'), while the 'skills' sub-domain measures the lack of qualifications in the resident working-age adult population ('stock').

The indicators

Children and Young People sub-domain

- Key Stage 2 attainment: The scaled score of pupils taking Mathematics, English reading and English grammar, punctuation and spelling Key Stage 2 exams
- Key Stage 4 attainment: The average capped points score of pupils taking Key Stage 4 (GCSE or equivalent) exams
- Entry to higher education: A measure of young people aged under 21 not entering higher education
- Pupil absence: The proportion of authorised and unauthorised absences for pupils attending maintained Primary, Secondary and Special Schools
- Persistent pupil absence: The proportion of pupils missing 10% or more of possible school sessions

Adult Skills sub-domain

- Adult skills: The proportion of working-age adults with no or low qualifications[53], or who cannot speak English or cannot speak English well, aged 25 to 66

Indicator details

Key Stage 2 attainment

4.5.2 This indicator has been calculated as a scaled score for state school pupils taking Mathematics, English reading, and English grammar, punctuation and spelling in Key Stage 2 examinations. The numerator is the scaled scores in these examinations in 2018/19, 2021/22 and 2022/23 in an LSOA. The denominator is the total number of subjects (exams) taken by pupils for the same years as the numerator.

[53] Low qualifications refers to qualifications of level 1 or below. Level 1 qualifications are: first certificate, GCSE - grades 3, 2, 1 or grades D, E, F, G, level 1 award, level 1 certificate, level 1 diploma, level 1 ESOL, level 1 essential skills, level 1 functional skills, level 1 national vocational qualification (NVQ) or music grades 1, 2 and 3

4.5.3 The data are for pupils in state-funded schools[54] and were supplied by the Department for Education from the National Pupil Database, based on the LSOA of pupil residence. Three years of data were used to reduce issues due to fluctuations between year-groups. As each year's results are separately moderated (and thus score thresholds change), standardisation and shrinkage has been applied separately to each year of data before combining into a single indicator using factor analysis.

Key Stage 4 attainment

4.5.4 The indicator is the average capped points score for pupils at Key Stage 4 (GCSE or equivalent)[55]. The numerator is the total capped score of pupils taking Key Stage 4 exams (GCSE or equivalent) in 2018/19, 2021/22 and 2022/23 in an LSOA. The denominator is the total number of pupils in the area who took Key Stage 4 exams, for the same years as the numerator.

4.5.5 The data are for pupils in state-funded schools and were supplied by the Department for Education from the National Pupil Database, based on the LSOA of pupil residence. Three years of data were used to reduce issues due to fluctuations between year-groups. As each year's results are separately moderated (and thus score thresholds change), standardisation and shrinkage were applied separately to each year of data before combining into a single indicator using factor analysis.

Pupil absence

4.5.6 This indicator is the proportion of authorised and unauthorised absences for pupils attending maintained primary, secondary and special schools. The numerator is the number of half days missed by pupils living in an LSOA due to authorised and unauthorised absences for 2018/19, 2021/22 and 2022/23. The denominator is the total number of possible half-day sessions for 2018/19, 2021/22 and 2022/23. The data are for pupils in state-funded schools and were supplied by the Department for Education from the National Pupil Database, based on the LSOA of pupil residence. Three years of data were used to reduce issues due to fluctuations between year-groups. Standardisation and shrinkage have been applied to the indicator.

Persistent pupil absence

4.5.7 The indicator is the proportion of pupils in maintained primary, secondary and special schools missing more than 10% of possible half-day sessions. The numerator is the number of pupils missing more than 10% of half-day sessions in 2018/19, 2021/22 and 2022/23 in each LSOA. The denominator is the number of pupils attending primary, secondary and special schools in an LSOA. Standardisation and shrinkage have been applied to the indicator.

Entry to higher education

4.5.8 This indicator has been collected from the Joint Information Systems Committee (JISC) and captures the proportion of young people aged under 21 not entering

[54] The state-funded schools comprise: academies, free schools and City Technology Colleges, and schools maintained by a local authority (Community, Foundation, Voluntary Aided, Voluntary Controlled, Community Special and Foundation Special).
[55] The average capped points score caps the total number of courses that can be included at the equivalent of eight full GCSEs. This places higher weight on the grades within the core of eight subjects than on the quantity of courses taken.

Higher Education. The numerator is based on the number of successful entrants aged under 21 to Higher Education (over a five-year period – from 2018/19 to 2022/23) in each LSOA. The denominator is the population aged 14-17 in the LSOA (in the preceding years). The indicator includes those aged under 21 who have successfully applied from a domestic postcode in England to a Higher Education institution anywhere in the UK. The data are restricted to first degree, first year, full-time students, and age has been calculated as at 31 August each year.

4.5.9 The indicator was first calculated in a positive form as a measure of those aged 21 entering Higher Education. This figure was then subtracted from 1 to produce the measure of young people not entering Higher Education. Shrinkage was then applied to the indicator.

Adult skills and English language proficiency

4.5.10 The adult skills and English language proficiency indicator captures those of working age who experience skills deprivation due to low or no qualifications and/or low English language proficiency.

4.5.11 A non-overlapping count of those adults with no or low qualifications, and/or who cannot speak English or cannot speak English 'well', has been provided by the Office for National Statistics from Census 2021 data.

4.5.12 The numerator is the number of usual residents aged 25 to 66 with no qualifications or Level 1 qualifications and/or cannot speak English or cannot speak English well. The denominator is the number of usual residents aged 25 to 66. These have been converted into a rate and shrinkage has been applied to the indicator.

Combining the indicators to create the domain

4.5.13 The indicators within the Children and Young People sub-domain were standardised by ranking and transforming to a normal distribution. The maximum likelihood factor analysis technique was used to generate the weights to combine the indicators into the sub-domain score, see Table 4.1.

Table 4.1. Indicator weights generated by factor analysis for the Children and Young People sub-domain

Indicator	Indicator weight
Key Stage 2 attainment	0.169
Key Stage 4 attainment	0.192
Pupil absence	0.247
Persistent pupil absence	0.246
Entry to higher education	0.146

4.5.14 The indicators within the Adult Skills sub-domain were the proportion of adults with no or low qualifications and/or lack of English language proficiency. As these were already combined into a non-overlapping indicator, no further combination was needed within the sub-domain.

4.5.15 The two sub-domains were standardised by ranking and transforming to an exponential distribution and combined with equal weights to create the overall domain score.

Changes since the Indices of Deprivation 2019

Key policy- and data-related issues

4.5.16 The COVID-19 pandemic had a considerable impact on the collection of education statistics. Examination assessments were suspended during the pandemic, with Centre Assessment Grades (CAGs) used in 2019/20 and the Teacher Assessed Grades (TAGs) used in 2020/21. The recording of pupil absences was similarly affected, with COVID-related absences recorded separately to other absences by the Department for Education (DfE). Moreover, different parts of the country were subject to different lockdown restrictions during the height of the pandemic, with associated differences in home schooling patterns and monitoring of absences. For these reasons, it is not possible to obtain nationally consistent pupil attainment or absence measures during the academic years 2019/20 and 2020/21. In order to mitigate the impacts of the pandemic, the pupil attainment and absence data has been produced for one pre-pandemic timepoint (the academic year 2018/19), and two timepoints after full external moderation by examination boards was re-established (2021/22 and 2022/23).

4.5.17 Following the easing of pandemic-related school restrictions, there is some evidence of a continued rise in school absences compared to the pre-pandemic situation. Evidence from the House of Commons Library Research Briefing[56] into school attendance found that the estimated absence rate for the 2022/23 academic year was 7.5%. This is higher than in the six years prior to the pandemic (when absence rates ranged between 4.5% and 4.8%).

4.5.18 Moreover, more than one-in-five pupils (22.5%) were recorded as “persistently absent” in 2021/22, equating to 1.6 million pupils (a pupil is identified as a persistent absentee if they miss 10% or more of their possible sessions; a school session is a half-day unit of schooling, consisting of a morning or an afternoon). Persistent absence was particularly high among pupils eligible for Free School Meals (FSM): 37.2% of FSM eligible pupils were classed as persistently absent, compared with 17.5% of pupils that were not eligible for FSM. Persistent absence has increased by more than half across all school types since the pandemic: from 28.8% in 2018/19 to 40.4% in 2021/22 in Special Schools; from 8.2% in 2018/19 to 17.7% in 2021/22 in Primary Schools; and from 13.7% in 2018/19 to 27.7% in 2021/22 in Secondary Schools. In response to these trends, the Education Committee has launched an inquiry into persistent absence and support for disadvantaged pupils[57]. There is strong evidence of the link between persistent absence and educational outcomes. The House of Commons Library Research Briefing into school attendance found that “Pupils who were persistently or severely absent (who missed more than 10% and 50% of possible school sessions, respectively) had lower average attainment. 35.6% of persistently absent pupils, and just 11.3% of severely absent pupils achieved grades 9-4 in English and maths

[56] Robert Long and Shadi Danechi (September 2023) https://commonslibrary.parliament.uk/research-briefings/cbp-9710/
[57] https://committees.parliament.uk/work/7179/persistent-absence-and-support-for-disadvantaged-pupils/

(compared to 67.6% of all pupils)"[58]. In recognition of the growing scale of recorded absences, the prominence of the issue in public policy debates and the impact on educational outcomes, a new measure of persistent absences has been introduced in the Education, Skills and Training Deprivation Domain, as well as extending the overall absence measure to include primary school and special school pupils.

4.5.19 The Education and Skills Act 2008 introduced changes to the minimum age at which young people in England can leave education and learning. The Act stipulated that young people must continue in education or training to the age of 17 from 2013, and to 18 from 2014. Young people are able to choose whether to stay in full-time education, undertake work-based learning such as an apprenticeship, or part-time education or training if they are employed, self-employed or volunteering for more than 20 hours per week. As a result of these changes to the compulsory school leaving age, the decision was taken to retain the IoD 2015 Staying on in education post-16 measure in the IoD 2019 rather than updating the indicator, to ensure that the methodology for producing the Education, Skills and Training domain remained consistent with the previous iteration. However, because the change to the compulsory school leaving age has been in place for 10 years, the decision has been taken to discontinue the Staying on in education post-16 indicator for the IoD 2025, rather than retain the IoD 2015 indicator.

Changes to the list of indicators

4.5.20 Three of the five indicators that comprised the Children and Young People sub-domain in the IoD 2019 have been retained and updated: Key Stage 2 attainment, Key Stage 4 attainment and Entry to Higher Education; one indicator has been removed: Staying on in education post 16; and one has been enhanced: Pupil absence, which has been expanded to include Primary Schools and Special Schools as well as Secondary Schools. In addition, one new indicator has been incorporated: Persistent absence. The Adult Skills sub-domain has also been retained and updated with minor modifications.

Changes to underpinning data and definitions

4.5.21 The structure and content of Census 2021 questions on qualifications slightly differ from those in the 2011 Census. This means that differences in the estimates from the two Censuses may partly represent real change and partly be attributable to a change in the way data was collected. Therefore, the highest qualification variable is not directly comparable with the 2011 Census. However, the differences are relatively minor.

4.5.22 The numerator for the Entry to Higher Education indicator is now collected and processed by the Joint Information Systems Committee (JISC). However, this has not led to any notable changes in the collation of this data.

Changes to the methodologies

4.5.23 The age coverage of the Adult skills measure has been changed from 25-60 for females and 25-64 for males to 25-66 for both females and males, to reflect the changes in the state retirement age.

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[58] Robert Long and Shadi Danechi (September 2023) https://commonslibrary.parliament.uk/research-briefings/cbp-9710/#:~:text=The%20most%20recent%20final%20Department,reason%20in%202020%2F21) page 6

4.6 Health Deprivation and Disability Domain

4.6.1 The Health Deprivation and Disability Domain measures the risk of premature death and the impairment of quality of life through poor physical or mental health. The domain measures morbidity, disability and premature mortality. The domain is comprised of four separate indicators measuring: illness and disability; premature mortality; acute morbidity; and mental health.

The indicators

- Comparative Illness and Disability Ratio: an age and sex standardised ratio of people receiving Disability Living Allowance (DLA), Employment and Support Allowance (ESA), Attendance Allowance (AA), Industrial Injuries Disablement Benefit/Reduced Earnings Allowance/ Retirement Allowance, Incapacity Benefit (IB), Severe Disablement Allowance (SDA), Personal Independence Payment (PIP) and Universal Credit (UC) Health Caseload
- Years of Potential Life Lost: an age and sex standardised rate of 'premature death', defined as death before the age of 75 from any cause
- Acute Morbidity: an age and sex standardised rate of hospital spells starting with an admission in an emergency and lasting more than one calendar day
- Mental health sub-component 1: Suicide: a rate of deaths coded as intentional
- Mental health sub-component 2: Hospital admissions: a rate of hospital admissions related to mental health
- Mental health sub-component 3: Prescribing data: a rate of patients prescribed pharmaceuticals for mental ill-health
- Mental health sub-component 4: Health benefits: the number of residents claiming Personal Independence Payments (PIP) and Disability Living Allowance (DLA) in disease groupings associated with mental health or behavioural disorders as a proportion of the total population aged 0-66.

Indicator details

Comparative illness and disability ratio

4.6.2 The comparative illness and disability ratio is an indicator of work limiting morbidity and disability, based on those receiving benefits due to inability to work through ill health.

4.6.3 This indicator has been calculated as a ratio of the number of benefits paid to people in ill health in an LSOA, compared to what would be expected given the area's age and sex structure.

4.6.4 The benefits included are: Disability Living Allowance (DLA), Employment and Support Allowance (ESA), Attendance Allowance (AA), Industrial Injuries Disablement Benefit / Reduced Earnings Allowance / Retirement Allowance, Incapacity Benefit (IB), Severe Disablement Allowance (SDA), Personal Independence Payment (PIP) and the UC Health Caseload (Live fit note (Pre-Work Capability Assessment), Limited capability for work, and Limited capability for work and work-related activity).

4.6.5 This indicator is based on data from four consecutive quarterly timepoints in the financial year 2022/23 (in order to precede the Managed Migration of Universal Credit of people with work limiting illness or disability), provided by DWP.

4.6.6 The denominator is the 2022 mid-year population estimate in five-year age-sex bands, as provided by ONS. The indicator has been directly age and sex standardised in five-year age-sex bands. Shrinkage has been applied to the indicator.

Years of potential life lost

4.6.7 The years of potential life lost indicator measures 'premature death', defined as death before the age of 75 from any cause (the commonly used measure of premature death).

4.6.8 This indicator has been calculated by comparing the actual number of deaths in an LSOA to what would be expected given the area's age and sex profile. The numerator is the number of deaths before the age of 75 from any cause, including death due to disease as well as external causes such as accidents, unlawful killing and deaths in combat. The numerator data are for the period 2018 to 2022 inclusive, provided by the Office for National Statistics.

4.6.9 The denominator is the 2018 to 2022 mid-year population estimates of five-year age-sex bands, provided by ONS. The level of unexpected mortality has been weighted by the age of the individual who has died. The indicator has been directly age and sex standardised in five-year age-sex bands. Shrinkage has been applied to the indicator.

Acute morbidity

4.6.10 The acute morbidity indicator measures the level of emergency admissions to hospital, based on administrative records of in-patient admissions.

4.6.11 Emergency admissions are defined as cases where 'admission is unpredictable and at short notice because of clinical need'. This includes admission via the Accident and Emergency department, admission directly onto a ward or into theatre and the emergency transfer of patients between hospitals. All emergency admissions greater than one day in length (where discharge is not on the same date as admission) are included as an indication of acute health problems. Only admissions to NHS hospitals are included in the data.

4.6.12 This indicator has been calculated as a rate of emergency admissions to hospital, based on administrative records of in-patient admissions in each LSOA. The numerator is the number of hospital spells starting with admission in an emergency and lasting more than one calendar day, based on data from 2021/22 to 2022/23 provided by the Health and Social Care Information Centre from the Hospital Episode Statistics database.

4.6.13 The denominator is the 2021 and 2022 mid-year population estimates in five-year age-sex bands, as provided by ONS. This indicator has been directly age and sex standardised in five-year age-sex bands, and shrinkage has been applied.

Mental health

4.6.14 The mental health indicator is a broad measure of levels of mental ill health in the local population. The definition used for this indicator includes mood (affective), neurotic, stress-related and somatoform disorders.

4.6.15 The indicator is a composite estimate based on four underlying sub-components from separate sources, outlined in the sections below: suicide mortality data, hospital admissions, prescribing data; and health benefits data. Although none of the four sources on their own provide a comprehensive measure of mental health conditions, used in combination they represent a large proportion of all those suffering mental ill health.

Suicide mortality data

4.6.16 This indicator has been calculated as the rate of suicide mortality. The numerator is deaths that occurred between 2018 and 2022 which had International Classification of Diseases 10 codes X60-X84 and Y10-Y34, excluding Y33.9 where the coroner's verdict was pending. The data has been provided by ONS. Five years of data have been used to reduce problems of small numbers. The denominator is the 2018 to 2022 mid-year population estimates, provided by ONS. A simple (not standardised) rate has been calculated, and shrinkage has been applied.

Hospital admissions for mental health conditions

4.6.17 This indicator has been constructed as 'annual incidence of hospitalisation', based on those individuals who have suffered at least one severe mental health in-patient spell during the year. The numerator is the number of in-patient admissions that are coded 01 – 08 in the Mental Health Care Clusters:

Table 4.2. Mental Health Care Clusters

Code	Description
01	Care Cluster 1 - Common Mental Health Problems (Low Severity)
02	Care Cluster 2 - Common Mental Health Problems (Low Severity with Greater Need)
03	Care Cluster 3 - Non-Psychotic (Moderate Severity)
04	Care Cluster 4 - Non-Psychotic (Severe)
05	Care Cluster 5 - Non-Psychotic Disorders (Very Severe)
06	Care Cluster 6 - Non-Psychotic Disorder of Over-Valued Ideas
07	Care Cluster 7 - Enduring Non-Psychotic Disorders (High Disability)
08	Care Cluster 8 - Non-Psychotic Chaotic and Challenging Disorders

4.6.18 This indicator has been based on two years of data, provided by the Mental Health Service Dataset (MHDS) for 2021/22 and 2023/23, to reduce problems of small numbers. The denominator is the 2021 and 2022 mid-year population estimates provided by ONS. A simple (not standardised) rate has been calculated, and shrinkage has been applied.

Prescribing data

4.6.19 This indicator estimates the number of patients at LSOA level with mental health problems using information on the conditions for which particular drugs are prescribed and their typical dosages[59]. Prescribing data is published at GP practice level[60]. First, a GP practice level indicator is estimated based on the assumption that those with mental ill health take the national 'average daily quantity' of a specific drug on every day of the year[61]. Two years of prescription data (for 2021/22 and 2022/23) have been used to reduce problems of small numbers. The estimate for each GP practice is then distributed indirectly to each LSOA using data on GP practice patients place of residence by LSOA level[62]. The denominator for this indicator is based on the same practice population distribution used to distribute the GP practice estimates to local areas.

Health benefits data

4.6.20 This indicator measures the proportion of people receiving benefits due to mental ill health outcomes. The numerator is the number of Disability Living Allowance (DLA) and Personal Independence Payment (PIP) claimants in the disease groupings associated with mental health or behavioural disorders (see Table 4.3 below).

Table 4.3. Mental health benefit disease codes

Benefit	Disease Code	Disease Code Name
DLA	D40	Learning Disability
DLA	D44	Psychosis
DLA	D45	Psychoneurosis
DLA	D46	Personality Disorder
DLA	D48	Dementia
DLA	D50	Behavioural Disorder
DLA	D51	Alcohol and Drug Misuse
DLA	D52	Hyperkinetic Syndrome
DLA	F02	Speech or language disorders
DLA	F03	Dyslexia
DLA	F05	Specific childhood learning disorder - type not known
DLA	F62	Cognitive disorder due to stroke
DLA	F65	Cognitive disorder - other / precise diagnosis not specified
PIP	80	Personality disorder

[59] Based on prescription medication use for anxiolytics (British National Formulary Section 4.1.2) and anti-depressants (British National Formulary Section 4.3), https://digital.nhs.uk/data-and-information/publications/statistical/nationaldementia-and-antipsychotic-prescribing-audit/national-dementia-and-antipsychotic-prescribing-audit-nationalsummary-report

[60] GP practice level prescription data was sourced from the Health and Social Care Information Centre (HSCIC) at https://digital.nhs.uk/data-and-information/publications/statistical/practice-level-prescribing-data

[61] While this assumption may not fit very well in individual cases, it is more likely to hold across the 'average' for the practice population. For information on average daily quantities, see the Prescribing Support Unit information at www.hscic.gov.uk/prescribing. The average daily quantities were used to produce an estimate of the numbers of patients required to account for the GP Practice level prescription volumes for the different prescription drugs based on 'typical' dosages.

[62] The GP Attribution Dataset contains information about populations registered with GP practices, and is maintained by the Health and Social Care Information Centre. Data is published for individual GP practice patients at Lower-layer Super Output Area level, for https://digital.nhs.uk/data-and-information/publications/statistical/patients-registeredat-a-gp-practice. For earlier time points, data was made available by the Health and Social Care Information Centre.

PIP	81	Dyslexia
PIP	82	Dyspraxia
PIP	83	Specific learning disorder - other / type not known
PIP	84	Speech or language disorder
PIP	85	Post traumatic stress disorder (PTSD)
PIP	86	Stress reaction disorders - Other / type not known
PIP	87	Agoraphobia
PIP	88	Anxiety disorders - Other / type not known
PIP	89	Generalised anxiety disorder
PIP	90	Panic disorder
PIP	91	Phobia - Social
PIP	92	Phobia - Specific
PIP	93	Obsessive compulsive disorder (OCD)
PIP	94	Anxiety and depressive disorders - mixed
PIP	95	Body dysmorphic disorder (BDD)
PIP	96	Conversion disorder (hysteria)
PIP	97	Dissociative disorders - Other / type not known
PIP	98	Somatoform disorders - Other / type not known
PIP	99	Bipolar affective disorder (Hypomania / Mania)
PIP	100	Depressive disorder
PIP	101	Mood disorders - Other / type not known
PIP	102	Psychotic disorders - Other / type not known
PIP	103	Schizoaffective disorder
PIP	104	Schizophrenia
PIP	105	Cognitive disorder due to stroke
PIP	106	Cognitive disorders - Other / type not known
PIP	107	Dementia
PIP	108	Anorexia nervosa
PIP	109	Bulimia nervosa
PIP	110	Eating disorders not otherwise specified (EDNOS)
PIP	111	Alcohol misuse
PIP	112	Drug misuse
PIP	113	Factitious disorders - Other / type not known
PIP	114	Munchausen syndrome
PIP	115	Down's syndrome
PIP	116	Fragile X syndrome
PIP	117	Learning disability - Other / type not known
PIP	118	Asperger syndrome
PIP	119	Autism
PIP	120	Retts disorder
PIP	121	ADHD / ADD
PIP	122	Conduct disorder (including oppositional defiant disorder)
PIP	123	Bedwetting (enuresis)
PIP	124	Faecal soiling (encopresis)
PIP	125	Psychiatric disorders of childhood - Other / type not known

4.6.21 This indicator is based on data from four consecutive quarterly timepoints during the financial year 2022/23, provided by DWP. The denominator is the 2022 mid-year population estimate aged 0-66, provided by ONS. A simple (not standardised) rate has been calculated, and shrinkage has been applied.

