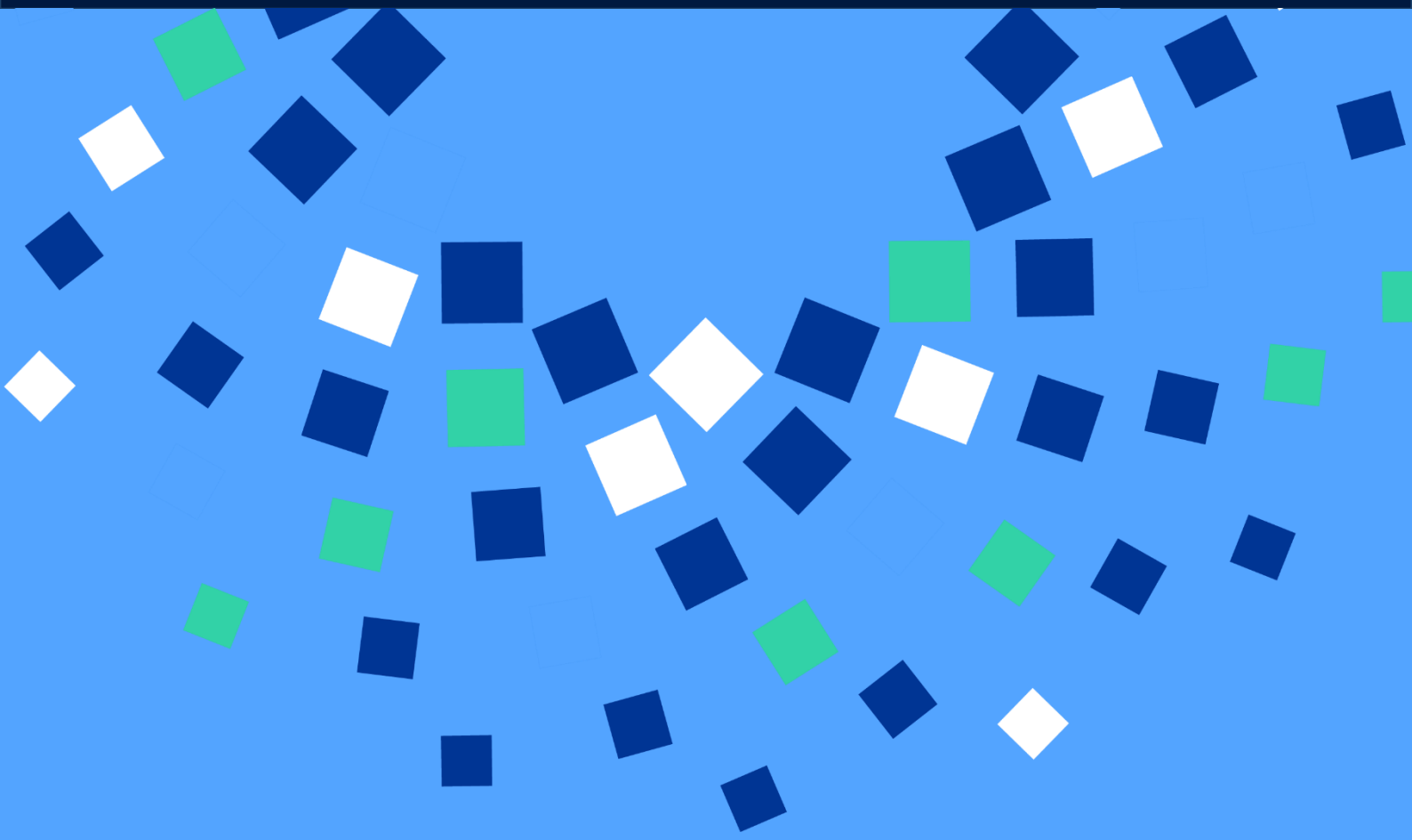
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Data Explained

Critical Care Data Set (CCDS)

