

1. Introduction

The Northern Ireland Multiple Deprivation Measures 2017 (NIMDM 2017) were published by the Demography and Methodology Branch (DMB), NISRA.

The deprivation measures are made up from 38 indicators, spread across 7 domains of deprivation, which are then combined to create the overall Multiple Deprivation Measure (MDM). All of these 38 indicators, each of the domains and the MDM are then ranked for each Super Output Area SOA in Northern Ireland. A list of indicators is provided in Annex A.

In order to get the breadth of coverage needed to rank each of the 890 SOAs in NI, the majority of the indicators were created using administrative data sources.

Under the UK Statistics Authority's Code of Practice for Official Statistics, producers of Official Statistics are required to ensure that:

- Official Statistics are produced to a level of quality that meets users' needs; and
- users are informed about the quality of statistical outputs.

In addition, the UK Statistics Authority issued a [statement](#) in January 2015 informing producers of official statistics that a [Regulatory Standard for the Quality Assurance of Administrative Data](#) had been published. This report was released in response to concerns about the quality of administrative data that emerged during its assessments of statistics on police recorded crime¹. The Standard recognises the increasing role that administrative data are playing in the production of Official Statistics and clarifies the Authority's expectations for what producers of Official Statistics should do to assure themselves of the quality of these data. The standard is supported with an Administrative Data Quality Assurance [Toolkit](#), which provides helpful guidance to statistical producers about the practices they can adopt to assure the quality of the data they utilise.

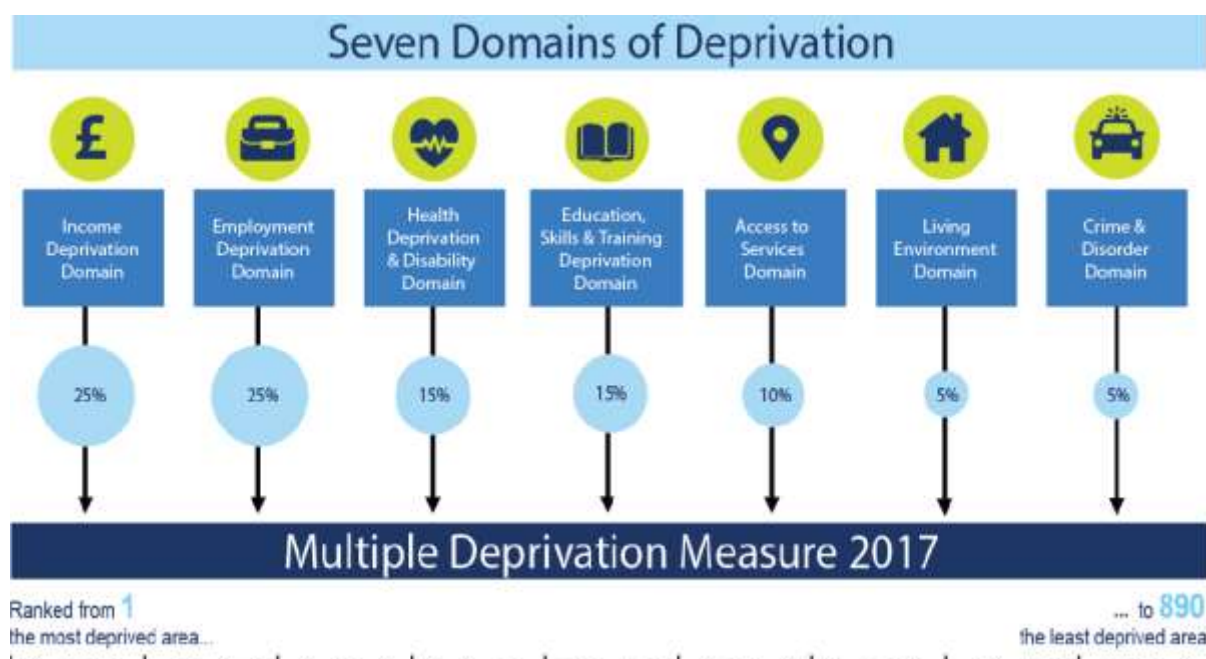
The purpose of this paper is to document the data sources that are utilised in the production of the NI Multiple Deprivation Measures 2017 and to document the results of the quality management actions that have been undertaken for assuring the suitability of the data sources for this purpose.