Combining the components to create a composite indicator

4.6.22 The four independent administrative data sources were combined to reduce the influence of under- or over-recording on any one source. First each of the four mental health components was ranked and transformed to a normal distribution, then they were combined using weights derived by factor analysis to generate the overall mental health indicator score, see Table 4.4.

Table 4.4. Indicator weights generated by factor analysis for the mental health indicator

Indicator	Indicator weight
Suicide mortality data	0.105
Hospital admissions	0.186
Prescribing data	0.211
Health benefits data	0.498

4.6.23 Using the four components minimises the impact of any variation in the organisation and practice of local services, where individuals with identical mental health needs may receive different types of treatment; the combined indicator should therefore be a more precise measure of the underlying 'true' rate of mental health than any single indicator on its own.

4.6.24 Unlike the other indicators in this domain, the mental health indicator is not age and sex standardised. Although there are particular ages when a person is at higher risk of suffering from these mental health disorders, and females are at greater risk than males, the distribution of mental health does not follow a clear distribution over the lifespan, so age and sex have not been controlled for.

Combining the indicators to create the domain

4.6.25 The indicators within the domain were standardised by ranking and transforming to a normal distribution. Factor analysis was used to generate the weights to combine the indicators into the final domain score, see Table 4.5.

Table 4.5. Indicator weights generated by factor analysis for the Health Deprivation and Disability Domain

Indicator	Indicator weight
Comparative illness and disability ratio	0.294
Years of potential life lost	0.240
Acute morbidity	0.222
Mental health	0.244

Changes since the Indices of Deprivation 2019

Key policy and data related issues

4.6.26 The impact of COVID-19 on health is substantial and, like other consequences of the pandemic, worse for those living in areas of higher deprivation. For example, Warner et al (2022) found that areas with the highest levels of deprivation had 84.5% more primary COVID-19 admissions than the least deprived areas[63]. Additionally, researchers have estimated that the year 2020, when COVID first emerged in the UK, showed a 15% increase in years of life lost compared with 2019, with a strong deprivation gradient in excess years of life lost, which was greatest in younger age groups[64]. As such, most indicators in this domain are likely to be affected by the COVID pandemic compared with IoD 2019.

4.6.27 Most data in this domain has been collected for the 2021/22 and 2022/23 time periods, thereby avoiding the early phase of the pandemic. However, longer-term effects are likely to be present in the data, including the impact of long COVID. Additionally, the Years of Potential Life Lost and Suicide indicators use a five-year time period to account for small numbers, so this includes all stages of the pandemic. However, the aforementioned findings are real effects and should be reflected in the Indices. This domain therefore does not include any adjustments or changes to the data because of the pandemic.

4.6.28 During the pandemic, DWP announced that all face-to-face assessments for disability benefits, including Work Capability Assessments (WCAs) for ESA and UC would be suspended for three months from 17 March 2020. This led to a delay in assessing the health of claimants. However, as the health benefits used in this domain relate to the year 2022/23, the pandemic-related data collection issue should not impact on the Comparative Illness and Disability Ratio (CIDR) or Health Benefit measures.

4.6.29 The Managed Migration of legacy benefit claimants to UC has presented a number of challenges for producing an updated Comparative Illness and Disability Ratio, as there is a geographic dimension to the rollout of Managed Migration which means that people in different parts of the country will be moved onto UC earlier or later, leading to the potential for inconsistent national data. Therefore the 2022/23 financial year time point has been used, which predates the widespread rollout of Managed Migration.

4.6.30 The Managed Migration process also presented a challenge to the Health Benefit sub-component of the Mood and Anxiety Disorder indicator. There is currently no data on UC claimants broken down by the requisite International Classification of Diseases (ICD) codes. Therefore, any claimants who were migrated from legacy benefits to the UC system could not be counted. In response to this, the mental health benefits measure has been modified to cover those in receipt of Disability Living Allowance (DLA) and Personal Independence Payments (PIP) with disease classification codes associated with mental health conditions. There has been a programme of work undertaken within the DWP to harmonise, standardise and

[63] Warner et al (2022) Socioeconomic deprivation and ethnicity inequalities in disruption to NHS hospital admissions during the COVID-19 pandemic: a national observational study https://qualitysafety.bmj.com/content/31/8/590
[64] Warner et al (2022) Socioeconomic deprivation and ethnicity inequalities in disruption to NHS hospital admissions during the COVID-19 pandemic: a national observational study https://qualitysafety.bmj.com/content/31/8/590

enhance the disease coding system used in the DLA and PIP statistics. It was therefore possible to produce a mental health benefit measure which consistently identified claimants regardless of whether they were receiving DLA or PIP.

Changes to the list of indicators

4.6.31 The Comparative Illness and Disability Ratio, Years of Potential Life Lost, and Acute Morbidity, have all been directly updated.

4.6.32 The Mood and Anxiety Disorders indicator has been replaced with a broader mental health indicator which takes into consideration a wider range of mental health conditions. The mental health indicator has been further enhanced through the re-introduction of a subcomponent indicator derived from DWP health benefit claimants which was not available for the Indices in 2019.

Changes to underpinning data and definitions

4.6.33 The UC Conditionality categories included within the IoD 2019 Comparative Illness and Disability Ratio have been replaced with the UC Health Caseload (which captures people on UC with a health condition or disability restricting their ability to work) for the IoD 2025. There are three categories within the UC Health Caseload: 1) Live fit note (Pre-Work Capability Assessment), 2) Limited capability for work and 3) Limited capability for work and work-related activity. The domain also includes those in receipt of Industrial Injuries Disablement Benefit/Reduced Earnings Allowance/Retirement Allowance (to capture those who are ill or disabled as a result of an accident at work or training scheme). Four quarters of data were used to take into account seasonal variations in benefit claimant rates.

4.6.34 Due the introduction of the Mental Health Service Dataset (MHDS), some Hospital Trusts are no longer submitting records to the Hospital Episode Statistics (HES). The Hospital Admissions sub-component of the mental health indicator therefore utilises the MHDS instead of HES for compiling data on mental health admissions. This measure includes a broader set of mental health conditions than were used in the previous measure (see the *Hospital admissions for mental health conditions* subsection above).

4.6.35 The denominators for the Comparative Illness and Disability ratio, Years of Potential Life Lost and Acute Morbidity indicators now reflect populations inclusive of prisons, as the LSOA numerators for these indicators can potentially include prisoners.

4.7 Crime Domain

4.7.1 Crime is an important feature of deprivation that has major effects on individuals and communities. The Crime Domain measures the risk of personal and material victimisation at local level.

The indicators

- Violence with injury, rate per 1,000 at risk population
- Violence without injury, rate per 1,000 at risk population
- Stalking and harassment, rate per 1,000 at risk population

- Burglary, rate per 1,000 at risk properties
- Theft, rate per 1,000 at risk population
- Criminal damage, rate per 1,000 at risk population
- Public order and possession of weapons, rate per 1,000 at risk population
- Anti-social behaviour, rate per 1,000 at risk population

Indicator details

Violence with injury, rate per 1,000 at risk population

Violence without injury, rate per 1,000 at risk population

Stalking and harassment, rate per 1,000 at risk population

Burglary, rate per 1,000 at risk properties

Theft, rate per 1,000 at risk population

Criminal damage, rate per 1,000 at risk population

Public order and possession of weapons, rate per 1,000 at risk population

Anti-social behaviour, rate per 1,000 at risk population

4.7.2 The National Police Chiefs Council (NPCC), the Home Office, and individual police forces, provided geocoded microdata on police recorded crime and police incidents of anti-social behaviour (ASB). The recorded crime data were sourced from a combination of three sources: (i) the national repository underpinning the Home Office Data Hub; (ii) the national repository underpinning Police.uk (using the full police geocodes, not the geographically anonymised data released into the public domain); and (iii) bespoke extracts provided by police forces. The Home Office Data Hub only contains records of crime, not ASB, so data on police incidents of ASB were sourced from two sources: (i) the national repository underpinning Police.uk (again using full police geocodes); and (ii) bespoke extracts provided by police forces.

4.7.3 All data sources comprised of individual records of crimes or incidents. Each record in the respective dataset contained information concerning the type of crime/incident (i.e. the notifiable offence code or ASB identifier), the date of occurrence, and the detailed location of occurrence (grid reference and/or postcode). Importantly, as noted above, the location data were included in full and without any geographical anonymisation. As such, reference to Police.uk data in this domain section relates to the raw police data that police forces provide to Police.uk, and not the post-anonymisation version that is subsequently released into the public domain via the Police.uk website.

4.7.4 Due to the sensitivity of the data, especially in relation to the detailed location of crime/incident occurrence, all data collation, storage, preparation and analysis was undertaken within the secure confines of Lancashire Constabulary Headquarters, as stipulated in the NPCC data processing agreements that facilitated this work.

4.7.5 Recorded crime data were provided for six statistical years, from 2018/19 to 2023/24, inclusive. Moving from a two-year data time series (as in the IoD 2019) to a six-year data time series provides a more robust basis for measuring underlying victimisation risk, as the indicators are less affected by short-term spikes in

offending, and less susceptible to small number variation. The six-year time period now adopted also reflects the impacts on individuals and communities of crimes committed during the pandemic period, including the increase in domestic violence during this period[65].

4.7.6 Incidents of ASB were provided for two statistical years, 2022/23 and 2023/24. Although data for ASB were also reviewed for the 2021/22 statistical year, data for 2021/22 were rejected due to concerns about geographical inconsistency of policing practices and recording practices relating to restriction 'breaches' during the pandemic period[66]. To avoid introducing geographical biases, ASB data were therefore only included for the post-pandemic period.

4.7.7 LSOA level counts were constructed for each indicator by aggregating the individual event-level geocoded crime and incident data using a bespoke mapping application. Where a crime or incident occurred within 10 metres of an LSOA boundary, it was apportioned equally to the areas either side of the boundary. A series of rules were imposed to maximise data quality, such as ensuring that records that were located well outside of the respective force boundary were not mapped at this stage.

4.7.8 The Appendix on quality assurance outlines the work done to check the input data and data processing involved (Appendix I).

4.7.9 The LSOA level counts for each of the seven recorded crime indicators were constrained to the aggregate counts of crime published at Police Force Area level which are available as open data[67]. This is because a minority of recorded crimes are not allocated a detailed geocode when they are recorded by the police, and such records therefore cannot be mapped to LSOAs. Any discrepancies between the Police Force Area level open data and the aggregated geocoded data are therefore dealt with in this constraining step, so that the constrained LSOA level aggregations from geocoded data sum up to match the Police Force Area level open data exactly. Following in-depth investigation and consultation with police force analysts, the indicator of ASB was not constrained to published open data[68]. Rather, the indicator of ASB was constrained to the total number of incidents in the original geocoded file.

4.7.10 For each of the eight indicators, the constrained LSOA counts for the time period in question (six years for recorded crime; two years for ASB) were expressed as annual average counts.

4.7.11 For the seven indicators other than burglary, the resultant counts were then expressed as rates per 1,000 'at-risk' population, using a special population-based denominator. This denominator was constructed by calculating the 'at-risk' population for each LSOA, which consisted of the resident population plus an estimate of the non-resident workplace population. See the section below on

[65] See, for instance: https://commonslibrary.parliament.uk/domestic-abuse-and-covid-19-a-year-into-the-pandemic/
[66] See, for instance, Halford et al. Crime Science (2022) 11:6. https://doi.org/10.1186/s40163-022-00168-x
[67] Although the Police Force Area level open data statistics do relate to the same underlying occurrence of crime, they are semi-independent of the geocoded crime data because the Police Force Area identifier in the crime record is not dependent upon the detailed geocode variable(s) (i.e. the grid reference or postcode).
[68] Analysts across a number of police forces advised that the published open data on anti-social behaviour at Police Force Area level should not be used for this purpose due to differences in the definition of anti-social behaviour incidents across the open data.

'Changes since the Indices of Deprivation 2019' for more details on the denominator construction process.

4.7.12 For the burglary indicator, the same methodological approach was taken, except that the resultant crime counts were expressed as a crime rate per 1,000 'at-risk' properties, using a special property-based denominator. This denominator consisted of residential dwellings at LSOA level from the 2021 Census plus non-residential properties at LSOA level from Ordnance Survey's Address Base.

4.7.13 Finally, shrinkage was applied to the LSOA level rates for each indicator, to produce the following eight composite indicator scores.

Violence with injury, rate per 1,000 at risk population

4.7.14 This indicator is based on all sub-categories of 'violence with injury', plus all categories of 'homicide'. Six years of recorded crime data are used: 2018/19 to 2023/24. The indicator is expressed as the annual average rate of offences per 1,000 at risk population in the LSOA.

Violence without injury, rate per 1,000 at risk population

4.7.15 This indicator is based on all sub-categories of 'violence without injury'. Six years of recorded crime data are used: 2018/19 to 2023/24. The indicator is expressed as the annual average rate of offences per 1,000 at risk population in the LSOA.

Stalking and harassment, rate per 1,000 at risk population

4.7.16 This indicator is based on all sub-categories of 'stalking and harassment'. Six years of recorded crime data are used: 2018/19 to 2023/24. The indicator is expressed as the annual average rate of offences per 1,000 at risk population in the LSOA.

Burglary, rate per 1,000 at risk properties

4.7.17 This indicator is based on all sub-categories of 'burglary'. Six years of recorded crime data are used: 2018/19 to 2023/24. The indicator is expressed as the annual average rate of offences per 1,000 at risk properties in the LSOA.

Theft, rate per 1,000 at risk population

4.7.18 This indicator is based on all sub-categories of 'theft' and 'robbery', except 'shoplifting', which is excluded[69]. Six years of recorded crime data are used: 2018/19 to 2023/24. The indicator is expressed as the annual average rate of offences per 1,000 at risk population in the LSOA.

Criminal damage, rate per 1,000 at risk population

4.7.19 This indicator is based on all sub-categories of 'criminal damage' and 'arson'. Six years of recorded crime data are used: 2018/19 to 2023/24. The indicator is expressed as the annual average rate of offences per 1,000 at risk population in the LSOA.

[69] Unlike other forms of crime, offences of shoplifting can only occur in LSOAs that contain shops. The LSOA level distribution of shoplifting crimes is very skewed, with almost one-quarter of LSOAs nationally having no shoplifting crimes at all over the six-year period, and a further one-quarter of LSOAs nationally having less than one shoplifting crime per year on average. At the other extreme of the LSOA distribution, some LSOAs contain over 1,000 shoplifting offences, ranging up to a maximum of almost 10,000 shoplifting offences in some LSOAs. As the other types of theft included in the Crime Domain Theft indicator are not restricted to shops, or indeed any other type of property, shoplifting was deemed to be inconsistent with the conceptual design of the Theft indicator, and so was excluded.

Public order and possession of weapons, rate per 1,000 at risk population

4.7.20 This indicator is based on all sub-categories of 'public order' and 'possession of weapon offences'. Six years of recorded crime data are used: 2018/19 to 2023/24. The indicator is expressed as the annual average rate of offences per 1,000 at risk population in the LSOA.

Anti-social behaviour (ASB), rate per 1,000 at risk population

4.7.21 This indicator is based on all sub-categories of ASB that are reported to the police and are recorded as police incidents, which consists of incidents of 'personal', 'environmental' and 'nuisance' anti-social behaviour. Two years of police incident data are used: 2022/23 and 2023/24. The indicator is expressed as the annual average rate of incidents per 1,000 at risk population in the LSOA.

Combining the indicators to create the domain

4.7.22 The eight composite indicators were each standardised by ranking and transforming to a normal distribution. Factor analysis was used to generate the weights to combine the indicators into the domain score, see Table 4.6.

Table 4.6. Indicator weights generated by factor analysis for the Crime Domain

Indicator	Indicator weight
Violence with injury	0.151
Violence without injury	0.154
Stalking and harassment	0.132
Burglary	0.074
Theft	0.097
Criminal damage	0.144
Public order and Possession of weapons	0.145
Anti-social behaviour	0.103

Changes since the Indices of Deprivation 2019

4.7.23 A considerable number of enhancements have been made to the Crime Domain since the IoD 2019. These include improvements to the sources of input data, and the methodologies used in the derivation of the domain. The key enhancements are as follows.

4.7.24 Improved sources of data: the IoD 2025 research team was granted permission to access recorded crime data from the Home Office Data Hub, as well as the data underlying Police.uk and bespoke police force extracts. This is the first time the Home Office have granted permission for the Home Office Data Hub to be used for external research purposes. Each of the three sources of data has its own strengths and weaknesses, and data from these three sources were combined in novel ways to maximise the quality of resultant data for every police force across the country. For example, in some instances, records were linked across these data sources using the unique crime reference number to ascertain or verify the detailed location of occurrence.

4.7.25 Extended indicator list: the IoD 2025 Crime Domain now consists of eight indicators, whereas the IoD 2019 Crime Domain (and earlier) consisted of just four indicators (which were: violence, burglary, theft and criminal damage). For the IoD 2025 Crime Domain, three separate violence-related indicators are now included, to better reflect the higher volume of violent crime relative to the other categories at national and sub-national levels. A separate indicator of public order and possession of weapons offences has been introduced, whereas in the IoD 2019 public order was subsumed within the single violence indicator. A new indicator of ASB based on police incident data has also been introduced for the first time in the IoD 2025.

4.7.26 More comprehensive suite of notifiable offences: whereas the IoD 2019 violence and theft indicators were composed of selected subsets of overall violence and theft-related notifiable offences, the IoD 2025 indicators are based on the full set of notifiable offence categories (with the exception of the exclusion of shoplifting from the theft indicator, as noted above).

4.7.27 Extended data period for indicators based on recorded crime: for the seven indicators derived from police recorded crime, six years of crime data are used in the IoD 2025, whereas only two years of crime data were used in the IoD 2019, and only one year of crime data was used in each of the earlier indices. This extended time series increases the robustness of the data by reducing the effects of small number volatility that can be observed year-on-year in LSOA crime statistics, to better reflect underlying risk of victimisation.

4.7.28 Introduction of a new indicator of ASB: this is the first time an indicator of ASB has been included in the English Indices of Deprivation. As part of the IoD 2025 development work, a consultation exercise was conducted with police force analysts across the country to ascertain whether ASB incident data was sufficiently robust for inclusion in the Crime Domain. Based on the feedback from this consultation exercise, the Indices team concluded that an indicator of ASB could be included. As noted above, two years of police incident data are used (2022/23 and 2023/24), as other research has found that different police forces adopted different approaches to recording incidents of ASB during the COVID pandemic. To avoid introducing systematic geographical biases due to COVID-period recording differences, ASB data were used for the ‘post-pandemic’ period only.

4.7.29 Redistribution of crimes and incidents initially geocoded to police stations and police headquarters: examination of the crime and ASB data revealed some geographical concentrations of records geocoded to police premises. These concentrations could be either true reflections of crime occurrence (for example, when crimes were committed within a police station custody suite) or they could be spurious concentrations (for example, when crimes are geocoded to a police headquarters due to lack of other geographical information within the crime record). In either case, it is inappropriate to geocode records to the location of the police station as this may lead to LSOAs being ranked as highly deprived on the Crime Domain simply by virtue of containing a police station or police headquarters. Therefore, crimes and incidents with occurrence locations at police premises were identified in the source data, and then were not mapped to the LSOA containing the police premises, but instead were distributed across the entire Police Force Area during the ‘constraining’ phase. This avoids LSOAs

appearing to be ‘hotspots’ of crimes and/or ASB simply by virtue of containing a police station or police headquarters.

4.7.30 LSOA crime and incident counts were ‘constrained’ to Police Force Area totals rather than Community Safety Partnership totals: this change of approach was motivated by two factors: (i) due to the new approach to dealing with crimes and incidents geocoded to police premises, it was deemed more appropriate to constrain to Police Force Area level, because some forces geocode records to the force headquarters, and these are better redistributed across the entire force area than only to the Community Safety Partnership area containing the headquarters; and (ii) the published aggregate-level police recorded crime statistics sometimes contain sizeable volumes of crimes coded as ‘Unassigned CSP’, whereas using the geocoded microdata it was often possible to successfully map these for the purpose of the Crime Domain, therefore the published CSP level statistics were deemed unsuitable for the constraining the IoD 2025.

4.7.31 Change to the spatial smoothing component of the mapping: whereas previous Indices used an approach whereby any crime that was geocoded to within 100m of an LSOA boundary would be split between the bordering LSOAs, for the IoD 2025 a smaller parameter value of 10m was used, in recognition of improvements to police geocoding practices, and with the aim of reducing the impact of this spatial smoothing approach on the resultant LSOA indicators. The advantages and disadvantages of different parameter values was discussed with external academics and the Home Office prior to selecting the 10m value for the IoD 2025 Crime Domain.

4.7.32 Denominators: as in previous Indices of Deprivation, the denominators in the Crime Domain are constructed to better reflect the ‘at-risk’ population in an LSOA, rather than solely the resident population (except for the Burglary indicator, which uses an ‘at risk properties’ denominator). In the IoD 2019 (and earlier iterations), the ‘at risk population’ denominator was constructed as the sum of the resident population (minus prison population) plus the non-resident workplace population from the most recent Census (in the case of the IoD 2019, this was the 2011 Census). Although the same general approach to constructing the ‘at risk population’ denominator has been retained for the IoD 2025 Crime Domain, two changes have been introduced.

(i) prison populations are no longer removed from this denominator, as concentrations of violent crime were found at prison locations, which suggests that the prison populations should be retained in the denominator as prisoners are at risk of victimisation.

(ii) More substantially, the derivation of the Census-based ‘non-resident workplace population’ component of the denominator was affected by the COVID pandemic. The 2021 Census was conducted on 21st March 2021, which was in the midst of pandemic restrictions, including restrictions on people’s employment status and, for those who were still working, their workplace location. Simply using the workplace data from the 2021 Census would generally undercount people’s workplace locations compared to what would likely be the case in the non-pandemic years. However, reverting to using the 2011 Census would generally overcount people’s workplace location during the pandemic years.

In recognition of this data challenge, the Indices research team explored a range of different data sources and methodologies for estimating the likely non-resident workplace population in the absence of the COVID pandemic. These data sources included both the 2011 and 2021 Censuses, Ordnance Survey data on non-residential properties (and change over time, as a potential indicator of employment growth centres), and the Business Register and Employment Survey (BRES). Each of these data sources was considered in isolation and in various combinations, with tests run to triangulate results at LSOA level, combined with various face validity assessments of generated outputs.

Following a period of review and consultation with stakeholders, the following approach was adopted: for the two 'pre-pandemic' years of 2018/19 and 2019/20, the non-resident workplace population was taken from the 2011 Census; for the two 'pandemic years' of 2020/21 and 2021/22, the non-resident workplace population was taken from the 2021 Census; and for the two 'post-pandemic' years of 2022/23 and 2023/24, the non-resident workplace population was constructed as the average of the 2011 and 2021 Census values, in recognition of the gradual return to pre-pandemic levels, albeit with persisting increases of people working from home compared to pre-pandemic levels.

To generate the relevant at-risk population denominator for each corresponding year of numerator data, the non-resident workplace population (as detailed above) was added to the respective mid-year resident population estimate provided by ONS.