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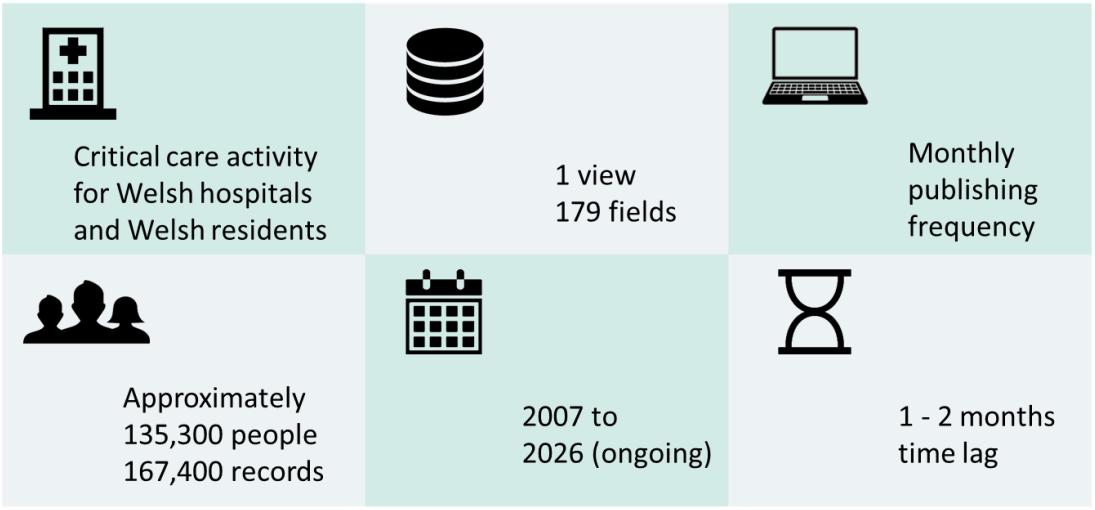


Summary

This Data Explained summarises experiences and learning from working with the Critical Care Data Set. This publication is intended to help guide future researchers using this data and to provide feedback into future dataset development and documentation.

The administrative data discussed in this Data Explained was made securely available through an approved SAIL project via the independent Information Governance Review Panel (IGRP) – project 1934. The data used in this research project comes from Digital Health and Care Wales (DHCW) and was accessed through the Secure Anonymised Information Linkage (SAIL) Databank. The data were not originally collected for research, and gaps and inconsistencies in their recording are expected; some are detailed below.

Overview



Introduction

The Critical Care Data Set (CCDS) is a patient-level data source containing information about the time patients spend receiving care in critical care wards across NHS Wales, regardless of where the patient is resident. It also contains information for Welsh residents receiving critical care treatment in English Trusts (Office for National Statistics, 2025).

Critical care is patient care provided to the sickest patients in the hospital system who are severely ill and high risk (Griffiths et al., 2022) (NHS Wales Health Collaborative, 2023). Critical care can be categorised as patients requiring at least one of the following:

- advanced respiratory system monitoring and support,
- the monitoring and support of two or more organ systems,
- or single organ system support in the presence of chronic failure (NHS Wales, n.d.-b).

The number of patients requiring critical care per year is relatively low, around 7,700 in 2024, but access to care often needs to be rapid (Welsh Government, 2019).

The CCDS was implemented in April 2007 in response to a review that identified a lack of consistent data collection for critical care activities, patient dependencies, and outcomes (Welsh Information Standards Board, 2006). The CCDS summarises critical care ward admission details, including the organ system(s) supported during the admission (Griffiths et al., 2022).

To be included in the CCDS, a patient must have been admitted to a critical care ward. The critical care level definitions within the CCDS are outlined in the *Designed for Life* document (NHS Wales, 2006), and activity in wards categorised as level 2 high dependency unit (HDU) or level 3 intensive care unit (ICU) are included in the data source.

A critical care period represents the time during which a patient receives care in a designated adult critical care bed (NHS Wales, n.d.-c), and the patient's critical care period will continue until they are discharged from the critical care location. Delays in discharge may result in the critical care period continuing after the patient's condition no longer requires critical care support.