¹ <https://www.statisticsauthority.gov.uk/archive/reports---correspondence/correspondence/letter-from-sir-andrew-dilnot-to-bernard-jenkin-mp-150114.pdf>

2. Background

The Northern Ireland Multiple Deprivation Measures (NIMDM 2017), which were constructed using the Noble Methodology in line with broad arrangements throughout the rest of the UK, were released in 2017 and are largely based on data relating to 2015/16.

The measures are comprised of 38 indicators combined into 7 domains of deprivation. Each domain is developed to measure a distinct form or type of deprivation. These domains, as detailed below, are then combined using the weights shown to create a Multiple Deprivation Measure.



The same weights, shown in the circles, were also used in the 2005 and 2010 measures. These weights were determined by the robustness of indicator data, user consultation and considerations of theory on models of multiple deprivation.

3. Quality Assurance

Multiple Deprivation Measures 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 measures since 2001, and involves a number of different processes.

The quality assurance process also draws on the quality assurance and audit arrangements 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 measures, and the scale of risk over the quality of the data².

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

The measures are hugely important to a wide variety of interested parties and users. They play a pivotal role in both informing (a) the targeting of resources to the most deprived areas in Northern Ireland and (b) the monitoring of the spatial impact of policy interventions. As such, we have assumed that the measures and all the indicators will have a higher public interest.

4. Choosing the indicators

4.1 Criteria

The starting point for the quality assurance work is that the indicators themselves have been designed to ensure a high quality output.

Each of the 7 domains consist of one or more indicators that are considered to encapsulate that particular type of deprivation. In order to be considered for inclusion, each indicator had to conform to the following 6 criteria:

- It should be specific to one of the 7 domains of deprivation thus avoiding double counting and attaching undue weight to any particular indicator;
- It should represent major features of that form of deprivation rather than deprivation affecting a small number of people or particular types of area in Northern Ireland. This allows the degree of deprivation to be identified as opposed to a simple 'present/ not present' approach;
- It should be available for all of Northern Ireland, collected in a consistent form and be free from spatially bias characteristics;
- It should represent either direct measures or good proxies of that form of deprivation;

² <http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/quality-assurance-toolkit.pdf>

- It should be statistically robust at the small area level, facilitating the identification of 'pockets' of deprivation; and
- It should be as up to date as possible.

These criteria meant that for data to be considered for use as an indicator it had to be at a high quality, even at low geographical levels.

4.2 Expert group meetings

To ensure the best quality data was selected for use in the measures, 'Domain Expert Groups' were created. These groups consisted of statisticians working in fields relating to each of the domains, as well as users of the measures. An expert group was also created to specifically look at the quality of the data and identify any urban rural bias.

During these meetings the group of experts discussed each indicator in detail, including whether they were a suitable measure of deprivation as well as the quality of the data. The experts, who in most cases were the data owners, were able to provide full detail on how and why the data was collected, as well as any issues or quality concerns there were. This close communication with the data suppliers ensured that the strengths and weaknesses of the underlying sources and indicators were well understood. Indicators were only agreed at this stage if all members of the group were satisfied that the data was of a high quality.

Three indicators that were part of the 2010 deprivation measures were excluded at this stage due to concerns over the quality. These included two indicators from the Education, Skills and Training Domain relating to pupil performance at Key Stage 2 and Key Stage 3. Since the previous deprivation update, industrial action has led to some schools not submitting their pupils' key stage performance to the Department of Education. This meant that the data would be missing for some areas and therefore not be robust enough for inclusion.

A third indicator was removed from the Living Environment Domain and related to homelessness. The homelessness data is collected by the Northern Ireland Housing Executive (NIHE) as people would be required to register as homeless to receive help with housing and/ or benefits. The representative from NIHE, who sat on the Living Environment Domain Expert Group advised that the majority of people registered as homeless in the big cities and towns rather than where they came from. The group also felt that attitudes towards registering as homeless vary across the country. In some areas registering as homeless may be considered embarrassing, and therefore people would be unlikely to register, whereas in other areas people may try to 'work the system' and exaggerate their circumstances in order to get help with housing. Because of these issues, the group felt that the available data would not reflect the true distribution of homelessness and therefore could not be included as an indicator.

4.3 Consultation

Once the expert groups decided on a set of indicators the deprivation team presented them to the Deprivation Steering Group³. Full details of each indicator and the data behind them was assessed and agreed. Minutes of steering group meetings have been published on the [NISRA website](#).

Following agreement from the domain expert groups and the Deprivation Steering Group, the indicators were put out to public consultation. This meant that all users of the measures would have their chance to agree on the data being used to create the measures.