4.8 Barriers to Housing and Services Domain

4.8.1 The Barriers to Housing and Services Domain measures the physical and financial accessibility of housing and local services. The indicators fall into two sub-domains: 'geographical barriers', which relates to the geographical (in)accessibility of key local services and amenities; and 'wider barriers' which relates to broader issues of accessibility, such to access to affordable housing and other important services.

The indicators

Geographical Barriers sub-domain

- Connectivity Score: Travel time to retail, education, health, employment and leisure/entertainment destinations by walking, cycling and public transport.

Wider Barriers sub-domain

- Housing affordability: Difficulty of access to owner-occupation or the private rental market, expressed as the inability to afford to enter owner-occupation or the private rental market.
- Household overcrowding: The proportion of households judged to have insufficient space to meet the household's needs.

- Statutory Homelessness: A Local Authority District level indicator expressed as the rate of acceptances for housing assistance under the homelessness provisions of housing legislation[70]
- Core Homelessness: A Local Authority District level indicator capturing households experiencing the most extreme and immediate forms of homelessness
- Broadband speed: Average broadband upload and download line speed (Mbit/s)
- Patient-to-GP ratio: Patient to GP ratio by GP surgery, allocated to LSOA level based on patient residence distributions

Indicator details

Connectivity Score

4.8.2 The Connectivity Score indicator is based on the Department for Transport (DfT) Connectivity Tool[71]. In line with the concepts and methods adopted by DfT for their Connectivity Tool, the IoD 2025 indicator defines connectivity as someone's ability to get where they want to go by foot, bicycle or public transport, taking into consideration the primary purposes for travel (the main destination types) and the modes of travel (walking, cycling and public transport). It measures the travel time required to reach key destinations weighted by destination category (based on the proclivity of people visiting key destinations) and people's assumed travel preferences.

4.8.3 Car travel is excluded from the DfT Connectivity Tool and is similarly excluded from the IoD 2025 Connectivity Score indicator.

4.8.4 Table 4.7 highlights the key data sources in the model:

Table 4.7. Key data sources in the Department for Transport Connectivity Tool

Concept	Dataset	Source
How, where, and when people travel	Self-reported number of trips by mode and purpose at different times of the day	DfT (National Travel Survey years 2011 – 2020)
Value of reaching destinations	Height and footprint of buildings	Ordnance Survey – Mastermap
People living within the area for social visits	Population estimates at the Output Area level	Office for National Statistics - Census Output Area Population Estimates
Travel infrastructure: public transport	Public transport locations and travel timetables	Basemap
Travel infrastructure: active travel & driving	Road and walking networks, including	Ordnance Survey – MasterMap networks

[70] Homelessness is defined as applications made to local housing authorities under the homelessness provisions of housing legislation where a decision was made, and the applicant was found to be eligible for assistance (acceptances). It therefore excludes any households found to be ineligible.
[71] https://www.gov.uk/guidance/connectivity-tool

	restricted access to certain paths	
Destinations	See Table 4.8 below	

4.8.5 Table 4.8 shows the data sources for each of the destination datasets.

Table 4.8. Data sources for destination data

Destination	Dataset	Source
Employment	Number of jobs in each postcode for all sectors	Office for National Statistics - Business Register and Employment Survey (BRES)
Education	Secondary School	Ordnance Survey (OS) AddressBase
	Special needs establishment	
	pre school nursery	
	further education	
	Primary school	
	University	
Leisure and recreation	Conference / Exhibition Centre	
	Amusement Park	
	Pub / Nightclub	
	Amusements	
	Historic site	
	Arena / Stadium	
	Campsite	
	Cinema/Theatre	
	Allotment	
	Recreation and Sports Ground	
	Bingo Hall / Concert Hall	
	Museum	
	Motor sports	
	Library	
	Leisure (generic)	
	Spiritual/religious	
Health	GP	
	Hospital	
	Other ‘health’ building	
Shopping	Bank	
	Gardening retail	
	Petrol retail	
	Retail generic	
	Retail shop	

	Royal mail infrastructure	
	Food retail	
	Bank	
Visiting friends	Visit friends at private home	ONS Population estimates and OS AddressBase

4.8.6 The model calculates the walking, cycling and public transport travel times from a given location, finding the shortest route between origin and destination using comprehensive public transport timetables[72] calculated for all times of day and weighted based on frequency of travel at that time, and people's willingness to travel the given distance on the specified transport mode. The timetables are calculated for a weekday Tuesday during school term time and are derived from Basemap[73]. Walking travel times are calculated using road and walking networks from the Ordnance Survey MasterMap and are based on an average walking speed of 4.8kph.

4.8.7 Separate scores were calculated for each destination category. An overall score was created by combining each of the destination category scores (weighted by the frequency of travel to each kind of destination within each category and informed by the National Travel Survey). It is this combined overall score that is used as the final Connectivity Score indicator, which constitutes the Geographical Barriers sub-domain.

Housing affordability

4.8.8 This indicator is a measure of the inability to afford to enter owner occupation or the private rental market. The indicator is made up of two component sub-indicators relating to housing affordability:

- Difficulty of access to owner-occupation for households where the head is aged under 40.
- Difficulty of access to the private rental market where the household head is under 40.

4.8.9 The target group is households where the head is aged under 40[74]. This aims to capture the cohort of households entering the housing market based on the recognition that most first-time buyers and renters are in the younger adult age group.

4.8.10 The indicator is a modelled estimate based on house prices and rents in the relevant Housing Market Area[75] and incomes at LSOA level. The indicator is based on 5 years of data covering financial years 2018 to 2022 (source: UK Household

[72] The model runs for 97 times of day, from 6am - 10pm, at intervals of 10 minutes
[73] https://www.gov.uk/government/publications/transport-connectivity-metric/transport-connectivity-metric
[74] Technically, the head of household is known as the "Household Reference Person", defined as the highest income householder without regard to gender.
[75] Housing Market Areas are a geography which were developed to identify the optimal areas within which planning for housing should be carried out. For more information see Gov.uk https://www.gov.uk/government/publications/housing-market-areas

Longitudinal Study (UKHLS), Family Resources Survey (FRS), 2021 Census, Land Registry, Zoopla and Valuation Office Agency (VOA)).

4.8.11 In order to combine the owner-occupation and private rental sub-components into a single indicator of housing affordability, each component was standardised by ranking and transforming to a normal distribution. The two components were then combined with equal weights to create the housing affordability indicator.

Household overcrowding

4.8.12 This indicator is the proportion of households in an LSOA that are classed as overcrowded based on the Census 2021 'occupancy rating'. The 'occupancy rating' provides a measure of whether a household's accommodation is overcrowded or under-occupied. There are two measures of occupancy rating, each constructed as separate components. The first component is based on the total number of rooms in a household's accommodation. The second component is based on the number of bedrooms.

4.8.13 For each component, the numerator is the number of overcrowded households in the LSOA while the denominator is the number of households in the same area. In order to combine the two components into a single indicator of housing overcrowding, each component was standardised by ranking and transforming to a normal distribution. Shrinkage was then applied to each component. The two sub-components were then combined with equal weights to create the overall household overcrowding indicator.

Statutory Homelessness

4.8.14 This indicator is constructed at LAD level and is expressed as the rate of acceptances for housing assistance under the homelessness provisions of housing legislation. The numerator data has been drawn from the statutory homelessness statistics published on a quarterly basis by MHCLG. The numerator data cover 11 quarters from October 2021 to June 2024. Any imputed statistics are excluded from the numerator of this indicator. The denominator is the number of households in the LAD from the 2021 Census. The denominator data are included for the same number of time points as there are valid (i.e. non-imputed) numerator data, to ensure consistency between numerator and denominator.

Core Homelessness

4.8.15 The core homelessness indicator measures the number of households experiencing the most extreme and immediate forms of homelessness. There is evidence that people who are classed as experiencing 'core homelessness' may not be captured in statutory homeless figures. As such, the addition of the core homelessness indicator in the IoD 2025 provides a more comprehensive account of homelessness than has been possible in previous Indices. Like the statutory homelessness indicator, the Indicator of core homelessness is measured at LAD level. The components of core homelessness and their definitions as applied in this measure are shown in Table 4.9 below.

Table 4.9. Core Homelessness Categories and Definitions		
Category	Description	Source
Rough Sleeping	Sleeping in the open e.g. in streets, parks, carparks, doorways	1. MHCLG Rough Sleeping Adjusted annual count/estimate, 2023 2. MHCLG Homelessness Case Level Collection (H-CLIC) Applications from Rough Sleeper or No Fixed Abode at LAD level, 2023 3. Destitution in the UK Survey (DUKS) and Family Resources Survey 2022
Unconventional Accommodation	Sleeping in places/spaces not intended as normal residential accommodation, e.g. cars, vans, lorries, caravans/motor home, tents, boats, sheds, garages, industrial/commercial premises	Public Voice survey, 2020
Hostels	Communal emergency and temporary accommodation primarily targeted at homeless people including hostels, refuges and shelters	1. DWP Freedom of Information (FOI) request on Short Exemption accommodation Housing Benefit cases, 2023 2. Census 2021 number of usual residents in homeless hostels 3. MHCLG H-CLIC Applications from last accommodation to Hostel flow; + Local Authority Temporary Accommodation return relating to the number in Hostels, 2023
Unsuitable Temporary Accommodation	Homeless households placed in temporary accommodation of certain types: Bed and Breakfast, Private Non-self-contained Licensed/Nightly Let, and Out of Area Placements	1. MHCLG Temporary Accommodation Statistics, year end 2023, 2. DWP FOI request from Single Housing Benefit Extract (SHBE) for households in Temporary Accommodation (2023)
Sofa Surfing	Individuals or family groups staying temporarily (expecting or wanting to move) with another household, excluding non-dependent children of host household and students, who are also overcrowded on the bedroom standard	1. English Housing Survey (EHS), pooled 2018-2022 (excluding Covid year); 2. Destitution UK Survey and Family Resources Survey 2022.

4.8.16 Each component source is assigned a weight before combining; with the relative weight size informed by project timeliness, coverage, sample size, response rates

and potential bias, and relevance of questions/categories. Please see Bramley (2023), *Homelessness Monitor Research Programme: Technical report*[76] for more details of the methodology for constructing, weighting and combining the measure. As noted above, the core homelessness indicator is constructed at LAD level, with the denominator being the number households in the LAD from the 2021 Census.

Broadband Speed

4.8.17 This indicator of digital connectivity represents the average broadband upload and download line-speeds (Mbit/s) for connections in the area. Data on broadband provision is gathered from 61 Internet Service Providers (ISPs) who provide information on the technology available, together with estimates of download and upload speeds. OfCom's analysis of active fixed broadband speeds is based on the information provided by these ISPs regarding the maximum measured speed of each active line. This represents the maximum possible connection speed achievable between the ISP's access network and the consumer premises.

Patient-to-GP Ratio

4.8.18 This indicator represents the number of patients registered at a GP Surgery as a ratio of all Full Time Equivalent GPs, with the data apportioned to LSOA level based on patient residence distributions. NHS Digital provides data on the number of patients registered at the practice and the number of Full-Time Equivalent (FTE) and headcount figures by four staff groups, (GPs, Nurses, Direct Patient Care (DPC) and administrative staff), with breakdowns of individual job roles within these high-level groups at GP Practice level. Figures are derived from the General Practice Workforce series of Official Statistics. The estimate for each GP practice is distributed indirectly to LSOA level, using the GP Attribution Dataset. The GP Attribution Dataset contains information about the place of residence for each patient registered with a GP practice and is maintained by NHS Digital. The patient resident data is aggregated to provide a count of the number of patients registered at each GP practice by LSOA. Using this information, it is possible to attribute the Patient-to-GP ratio scores to each LSOA in England.

Combining the indicators to create the domain

4.8.19 The Geographical Barriers sub-domain is composed solely of the Connectivity Score indicator.

4.8.20 Within the Wider Barriers sub-domain, each of the indicators was standardised by ranking and transforming to a normal distribution, before being combined together, with each indicator given an equal weighting within the sub-domain. Prior to combining, a composite Homeless indicator was created by adding together the standardised Core Homelessness and Statutory Homelessness scores.

4.8.21 The Wider Barriers and Geographical Barriers sub-domains were then standardised by ranking and transforming to an exponential distribution and combined with equal weights to create the overall domain score.

[76] Bramley, G 2023, Homelessness Monitor Research Programme: Technical report on updated baseline estimates and scenario projections 2023. Heriot-Watt University. https://doi.org/10.17861/949n-am24

Changes since the Indices of Deprivation 2019

Key policy and data related issues

4.8.22 There has been a change to the statistical returns used to derive the statutory homelessness indicator. As part of the IoD 2019, homeless statistics were collected from the P1E quarterly return. However, from April 2021, all Local Authorities are expected to provide data via H-CLIC as the P1E was discontinued. There have also been legislative changes, with the introduction of new prevention and relief duties owed as part of the 2017 Homelessness Reduction Act (HRA)[77]. These changes mean that statutory homeless figures are not comparable to the activity information collected previously.

Changes to the list of indicators

4.8.23 The Connectivity Score indicator has replaced the road distance to services measures used in previous Indices. This has brought in a number of enhancements. The first main enhancement is that the Connectivity Score indicator takes into account the availability, frequency and efficiency of public transport in a local area. This represents an improvement on the existing measures by providing a closer approximation of available travel modes from residential addresses and removing the assumption of car ownership and availability in the household. The second main enhancement is that it is possible to capture access for a greater number and breadth of service destinations, with 33 service destination types included in the Connectivity Score measure, compared with just four services used in the IoD 2019.

4.8.24 The household overcrowding indicator has been enhanced to incorporate inadequate number of bedrooms as well as rooms. Extending this indicator to incorporate bedrooms was supported in the Indices Futures consultation[78] and is already used in the latest Welsh Index of Multiple Deprivation (WIMD). Moreover, measuring overcrowding using a bedroom standard is increasingly commonplace, for example in 2012, MHCLG issued guidance which recommended that LADs should use the non-statutory bedroom standard when assessing whether or not households are overcrowded for the purpose of housing allocation[79].

4.8.25 A new core homelessness indicator has been introduced alongside the existing Statutory Homeless indicator. This captures those households experiencing the most extreme and immediate forms of homelessness, complementing existing statutory measures.

4.8.26 Average broadband upload and download line-speeds (Mbit/s) for connections in the area has also been brought into the Wider Barriers sub-domain. This is in response to support for a measure of digital connectivity in the Indices Futures

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[77] https://www.legislation.gov.uk/ukpga/2017/13/contents/enacted

[78] Ministry for Housing Communities and Local Government (MHCLG) (2022) Indices Futures: Updating the English Indices of Deprivation (IoD) consultation - https://www.gov.uk/government/consultations/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation/outcome/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation-government-reponse

[79] https://www.ons.gov.uk/census/censustransformationprogramme/questiondevelopment/housingcommunalestablishmentsandvisitors/estimatingthenumberofroomsincensus2021anupdateonderivinganoccupancyratingfromvaluationofficeagencynumberofrooms

Consultation[80] to reflect the importance of online transactions and interactions. This brings the English Indices of Deprivation more closely in line with the Welsh, Scottish and Northern Irish equivalents, which all provide a measure of broadband provision in their respective access to services measures.

4.8.27 A further new indicator has been introduced as part of the Wider Barriers sub-domain: The number of patients registered at a GP Surgery as a ratio of all Full Time Equivalent GPs. This indicator is intended to capture access in terms of service availability, rather than geographic proximity.

4.8.28 The housing affordability indicator has been enhanced to reflect changes in the data availability (these modifications were subject to empirical testing). This includes:

- Incorporating Census 2021 in the modelling;
- Blending of Zoopla and Valuation Office Agency (VOA) data for rent estimates;
- Review of Housing Market Areas (HMAs);
- Rebasing the residual income ratio, to reflect incomes 'After Housing Costs';
- Modifying the bedroom size requirements applied to reflect social and market realities. For example, younger, recently formed households, particularly couples, are assumed more likely to anticipate family formation, while families with younger children may anticipate either additional children or their children becoming teenagers, both of which would affect bedroom requirements. It is assumed that most couple first time buyers would seek at least one spare bedroom, and that would be a norm for Registered Social Landlords providing low cost home ownership products. Some households with disability may require an extra room for carers or equipment, and some families emerging from relationship breakdown may require bedrooms for children to visit part time. Post-Covid, many working households would seek to have a study/workspace.

4.9 Living Environment Deprivation Domain

4.9.1 The Living Environment Deprivation Domain measures the quality of the local environment. The indicators fall into two sub-domains. The 'indoors' sub-domain contains measures relating to the quality of the home environment, while the 'outdoors' sub-domain contains measures relating to the local neighbourhood environment.

[80] Department for Levelling up Housing and Communities (December 2022) Indices Futures: Updating the English Indices of Deprivation (IoD) – consultation https://www.gov.uk/government/consultations/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation

The indicators

Indoors sub-domain

- Housing in poor condition: The proportion of social and private homes that fail to meet three components of the Decent Homes standard.
- Housing Energy Performance Score: A measure reflecting housing quality derived from the Energy Performance Certificate (EPC) data collated by MHCLG.
- Housing lacking private outdoor space: A derived from Ordnance Survey (OS) and Office for National Statistics (ONS) data on residential properties and associated private outdoor space.

Outdoors sub-domain

- Air quality: A measure of air quality based on emissions rates for four pollutants.
- Road traffic accidents involving injury to pedestrians and cyclists: A measure reflecting the rate of pedestrians and cyclist casualties from road traffic collisions.
- Noise pollution: The percentage of the population of each LSOA exposed to noise pollution greater than or equal to 55dB *Lden*.
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Indicator details

Housing in poor condition

4.9.2 The housing in poor condition indicator is a modelled estimate of the proportion of social and private homes that fail to meet three components of the Decent Homes standard.

4.9.3 For the purposes of this IoD 2025 deprivation indicator, a property is said to be in poor condition if it fails to meet any one of the three separate components shown in the table below[81]. Each of these components was modelled separately, using data from the 2019 and 2020 English Housing Survey at national level, in combination with 2023 Experian dwelling-level data and 2023 Ordnance Survey geographic dwelling level data that provides information on the age, type, tenure and occupant characteristics of the housing stock at individual dwelling level. Failure likelihood factors for individual dwellings were generated by segmentation analysis and logistic regression models. These were then aggregated to LSOA.

[81] See 'A Decent Home: Definition and guidance for implementation' published in June 2006 for details of the Decent Homes standard. https://www.gov.uk/government/publications/a-decent-home-definition-and-guidance

Table 4.10. The components of the Housing in Poor Condition Indicator	
Component	Description
Housing Health and Safety Rating System (HRSS) Category 1 Hazards	Dwellings which fail to meet this criterion are those containing one or more hazards assessed as serious ('Category 1'). The system includes 29 hazards in the home categorised into three categories 1) Excess cold 2) falls 3) other.
Disrepair	A dwelling is said to be in disrepair if: at least one of the key building components is old and needs replacing or major repair due to its condition; or more than one of the other building components are old and need replacing or major repair due to their condition.
Modernisation	A dwelling is said to fail this criterion if it lacks three or more of the following: a reasonably modern kitchen (20 years old or less); a kitchen with adequate space and layout; a reasonably modern bathroom (30 years old or less); an appropriately located bathroom and WC; adequate insulation against external noise (where such noise is a problem); or adequate size and layout of common areas for blocks of flats.

4.9.4 Once the three component parts of the Decent Homes Standard had been established, they were combined to produce a composite variable. If a dwelling passed all three of the component standards, then the variable was set to false (i.e. not poor housing). If a dwelling failed one or more of the components, then the variable was set to true (i.e. poor housing). Finally, the binary variable was aggregated to LSOA level to form the numerator of the indicator, and the totals were checked against regional EHS totals to ensure consistency. The denominator is the number of households in the LSOA.

4.9.5 In the IoD 2019, the 'housing in poor condition' indicator consisted of four components of the Decent Homes Standard rather than the three components used for the IoD 2025. In the IoD 2019, the indicator also included a component relating to 'thermal comfort', but this was removed from the IoD 2025 indicator due to the inclusion of the new IoD 2025 indicator based on 'housing energy performance', which includes thermal comfort as one of the assessment criteria and should better measure as it is based on administrative data rather than modelled survey data.

Housing energy performance score

4.9.6 This indicator measures the average energy performance of residential buildings at LSOA level as an indicator of housing quality. It is based on administrative data from Energy Performance Certificates (EPCs), collated and published as open data by MHCLG.

4.9.7 The EPC open data used for this indicator included records up to December 2024. Following advice from MHCLG, only records from 2012 onwards were used, as data quality prior to this date was less reliable.

4.9.8 The EPC data were linked to the Ordnance Survey National Geographic Database (NGD) buildings dataset using the Unique Property Reference Number (UPRN),

which is common to both sources. This linkage confirmed that approximately 60% of residential properties had a valid EPC assessment. Imputation was therefore undertaken to estimate EPC scores for the remaining 40% of properties without valid certificates.

4.9.9 Following consultation with key stakeholders, a nearest-neighbour imputation methodology was developed for this IoD 2025 indicator. Each property without an EPC was matched to similar dwellings (based on dwelling type, build period, and construction material) within its own or directly contiguous LSOAs. An estimated EPC score was then assigned for each property using the mean EPC rating of its five closest neighbouring properties of similar type. This process successfully generated imputed values for 98% of properties initially lacking valid EPC ratings.

4.9.10 For the small residual proportion of unresolved properties, the imputation was re-run using progressively relaxed matching criteria: first by removing construction material as a criterion, and then by allowing matches across the wider LAD. Following this staged process, every residential property in England had either an observed or imputed EPC score.

4.9.11 Property counts by dwelling type and their associated EPC scores (observed EPC value where available, and imputed EPC value otherwise) were aggregated to LSOA level to form the indicator's denominator and numerator, respectively. Prior to calculating the LSOA-level mean EPC score, a final adjustment was made to address potential distortion caused by holiday caravan parks. In affected LSOAs, the number of caravans (and their associated EPC scores) were scaled to align with Census 2021 counts of households resident in caravan accommodation.

4.9.12 After these adjustments, the mean EPC score was calculated for each LSOA by dividing the numerator (total EPC score across the LSOA) by the denominator (total residential properties in the LSOA). To express this as a deprivation indicator, the LSOA mean EPC score was subtracted from 100 (so that a higher indicator score reflected greater deprivation levels), and a standard shrinkage procedure was then applied.

Housing lacking private outdoor space

4.9.13 This indicator measures the extent to which residential properties in England lack access to private outdoor space. This is a new indicator and has been included in the IoD 2025 in recognition of the positive effects private outdoor space can have on people's wellbeing[82] and in response to recommendations raised in the consultation. The indicator builds on previous data development and analytical work undertaken by Ordnance Survey (OS) and the Office for National Statistics (ONS)[83].

4.9.14 The indicator is based on a bespoke extract of property-level data provided by OS and ONS for the purpose of the IoD 2025. These data show a range of spatial attributes for every residential property in the country, including the total building footprint area, the total site area, the total outdoor space area, and a breakdown of

[82] Landscape and Urban Planning Volume 200, August 2020, 103836 "Spending time in the garden is positively associated with health and wellbeing: Results from a national survey in England" University of Exeter
[83] https://www.ons.gov.uk/economy/environmentalaccounts/articles/oneineightbritishhouseholdshasnogarden/2020-05-14

how that outdoor space is configured between the ‘front’ and ‘back’ of each property. The source data relates to a mid-2023 time point.

4.9.15 Following consultation with stakeholders, the definition of access to ‘private outdoor space' adopted for this indicator is based on the presence, and size, of outdoor space at the ‘back’ of the property. This is to avoid including driveways and other areas of space at the front of properties that would not necessarily be thought of as private, as access to these areas is not always restricted. By limiting the definition of private outdoor space to that at the ‘back’ of the property, this indicator more reliably captures space that is truly private to the household.

4.9.16 However, whilst the identification of ‘private outdoor space’ is typically quite straightforward for most houses, this is often not the case for flats, where access to outdoor space can either be unknown or, where access is known, it is unclear whether this is truly private to the household or shared with other residents. For the purpose of this IoD 2025 indicator, the definition of ‘private outdoor space’ includes communal outdoor spaces for flat residents. A further acknowledged limitation of this indicator is that it cannot take into account balconies, which often offer private space to flat residents. Neither the OS data, nor any other source of data, currently contains details of whether flats have balconies. The measure of private outdoor space developed here therefore excludes any ‘outdoor’ features that are contained within the physical building footprint; only space external to the building can be taken into account.

4.9.17 A series of diagnostic tests were undertaken on the source data, which identified some instances where the derivation of private outdoor space had either failed or had resulted in implausibly large values. An example of implausibly large values is where all properties in a cul-de-sac might be assigned the same value for private outdoor space, with this value representing the combined total across all those properties, rather than the specific value for each property individually. In instances such as this, the private outdoor space values were identified as being implausibly large and the properties were flagged as requiring imputation. A series of different imputation approaches were applied with the aim of deriving more plausible estimates of private outdoor space using the data available. In the case of the cul-de-sac example, the private outdoor space value might simply be derived by dividing the stated value by the number of properties in the cul-de-sac that shared that common value. Different features of the underlying data were used to refine the imputation approaches as much as possible. When imputation was applied, data were drawn from properties of similar type in the same local area, in order to respect local level differences in access to private outdoor space.

4.9.18 For flats, the total private outdoor space value was first divided by the number of flats in that building. This assumes that the private outdoor space value associated with the flats is communal and is available to all flat residents, which is an acknowledged limitation of this indicator development process.

4.9.19 The deprivation indicator was first constructed at property level, ranging from a low of 0 (i.e. not deprived on this measure) to a high of 100 (i.e. maximally deprived on this measure). To generate this property level deprivation indicator, calculations were first performed to ascertain the national median value of private outdoor space across all houses (not flats) in the country that had some form of private outdoor space. This national median value was 120m². A deprivation score was then assigned to each property (houses and flats) to denote the extent to which the

property's private outdoor space value fell below this 120m² national median threshold. Any properties with a private outdoor space value of 120m² or over were assigned a deprivation score of zero, as households living in these properties were deemed to be not deprived on this indicator. For those properties that had a private outdoor space value of less than 120m², a scaled deprivation score between 0 and 100 was assigned to denote how far below that 120m² threshold the property's own private outdoor space value fell. Properties that had no access to private garden space at all were assigned the maximum value of 100 on this deprivation indicator.

4.9.20 The number of properties and the property level deprivation scores were then summed to LSOA level, to give the denominator and numerator of the indicator, respectively. Prior to calculating the final LSOA level indicator deprivation score, a final adjustment was made to deal with holiday caravan parks by capping the number of caravan properties in an LSOA at the number of households recorded as being resident in caravan dwellings at the time of the 2021 Census.

4.9.21 The final LSOA level deprivation indicator was derived by calculating the mean deprivation score across the properties in LSOA and applying the standard shrinkage approach.

Air quality

4.9.22 The indicator is an estimate of the concentration of four pollutants: nitrogen dioxide, benzene, sulphur dioxide and particulates. Background pollution maps at 1x1 km resolution are modelled each year under Defra's Modelling of Ambient Air Quality (MAAQ) programme, and are published by the UK Air Information Resource at this 1km grid-square resolution[84]. Indicators for each of the four pollutants used in the IoD 2025 air quality indicator were based on 2023 data, which were mapped to LSOA level using the point-in-polygon method. For LSOAs that did not have grid points falling within them, data from the nearest point of the air quality grid was assigned.

4.9.23 For each pollutant, the atmospheric concentration was compared to the World Health Organization (WHO) 2021 Air Quality Guidelines[85], with the concentrations in each LSOA divided by the appropriate WHO standard, as shown in the table below.

Table 4.11. World Health Organisation air quality standards (2021)

Pollutant	$\mu g/m^3$
Nitrogen Dioxides (NO2)	10
Particulate Matter (PM2.5)	5
Sulphur Dioxides (So2)	50
Benzene	5

[84] UK-AIR: Air Information Resource https://uk-air.defra.gov.uk/data/pcm-data
[85] WHO (2021) What are the WHO Air quality guidelines? Sept 21, 2021 online https://www.who.int/news-room/feature-stories/detail/what-are-the-who-air-quality-guidelines

4.9.24 After standardising against the respective WHO standard in the table above, the four standardised pollutant scores were summed to produce a single composite indicator of poor air quality.

4.9.25 In theory, values for the combined indicator range from zero to infinity. However, in practice, values range from a low of 0.92 to a high of 5.72 at LSOA level across England, with higher scores representing higher levels of air pollution.

Road traffic accidents involving injury to pedestrians and cyclists

4.9.26 This indicator is based on reported accidents that involve death or personal injury to a pedestrian or cyclist[86]. The indicator uses open data for 2019 to 2023 published by the Department for Transport[87], with five years of data used to reduce the problem of small numbers. In the source data, each pedestrian and/or cyclist casualty in a road traffic accident is coded according to the injury severity category: slight, serious or fatal[88].

4.9.27 The numerator for this indicator is the number of reported pedestrian or cyclist casualties involved in road traffic accident in an LSOA over the five-year period, weighted according to casualty severity: a weight of 1 was applied for slight severity, 2 for serious and 3 for fatal.

4.9.28 Each incident was plotted according to its grid reference, which gives its location accurate to the nearest metre. Where an incident occurred within 100 metres of an LSOA boundary, the incident was apportioned equally to the areas either side of the boundary.

4.9.29 The denominator for this indicator consists of the resident population of the LSOA plus an estimate of the non-resident workplace population, to better reflect the population at risk of becoming a road traffic casualty in any given LSOA. The resident population estimates are taken from annual population estimate data provided by ONS, with prison populations excluded. The non-resident workplace population component is constructed from the 2011 and 2021 Censuses, using the 2011 Census data for the 'pre-pandemic data year of 2019; the 2021 Census data for the 'pandemic years' of 2020 and 2021; and an average of the 2011 and 2021 Census data for the 'post-pandemic' years of 2022 and 2023.

4.9.30 Shrinkage was applied to the indicator.

Noise pollution

4.9.31 The noise pollution indicator measures the level of population exposure to environmental noise from major transport sources, based on modelled estimates of average day–evening–night noise levels (*Lden*) for road, rail, and aircraft across England.

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[86] Only accidents that involve at least one 'mechanically propelled' vehicle are included in the dataset. Accidents involving personal injury are counted, including deliberate acts of violence but not confirmed cases of suicide. Accidents involving pedal cycles are included. Where many casualties were associated with one accident, all pedestrian and cyclist casualties were counted. Injuries sustained on private roads and in car parks are not included. See www.gov.uk/government/collections/road-accidents-and-safety-statistics for details.

[87] https://www.gov.uk/government/statistics/road-safety-data

[88] The Department for Transport has applied some adjustments to the severity categorisation in order to account for differences in recording approaches between police forces. For this IoD 2025 indicator, the severity adjusted data were used. For further details, please see: https://www.gov.uk/government/publications/guide-to-severity-adjustments-for-reported-road-casualty-statistics

4.9.32 This indicator was produced by Defra[89] in consultation with the IoD 2025 research team. The indicator was derived from the 2021 Round 4 strategic noise mapping results, produced under Defra's Noise Modelling System (NMS) in accordance with the Environmental Noise (England) Regulations 2006[90] (as amended[91]). Noise levels for all public roads, railways, and major airports were estimated at building level and aggregated to 2021 LSOAs. Because Round 4 included every public road and railway, full coverage was available across all LSOAs in England. This is the first time that noise exposure could be incorporated within the Indices of Deprivation.

4.9.33 The *Lden* metric, also referred to as the 'day–evening–night level', represents the annual average long-term noise over 24 hours. It applies a 5 dB(A) penalty for the evening period (19:00–23:00) and a 10 dB(A) penalty for the night-time period (23:00–07:00), to reflect greater sensitivity to noise during these hours[92] .

4.9.34 Combined exposure to road, rail, and aircraft noise was calculated using logarithmic summation of the source-specific *Lden* values. Other sources, such as industrial noise, were excluded due to the absence of suitable national data.

4.9.35 The numerator is the number of residents in each LSOA exposed to combined transport noise above 55 dB *Lden*. The 55 dB *Lden* threshold was selected because it is generally regarded as the level at which potentially harmful effects begin to occur and aligns with the minimum noise band required for strategic noise mapping. The denominator is the total population of the LSOA in 2021. Shrinkage was applied to this indicator.

Combining the indicators to create the domain

4.9.36 The indicators within each of the sub-domains were standardised by ranking and transforming to a normal distribution then combined using equal weights to create each sub-domain. The two sub-domains were then standardised by ranking and transforming to an exponential distribution.

4.9.37 The domain was created by summing the two sub-domains, weighted according to patterns of 'indoors' and 'outdoors' time use, based on data from the 2014/15 time use survey[93]. The Indoors Living Environment sub-domain was given 70% of the domain's weight, and the Outdoors Living Environment sub-domain, 30%.

Changes since Indices of Deprivation 2019

4.9.38 The primary changes to the domain since the IoD 2019 are the removal of one indicator from the IoD 2019 and the inclusion of three new indicators for the IoD 2025.

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[89] Defra requested their external contractor, Noise Consultants Ltd, to produce the modelled noise exposure data at LSOA level for the IoD 2025.
[90] https://www.legislation.gov.uk/uksi/2006/2238/contents
[91] https://www.legislation.gov.uk/uksi/2018/1089/contents/made
[92] The *Lden* noise metric is widely used in health effect studies, linking long term noise exposure to the risk of ischaemic heart disease (IHD), hypertension, stroke and annoyance. This metric is therefore considered appropriate as the basis for a measure of deprivation. More information can be found in the World Health Organization's Environmental Noise Guidelines for the European Region. For further details, see: https://www.who.int/europe/publications/i/item/9789289053563.
[93] These data were constructed for the purpose of the IoD 2025 by ONS: https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/adhocs/2655proportionoftimespentinthehomeandoutsideofthehomeuk2000to2001and2014to2015

4.9.39 The IoD 2019 indicator on households lacking central heating, which was based on Census data, was not included in the IoD 2025. This indicator was dropped following a review of the latest Census data and in line with recommendations from the Indices consultation carried out in 2022 by MHCLG. Only a very small proportion of households across the country now lack central heating, with many LSOAs containing no households without central heating. As such, this indicator no longer met the criteria for indicator inclusion.

4.9.40 Three new indicators have been introduced into the IoD 2025: (i) the indicator of housing quality based on EPC data; (ii) the indicator of households lacking private outdoor space based on OS and ONS data; and (iii) the indicator of noise pollution from road, rail and aircraft, based on Defra noise exposure data.

4.9.41 Other notable changes between the IoD 2019 and IoD 2025 concern indicators that were updated and enhanced. These include: (i) removing the thermal comfort component from the indicator on housing in poor condition, as this component is now better measured as part of the new EPC-based indicator: (ii) updating the air quality standards against which the pollutant levels are assessed, to now use the latest WHO guidelines; and (iii) increasing the time period of road traffic casualty data from three years to five years, to mitigate the effects of small numbers, thereby increasing indicator robustness.

With regards to domain construction, the weights assigned to the two sub-domains were updated based on calculations performed by ONS using the latest suitable version of the Time Use Survey, which led to a slight increase in the weight assigned to the indoors sub-domain, from 67% in the IoD 2019 to 70% in the IoD 2025.

Chapter 5. Ensuring reliability of the Indices of Deprivation

5.1 Overview of quality assurance

5.1.1 The IoD 2025 have been carefully designed and developed to ensure the robustness and reliability of the output datasets and reports. The quality assurance process for the methods, input data sources, data processing steps and outputs builds on the research team's experience of previous developments of the Indices of Deprivation since 2000 and involves a number of different processes outlined in this section.

5.1.2 The quality assurance process also draws on the quality assurance, audit arrangements and practice models developed by the UK Statistics Authority to ensure that the assessment of data sources and methodology carried out is proportionate to both the level of public interest in the Indices, and the scale of risk over the quality of the data[94].

5.1.3 Further detail on the quality assurance is provided in Appendices I and J, including our assessment against the UK Statistics Authority criteria for National Statistics status and additional validation carried out for certain indicators (Appendix I), and quality assurance documents for the input data sources (Appendix J).

Our assessment of the quality of the Indices of Deprivation

5.1.4 Based on the design and development of the IoD 2025, and the quality assurance processes and actions, we have assessed that the IoD 2025 outputs are fit for purpose. This is based on our assessment of the level of risk of quality concerns and public interest in the Indices, which use the risk and profile matrix set out in the UK Statistics Authority toolkit.

5.1.5 In the following sections we outline how our quality management meets the criteria required for the basic and enhanced levels of assurance. Our quality assurance draws on the four practice areas associated with data quality set out by the UK Statistics Authority toolkit: operational context and data collection; communication with data suppliers; quality assurance principles, standards and checks; and quality assurance investigations carried out for enhanced assurance.

5.2 Designing the Indices to ensure quality

5.2.1 The starting point for the quality assurance work is that the Indices themselves have been designed to ensure the high quality of the output data. The design of the IoD 2025 is based on a set of principles and practices that help to ensure data

[94] UK Statistics Authority (2019) Administrative Data Quality Assurance Toolkit. https://www.statisticsauthority.gov.uk/wp-content/uploads/2019/02/qualityassurancetoolkit_updated_Feb19_2.pdf

quality (more detail on the methods, domains and indicators is given in Chapters 3 and 4):

- The domains and IMD 2025 bring together 55 indicators of deprivation, from a wide range of data sources. This sheer diversity of inputs also leads to more reliable overall data outputs; to be highly deprived on the IMD 2025, an area is likely to be highly deprived on many of the domains[95]. Due to the variety of data inputs, there is little chance that an area is identified as highly deprived due to a bias in one of the component indicators; the use of multiple independent indicators increases robustness of the final outputs.
- Shrinkage estimation is used to improve reliability of the small area data, by 'borrowing strength' from larger groupings of areas. This tends to result in unreliable values (those having larger standard errors) being shifted or 'shrunk' towards the average of the larger area. During the development of the Indices (see below), all indicators were compared before and after shrinking, to examine the extent of movement of unreliable scores.
- The different domain scores are standardised (in order to combine them into the overall IMD 2025) by ranking across all areas. This has the effect of pulling in any extreme area scores that lie at the top or bottom of the distribution. Exponential transformation is then used to ensure that deprivation on one domain is not completely cancelled out by lack of deprivation on another domain. The domains are weighted before combining into the overall IMD 2025.

5.3 How we have ensured quality of the Indices

Appropriate and robust indicators, based on well understood data sources

5.3.1 As outlined in Chapter 3, the development of the IoD 2025 identified a set of 55 indicators that can be used to measure relative deprivation across the seven domains. These indicators are based on data sources that can be used to derive appropriate and consistent measures covering England at small area level. Chapter 4 sets out the sources used for each of the indicators. The data sources used as inputs to the IoD 2025 can be grouped into three types as shown in the table below.

5.3.2 For each of the input data sources used, the research team assessed and documented its quality. Appendix J lists the quality documents for each data source. Close communication with the data suppliers ensured that the strengths and weaknesses of the underlying sources and indicators were well understood.

[95] To a lesser extent, this also applies to individual domains of deprivation; to be highly deprived on a domain, an area is likely to be highly deprived on the individual indicators from which the domain is constructed.

Table 5.1. Types of data sources used as inputs to the Indices of Deprivation 2025		
Data source	Notes	Documentation assessed
Published i.e. open data	The preference was to directly use, wherever possible, existing high quality open data sources that have themselves been validated as being of National Statistics quality. In some cases, small variations on open data sources were obtained from the same source through special request; for example, Census 2021 data on qualifications and English language proficiency was obtained from the Office for National Statistics.	Quality assurance report(s) supplied with the open data
Administrative data sources made available to the research team	In the absence of appropriate published open data sources, the second preference was for the IoD 2025 to derive indicators from established and well-understood administrative data sources. These data sources, or indicators derived from them, were made available to the research team by data suppliers. In many cases, these data sources are also used by data suppliers to derive published statistical data outputs; for example, the Income Deprivation and Employment Deprivation domains are in-part derived from the DWP RAPID benefits database, which is a source for DWP Official Statistics (many of which have themselves been assessed as being of National Statistics quality). In practice, the majority of indicators in the Indices were built directly from well-understood administrative sources in this way.	Quality assurance report(s) on the underlying administrative data sources
Modelled estimates derived for the IoD 2025	In the small number of cases where there was an absence of appropriate open data or established and well-understood administrative data sources, the IoD 2025 used specially modelled estimates for the deprivation indicator at hand. In practice, this was the case for only five indicators: housing affordability, core homelessness, housing in poor condition, air quality and noise pollution. These were developed and quality assured by leading experts in the appropriate fields (see Chapter 4 for further details on these indicators).	Quality assurance report(s) on any underlying data sources, and technical summaries of the methodology used to construct the indicator

5.3.3 In practice, the majority of the datasets used in the IoD 2025 were derived from administrative records, which have close to 100 per cent coverage of the target population. In many instances the raw administrative records are the same as those used to produce published National Statistics.

5.3.4 The research team conducted additional exploration of issues that could affect the quality of the sources, such as the impact of any changes since the IoD 2019, and considered actions to minimise risks to quality. These are set out in Appendix J.

5.3.5 The following sections outline the quality assurance steps undertaken during the development of the data outputs. Appendix I provides further detail of the quality assurance process, under the framework outlined by the UK Statistics Authority.

Minimise the impact of potential bias and error in the input data sources

5.3.6 As set out in Section 5.2, the IoD 2025 have been carefully designed to minimise the impact of possible bias and error in the input data sources. The different processing stages, and range of different indicators used, mean that the resulting output datasets provide a robust identification of deprived areas.

5.3.7 An example of this comes from the Mental Health indicator of the Health and Disability Deprivation Domain. This indicator is constructed from four independent administrative data sources (see Section 4.6). Although none of the four sources on their own provide a comprehensive measure of mental ill health, used in combination they will represent a large proportion of all those people who are suffering mental ill health. In addition, using the four component indicators in this way reduces the influence of under- or over-recording from any one source, and minimises the impact of any variation in the organisation and practice of local services, where individuals with identical mental health needs may receive different types of treatment. The combined indicator should therefore be a more reliable measure of the underlying 'true' rate of mental health than any single indicator on its own.

Views of data users

5.3.8 The key findings from the Indices Futures consultation[96] were instrumental in shaping the development of the IoD 2025. As part of Stage 1 of the project, the project team prepared detailed responses to each of the consultation comments. The consultation feedback informed the development of the 2025 Indices in terms of the project scope, the data sources investigated, and the methodological enhancements explored and ultimately integrated into the final Indices. In addition, continuous and detailed engagement with key stakeholders in government and academia helped shape the methodological approach to producing the final Indices.

Audited, replicable and validated processing steps are used to construct the indicators, domains and Index of Multiple Deprivation 2025

5.3.9 All processing of the data was carried out using syntax, providing a complete audit of the processing steps from input data sources through to data outputs. Using syntax avoids the risks associated with carrying out calculations and processing using spreadsheets.

[96] Ministry for Housing, Communities and Local Government (MHCLG) (2022) Indices Futures: Updating the English Indices of Deprivation (IoD) consultation - https://www.gov.uk/government/consultations/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation/outcome/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation-government-reponse

5.3.10 The syntax also enabled clearer validation and audit of the work done, both internally within the teams responsible for the domains and other members of the research team, and externally by the independent assessor (see paragraph 5.3.18). The checks included external replication and validation of the complete set of processing steps. The syntax was checked to confirm the processing steps were being implemented accurately and produced data outputs as expected.

Real world validation of the data inputs and outputs

5.3.11 An important part of the checking process was to compare the IoD 2025 data against the data used to construct the previous Indices (the IoD 2019) at all stages in the process. A range of methods were used, including plotting histograms and box plots to examine the range and distribution of data, and scatter plots and correlations to determine the overall association of data between years. The final domains and Index of Multiple Deprivation were tabulated for the 2025 and 2019 versions, and areas that had changed significantly between the versions were examined.

5.3.12 The administrative datasets used in the Indices of Deprivation are liable to change between years as eligibility criteria, definitions and methodology are modified over time. Additionally, new datasets come online and may be incorporated into the Indices. Likewise, some other datasets may be removed. To ensure that reliable data was used, the input data sources were compared thoroughly with the sources used in producing the previous Indices where available. This quality check was carried out before any data processing, in order to check for large differences that might indicate a methodological change in the administrative datasets being used.

5.3.13 Examining the input data sources also helped contextualise differences seen at a later stage of data processing. For example, trends in benefit claimant numbers were used in the quality checks once data processing had been carried out, helping judge whether any change between years identified by the Indices data is realistic.

5.3.14 Where possible, the IoD 2025 data was compared to equivalent published data to check that they were broadly similar. Small differences between the IoD 2025 data and published data are inevitable due to methodological differences, but significant differences would lead to further detailed investigation to ensure that no errors had been introduced. Published data were not always available at LSOA level, so sometimes the comparisons were made at a spatial scale that was possible, most commonly at LAD level. Ideally this validation would have used data from independent sources to compare to those used in constructing the Indices, however in practice this was not always possible as no such separate source existed.

5.3.15 The deprivation deciles of each indicator, sub-domain and domain were mapped and the geographical pattern of deprivation examined. Checks of the overall distribution of deprivation across England were accompanied by more detailed checks of small areas known to the research team.

5.3.16 In addition, ‘reality checks’ were undertaken to consider whether the IoD 2025 data corresponded with the expected pattern of deprivation. For example, overcrowding is expected to be more severe in urban areas than rural locations because cities are more densely populated. Reality checking provides an additional check that the

data processing has been correctly carried out, and that the indicators, domains and overall IMD 2025 have been correctly ranked.

Internal and external quality assurance checks

5.3.17 *Internal audit*. The data processing steps and data outputs were subject to a series of internal quality assurance checks by the project team. Indicators and domains were reviewed by the team responsible for constructing the domain, and internally audited by a team member who was not involved in constructing the domain. The IMD and higher-level summaries were reviewed and audited by two team members.