5. Gathering the data

When the final set of indicators were agreed, a blueprint document was published outlining exactly what data would be included in the final measures and the deprivation team began gathering the data.

A relationship was already established between the deprivation team and data suppliers through the expert group meetings, so that when the data was requested all parties knew what was expected. To ensure that all parties were satisfied with what data was being transferred formal data requests were issued.

In line with the Statistics Authority's Code of Practice, data sharing agreements (DSA) were signed, documenting exactly what data would be transferred, the legal basis for the transfer, as well as any arrangements necessary for data protection purposes.

6. Quality Assurance by the Deprivation team

Before the deprivation team received any data, the quality has been investigated by the data suppliers⁴ and agreed on by the expert groups, the steering group and the public, through consultation.

When the deprivation team received the data, further investigations were carried out. For each dataset the team looked at the range and distribution of the data and carried out some 'common sense' checks.

³ Minutes of the Steering Group Meetings, including presented papers, are available at: <https://www.nisra.gov.uk/publications/northern-ireland-multiple-deprivation-measure-2017-steering-group>

⁴ Quality procedures for each data source in Section 11

One issue that the deprivation team came across in a number of datasets was that the numbers were too small at Super Output Area level and would not have given an accurate representation of what was really going. A close working relationship and regular contact between the data suppliers and the deprivation team meant that additional year's data could be added to increase the count at SOA level and improve the reliability of the data.

Where possible, the figures were compared to previous years to ensure there had been no significant changes. If there were areas that changed significantly further investigation was required, this meant the team looking at the context for the change and ruling out any faults in the data. One example of this is an area where an army barracks closed down leading to a large change in the demographics.

7. Creating the Indicators

When the indicators were being constructed the deprivation team consulted with producers of similar measures in the rest of the UK. This meant they were using known and tested techniques to create the indicators. Each indicator was created and then replicated by another team member and the complete set of processing steps were validated.

Once the indicators were constructed the deprivation team carried out further checks by looking at the correlation with similar NIMDM 2010 indicators, mapping them to look for any obvious issues and carrying out some 'reality checks'. For example, when the flood risk indicator is mapped it is clear to see that areas with higher flood risk are near to the sea and/ or rivers.

8. Risk/ profile Matrix

The quality assurance of the NIMDM 2017 used the risk and profile matrix⁵ to assess the required level of quality assurance. All administrative datasets were given a score of A1. Quality Assurance Documents of all data sources are available in Annex B.

Level of risk of quality concern	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]

⁵ UK Statistics Authority's Administrative Data Quality Assurance Toolkit:
<http://www.statisticsauthority.gov.uk/assessment/monitoring/administrative-data-and-official-statistics/qualityassurance-toolkit.pdf>

Annex A List of indicators



Annex B Quality Assurance Documents

The table below lists the main quality assurance documents available for the data sources used in the NIMDM 2017.

Source	Data Supplier	Matrix Score	Data source information	links- QA	Links - confidentiality (DSA etc)
Database for Income Measuring and Estimation (DIME)	Department for Communities (DfC) Analytical Services Unit (ASU)	A1	The Database for Income Measuring and Estimation (DIME) was developed by the Department of Communities (DfC) by bringing together data from the HMRC as well as the Social Security Benefits System and Department for Work and Pensions to create a picture of household Income in Northern Ireland.	https://www.communities-ni.gov.uk/publications/analytical-services-statement-administrative-sources	https://www.communities-ni.gov.uk/publications/analytical-services-confidentiality-statement
Social Security Agency Benefits Computer Systems	Department for Communities (DfC) Analytical Services Unit (ASU)	A1	The Social Security Agency Benefits Computer Systems is used by the Department of Communities for administration and payment of welfare benefits.	https://www.communities-ni.gov.uk/publications/analytical-services-statement-administrative-sources	https://www.communities-ni.gov.uk/publications/analytical-services-confidentiality-statement
Northern Ireland Registration Office System (NIROS) General Registrars Office (GRO)	NISRA DMB Vital Statistics	A1	It is a legal requirement for individuals to register all births and deaths which occur in Northern Ireland and this is done through the General Register Office (GRO).	https://www.nisra.gov.uk/publications/vital-statistics-documentation	https://www.nisra.gov.uk/publications/vital-statistics-documentation
Northern Ireland Cancer Registry	Northern Ireland Cancer Registry (NICR)	A1	The Northern Ireland Cancer Registry (NICR) collates information on new diagnoses of cancer from three main sources; Patient Administration System (PAS) used by all the Hospital Trusts, pathology reports from Trusts and death notifications which are supplied by the General Register Office (GRO).	https://www.qub.ac.uk/research-centres/nicr/CancerInformation/data-quality/	http://www.qub.ac.uk/research-centres/nicr/FileStore/PDF/Fileupload,775587,en.pdf

Accident & Emergency System (NIRAES)/Symphony	Hospital Information Branch (HIB) Department of Health (DoH)	A1	The Accident & Emergency System (NIRAES) and Symphony Systems are used by the Department of Health for administration of patients attending accident and emergency units.	https://www.health-ni.gov.uk/publications/doh-statistics-charter	https://www.health-ni.gov.uk/publications/statement-administrative-sources
Child Health System	Project Support Analysis Branch (PSAB) Department of Health (DoH)	A1	System used by Health and Social Care Trusts to record information relating to children's health from birth until school leaving	https://www.health-ni.gov.uk/publications/doh-statistics-charter	https://www.health-ni.gov.uk/publications/statement-administrative-sources
COMPASS	HSC BSO	A1	COMPASS is a prescribing information system developed to provide GPs with feedback on their prescribing (COMPASS Prescribing Report)	http://www.hscbusiness.hscni.net/pdf/20180524_Information_Governance_Policy.pdf	http://www.hscbusiness.hscni.net/pdf/20180524_Data_Protection_Policy.pdf
Family Practitioner Service	BSO	A1	Family Practitioner Services provide services to General Medical, Dental, Ophthalmic and Pharmaceutical practitioners across the province.	http://www.hscbusiness.hscni.net/pdf/20180524_Information_Governance_Policy.pdf	http://www.hscbusiness.hscni.net/pdf/20180524_Data_Protection_Policy.pdf
Census	Census Office	A1	The 2011 Census in Northern Ireland was conducted on 27 March 2011, in line with arrangements across the rest of the United Kingdom.	https://www.nisra.gov.uk/archive/census/2011/evaluation/quality-assurance-report.pdf	https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/2011-census-privacy-impact-assessment.pdf
HESA	Higher Education Statistics Agency (HESA) Department of Education (DE) analytical	A1	Information on Northern Ireland (NI) students studying at UK Higher Education Institutions (HEIs) and all students studying at NI HEIs are collected by the Higher Education Statistics Agency (HESA). HESA collects information for all publicly funded universities throughout the UK.	https://www.economy-ni.gov.uk/sites/default/files/publications/economy/six-month-DLHE-quality-report-2015-16.pdf	https://www.economy-ni.gov.uk/publications/statement-administrative-sources-used-statistical-purposes

	Services Unit (ASU)				
Schools Information Management Systems (SIMS)	Department of Education (DE) Statistics and Research Team	A1	Staff within DE Analytical Services Unit sit on a Liaison group with C2k, and therefore are kept well informed of developments in relation to SIMS and well placed to respond to proposed changes and to instigate them where the need arises.	https://www.education-ni.gov.uk/sites/default/files/publications/education/Statement%20of%20Administrative%20Sources%20used%20for%20statistical%20purposes%20rr.pdf	https://www.education-ni.gov.uk/sites/default/files/publications/education/Confidentiality%20and%20Access.pdf
School Leavers Survey	Department of Education (DE) Statistics and Research Team	A1	The School Leavers Survey is an annual exercise to collect and validate the qualifications and destinations of Northern Ireland school leavers.	https://www.education-ni.gov.uk/sites/default/files/publications/education/Background-Quality-Report-School-Leavers-Survey.pdf	https://www.education-ni.gov.uk/sites/default/files/publications/education/Confidentiality%20and%20Access.pdf
BSO list of Accident and Emergency Hospitals/ Dentists/ GP surgeries/ Opticians/ Pharmacies	Business Services Organisation	A1	HSC BSO is responsible for the management of health care services in NI	http://www.hscbusiness.hscni.net/pdf/20180524_Information_Governance_Policy.pdf	http://www.hscbusiness.hscni.net/pdf/20180524_Data_Protection_Policy.pdf
Inter-Departmental Business Register (IDBR)	Department for Finance (DoF) Economic and Labour Market Statistics Branch (ELMS)	A1	The Inter-Departmental Business Register contains information on all businesses in the UK which are VAT registered or operating a PAYE scheme.	https://www.nisra.gov.uk/publications/idbr-user-group-meeting-and-further-information	https://www.nisra.gov.uk/publications/dof-confidentiality-statement