5.3.18 *External scrutiny of the complete process*. On completion of the Indices, an external independent assessor carried out external validation and assurance of the data processing steps for construction of the indicators, domains and IMD from start to finish. This external scrutiny included assessment of the data processing methods and syntax, and real-world analysis of the IoD 2025 output datasets against the Indices 2019 data outputs and comparable open data sources. This external checking was carried out on all parts of the Indices construction process that did not involve highly sensitive microdata, as the work on the sensitive microdata was undertaken in secure data environments under strict access control conditions (e.g. the raw crime and ASB records could not be removed from Lancashire Constabulary HQ). For the indicators based on sensitive microdata, the external checks were therefore focused on the processing steps undertaken once the microdata had been aggregated to LSOA level, as these LSOA level data could be extracted from the secure data environment. All parts of the Indices data processing that used the sensitive microdata within secure data environments were therefore subjected to additional internal quality assurance steps by the Indices research team prior to aggregating the data to LSOA level.

Roles and responsibilities of the research team and data suppliers

5.3.19 The development and construction of the IoD 2025 was a complex project, involving multiple data suppliers and processing steps carried out by the research team. The composition of the research team carrying out the production of the IoD 2025 has been carefully considered to ensure quality of the data outputs.

5.3.20 In addition, clear communication and coordination between the different research partners involved was an important factor in ensuring the quality of the final outputs. Regular contact with each of the data suppliers helped understand the strengths and weaknesses of the different input data sources and modelling techniques used.

Appendix A. Indicator details and data sources

A.1. Overview

A.1.1. This Appendix provides numerator and denominator details for each of the 55 indicators included in the IoD 2025.

A.1.2. As far as is possible, each indicator has been based on data from the most recent time point available. Using the latest available data in this way means that there is not a single consistent time point for all indicators.

A.1.3. Where the denominator is detailed as residential population, this includes the communal establishment population (inclusive of any prison population), as provided to the IoD 2025 research team by ONS.

A.2. Income Deprivation Domain

- **Adults and children in Income Support benefit units**
  Numerator: As described, March 2024 (Department for Work and Pensions)
  Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).
- **Adults and children in income-based Jobseeker's Allowance benefit units**
  Numerator: As described, March 2024 (Department for Work and Pensions)
  Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).
- **Adults and children in income-based Employment and Support Allowance benefit units**
  Numerator: As described, March 2024 (Department for Work and Pensions)
  Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).
- **Adults and children in Pension Credit (Guarantee) benefit units**
  Numerator: As described, March 2024 (Department for Work and Pensions)
  Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).
- **Adults and children in Universal Credit benefit units 'out of work' conditionality categories: 'No work requirements', 'Planning for work', 'Preparing for work', 'Searching for work'**
  Numerator: As described, March 2024 (Department for Work and Pensions)
  Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).
- **Adults and children in Universal Credit benefit units 'in work' conditionality categories: 'Working with requirements' and 'Working no requirements' with equivalised income below 70% national median After Housing Costs**
  Numerator: As described, March 2024 (Department for Work and Pensions)

Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).

- **Adults and children in Housing Benefit claimant benefit units with equivalised income below 70% national median After Housing Costs**
  Numerator: As described, March 2024 (Department for Work and Pensions)
  Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).
- **Adults and Children in Tax Credit claimant benefit units with equivalised income below 70% national median After Housing Costs**
  Numerator: As described, March 2024 (Department for Work and Pensions)
  Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).
  Asylum seeker adults and children in dispersed accommodation receipt of support
  Numerator: As described, March 2024 (Home Office)
  Denominator (for summed Income Domain indicators): Total resident population mid-2022 (Office for National Statistics).

A.3. Employment Deprivation Domain

- **Claimants of Jobseeker's Allowance (both contribution-based and income-based)**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator (for summed Employment Domain indicators): Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of Employment and Support Allowance (both contribution-based and income-based)**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator (for summed Employment Domain indicators): Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of Incapacity Benefit**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator (for summed Employment Domain indicators): Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of Severe Disablement Allowance**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)

Denominator (for summed Employment Domain indicators): Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).

- **Carer's Allowance**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator (for summed Employment Domain indicators): Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of New Style Jobseeker's Allowance**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator: Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of New Style Employment and Support Allowance**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator: Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of Income Support**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator: Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of Universal Credit in the '*Searching for work*' conditionality group**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator (for summed Employment Domain indicators): Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of Universal Credit in the '*No work requirements*' conditionality group**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator (for summed Employment Domain indicators): Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).
- **Claimants of Universal Credit in '*Planning for work'* conditionality group**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator: Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).

- **Claimants of Universal Credit in '*Preparing for work*' conditionality group**
  Numerator: As described, twelve monthly time points spanning the financial year 2022/2023 (Department for Work and Pensions) for working age claimants (aged 18-66)
  Denominator: Working-age population, aged 18 to 66 (Office for National Statistics population estimates 2022).

A.4. Education, Skills and Training Deprivation Domain

- **Key Stage 2 attainment**
  Numerator: Scaled score of pupils taking Mathematics, English reading and English grammar, punctuation and spelling in Key Stage 2 examinations in 2018/19, 2021/22 and 2022/23
  Denominator: Total number of Key Stage 2 subjects taken by pupils in maintained schools, 2018/19, 2021/22 and 2022/23 (Department for Education).
- **Key Stage 4 attainment**
  Numerator: Total capped (best 8) score of pupils taking Key Stage 4 exams (GCSE or equivalent) in maintained schools, 2018/19, 2021/22 and 2022/23 (Department for Education)
  Denominator: All pupils in maintained schools who took Key Stage 4 exams, 2018/19, 2021/22 and 2022/23 (Department for Education).
- **Pupil absence**
  Numerator: Number of authorised and unauthorised absences (half days missed) for pupils attending maintained primary, secondary and special schools, 2018/19, 2021/22 and 2022/23 (Department for Education)
  Denominator: Total number of possible half-day sessions for 2018/19, 2021/22 and 2022/23 (Department for Education).
- **Persistent pupil absence**
  Numerator: Number of pupils missing more than 10% of half-day sessions in 2018/19, 2021/22 and 2022/23 (Department for Education).
  Denominator: Number of pupils attending primary, secondary and special schools in 2018/19, 2021/22 and 2022/23 (Department for Education).
- **Entry to higher education**
  Numerator: Young people aged under 21 not entering higher education, 2018/19 to 2022/23 (Joint Information Systems Committee (JISC))
  Denominator: Population aged 14-17, 2018/19 to 2022/23 (Office for National Statistics population estimates) less the prison population (Ministry of Justice).
- **Adult skills and English language proficiency**
  Numerator: Working-age adults with no or low (level 1) qualifications, non-overlapping count with English language proficiency indicator (cannot speak English or cannot speak English well), aged 25 to 66, 2021 (Office for National Statistics, from Census 2021)
  Denominator: Working-age adults aged 25 to 66, 2021 (Census).

A.5. Health Deprivation and Disability Domain

- **Comparative illness and disability ratio**
  Numerator: Non-overlapping counts of people in receipt of Disability Living Allowance (DLA), Employment and Support Allowance (ESA), Attendance Allowance (AA), Industrial Injuries Disablement Benefit / Reduced Earnings Allowance / Retirement Allowance, Incapacity Benefit (IB), Severe Disablement Allowance (SDA), Personal Independence Payment (PIP) and the UC Health Caseload (Live fit note (Pre-Work Capability Assessment), Limited capability for work and Limited capability for work and work-related activity) in five-year age-sex bands, based on data from four consecutive quarterly timepoints in the financial year 2022/23 (Department for Work and Pensions)
  Denominator: Total resident population in five-year age-sex bands, 2022 (Office for National Statistics population estimates).
- **Years of potential life lost**
  Numerator: Number of deaths before the age of 75 from any cause, including death due to disease as well as external causes such as accidents, unlawful killing and deaths in combat in five-year age-sex bands, for 2018 to 2022 (Office for National Statistics)
  Denominator: Total resident population in five-year age-sex bands, for 2018 to 2022 (Office for National Statistics population estimates)
- **Acute morbidity**
  Numerator: Hospital spells starting with admission in an emergency in five-year age-sex bands, from 2021/22 to 2022/23 (Health and Social Care Information Centre, Hospital Episode Statistics)
  Denominator: Total resident population in five-year age-sex bands, 2021 and 2022 (Office for National Statistics population estimates).
- **Mental health**
  - Suicide mortality (source: Office for National Statistics, 2018 to 2022),
  - Hospital admissions (source: Mental Health Service Dataset, 2021/22 and 2022/23)
  - Prescribing data (source: Health and Social Care Information Centre, 2021/22 and 2022/23)
  - Health benefits data (source: Department for Work and Pensions, four consecutive quarters in 2022/23).

A.6. Crime Domain

- **Violence with injury, rate per 1,000 at risk population**
  Numerator: This indicator is based on all sub-categories of ‘violence with injury’, plus all categories of ‘homicide’. Six years of recorded crime data are used: 2018/19 to 2023/24 (provided by National Police Chiefs Council, the Home Office, individual Police Forces).
  Denominator: Total resident population plus the non-resident workplace population. For the two ‘pre-pandemic’ years of 2018/19 and 2019/20, the non-resident workplace population was taken from the 2011 Census; for the two ‘pandemic years’ of 2020/21 and 2021/22, the non-resident workplace population was taken from the 2021 Census; and for the two ‘post-pandemic’

years of 2022/23 and 2023/24, the non-resident workplace population was constructed as the average of the 2011 and 2021 Census values.

- **Violence without injury, rate per 1,000 at risk population**
  Numerator: This indicator is based on all sub-categories of 'violence without injury'. Six years of recorded crime data are used: 2018/19 to 2023/24 (provided by National Police Chiefs Council, the Home Office, individual Police Forces).
  Denominator: Total resident population plus the non-resident workplace population. For the two 'pre-pandemic' years of 2018/19 and 2019/20, the non-resident workplace population was taken from the 2011 Census; for the two 'pandemic years' of 2020/21 and 2021/22, the non-resident workplace population was taken from the 2021 Census; and for the two 'post-pandemic' years of 2022/23 and 2023/24, the non-resident workplace population was constructed as the average of the 2011 and 2021 Census values.
- **Stalking and harassment, rate per 1,000 at risk population**
  Numerator: This indicator is based on all sub-categories of 'Stalking and harassment'. Six years of recorded crime data are used: 2018/19 to 2023/24 (provided by National Police Chiefs Council, the Home Office, individual Police Forces).
  Denominator: Total resident population plus the non-resident workplace population. For the two 'pre-pandemic' years of 2018/19 and 2019/20, the non-resident workplace population was taken from the 2011 Census; for the two 'pandemic years' of 2020/21 and 2021/22, the non-resident workplace population was taken from the 2021 Census; and for the two 'post-pandemic' years of 2022/23 and 2023/24, the non-resident workplace population was constructed as the average of the 2011 and 2021 Census values.
- **Burglary, rate per 1,000 at risk properties**
  Numerator: This indicator is based on all sub-categories of 'burglary'. Six years of recorded crime data are used: 2018/19 to 2023/24 (provided by National Police Chiefs Council, the Home Office, individual Police Forces).
  Denominator: Total at risk properties. This includes residential dwellings from the 2021 Census plus non-domestic properties from Ordnance Survey's AddressBase Plus.
- **Theft, rate per 1,000 at risk population**
  Numerator: This indicator is based on all sub-categories of 'theft' and 'robbery', except 'shoplifting', which is excluded[97]. Six years of recorded crime data are used: 2018/19 to 2023/24 (provided by National Police Chiefs Council, the Home Office, individual Police Forces).
  Denominator: Total resident population plus the non-resident workplace population. For the two 'pre-pandemic' years of 2018/19 and 2019/20, the non-resident workplace population was taken from the 2011 Census; for the two 'pandemic years' of 2020/21 and 2021/22, the non-resident workplace population was taken from the 2021 Census; and for the two 'post-pandemic'

[97] Unlike other forms of crime, offences of shoplifting can only occur in LSOAs that contain shops. The LSOA level distribution of shoplifting crimes is very skewed, with almost one-quarter of LSOAs nationally having no shoplifting crimes at all over the six-year period, and a further one-quarter of LSOAs nationally having less than one shoplifting crime per year on average. At the other extreme of the LSOA distribution, some LSOAs contain over 1,000 shoplifting offences, ranging up to a maximum of almost 10,000 shoplifting offences in some LSOAs. As the other types of theft included in the IoD 2025 Theft indicator are not restricted to occurring in shops, or indeed any other type of property, shoplifting was deemed to be inconsistent with the conceptual design of the Theft indicator, and so was excluded.

years of 2022/23 and 2023/24, the non-resident workplace population was constructed as the average of the 2011 and 2021 Census values.

- **Criminal damage, rate per 1,000 at risk population**
  Numerator: This indicator is based on all sub-categories of 'criminal damage' and 'arson'. Six years of recorded crime data are used: 2018/19 to 2023/24 (provided by National Police Chiefs Council, the Home Office, individual Police Forces).
  Denominator: Total resident population plus the non-resident workplace population. For the two 'pre-pandemic' years of 2018/19 and 2019/20, the non-resident workplace population was taken from the 2011 Census; for the two 'pandemic years' of 2020/21 and 2021/22, the non-resident workplace population was taken from the 2021 Census; and for the two 'post-pandemic' years of 2022/23 and 2023/24, the non-resident workplace population was constructed as the average of the 2011 and 2021 Census values.
- **Public order and Possession of weapons, rate per 1,000 at risk population**
  Numerator: This indicator is based on all sub-categories of 'public order' and 'possession of weapon offences'. Six years of recorded crime data are used: 2018/19 to 2023/24 (provided by National Police Chiefs Council, the Home Office, individual Police Forces).
  Denominator: Total resident population plus the non-resident workplace population. For the two 'pre-pandemic' years of 2018/19 and 2019/20, the non-resident workplace population was taken from the 2011 Census; for the two 'pandemic years' of 2020/21 and 2021/22, the non-resident workplace population was taken from the 2021 Census; and for the two 'post-pandemic' years of 2022/23 and 2023/24, the non-resident workplace population was constructed as the average of the 2011 and 2021 Census values.
- **Anti-social behaviour, rate per 1,000 at risk population**
  Numerator: This indicator is based on all sub-categories of 'anti-social behaviour' that are reported to the police and are recorded as police incidents, which consists of incidents of 'personal', 'environmental' and 'nuisance' anti-social behaviour. Two years of police incident data are used: 2022/23 and 2023/24 (provided by National Police Chiefs Council, the Home Office, individual Police Forces).
  Denominator: Total resident population plus the non-resident workplace population, with the non-resident workplace component constructed as the average of the 2011 and 2021 Census values.

A.7. Barriers to Housing and Services Domain

- **Connectivity Score**
  Travel time to retail, education, health, and leisure/entertainment destinations by walking, cycling and public transport, 2025 (Department for Transport (DfT) Connectivity Tool).
- **Housing affordability**
  Modelled estimate of households unable to afford to enter owner-occupation or the private rental market on the basis of their income, based on five years of data from the financial years 2018 to 2022 (source: UK Household Longitudinal Study (UKHLS), Family Resources Survey (FRS), 2021 Census, Land Registry, Zoopla and Valuation Office Agency (VOA))

- **Household overcrowding**
  Numerator: Overcrowded households (rooms and bedrooms), 2021 (Census)
  Denominator: Total number of households, 2021 (Census).
- **Statutory Homelessness**:
  Numerator: Number of accepted decisions for assistance under the homelessness provisions of housing legislation, average of 11 quarters from October 2021 to June 2024 (MHCLG).
  Denominator: Total number of households, 2021 (Census 2021).
- **Core Homelessness:**
  Numerator: Number of households experiencing the most extreme and immediate forms of homelessness, based on data from 2020/21, 2021/22 and 2022/23 (source: Joseph Rowntree Foundation).
  Denominator: Total number of households, 2021 (Census 2021).
- **Broadband speed**
  Average broadband upload and download line speed (Mbit/s) for connections in the area, based on data from December 2024 (source: Ofcom)
- **Patient-to-GP Ratio**
  The number of patients registered at a GP surgery as a ratio of all full-time equivalent GPs, apportioned to LSOAs according to patient residence distributions, based on data from November 2024 (source: General Practice Workforce statistics, NHS Digital)

A.8. Living Environment Deprivation Domain

- **Housing in poor condition**
  Modelled estimate of the proportion of social and private homes that fail to meet three components of the Decent Homes standard, estimated from the English Housing Survey, 2019 and 2020 in combination with 2023 Experian dwelling-level data and 2023 Ordnance Survey geographic dwelling level data.
- **Housing Energy Performance Score**
  Numerator: derived from EPC data for assessments undertaken between January 2012 and December 2024 (source: MHCLG open data). Note that residential properties without an observed EPC rating were imputed.
  Denominator: total number of residential properties (source: Ordnance Survey National Geographic Database).
- **Households lacking private outdoor space**
  Numerator: derived from data on residential properties and associated outdoor space (source: Ordnance Survey and Office for National Statistics).
  Denominator: all residential properties in the LSOA (source: internal to the Ordnance Survey / ONS dataset)
- **Air quality**
  Modelled estimates of air quality based on the concentration of four pollutants (nitrogen dioxide, benzene, sulphur dioxide and particulates), estimated from UK Air Information Resource air quality, 2023.
- **Road traffic accidents**
  Numerator: Injuries to pedestrians and cyclists caused by road traffic accidents, calendar years 2019 to 2023, inclusive (Department for Transport)

Denominator: Total resident population, plus the non-resident workplace population. For the ‘pre-pandemic’ calendar year of 2019, the non-resident workplace population was taken from the 2011 Census; for the two ‘pandemic years’ of 2020 and 2021, the non-resident workplace population was taken from the 2021 Census; and for the two ‘post-pandemic’ years of 2022 and 2023, the non-resident workplace population was constructed as the average of the 2011 and 2021 Census values.

- **Noise pollution**
  Numerator: Modelled estimate of the number of residents in each LSOA exposed to combined transport noise above 55 dB *Lden* (source: Defra Noise Modelling System (NMS)).
  Denominator: Total resident population (Census 2021).

Appendix B. Denominators

B.1. Overview

B.1.1. The majority of the 55 indicators used in the IoD 2025 are expressed as rates or proportions, and thus require a numerator (for example the number of people experiencing a particular form of deprivation in an area) and a suitable denominator (for example the total number of people 'at-risk' of the deprivation in the same area). This Appendix details the issues involved and the data and methodology employed in the construction of estimates of the at-risk population for the various indicators.

B.2. Choosing suitable denominators

B.2.1. A denominator should represent the population at-risk of experiencing a given type of deprivation and therefore it is important to choose a denominator that relates to the numerator with which it will be combined. Certain indicators use numerators and denominators derived from the same data source, while other indicators require their numerators and denominators to be constructed from different sources. Whichever is required, it is important to try to ensure that each denominator includes only those individuals (or households, properties etc.) that are at-risk of experiencing the particular form of deprivation being measured by that indicator.

B.2.2. So, for example, in the Education, Skills and Training Deprivation Domain, the Key Stage 2 attainment indicator is constructed by deriving both the numerator (the points achieved in Key Stage 2 examinations by pupils living in a LSOA) and the denominator (the sum of the number of subjects taken by pupils living in an LSOA) from the National Pupil Database dataset. Similarly, for the indicators where numerators were derived from the 2021 Census, the denominators were also drawn from the Census. Deriving both numerator and denominator using a single data source rules out any systematic error that arises from datasets of different coverage or representativeness.

B.2.3. For a considerable number of indicators, however, estimates of the at-risk population need to be constructed using external data sources. This is discussed below.

B.3. Data for the denominators

B.3.1. 'Mid-year' population estimates at LSOA level are produced by the Office for National Statistics' Small Area Population Estimation (SAPE) team. These are a single year of age and sex mid-year estimates that are produced each year. The latest mid-year estimates that were available at the time of Indices construction in March 2024 related to the mid-point of 2022.

B.3.2. The Office for National Statistics provided a special bespoke series of small area population estimates for 2022 for the purpose of the IoD 2025. The extract included a small number of special adjustments to the prisoner population compared to the data in the published Small Area Population Estimates.

B.4. Defining the at-risk population

B.4.1. The population estimates used as denominators for many of the indicators included resident population and communal establishment population. Unlike in previous Indices, the prisoner populations were included in the denominator for the majority of indicators. Prisoners have been included where they are identified as at-risk of the many forms of deprivation captured in the Indices of Deprivation. This is particularly the case in the Income and Employment Deprivation Domains, where Indices project quality assurance checks revealed that prisoners can continue to claim certain benefits for a limited time at the beginning of a prison spell, and their location of residence during that time would be the prison location, meaning they would be included in the LSOA numerator, and thus should also be included in the LSOA denominator.

B.4.2. However, for a small number of indicators (for instance, the Road Traffic Accident indicator in the Living Environment Domain), prisoner populations were excluded from the denominator as prisoners were not deemed to be at risk of being included in the numerator (e.g. people in prison will not be at risk of being involved in a road traffic accident within the prison). The Office for National Statistics provided an additional special bespoke series of population estimates excluding prison populations for these indicators.

B.5. Age and sex profile

B.5.1. Some indicators required estimates of the total population for the denominator while others required estimates of the population of a specific age and sex. Population estimates by five-year age band and sex, and by non-standard age/sex groupings as required by particular indicators, were created by the research team from the population estimates provided by the Office for National Statistics. For example, the Employment Deprivation Domain required a denominator of people aged 18 to 66, while the standardised health indicators required a population denominator for each five-year age and sex band.

Appendix C. The shrinkage technique

C.1. Improving the reliability of small area data values using shrinkage estimation

C.1.1. The shrinkage technique is designed to deal with the problems associated with small numbers in a LSOA. In some areas – particularly where the population of interest is small – data may be at risk of being 'unreliable' due to low counts.

C.1.2. The technique of shrinkage estimation (in other words empirical Bayesian estimation[98]) is used to 'borrow strength' from larger areas (or groupings of small areas) to avoid creating unreliable small area data. Shrinkage estimation involves moving LSOA scores towards another more robust score, often relating to a higher geographical level. All LSOA scores will move somewhat through shrinkage, but those with large standard errors (in other words the most 'unreliable' scores) will tend to move the most. The LSOA score may be moved towards a 'more deprived' or 'less deprived' score through shrinkage estimation. Without shrinkage, some LSOAs might have scores which do not reliably describe the deprivation in the area due to chance fluctuations from year to year.

C.1.3. It could be argued that shrinkage estimation is inappropriate for administrative data which are, in effect, a census. This is not correct. The problem exists not only where data are derived from samples but also where scans of administrative data effectively mean that an entire census of a particular group is being considered. This is because such censuses can be regarded as samples from 'super-populations', which one could consider to be samples in time. All the data from administrative sources and the 2021 Census are treated as samples from a super-population in this way, and the shrinkage technique was applied to indicators which use this data. The exceptions are the modelled indicators, road distance indicators and indicators supplied at LAD level.

C.2. Selecting the larger areas from which unreliable small area data can borrow strength

C.2.1. The principle for selecting the larger area should be that the LSOAs within them share characteristics. In previous Indices, the larger areas used for shrinkage were LADs. However, this has been refined to also take into consideration the socio-demographic characteristics of the LSOA, based on the Office for National Statistics (ONS) LSOA Classification[99]. The approach taken was to shrink the results for an individual LSOA, so that it moved closer to the average of all LSOAs

[98] For more information see: RAO, J. N.K., (2003). Small Area Estimation. Hoboken: Wiley. Also: M. Ghosh. J. N. K. Rao. "Small Area Estimation: An Appraisal." Statist. Sci. 9 (1) 55 - 76, February, 1994. https://doi.org/10.1214/ss/1177010647

[99] UK LSOA / DZ / SDZ Classification (2021/2 LSOAC) (2025) Geographic Data Service Authored by: Jakub Wyszomierski, Paul A Longley, Alexander D Singleton, Christopher Gale, Oliver O'Brien, Jen Hampton https://data.geods.ac.uk/dataset/lsoac

in the same LSOA Super Group classification group within the Local Authority[100]. In other words, the parent area grouping used in the calculation is a combination of LSOA Super Group (to reflect shared socio-demographic characteristics) and parent LAD, to allow for the impact of LSOAs within a single district sharing issues relating to local governance and possibly to economic sub-climates.

C.3. The shrinkage calculation

C.3.1. The actual mechanism of the shrinkage procedure is to estimate deprivation in a particular LSOA using a weighted combination of (a) data from the LSOA, and (b) data from another more robust score (in the case of the Indices, this is the parent ONS Area Classification within a LAD score – henceforth referred to as 'LA Classification'). The weight attempts to increase the efficiency of the estimation, while not increasing its bias. All LSOA scores are adjusted to some degree through the shrinkage process, but the magnitude of the adjustment will be greatest for areas with the least reliable scores. The amount of movement depends on both the size of the standard error and the amount of heterogeneity amongst the LSOAs in a 'LA Classification' area.

C.3.2. The 'shrunk' estimate of an LSOA level proportion (or ratio) is a weighted average of the two 'raw' proportions for the LSOA and for the corresponding 'LA Classification' area.

C.3.3. The weights used are determined by the relative magnitudes of within-LSOA and between-LSOA variability.

If the rate for a particular indicator in LSOA j is r_j events out of a population of n_j, the empirical logit for each LSOA is:

$$m_j = \log\left[\frac{(r_j + 0.5)}{(n_j - r_j + 0.5)}\right]$$

whose estimated standard error s_j is the square root of:

$$s_j^{\,2} = \frac{(n_j + 1)(n_j + 2)}{n_j(r_j + 1)(n_j - r_j + 1)}$$

The corresponding counts r out of n for the district in which LSOA j lies gives the district-level logit:

$$M = \log\left[\frac{(r + 0.5)}{(n - r + 0.5)}\right]$$

The 'shrunk' LSOA level logit is then the weighted average:

[100] Note, for a small number of indicators: Key Stage 2 attainment, Key Stage 4 attainment, pupil absence, persistent absence, years of potential life lost, acute morbidity, suicide mortality, mental health admissions, self harm and GP prescriptions, Local Authorities were used as the parent area in shrinkage calculations. This is because these were constructed in secure environments, prior to the development of the UK LSOA / DZ / SDZ Classification (2021/2 LSOAC) classification.

$$m_j^* = w_j m_j + (1 - w_j) M$$

where w_j is the weight given to the 'raw' LSOA -j data and $(1-w_j)$ the weight given to the overall rate for the district. The formula used to determine w_j is:

$$w_j = \frac{1/s_j^2}{1/s_j^2 + 1/t^2}$$

where t^2 is the inter- LSOA variance for the k LSOA in the district, calculated as:

$$t^2 = \frac{1}{k-1} \sum_{j=1}^{k} (m_j - M)^2$$

C.3.4. Thus large LSOAs, where precision $1/s_2^j$ is relatively large, have weight w_j close to 1 and so shrinkage has little effect. The shrinkage effect is greatest for small LSOAs in relatively homogeneous districts.

The final step is to back-transform the shrunk logit m_j^* using the 'anti-logit', to obtain the shrunk LSOA level proportion for each LSOA:

$$z_j = \frac{\exp(m_j^*)}{1 + \exp(m_j^*)}$$

Appendix D. Factor analysis

D.1. Combining different types of indicator using factor analysis

D.1.1. In a number of the domains, factor analysis is used as a method for combining indicators, by finding appropriate weights for combining indicators into a single score based on the inter-correlations between all the indicators[101].

D.1.2. Factor analysis is only used in domains where 'latent variables' are hypothesised to exist and where the indicator variables are 'effect indicators', i.e. indicators that are influenced by the latent variable. In practice, the technique is applied to three parts of the IoD 2025: the Children and Young People sub-domain of the Education, Skills and Training Deprivation Domain; the Health Deprivation and Disability Domain; and the Crime Domain.

D.1.3. There are many candidates in terms of types of factor analysis. Two of the main contenders are maximum likelihood factor analysis (as used in the current and previous versions of the Indices of Deprivation) and Principal Components Analysis. The distinction between maximum likelihood factor analysis and Principal Components Analysis is a technical one. In brief, the assumptions underpinning Principal Components Analysis are that the indicators going into the analysis are perfectly reliable and measured without error. Maximum likelihood factor analysis requires no such assumption.

D.1.4. It is not the aim of this analysis to reduce a large number of variables into a number of theoretically significant factors as is usual in much social science use of factor analysis. The indicators within a domain have been chosen because they are held to measure a single area-deprivation factor. The analysis therefore involves exploring a one-common factor model against the possibility of there being more than one meaningful factor. If a meaningful second common factor were found it would suggest the need for a new domain or the removal of variables in order to ensure coherence amongst indicators within each domain. This possibility can be examined through standard tests and criteria, such as examination of Eigen values. No meaningful second factors (in other words second factors that measured deprivation) emerged in any of the domains.

D.2. The process for combining indicators using factor analysis

D.2.1. The process of combining indicators using factor analysis comprised three stages:

1. All indicators were converted to the standard normal distribution (following shrinkage, where appropriate).

[101] See Noble et al. 2004 Annex F for a full account of the Factor Analysis technique applied.

2. The standardised scores were factor analysed (using the Maximum Likelihood method), deriving a set of weights.
3. The indicators were then combined using these weights.

Appendix E. Exponential transformation

E.1. Using exponential transformation to prepare the domains for combination

E.1.1. In order to combine the domains into an overall IMD 2025, the domain scores first need to be standardised. Any standardisation and transformation should meet the following criteria:

- *Standard distribution*. It must ensure that each domain has a common distribution, so that domains can be combined, without one domain dominating due to a much larger distribution.
- *Cancellation*. It must have an appropriate degree of 'cancellation' built into it (discussed below)
- *Identify deprived areas*. It must facilitate the easy identification of the most deprived LSOAs.
- *Scale independent*. It must not be scale dependent (in other words, it must not equate the level of deprivation with the size of the population).

E.1.2. The standardisation and transformation used in the IoD 2025 involves each of the domain scores being ranked, and then the ranks are transformed to an exponential distribution. The exponential distribution has a number of properties that satisfy the criteria above, most importantly that it enables control over cancellation, and it helps identify the most deprived LSOAs.

Standard distribution

E.1.3. The exponential distribution transforms each domain so that they each have a common distribution, the same range and identical maximum / minimum values. The process starts by ranking the scores in each domain to standardise the domain scores (from 1 for the least deprived, to 33,755 for the most deprived), before applying the exponential transformation procedure to create a standardised domain score ranging from 0 (least deprived) to 100 (most deprived).

Cancellation

E.1.4. The exponential transformation procedure gives control over the extent to which a lack of deprivation in one domain cancels or compensates for deprivation in another domain. It allows precise regulation, although not elimination, of these cancellation effects. The scaling constant (23) was used in order to produce the objective of achieving roughly 10 per cent cancellation[102]. This means that in the extreme case, an LSOA which was ranked most deprived on one domain but least deprived on another would overall be ranked at the 90th percentile in terms of combined deprivation across the two domains (if the two domains were equally

[102] The constant (23) determines that approximately 10% of areas have a score higher than 50. Michael Noble et al (December 2004) Measuring multiple deprivation at the small-area level cited in Environment and Planning A 2006, volume 38, pages 169 ^ 185 https://journals.sagepub.com/doi/10.1068/a37168

weighted). This compares to the 50th percentile if the untransformed ranks or a normal distribution had been used instead. For example, an LSOA that ranked most deprived in terms of the Income Deprivation Domain but was ranked least deprived on the Barriers to Housing and Services Domain would still be at the 90th percentile (top 10 per cent) if these two domains were combined with equal weights.

Identify deprived areas

E.1.5. The exponential transformation effectively spreads out that part of the distribution in which there is most interest - that is the 'tail' which contains the most deprived LSOAs in each domain. The scaling constant ensures that the most deprived 10 per cent of LSOAs cover 50 per cent of the distribution of scores (in other words, scores between 50 and 100 after exponential transformation).

Scale independent

E.1.6. The transformation is not affected by the size of the LSOA's population.

E.2. The exponential transformation calculation

E.2.1. The transformation used is as follows:

For any LSOA, denote its rank on the domain R, scaled to the range [0,1]. R=1/N for the least deprived and R=N/N (in other words R=1) for the most deprived, where N=the number of LSOAs in England.

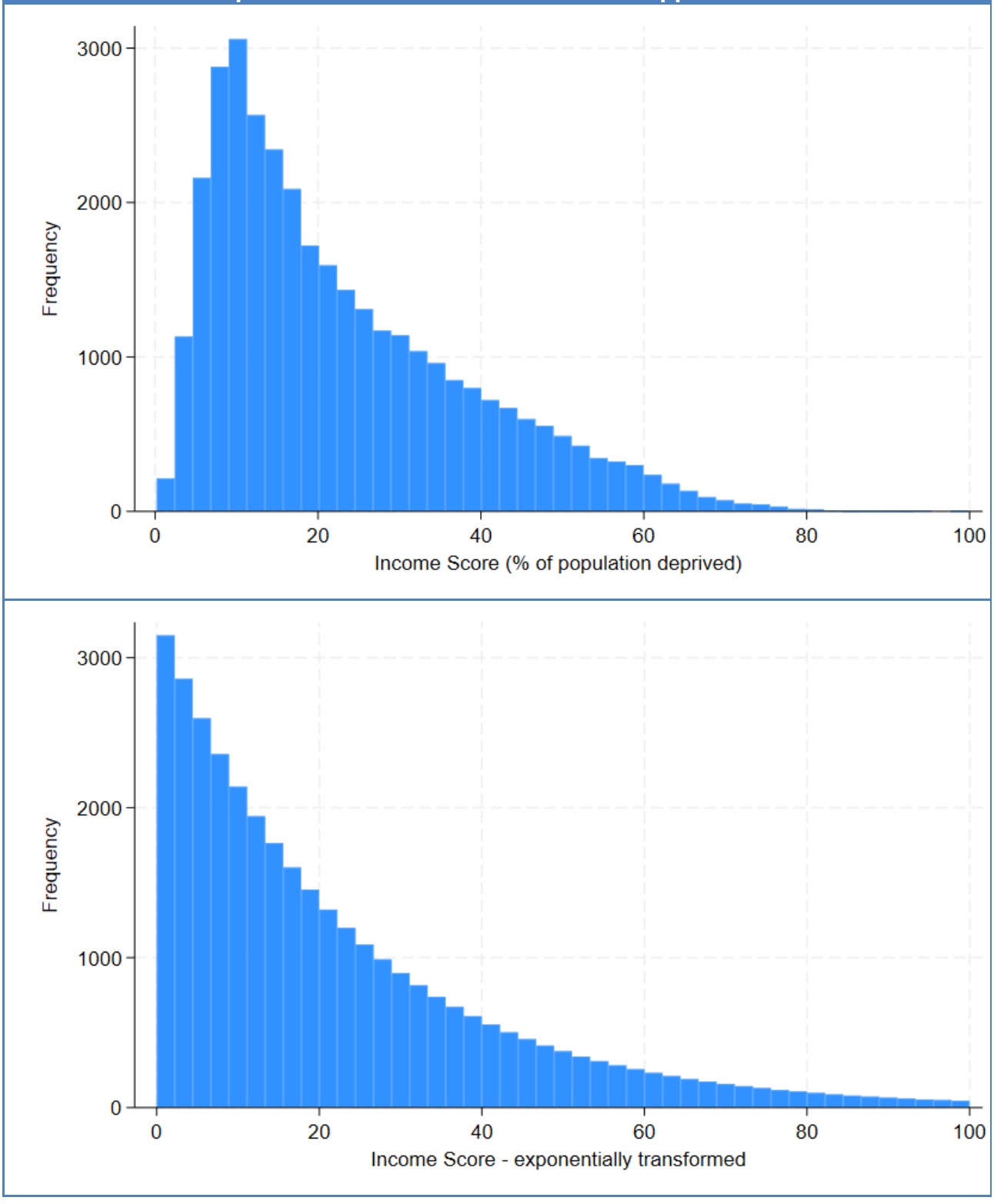
The transformed domain score X is given by:

$$X = -23 \ln\left(1 - R\left(1 - \exp^{-100/23}\right)\right)$$

where 'ln' denotes natural logarithm and 'exp' the exponential or antilog transformation

E.2.2. Figure E.1 illustrates the effect of the exponential distribution using the Income Deprivation Domain as an example. The first figure shows the distribution of the Income Deprivation scores, in other words the percentage of income-deprived people in each area. The second figure shows the exponentially transformed domain scores, which range from 0 to 100. The 10 per cent most deprived LSOAs (numbering 3,375) have an exponentially transformed score between 50 and 100. The remaining 90 per cent have an exponentially transformed domain score between 0 and 50.

Figure E.1. Distribution of Indices of Deprivation 2025 Income deprivation domain, before and after exponential transformation has been applied



Appendix F. Weighting the domains

F.1. Weighting the domains to create an overall Index of Multiple Deprivation

F.1.1. Combining the different domains into an overall index always involves weighting the domains, whether the weights are set explicitly or not. Greater weight on a specific domain gives greater importance to that domain in the overall index. Weights may be set explicitly, as they were in the IoD 2000 and subsequent updates. If domain scores were simply added together (after standardisation), this would give each domain an equal weight. Conversely, if domains are not standardised to lie on the same scale or distribution, weights are set implicitly by the domain distributions.

F.1.2. In the final analysis there is no ultimate method by which to measure multiple deprivation, as it is a combination of individual deprivations measured in the component domains. However, the choice of weights is not arbitrary; for the IoD 2000 and subsequent updates, the aim was that the weights should be explicit and based on clear criteria:

- Income and Employment Domains should carry more weight than the other domains. This is supported by research and the wider academic literature, for example the work of Townsend[103]. Accordingly, the Income and Employment Domains have been given the highest weights, accounting for 45 per cent between them of the final domain weights in IoD 2025.
- Domains with the *most robust* indicators should be given the greater weights. It is important to note that only those indicators which are sufficiently robust are included within the Indices, and all the indicators do meet the specific criteria for being included: they are 'domain specific' and measure major features of deprivation in that domain, are up-to-date, are capable of being updated on a regular basis, and are available across England at a small area level. The relative robustness of the indicators was gauged by extensive and detailed quality assurance testing of the data which also drew on extensive experience of working with such data.

F.1.3. During the consultation for the IoD 2000 and each of the subsequent English Indices of Deprivation where a consultation has taken place (2007, 2010, 2015, and the 2022 consultation that preceded the IoD 2025), there has been a great deal of support for the weights chosen. Subsequent assessment of potential weights based on empirical methodologies (see below) also supports the weights used for IoD 2025.

F.1.4. Assessment of potential weights based on empirical methods showed consistent results. Analysis commissioned from Dibben et al[104] explored three alternative

[103] Townsend (1987), *Deprivation*, p.125-126, our italics.
[104] Dibben, C., Atherton, I., Cox, M., Watson, V., Ryan, M. and Sutton, M. (2007) Investigating the Impact of Changing the Weights that Underpin the Index of Multiple Deprivation 2004, London: Communities and Local Government.

empirical methods for setting domain weights, rather than the theoretical basis outlined above:

- Survey approach – How does living in the conditions measured by each domain affect an individual's chance of being socially excluded? This used data from the Millennium Poverty and Social Exclusion Survey to examine the contributions of different domains to a social well-being measure closely related to social exclusion.
- Revealed preference approach – How does the state divide up the 'public purse' between different policies aimed at reducing the proportion of the population affected by each of the domains of deprivation? This analysis allocated departmental and local government spend between each of the domains
- Discrete Choice Experiment – Given a choice between individuals living in these different conditions, who is felt to be most in need of support from the government? The experiment surveyed 1,000 households, asking respondents to choose between supporting individuals with different types of deprivation; these responses were used to derive empirical weights for the domains.

F.1.5. There was close overall agreement between the three empirical methods for deriving domain weights, and the actual domain weights, with the research recommending consideration of a possible single change to the weights: switching the weights of the Employment Domain (from 22.5 per cent to 13.5 per cent) and Health and Disability Deprivation Domain (from 13.5 per cent to 22.5 per cent) domains. However, analyses showed that this would make little difference to the overall Index distribution.

F.1.6. With reference to these research findings, the use of these weights was revisited in the most recent consultations preceding the release of the IoD 2007[105], IoD 2010[106] and IoD 2015[107] and the current Indices[108]. All four consultations found the vast majority of respondents were in favour of keeping the weights the same. Furthermore, sensitivity testing was applied to explore on different approaches to weighting the domains as part of the thorough review of methods undertaken during the early phase of the IoD 2025. The review concluded that re-weighting the domains would not have a notable impact on the overall results. In light of the very high level of user support and lack of demonstrable impact on results, the weights used in the IoD 2025 remain the same as those used in the IoD 2019.

[105] Ministry of Housing, Communities and Local Government (2007) Updating the English Indices of Deprivation 2004: Stage Two 'Blueprint' Consultation Report – Summary of Responses. http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/publications/communities/indicesdeprivationresponses

[106] Ministry of Housing, Communities and Local Government (2011) English Indices of Deprivation consultation: summary of responses. https://www.gov.uk/government/consultations/english-indices-of-deprivation.

[107] Ministry of Housing, Communities and Local Government (2014) English Indices of Deprivation consultation: summary of responses https://www.gov.uk/government/consultations/updating-the-english-indices-of-deprivation

[108] Ministry for Housing Communities and Local Government (MHCLG) (2022) Indices Futures: Updating the English Indices of Deprivation (IoD) consultation - https://www.gov.uk/government/consultations/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation/outcome/indices-futures-updating-the-english-indices-of-deprivation-iod-consultation-government-reponse

Appendix G. Categories of recorded crime and incidents of anti-social behaviour

G.1. Violence with injury

G.1.1. The IoD 2025 ‘violence with injury’ indicator includes all Home Office sub-categories of homicide and violence with injury.

Table G.1. Home Office offence codes used for the ‘violence with injury’ indicator

Offence code	Offence name	Applicable years
1	Murder	2018/19 - 2023/24
4.1	Manslaughter	2018/19 - 2023/24
4.10	Corporate manslaughter	2018/19 - 2023/24
4.2	Infanticide	2018/19 - 2023/24
2	Attempted murder	2018/19 - 2023/24
4.3	Intentional destruction of viable unborn child	2018/19 - 2023/24
5D	Assault with intent to cause serious harm	2018/19 - 2023/24
5E	Endangering life	2018/19 - 2023/24
4.7	Causing or allowing death or serious physical harm of child or vulnerable person	2018/19 - 2023/24
8N	Assault with injury	2018/19 - 2023/24
8P	Racially or religiously aggravated assault with injury	2018/19 - 2023/24
8S	Assault with injury on a constable	2018/19 - 2023/24
8T	Assault with injury on an emergency worker (other than constable)	2018/19 - 2023/24

G.2. Violence without injury

G.2.1. The IoD 2025 ‘violence without injury’ indicator includes all Home Office sub-categories of violence without injury.

Table G.2. Home Office offence codes used for the ‘violence without injury’ indicator

Offence code	Offence name	Applicable years
3A	Conspiracy to murder	2018/19 - 2023/24
3B	Threats to kill	2018/19 - 2023/24
11A	Cruelty to children/young persons	2018/19 - 2023/24
13	Child abduction	2018/19 - 2023/24
14	Procuring illegal abortion	2018/19 - 2023/24
36	Kidnapping	2018/19 - 2023/24
104	Assault without injury on a constable	2018/19 - 2023/24
105A	Assault without Injury	2018/19 - 2023/24
105B	Racially or religiously aggravated assault without injury	2018/19 - 2023/24
106	Modern Slavery	2018/19 - 2023/24

G.3. Stalking and harassment

G.3.1. The IoD 2025 ‘stalking and harassment’ indicator includes all Home Office sub-categories of stalking and harassment.

Table G.3. Home Office offence codes used for the ‘stalking and harassment’ indicator

Offence code	Offence name	Applicable years
8L	Harassment	2018/19 - 2023/24
8M	Racially or religiously aggravated harassment	2018/19 - 2023/24
8Q	Stalking	2018/19 - 2023/24
8R	Malicious communication	2018/19 - 2023/24
8U	Controlling or Coercive behaviour	2018/19 - 2023/24

G.4. Burglary

G.4.1. The IoD 2025 ‘burglary’ indicator includes all Home Office sub-categories of burglary.

Table G.4. Home Office offence codes used for the ‘burglary’ indicator

Offence code	Offence name	Applicable years
28E	Burglary - Residential	2018/19 - 2022/23
28F	Attempted burglary - Residential	2018/19 - 2022/23
28G	Distraction burglary - Residential	2018/19 - 2022/23
28H	Attempted distraction burglary - Residential	2018/19 - 2022/23
28I	Residential burglary of a home	2023/24
28J	Attempted residential burglary of a home	2023/24
28K	Distraction burglary - residential (home)	2023/24
28L	Attempted distraction burglary - residential (home)	2023/24
28M	Residential burglary of unconnected building	2023/24
28N	Attempted residential burglary of unconnected building	2023/24
28O	Distraction burglary - residential (unconnected building)	2023/24
28P	Attempted distraction burglary - residential (unconnected building)	2023/24
29A	Aggravated burglary -Residential	2018/19 - 2022/23
29B	Aggravated burglary - residential (home)	2023/24
29C	Aggravated burglary - residential (unconnected building)	2023/24
30C	Burglary - business and community	2018/19 - 2023/24
30D	Attempted burglary - business and community	2018/19 - 2023/24
31A	Aggravated burglary - business and community	2018/19 - 2023/24

G.5. Theft

G.5.1. The IoD 2025 ‘theft’ indicator includes all Home Office sub-categories of robbery and theft, except shoplifting.

Table G.5. Home Office offence codes used for the ‘theft’ indicator

Offence code	Offence name	Applicable years
34A	Robbery of business property	2018/19 - 2023/24
34B	Robbery of personal property	2018/19 - 2023/24
37.2	Aggravated vehicle taking	2018/19 - 2023/24
45	Theft from a vehicle	2018/19 - 2023/24
48	Theft or unauthorised taking of a motor vehicle	2018/19 - 2023/24
126	Vehicle interference	2018/19 - 2023/24
39	Theft from the person	2018/19 - 2023/24
44	Theft or unauthorised taking of a pedal cycle	2018/19 - 2023/24
35	Blackmail	2018/19 - 2023/24
40	Theft in a dwelling other than from an automatic machine or meter	2018/19 - 2023/24
41	Theft by an employee	2018/19 - 2023/24
42	Theft of mail	2018/19 - 2023/24
43	Dishonest use of electricity	2018/19 - 2023/24
47	Theft from automatic machine or meter	2018/19 - 2023/24
49	Other theft	2018/19 - 2023/24
49A	Making off without payment	2018/19 - 2023/24

G.6. Criminal damage

G.6.1. The IoD 2025 ‘criminal damage’ indicator includes all Home Office sub-categories of criminal damage and arson.