DfC operations	Department for Communities (DfC) Analytical Services Unit (ASU)	A1	DfC hold Organisational information, locations and contacts as part of its normal business activities	https://www.communities-ni.gov.uk/publications/analytical-services-statement-administrative-sources	https://www.communities-ni.gov.uk/publications/analytical-services-confidentiality-statement
DE list of schools	Department of Education (DE) Statistics and Research Team	A1	DE hold locations and contacts of schools as part of its normal business activities	https://www.education-ni.gov.uk/sites/default/files/publications/education/Statement%20of%20Administrative%20Sources%20used%20for%20statistical%20purposes%20rr.pdf	https://www.education-ni.gov.uk/sites/default/files/publications/education/Confidentiality%20and%20Access.pdf
Family Support NI Directory	Family Support NI	A1	Family Support NI hold locations and contacts of schools as part of its normal business activities	https://www.health-ni.gov.uk/publications/doh-statistics-charter	https://www.health-ni.gov.uk/publications/statement-administrative-sources
OfCOM	OfCOM market intelligence team	A1	OfCOM market intelligence team collects and analyses information from industry; directly, by using our power to make formal requests; and indirectly, by using third-party information sources. It monitors and interprets market developments and industry trends, across the media and telecommunications sectors and other relevant industries, at company, sector, UK and overseas levels.	https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/connected-nations-2016/downloads	https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/connected-nations-2016/downloads
Road Maintenance Client System (RMCS)	Department for Infrastructure (DfI) Analysis, Statistics and Research Branch	A1	Road Maintenance Client System includes information on road lengths. NI public road lengths are published in the NI Transport Statistics report.	https://www.infrastructure-ni.gov.uk/publications/code-practice-official-statistics-supporting-statements	https://www.infrastructure-ni.gov.uk/publications/code-practice-official-statistics-supporting-statements
Rivers Agency	Department for Infrastructure (DfI)	A1	Flood Risk Management Plans (FRMPs) are a requirement of the European Union Floods Directive. Article 7 of the Directive required each member state to prepare Flood Risk Management Plans by December 2015.	https://www.infrastructure-ni.gov.uk/publications/code-practice-official-statistics-supporting-statements	https://www.infrastructure-ni.gov.uk/publications/code-practice-official-statistics-supporting-statements

PSNI Crime Mapper	Police Service of Northern Ireland (PSNI)	A1	Statistics on police recorded crime in Northern Ireland are collated and produced by statisticians seconded to the Police Service of Northern Ireland (PSNI) from the Northern Ireland Statistics and Research Agency (NISRA). They are recorded in compliance with the Home Office Counting Rules and further details of recording practices are available in the User Guide to Police Recorded Crime Statistics.	https://www.psni.police.uk/globalassets/inside-the-psni/our-statistics/police-recorded-crime-statistics/documents/crim-e-user-guide.pdf	https://www.psni.police.uk/globalassets/inside-the-psni/our-statistics/official-statistics/psni_confidentiality_protection_statement_final.pdf
NIFRS list of incidents	NI Fire and Rescue Service (NIFRS)	A1			
NI House Conditions Survey (HCS)	Ni Housing Executive (NIHE)	A1	The NIHCS presents a comprehensive overview of Northern Ireland's dwelling stock and its occupants in 2016, including information about fuel poverty, disrepair, Decent Homes, the Standard Assessment Procedure (SAP), the Housing Health and Safety Rating System (HHSRS), unfitness, and household profiles.	https://www.nihe.gov.uk/house_condition_survey_main_report_2016.pdf	https://www.nihe.gov.uk/privacy_notice.pdf
Land Registry	Land & Property Services (LPS)	A1	Land Registry was established in 1892 and maintains a record of map based land registrations in Northern Ireland. The Registry does not merely provide a mechanical registration system, it actually guarantees the validity of the legal title.	https://www.finance-ni.gov.uk/lps-and-national-fraud-initiative	https://www.finance-ni.gov.uk/lps-freedom-information
Population Website	NISRA DMB Population Statistics	A1	National Statistics published by the Population Statistics section within Demography and Methodology Branch (DMB), NISRA are based on data gathered from statistical censuses and surveys, and data extracted from its own and other organisations' administrative or management systems.	https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/Population-DataQuality_1.pdf	