Table G.6. Home Office offence codes used for the ‘criminal damage’ indicator

Offence code	Offence name	Applicable years
56A	Arson endangering life	2018/19 - 2023/24
56B	Arson not endangering life	2018/19 - 2023/24
58A	Criminal damage to a dwelling	2018/19 - 2023/24
58B	Criminal damage to a building other than a dwelling	2018/19 - 2023/24
58C	Criminal damage to a vehicle	2018/19 - 2023/24
58D	Other criminal damage	2018/19 - 2023/24
58J	Racially or religiously aggravated criminal damage	2018/19 - 2023/24

G.7. Public order and Possession of weapons

G.7.1. The IoD 2025 ‘public order and possession of weapons’ indicator includes all Home Office sub-categories of public order and possession of weapons offences.

Table G.7. Home Office offence codes used for the ‘public order and possession of weapons’ indicator

Offence code	Offence name	Applicable years
9A	Public fear, alarm or distress	2018/19 - 2023/24
9B	Racially or religiously aggravated public fear, alarm or distress	2018/19 - 2023/24
62A	Violent disorder	2018/19 - 2023/24
66	Other offences against the State or public order	2018/19 - 2023/24
10A	Possession of firearms with intent	2018/19 - 2023/24
10B	Possession of firearms offences	2018/19 - 2023/24
10C	Possession of other weapons	2018/19 - 2023/24
10D	Possession of article with blade or point	2018/19 - 2023/24
81	Other firearms offences	2018/19 - 2023/24
90	Other knives offences	2018/19 - 2023/24

G.8. Anti-social behaviour

G.8.1. The IoD 2025 ‘anti-social behaviour’ indicator includes all Home Office sub-categories of anti-social behaviour.

Table G.8. Home Office incident types used for the ‘anti-social behaviour’ indicator

Incident type	Applicable years
Personal	2022/23 - 2023/24
Environmental	2022/23 - 2023/24
Nuisance	2022/23 - 2023/24

Appendix H. Potential indicators explored but not included in the IoD 2025

H.1. Introduction

H.1.1. During the construction of the IoD 2025, a wide range of issues and indicators were explored in order to understand the potential to enhance the Indices. Where changes have been made to the Indices as a result, primarily new indicators and enhancements to existing indicators, these have been detailed in Chapter 4.

H.1.2. This Appendix outlines a number of issues and potential indicators that were examined, but that did not result in changes to the Indices. This list is not exhaustive, but rather reflects some of the key issues that were afforded consideration.

H.1.3. The following tables describe those indicators which were explored, but were not included in the IoD 2025, either due to lack of suitable data or other conceptual or methodological concerns.

Table H.1. Income Deprivation Domain, potential considered for inclusion

Indicator	Reason explored	Reason not recommended for inclusion in IoD 2025
People listed in RAPID as being in employment and who appear to have a low income, but who are not claiming a DWP benefit or HMRC tax credits	Ideally, we would like to include people in low paid employment whose income falls below the 70% median threshold, even if they are not claiming DWP benefits or HMRC tax credits.	There are two main reasons why any such people cannot be included in the numerator for the Income Deprivation Domain: (i) there is no way to group adults and children into benefit units for people who are not claiming DWP benefits or HMRC tax credits, so it would not be possible to apply the income equivalisation; and (ii) there is no way to confidently assign such people to LSOAs, as there is no obligation on people to inform DWP or HMRC of their home addresses if they are not claiming DWP benefits or HMRC tax credits. It is also worth noting that there is an incomplete coverage of income sources in RAPID (e.g. excluding investment income etc), and indeed it may be the other sources of income that are the reason why people on apparently low income are not claiming benefits, as these other sources would be taken into account in any benefit eligibility assessment.
Adjustments to the existing approach, such as artificially inflating the	Raised in public consultation	We acknowledge that there are many reasons why people may not claim the benefits or tax credits to which they might be eligible, and we are aware of evidence suggesting that the

Table H.1. Income Deprivation Domain, potential considered for inclusion		
administrative data counts using estimates of 'take up'.		potential for take up may be lower within certain communities. However, any attempts to adjust administrative data-based statistics for differences in take up would require a number of generalised assumptions to be adopted, which would be impossible to empirically validate.
Switching the domain away from administrative data to incorporate, or be based solely on, modelled income data.	Raised in public consultation	This would represent a fundamental change to the structure of the domain, and it would be in contravention of a general principle of the Indices that indicators should ideally be based on administrative data wherever possible. Furthermore, it is questionable whether a sufficiently robust measure at LSOA level could be based on modelled income data.
New indicators of 'destitution' and 'food insecurity'.	The Joseph Rowntree Foundation is leading a programme of research into 'Destitution in the UK' Food bank usage was also raised in the 2022 public consultation exercise as a data source to consider	Although we believe there is academic merit in exploring the development of new indicators of 'destitution' and 'food insecurity' at LSOA level, we do not believe these would fit within the existing domain structure of the Indices, and we do not believe these indicators would merit a fundamental change to domain structure. Both these two potential new measures would need to be constructed as modelled indicators. Food bank usage was mentioned in the public consultation exercise, and such usage of food banks would be an integral part of any modelled measure of 'food insecurity'. However, given that this is a relatively new emerging metric of income deprivation, and the current lack of empirical research at small area level, we believe that this is something that would be better pursued outside the main Indices update work. Although there was no mention of 'destitution' in the public consultation, this is also a concept that is lacking small area level empirical analysis and broader consensus on definition, and so again we do not believe this fits within the main Indices update work.

Table H.2. Employment Deprivation Domain, potential considered for inclusion		
Indicator	Reason explored	Reason not recommended for inclusion in IoD 2025
Adjustments to the existing approach, such as artificially inflating the administrative data counts using estimates of 'take up'.	Raised in public consultation	We acknowledge that there are many reasons why people may not claim the benefits to which they might be eligible, and we are aware of evidence suggesting that the potential for take up may be lower within certain communities. However, any attempts to adjust administrative data-based statistics for differences in take up would require a number of generalised assumptions to be adopted, which would be impractical to empirically validate.
Expanding the definition of the domain to include a measure of the 'quality' of employment	Raised in public consultation	Although, in theory, incorporating measures of employment 'quality' might be regarded as an enhancement to the domain, there are currently no datasets available that would enable robust measures of employment quality to be produced at small area level.

Table H.3. Education, Skills and Training Deprivation Domain, potential considered for inclusion		
Indicator	Reason explored	Reason not recommended for inclusion in IoD 2025
Early years foundation stage performance	The Welsh IMD (WIMD) 2019 contained an indicator of Foundation Phase Average Point Score. The importance of capturing early years education was also raised in the 2022 consultation, where respondents cited the predictive capacity of early years performance for educational outcomes in later life.	Early years assessments are based primarily on the teacher's professional knowledge of what the child knows, remembers and can do, and are informally assessed. The assessments are not externally moderated and there is a degree of flexibility in the approaches taken. It is therefore not possible to develop a nationally consistent indicator of early years attainment.
Pupils meeting the expected KS1 standards in reading, writing and maths	Raised in the consultation.	Local Authorities are responsible for moderating KS1 teacher assessments to ensure that they are appropriate and consistent with national standards. They must ensure that at least a quarter of their schools receive external moderation

Table H.3. Education, Skills and Training Deprivation Domain, potential considered for inclusion		
		visits each year and that all schools are moderated at least once in a four year cycle. Given there is only partial external moderation at Key Stage 1 this indicator was not recommended for inclusion due to the risk of nationally inconsistent approaches to moderation.
All Education Dataset for England (AEDE)	To incorporate an administrative source of data on qualifications to provide more timely and regularly updated data on adult skills.	Only a younger adult cohort are included in the AEDE measure, those aged 14 to 29, whilst the Adult Skills sub-domain of the Education, Skills and Training Domain is focused on those aged 25 to 66. Also, the AEDE only provides school and Further Education qualifications obtained in England, whereas the 2021 Census provides recorded qualifications obtained anywhere in the world.

Table H.4 Health Deprivation and Disability Domain, potential considered for inclusion		
Indicator	Reason explored	Reason not recommended for inclusion in IoD 2025
Public health-related measures (such as data on smoking and obesity, chronic illnesses such as asthma, COPD and cardiovascular disease and behavioural data such as physical inactivity).	Raised in public consultation	These conditions are already indirectly incorporated, in terms of hospital admissions and years of life lost, both of which are the consequence of differences in these conditions/risk factors. The health domain focuses on outcomes and not risks. There are also relatively low counts for some of these conditions. For example, there were only around 11,000 hospital admissions with a primary diagnosis of obesity in England in 2018/19 [109]. This would lead to a large number of zero values at LSOA level, particularly when age/sex standardisation was applied.

[109] https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-obesity-physical-activity-and-diet/england-2020/data-tables

Table H.5 Crime Domain, potential considered for inclusion		
Indicator	Reason explored	Reason not recommended for inclusion in IoD 2025
Fires	The WIMD 2019 contained an indicator reflecting incidents of all primary, secondary and chimney fires at LSOA level; the NIMDM 2017 contained an indicator reflecting all deliberate primary and secondary fires at SOA level.	The numbers of all primary, secondary and chimney fires are typically very low at LSOA level in England (see latest published data containing LSOA codes[110]). Furthermore, we do not believe that all such fires should be considered as a form of crime or disorder, as they are not necessarily deliberate in nature. As such, fire service data were not deemed to be suitable for inclusion in the English IoD 2025 Crime Domain.

Table H.6 Barriers to Housing and Services Domain, potential considered for inclusion		
Indicator	Reason explored	Reason not recommended for inclusion in IoD 2025
Access to accessible green spaces	There is a body of research establishing the links between the role of green space and improved mental and physical health and wellbeing[111].	There are three potential sources of accessible green infrastructure which were explored in detail for the IoD 2025: 1) DEFRA publicly accessible green and blue space measure. 2) Access points to the Network of Public Rights of Way: These are the points at which people can enter accessible green spaces. 3) Green assets that meet Accessible Greenspace Standards. Following a detailed review and consultation with stakeholders, we concluded that none of the above sources are suitable due to lack of full national coverage and a lack of data on cross border accessibility to green spaces.

[110] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1173209/low-level-geography-dataset-270723.ods

[111] See for example, FAIRBURN, Jon, Walker, Gordon and SMITH, Graham (2005) Investigating environmental justice in Scotland: links between measures of environmental quality and social deprivation. Project Report. SNIFFER, Edinburgh. https://eprints.staffs.ac.uk/1828/, Wells, N.M. & Evans, G.W., 2003. Nearby Nature: A Buffer of Life Stress among Rural Children.

Table H.7. Living Environment Domain, potential considered for inclusion		
Indicator	Reason explored	Reason not recommended for inclusion in IoD 2025
Households not connected to mains gas	Recommended for exploration in 2022 public consultation as a potential improvement on current 'households without central heating' indicator	We have considered the potential for developing an indicator relating to mains gas connection, and we have explored data on this issue from the 2021 Census, the EPC administrative data, and Department for Energy Security & Net Zero (DESNZ) data on the domestic gas network. We decided not to take this forward due to concerns about the ability to isolate mains gas connection from other sources based on the question response categories, and concerns around the distinction between mains gas and other (potentially cleaner) energy sources. For instance, there are arguments for and against mains gas being preferable to mains electricity for household energy supply. There is therefore no concrete way to split different energy sources into two groups to indicate presence/absence of 'indoors' living environment deprivation. Instead, we have included EPC data to construct a broader indicator of building quality.
Flood risk	Recommended in the 2022 public consultation	Although we acknowledge that the impacts of flooding can be severe for those households that are affected, only a small proportion of the households across the country are at risk of flooding in the short- to medium-term. Any indicator of flood risk would therefore have a large proportion of LSOAs with zero values, which would invalidate any such indicator when assessed against the criteria used to judge the data integrity of potential Indices indicators.

Environment and Behavior, 35, 311-330, Van den Berg, A. E, et al., 2010. Green space as a buffer between stressful life events and health. Social Science & Medicine, 70, 1203-1210, Conniff, A, et al., 2016. A methodological approach to understanding the wellbeing and restorative benefits associated with greenspace. Urban Forestry & Urban Greening, 19, 103-109,

Appendix I. Quality assurance of the Indices of Deprivation 2025

I.1. Level of assurance

I.1.1. The quality assurance of the IoD 2025 used the risk and profile matrix set out in the UK Statistics Authority Administrative Data Quality Assurance Toolkit[112], summarised in the table below.

Table I.1. Risk and profile matrix for administrative data quality assurance

Level of risk of quality concerns	Public interest profile		
	Lower	Medium	Higher
Low	Statistics of lower quality concern and lower public interest [A1]	Statistics of low quality concern and medium public interest [A1/A2]	Statistics of low quality concern and higher public interest [A1/A2]
Medium	Statistics of medium quality concern and lower public interest [A1/A2]	Statistics of medium quality concern and medium public interest [A2]	Statistics of medium quality concern and higher public interest [A2/A3]
High	Statistics of higher quality concern and lower public interest [A1/A2/A3]	Statistics of higher quality concern and medium public interest [A3]	Statistics of higher quality concern and higher public interest [A3]

Level of risk of quality concerns

I.1.2. Our assessment for each indicator, domain and the overall Index of Multiple Deprivation is based on the criteria set out in the table below.

Table I.2. Our criteria for assessing the level of risk of quality

Summary	• What weight does this indicator contribute to the overall IMD? • Our assessment of level of risk of quality concerns: Low; Medium; High.
Operational context and data collection	• Is the indicator published (i.e. open data), in a form that could be used to recreate the indicator relatively straightforwardly? • If published as open data, is the indicator National Statistics? (i.e. of recognised quality, and with appropriate quality assurance documentation)

[112] UK Statistics Authority (2015) Administrative Data Quality Assurance Toolkit. http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/quality-assurance-toolkit.pdf.

	• If the indicator is not published as open data, is it based on underlying datasets that are themselves used to generate National Statistics? • Is the underlying data used for payments (e.g. benefit systems)? (i.e. likely to high quality and regularly audited) • Is the underlying data used for performance targets (e.g. crime data)? (i.e. risk of performance pressure) • Is the underlying source data collated from separate sources? (i.e. risk of inconsistent processes across the different sources) • Have any statistical disclosure control methods been applied to the data before being provided to us?
Communication with data suppliers	• Is there a single point of contact with the data supplier? • Have the data supplier and project team established appropriate contact points to discuss data supply and quality assurance? • Has sufficient quality assurance documentation been provided by the data supplier?
Quality assurance principles, standards and checks	• Have concerns been raised by suppliers, users or reviewers over the quality of the indicator or underlying data sources? • If any such concerns have been raised, have these been responded to in the Indices methodology and/ or documentation? • Do good proxy datasets exist for validating the indicator against real-world data sources? E.g. if the underlying datasets are not published, are any derivatives from the datasets available for our quality assurance validation such as data at LAD level?

I.1.3. Based on our assessment of the Indices inputs and outputs, we have identified:

- The domains and overall Indices of Multiple Deprivation have a *low* Level of risk of quality concerns. These datasets might be seen to have a *high* risk of quality concerns due to the number of different data collection bodies, and complex data collection processes. However, these risks are mitigated by the design, data processing, and multiple independent indicators used, in developing the domains and the IMD.
- The input indicators have a mixture of *low* and *medium* concerns over data quality. For each of the data sources used for the indicators, Appendix J sets out the main quality assurance documents available.

Public interest profile

I.1.4. Based on our assessment of the Indices inputs and outputs, we have identified the public interest in the Indices:

- *Medium* public interest in the overall IMD and higher level summary measures;
- *Lower / medium* public interest for the domains;
- *Lower* public interest for the underlying indicators used in the Indices.

Overall level of assurance

I.1.5. Based on our assessment of the Indices inputs and outputs, we have determined the level of assurance required to be as follows:

- *Enhanced assurance* is appropriate for the overall IMD and higher level summary measures, and the Crime Domain indicators. Additional assurance work for the Crime Domain indicators is outlined in Appendix I.3 below.
- *Basic assurance* is appropriate for the remaining indicators and domains.

I.2. Quality management actions

I.2.1. The work to produce the IoD 2025 has incorporated a number of actions to ensure quality, which are set out in Chapter 5. The table below lists the primary actions against the quality management actions framework set out in the UK Statistics Authority toolkit[113].

Table I.3. Quality management actions undertaken for quality assurance of the Indices of Deprivation

Quality management area	Actions
Manage	• Design of the Indices, including quality of the input data sources; statistical techniques to improve the reliability of small area data; and communication with data suppliers and users. • Clear roles and responsibilities across the research team and data suppliers, and separate internal and external quality assurance checks.
Communicate	• Review of potential data sources with data suppliers, to identify strengths and weaknesses of the data sources and data processing considered for inclusion in the Indices. • Regular dialogue with data suppliers, project manager and the research team. • Documenting quality guidelines and quality assurance for all input data sources used in the Indices (see Appendix J) • Description of the indicators used in the Indices, including biases and assumptions.

[113] UK Statistics Authority (2015) Administrative Data Quality Assurance Toolkit. http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/quality-assurance-toolkit.pdf.

Table I.3. Quality management actions undertaken for quality assurance of the Indices of Deprivation	
Quality management area	Actions
Investigate	• Quality assurance of all data sources used as inputs in the Indices, including review of quality processes for administrative and survey data, and modelling methodologies used to develop specific indicators. • Quality assurance of the processing steps used to construct all indicators, sub-domains, domains, the overall IMD, and the higher area level summaries. • Real world validation of the outputs against data from the previous IoD 2019 and 2015, as well as appropriate open data sources. This included sense checking of geographic patterns and time series trends. Ideally this validation would have used data from independent sources to those used in constructing the Indices; however, in practice this was not always possible as no such separate source existed. • In addition to the quality assurance carried out when constructing the domains, internal audit and external scrutiny are carried out on the complete process. These include scrutiny of the methods, processing syntax, and the constructed datasets. The internal audit was carried out on a domain-by-domain basis by a team member not involved in the construction of the domain. The external scrutiny was carried out by an external academic, to provide independent verification.

I.3. Enhanced assurance

I.3.1. The Crime Domain was again (as per previous Indices of Deprivation) identified as requiring additional quality assurance: This is primarily due to the data underpinning the Crime Domain originating from 39 separate police forces across England. Although all police forces follow the recording guidelines as set out in the National Crime Recording Standard, the Home Office Counting Rules, and the National Standard for Incident Recording, in practice some differences in data collection and processing do exist between different police forces. For example, there are differences between police forces in the approaches adopted to geocoding certain types of records, such as records for which the actual occurrence location is unknown. In order to ensure maximum consistency across all 39 police forces in England, the IoD 2025 Crime Domain involved an extensive programme of enhanced quality assurance, as detailed below.

Crime Domain

I.3.2. The Crime Domain has been included since the 2004 Indices. From the IoD 2004 to the IoD 2019, the domain consisted of four component indicators, each based entirely on geocoded police recorded crime data. For the IoD 2025, the Crime Domain consists of eight component indicators: seven of which are based on

geocoded police recorded crime data, and one based on police incident data relating to anti-social behaviour.

I.3.3. It is recognised that not all crimes or incidents that occur are reported to the police, and further that not all crimes or incidents that are reported are necessarily recorded by the police. However, the National Crime Recording Standard, Home Office Counting Rules, and National Standard for Incident Recording all provide detailed instruction to police forces on how to record those crimes and incidents that are reported to them. These rules and standards do, therefore, provide a high degree of structure which should lead to considerable consistency across and between police forces.

Additional quality checks and processes carried out on the geocoded police recorded crime and police incident datasets

I.3.4. The individual-level geocoded recorded crime and incident data used to construct the Crime Domain of the IoD 2025 was drawn from three sources: (i) the Home Office Data Hub; (ii) the raw data repository underpinning Police.uk; and (iii) bespoke extracts of data from the 39 police forces across England. The National Police Chiefs' Council granted members of the IoD 2025 research team access to the raw (i.e. non-anonymised) police data within a secure police setting for the purposes of updating the Indices.

I.3.5. In addition to the quality assurance checks already performed by the respective police forces and the Home Office in producing the underlying data sources, the IoD 2025 research team performed an extensive series of checks on the geocoded police data to ensure the appropriate levels of accuracy and completeness prior to incorporation into the Crime Domain. As well as the quality checks carried out, various techniques were used to maximise the quality of the LSOA level crime counts constructed from the raw geocoded crime data.

I.3.6. The most important checking process carried out was to compare the IoD 2025 LSOA crime counts generated from the raw individual-level geocoded data, against aggregate crime counts at the Police Force-level and Community Safety Partnership-level that were supplied separately by the Home Office and which are available as open data. These checks of geocoded data against the Home Office aggregate statistics were performed at the end of each major data processing phase of the Crime Domain. Primarily, these checks enabled assessment of:

- the degree to which the raw geocoded data contained the correct number of crime records (per crime type, time period and Police Force) prior to any mapping being undertaken; and
- the degree to which the geocoded data could be successfully mapped to appropriate LSOAs using the grid reference and/or postcode of offence location.

I.3.7. Where checks revealed discrepancies between the geocoded data and the open data, an enquiry was submitted to the relevant police force and/or the Home Office. The IoD 2025 research team worked closely with data analysts in the 39 police forces and the Home Office to resolve any issues, which sometimes involved requesting new bespoke extracts of source data.

I.3.8. The extensive checks performed on the final geocoded data demonstrated a high level of correspondence with the publicly available open data at Police Force-level and Community Safety Partnership-level.

I.3.9. As part of the work to develop the new LSOA level measure of anti-social behaviour for the IoD 2025 Crime Domain, the research team reviewed the geocoded police incident data in detail, and then liaised with data analysts across the police forces and at the Home Office. This process of investigation included undertaking a consultation with police force analysts to collect information on how police incidents of anti-social behaviour are coded and reported to the Home Office. Based on findings from these investigations, the IoD 2025 research team concluded that the published statistics on anti-social behaviour at Police Force Area and Community Safety Partnership level could not be used as a benchmark against which to compare the geocoded police incident data, due to differences in how police forces interpret the guidance on what to return for the published statistics. As such, in conjunction with the police analysts it was agreed that the geocoded police incident data was the most reliable account of anti-social behaviour available on a consistent basis for the whole of England.

I.3.10. Based on these extensive quality assurance checks, we have concluded that these crime and incident data provide the best measure of crime and disorder levels at LSOA level and that the data are fit for purpose to use as input sources for the IoD 2025.

Appendix J. Quality assurance documents for input data sources

Table J.1 in this appendix lists the main quality assurance documents available for the input data sources used in the IoD 2025, with web links where available[114]. Table J.2 provides a look-up between the indicator identification code used in the table, and the name of the indicator.

Table J.1. Quality assurance documents available for the input data sources

Indicator codes(s)	Document / resource name	Web link (if available)
ID1, ID2, ID3, ID4, ID5, ID6, ID7, ID8, ID10, ID11, ID12, ID13, ID14, ID15, ID16, ID17, ID18, ID19, ID20, ID21, ID28, ID32	DWP Statistics Quality Guidelines Statement	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/203643/dwp-statistics-Quality_Guidelines_statement_final.pdf
ID1, ID2, ID3, ID4, ID5, ID6, ID7, ID8, ID10, ID11, ID12, ID13, ID14, ID15, ID16, ID17, ID18, ID19, ID20, ID21, ID28, ID32	Quality statement: DWP benefits statistical summary	https://www.gov.uk/government/publications/dwp-statistical-summary-policies-and-statements/quality-statement-dwp-benefits-statistical-summary
ID1, ID2, ID3, ID4, ID5, ID6, ID7, ID8, ID10, ID11, ID12, ID13, ID14, ID15, ID16, ID17, ID18, ID19, ID20, ID21, ID28, ID32	Confidentiality and access policy for DWP statistics	https://www.gov.uk/government/statistics/confidentiality-and-access-policy-for-dwp-statistics
ID1, ID2, ID3, ID4, ID5, ID6, ID7, ID8, ID10, ID11, ID12, ID13, ID14, ID15, ID16, ID17, ID18, ID19, ID20, ID21, ID28, ID32	Policies and statements related to DWP statistical summaries (including Quality statement and Methodology statement)	https://www.gov.uk/government/statistics/dwp-statistical-summary-policies-and-statements

[114] All web references were downloaded 10th October 2025

Table J.1. Quality assurance documents available for the input data sources		
Indicator codes(s)	Document / resource name	Web link (if available)
ID1, ID2, ID3, ID4, ID5, ID6, ID7, ID8, ID10, ID11, ID12, ID13, ID14, ID15, ID16, ID17, ID18, ID19, ID20, ID21, ID28, ID32	Policies and statements related to DWP abstract of statistics	https://www.gov.uk/government/statistics/dwp-abstract-of-statistics-policies-and-statements
ID1, ID2, ID3, ID4, ID5, ID6, ID7, ID8, ID10, ID11, ID12, ID13, ID14, ID15, ID16, ID17, ID18, ID19, ID20, ID21, ID28, ID32	Fraud and error in benefits recent guidelines/QA/Tech annexe	https://www.gov.uk/government/publications/fraud-and-error-in-the-benefit-system-supporting-documents-for-statistical-reports
ID9	Home Office statistics statement of compliance with code of practice for official statistics	https://www.gov.uk/government/publications/statement-of-compliance-with-code-of-practice-for-official-statistics
ID9	Home Office statement of compliance – release practices	https://www.gov.uk/government/publications/home-office-statement-of-compliance-release-practices
ID9	Home Office use of administrative sources for statistical purposes	https://www.gov.uk/government/publications/home-office-use-of-administrative-sources-for-statistical-purposes
ID26	Higher Education Statistics Agency (HESA) data quality report	https://www.hesa.ac.uk/about/regulation/official-statistics/quality-report
ID27, ID45	Census quality assurance	https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/methodologies/howweassuredthequalityofcensus2021estimates
ID27, ID45	Census response and imputation rates	https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/methodologies/howweassuredthequalityofcensus2021estimates

Table J.1. Quality assurance documents available for the input data sources		
Indicator codes(s)	Document / resource name	Web link (if available)
ID27, ID45	Census assessing accuracy of responses	https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/methodologies/howweassuredthequalityofcensus2021estimates
ID27, ID45	Census confidence intervals	https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/methodologies/howweassuredthequalityofcensus2021estimates
ID27, ID45	Census quality notes and clarifications	https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/methodologies/howweassuredthequalityofcensus2021estimates
Denominators	Quality and methodology information for population indicators	https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/methodologies/midyearpopulationestimatesqmi
Denominators	Maximising the quality of Census 2021 population estimates	https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/methodologies/maximisingthequalityofcensus2021populationestimates
ID30	The HES processing cycle and data quality	https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics/the-processing-cycle-and-hes-data-quality
ID29, ID30, ID31, ID33, ID34	HSCIC data quality	https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/data-quality
ID31, ID49	Patients Registered at a GP practice Data Quality Statement	https://digital.nhs.uk/data-and-information/publications/statistical/patients-registered-at-a-gp-practice/data-quality-statement
ID22, ID23, ID24, ID25	Standards for official statistics published by DfE	https://www.gov.uk/government/publications/standards-for-official-statistics-published-by-the-department-for-education
ID29, ID30, ID31, ID32, ID33, ID34, ID35, ID36	UK Statistics Authority The quality of police recorded crime statistics for England and Wales	https://osr.statisticsauthority.gov.uk/publication/the-quality-of-police-recorded-crime-statistics-for-england-and-wales/
ID35, ID36, ID37, ID38, ID39, ID40, ID41, ID42	Crime in England and Wales Quality and Methodology Information report	https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/methodologies/crimeinenglandandwalesqmi

Table J.1. Quality assurance documents available for the input data sources		
Indicator codes(s)	Document / resource name	Web link (if available)
ID46, ID47, D51	MHCLG - Statement of administrative sources	https://www.gov.uk/government/publications/statement-of-administrative-sources-for-statistical-purposes
ID46, ID47, D51	MHCLG - Revisions policy	https://www.gov.uk/government/publications/statistical-notice-dclg-revisions-policy
ID46, ID47	Statutory homelessness in England: Statistics use, improvements, and user engagement	https://www.gov.uk/government/statistics/statutory-homelessness-in-england-january-to-march-2025/statutory-homelessness-in-england-statistics-use-improvements-and-user-engagement-note
ID46, ID47, D51	MHCLG open data strategy	https://www.gov.uk/government/publications/the-second-department-for-communities-and-local-government-open-data-strategy
ID54	Road accident and safety statistics guidance	https://www.gov.uk/government/publications/road-accidents-and-safety-statistics-guidance
ID43, ID54	DfT - statement on data quality	https://www.gov.uk/government/publications/standards-for-official-statistics-published-by-the-department-for-transport
ID43, ID54	DfT - statement of administrative sources	https://www.gov.uk/government/publications/statement-of-administrative-sources-for-official-statistics-published-by-the-department-for-transport
ID44, ID47	Family Resources Survey: quality assessment report	https://www.gov.uk/government/publications/family-resources-survey-quality-assessment-report/family-resources-survey-quality-assessment-report
ID50	English Housing Survey: guidance and methodology	https://www.gov.uk/guidance/english-housing-survey-guidance-and-methodology
ID52	National and International Standards for location data	https://www.ordnancesurvey.co.uk/governance/policies/psga-standards
ID55	Defra digital and data transformation strategy	https://www.gov.uk/government/publications/defra-digital-and-data-transformation-strategy-2023-to-2030/defra-digital-and-data-transformation-strategy

Table J.2. Lookup from indicator codes used in Table J.1. to indicator names	
Indicator code	Indicator name
ID1	Adults and children in Income Support benefit units
ID2	Adults and children in income-based Jobseeker's Allowance benefit
ID3	Adults and children in income-based Employment and Support Allowance benefit units
ID4	Adults and children in Pension Credit (Guarantee) benefit units
ID5	Adults and children in Universal Credit benefit units 'out of work' conditionality categories: 'No work requirements', 'Planning for Work', 'Preparing for work', 'Searching for work'
ID6	Adults and children in Universal Credit benefit units 'in work' conditionality categories: 'Working with requirements' and 'Working no requirements'
ID7	Adults and children in Housing Benefit claimant benefit units
ID8	Adults and Children in Tax Credit claimant benefit units
ID9	Asylum seeker adults and children in dispersed accommodation receipt of support
ID10	Claimants of Jobseeker's Allowance (both contribution-based and income-based)
ID11	Claimants of Employment and Support Allowance (both contribution-based and income-based)
ID12	Claimants of Incapacity Benefit
ID13	Claimants of Severe Disablement Allowance
ID14	Claimants of Carer's Allowance
ID15	Claimants of New Style Jobseeker's Allowance
ID16	Claimants of New Style Employment and Support Allowance
ID17	Claimants of Income Support
ID18	Claimants of Universal Credit in No work requirements conditionality group
ID19	Claimants of Universal Credit in Searching for work conditionality group
ID20	Claimants of Universal Credit in Planning for work conditionality group
ID21	Claimants of Universal Credit in Preparing for work conditionality group
ID22	Key Stage 2 attainment
ID23	Key Stage 4 attainment
ID24	Pupil absence
ID25	Persistent pupil absence
ID26	Entry to higher education
ID27	Adult skills and English language proficiency
ID28	Comparative Illness and Disability Ratio
ID29	Years of potential life lost
ID30	Acute morbidity
ID31	Mental health: Prescribing data
ID32	Mental health: Health benefits
ID33	Mental health: Hospital admissions
ID34	Mental health: Suicide mortality
ID35	Violence with injury, rate per 1,000 at risk population
ID36	Violence without injury, rate per 1,000 at risk population
ID37	Stalking and harassment, rate per 1,000 at risk population
ID38	Burglary, rate per 1,000 at risk properties
ID39	Theft, rate per 1,000 at risk population

ID40	Criminal damage, rate per 1,000 at risk population
ID41	Public order and possession of weapons, rate per 1,000 at risk population
ID42	Anti-social behaviour, rate per 1,000 at risk population
ID43	Connectivity Score
ID44	Housing affordability
ID45	Household overcrowding
ID46	Statutory Homelessness
ID47	Core Homelessness
ID48	Broadband speed
ID49	Patient-to-GP Ratio
ID50	Housing in poor condition
ID51	Housing Energy Performance Score
ID52	Housing lacking private outdoor space
ID53	Air quality
ID54	Road traffic accidents
ID55	Noise pollution

Appendix K. History of the Indices of Deprivation

K.1.1. The IoD 2000 attempted to measure multiple deprivation with respect to a single overall index as well as separate domain indices. Previous indices (1981 z-scores, 1991 Index of Local Conditions and 1998 Index of Local Deprivation) that had been constructed did not attempt to measure each domain of deprivation separately before combining the indicators into an overall index; these earlier indices also comprised a smaller number of indicators, utilised proxy measures and relied heavily on Census data. The IoD 2000 therefore reflected an attempt to refine the conceptualisation of multiple deprivation and the methodology for constructing the indices and included new and more up-to-date indicators.

K.1.2. In subsequent updates of the Indices of Deprivation, the number of indicators has increased as more data sources become accessible, and the methodology has gradually been refined. The main focus in recent years has been to maintain a consistent methodology to allow meaningful comparisons between years.

K.1.3. The IMD 2000 consisted of six domains: Income Deprivation; Employment Deprivation; Health Deprivation and Disability; Education, Skills and Training Deprivation; Housing Deprivation; and Geographical Access to Services Deprivation.

K.1.4. In updating these to the IoD 2004, the main change was the addition of the Crime Domain. Some changes were made to the Housing Deprivation Domain and the Geographical Access to Services Deprivation Domain, which became the Living Environment Deprivation Domain and the Barriers to Housing and Services Domain respectively. A small number of indicators were redistributed into these new domains. The IoD 2004 therefore consisted of seven domains:

- Income Deprivation
- Employment Deprivation
- Education, Skills and Training Deprivation
- Health Deprivation and Disability
- Crime
- Barriers to Housing and Services
- Living Environment Deprivation

K.1.5. There was also a change to the geography used, from wards in the IoD 2000 to LSOAs[115] in the IoD 2004. The intention has always been to construct the Indices at the smallest practicable spatial scale to provide a detailed measure of deprivation at a small spatial unit. The 2004 Indices and all subsequent Indices have been constructed on the LSOA geography. This is a statistical geography which has more even and (on average) smaller population sizes than wards and, until it was reviewed following Census 2011, had not been subject to boundary changes (which happen regularly with wards). LSOAs are aggregations of Census

[115] For further information about LSOAs see http://neighbourhood.statistics.gov.uk/dissemination/Info.do?page=nessgeography/superoutputareasexplained/output-areas-explained.htm.

Output Areas, the base unit for Census data releases. The use of OAs have been suggested in public consultations and explored as a potential smaller area unit from which to construct the Indices going forward, However, requisite data of sufficient breadth, quality and consistency across England to measure deprivation in the same way is currently not available.

K.1.6. The IoD 2007 aimed to maintain the methodology of previous Indices and no changes were made to the domains or spatial scale. The same was true of the IoD 2010 and 2015. There were a modest number of changes to the basket of indicators used in the domains over this period, resulting in a small number of new, modified and dropped indicators.

K.1.7. The aim when updating the IoD 2015 was to only introduce change when necessitated due to changes to the data landscape that prevented an indicator from being directly updated. The IoD 2019 are therefore very similar to the IoD 2015. As detailed in the relevant sections above, one component of the mood and anxiety indicator was dropped due to data quality concerns (health benefits component) and a number of small modifications were made to existing indicators due to the availability of additional data. The introduction of Universal Credit also affected the indicators in the Income Deprivation Domain, Employment Deprivation Domain and Health Deprivation and Disability Domain.

K.1.8. There have been notable changes to the composition of indicators in the 2025 Indices, with 20 new indicators introduced and 14 indicators significantly modified. Chapter 4 (above) summarises these changes in more detail.

Appendix L. What data have been published?

L.1.1. The IoD 2025 datasets are available to download at www.gov.uk/government/statistics/english-indices-of-deprivation-2025.

Lower-layer Super Output Area (LSOA) data

L.1.2. Nine sets of data have been published for LSOAs:

1. Index of Multiple Deprivation: The rank and decile for each area, on the overall Index of Multiple Deprivation.
2. Domains of deprivation: The rank and decile for each area, for each of the seven domains, as well as the Index of Multiple Deprivation
3. Supplementary Indices - Income Deprivation Affecting Children Index and Income Deprivation Affecting Older People Index: The rank and decile for each area, for the Income Deprivation Affecting Children Index and the Income Deprivation Affecting Older People Index, as well as the Index of Multiple Deprivation.
4. Sub-domains of deprivation: The rank and decile for each area, for each of the six sub-domains, as well as their respective domains.
5. Scores for the Indices of Deprivation: The scores for each area, for the overall Index of Multiple Deprivation, the seven domains, the supplementary indices, and the six sub-domains.
6. Population denominators: The primary population denominators (all people, children, working age, and older people) used in the IoD 2025. These can be used for aggregating the datasets, weighted by population, to other geographies such as wards (see Appendix A of Research Report).
7. All ranks, deciles and scores for the Indices of Deprivation, and population denominators (CSV file): A single text file containing all of the datasets listed above.
8. Underlying indicators. The indicators used to construct the seven domains, for those that are able to be published.
9. Transformed domain scores: The seven domain scores in this file have been standardised by ranking, and then transformed to an exponential distribution. These transformed domain scores can be used as the basis for users to combine the domains together using different weights (see Appendix B of Research Report).

Higher-level geography files

L.1.3. Seven sets of data have been published for higher-level geographies:

10. Local Authority District Summaries.
11. Upper-tier Local Authority Summaries.
12. Local Enterprise Partnership Summaries.
13. Integrated Care Boards Summaries.
14. Local Resilience Forums Summaries.
15. Built up Areas Summaries.

L.1.4. To summarise the level of deprivation in larger areas, a range of summary measures of the IMD 2025, the domains and the two supplementary indices (Income Deprivation Affecting Children Index and Income Deprivation Affecting Older People Index) have been created [116].

L.1.5. These measures are described in Table 3.2 of the Technical Report and advice on their interpretation is provided in Section 3.3 of the Research Report.

[116] For the Indices of Deprivation 2010 and previous versions, the majority of summary measures published were for the Index of Multiple Deprivation only. In response to demand from users, additional summary measures for the domains and supplementary indices were published for the Indices of Deprivation 2015, and this expanded list of measures is also published for the Indices of Deprivation 2019.

Appendix M. Worked examples of the higher-level summary measures

M.1. Overview

M.1.1. The summary measures have been produced for the following higher-level geographies for the IMD 2025, domains and supplementary indices: Local Authority Districts, upper tier Local Authorities, Local Enterprise Partnerships, Integrated Care Boards, Local Resilience Forums, and Built up Areas. As with the LSOA data, both ranks and scores are produced, with higher scores corresponding to higher levels of deprivation, and areas ranked so that a rank of 1 identifies the most deprived high-level area on that measure.

M.1.2. In order that higher scores can consistently be interpreted as corresponding to higher levels of deprivation, those summary measures that are based on LSOA *ranks* (the average rank and local concentration summary measures) use a reversed ranking – where 33,755 rather than 1 corresponds to the most deprived area – in the calculation of the summary measure score.

M.1.3. To help users understand each of the summary measures, the sections below describe how to calculate the measures for hypothetical Local Authority Districts.

M.2. Average rank

M.2.1. A user wishes to calculate the IMD 2025 average rank for their LAD. The average rank measure summarises the average level of deprivation across the district, based on the population-weighted ranks of the LSOAs in the area.

M.2.2. The district contains five LSOAs, with populations of 1,200, 1,800, 1,400, 1,500 and 1,700, giving a total population of 7,600, and have IMD ranks of 3,000, 10,000, 500, 1,000 and 20,000 respectively.

M.2.3. To calculate the average rank for the LAD, each LSOA rank is multiplied by the LSOA population. These values are then summed, before dividing by the district's population to create the average rank for the district.

M.2.4. In order that higher scores can consistently be interpreted as corresponding to higher levels of deprivation, those summary measures that are based on LSOA *ranks* use a reversed ranking - where 32,755 rather than 1 corresponds to the most deprived area. The user would therefore calculate the average rank for the district as:

Average rank = 33,755 – (3,000 x 1,200 + 10,000 x 1,800 + 500 x 1,400 + 1,000 x 1,500 + 20,000 x 1,700) / 7,600

Average rank = 26,150

When the average rank score is itself ranked then the rank of 1 (most deprived) is given to the largest average rank value.

M.3. Average score

M.3.1. The same user wishes to calculate the IMD 2025 average score for their LAD. The average score measure summarises the average level of deprivation across the district, based on the population-weighted scores of the LSOAs in the area.

M.3.2. The district contains five LSOAs, with populations of 1,200, 1,800, 1,400, 1,500 and 1,700, giving a total population of 7,600, and have IMD scores of 45.90, 26.51, 65.67, 59.14 and 13.64 respectively.

M.3.3. In order to calculate the average score for the local district authority, each LSOA score is multiplied by the LSOA population. These values are then summed, before dividing by the district's population to create the average score for the district. The user would calculate the average score for the district as:

Average score	=	(45.90 x 1,200 + 26.51 x 1,800 + 65.67 x 1,400 + 59.14 x 1,500 + 13.64 x 1,700) / 7,600
Average score	=	40.35

When the average score is ranked then the rank of 1 (most deprived) is given to the largest average score value

M.4. Proportion of LSOAs in the most deprived 10 per cent nationally

M.4.1. A user wishes to calculate for their LAD the proportion of LSOAs that are in the most deprived 10 per cent nationally.

M.4.2. Their LAD contains 65 LSOAs. Of these, 18 are ranked in the most deprived decile (i.e., 10%) of all areas in England. The user would calculate the proportion of LSOAs in the most deprived 10 per cent nationally for the district as:

Proportion of LSOAs in the most deprived 10 per cent nationally	=	18 / 65
Proportion of LSOAs in the most deprived 10 per cent nationally	=	0.277 (i.e. 27.7%)

When the score for this summary measure is ranked then the rank of 1 (most deprived) is given to the largest proportion.

M.5. Extent

M.5.1. A user wishes to calculate the extent measure for their LAD. The extent measure is a summary of the proportion of the local population that live in areas classified as among the most deprived in the country. The extent measure uses a weighted measure of the population in the most deprived 30 per cent of all areas:

- The population living in the most deprived 10 per cent of LSOAs in England receive a 'weight' of 1.0;
- The population living in the most deprived 11 to 30 per cent of LSOAs receive a sliding weight, ranging from 0.95 for those in the most deprived eleventh percentile, to 0.05 for those in the most deprived thirtieth percentile. In practice this means that the weight starts from 0.95 in the most deprived eleventh percentile, and then decreases by (0.95-0.05)/19 for each of the subsequent nineteen percentiles until it reaches 0.05 for the most deprived thirtieth percentile, and zero for areas outside the most deprived 30 per cent.

M.5.2. A LAD contains 70,000 people. Of the LSOAs in the district, only four are in the most deprived 30 per cent of all LSOAs in England; the populations for only these LSOAs are included in the extent calculation. The ranks for these four LSOAs are 500, 1,000, 3,000, and 9,400 respectively, with populations of 1,400, 1,500, 1,200, and 1,800 respectively.

- The first three LSOAs are in the most deprived 10 per cent of areas (with 33,755 areas in England, the areas ranked 1 to 3,376 are in the top 10 per cent). These receive a weight of 1.0, so contribute 100 per cent of their population.
- The fourth LSOA is ranked 9,400, so is in the 28th percentile (to find out which percentile an area is in, divide the rank by the total number of ranks, in this case 33,755, multiply by 100 and round up to the nearest integer). This receives a weight of 0.1447 so contributes 14.47% of its population: the weight decreases from 0.95 for the eleventh decile by (0.95-0.05)/19, so is 0.1447 for the 28th percentile.

M.5.3. The user would therefore calculate the extent summary measure for the district as:

Extent = (1,400 + 1,500 + 1,200 + 0.1447 x 1,800) / 70,000

Extent = 0.062292

When the extent score is ranked then the rank of 1 (most deprived) is given to the largest extent score.

M.6. Local concentration

M.6.1. A user wishes to calculate the local concentration measure for their LAD. The local concentration measure is a summary of how the most deprived LSOAs in the higher-level area compare to those in other areas across the country. It measures the population-weighted average rank for the LSOAs that are ranked as most

deprived in the higher-area, and that contain exactly 10 per cent of the higher-area population (in many cases, this will not be a whole number of LSOAs).

M.6.2. A LAD contains 70,000 people; 10 per cent of this population is 7,000 people. The local concentration measure calculates the population-weighted rank of the most deprived LSOAs containing exactly 7,000 people. Having sorted the LSOAs in descending order of deprivation, the five most deprived LSOAs in the LAD have populations of 1,400, 1,500, 1,200, 1,800, and 1,700, giving a total population of 7,600 (just higher than the 7,000 population required).

M.6.3. These LSOAs have ranks of 500, 1,000, 3,000, 10,000 and 20,000 according to the IMD 2025. In order that higher scores can consistently be interpreted as corresponding to higher levels of deprivation, those summary measures that are based on LSOA *ranks* use a reversed ranking - where 33,755 rather than 1 corresponds to the most deprived area.

M.6.4. To reach the required population of 7,000 (i.e., 10 per cent of the district's population) the first four LSOAs are included plus 1,100 of the fifth LSOA population. The user would calculate the local concentration measure for the district as:

Local concentration = 33,756 –
(1,400 x 500 + 1,500 x 1,000 + 1,200 x 3,000 +
1,800 x 10,000 + 1,100 x 20,000) / 7,000

Local concentration = 27,213.14

When the local concentration score is ranked then the rank of 1 (most deprived) is given to the largest local concentration score

M.7. Income scale and employment scale (two measures)

M.7.1. A user wishes to calculate the income scale and employment scale for their LAD. The two scale measures summarise the number of people in the higher-level area who are income deprived (the income scale) or employment deprived (the employment scale).

M.7.2. A district contains five LSOAs. The number of people in low income families in each LSOA (i.e., the Income Deprivation Domain numerator) is 1,563, 1,672, 1,745, 1,499 and 1,812.

M.7.3. The user would calculate the income scale measure for the district as:

Income scale = 1,563 + 1,672 + 1,745 + 1,499 + 1,812

Income scale = 8,291

M.7.4. The employment scale measure is calculated in the same way, but using the numerator of the Employment Deprivation Domain.