CCDS coverage starts from April 2007; however, there are a smaller number of records available from April 2006.

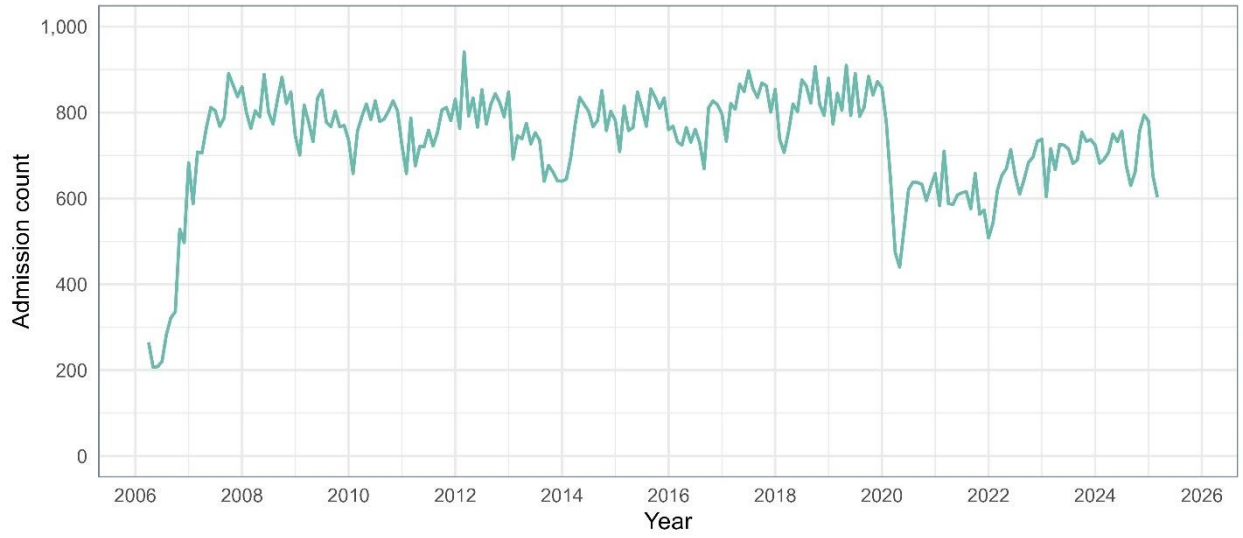


Figure 1 - Count of CCDS admissions per month.

How is the data collected?

Data on Welsh critical care activity, such as organ support provided and admission and discharge details, is captured at Welsh hospitals. The Welsh Health Boards (HBs) (excluding Velindre Trust and Powys Teaching Health Board, which do not provide these services) are required to submit a monthly extract of this data via the NHS Wales Data Switching Service (NWDSS). A check can be conducted prior to submission using the Validation at Source Service (VASS), which enables the HBs to validate and correct their data prior to submission, thereby improving data quality (NHS Wales, n.d.-a).

Digital Health and Care Wales (DHCW) is responsible for collating and processing Welsh NHS site returns, alongside data on Welsh residents treated in critical care wards in English Trusts (Office for National Statistics, 2025).

Within the CCDS, a critical care period starts when a patient is admitted to a critical care location and ends when the patient is discharged or dies. Repeat admissions and transfers to different critical care locations will result in a new critical care period, but changes of consultant or brief transfers for investigation or treatment will not cause the critical care period to end (NHS Wales, n.d.-c).

Data structure and linkage

CCDS is provided within SAIL as a single, individual-level table, with each record representing a unique critical care period. The data includes a unique Anonymised Linkage Field (ALF) for each individual, enabling robust linkage to other data sources in the SAIL Databank. While PAT_ID_PE and HOSP_SPELL_NUM_PE fields are also available, they do not act as linkage fields to other SAIL data sources with patient ID and spell number fields.

Key variables

The NHS Wales Data Dictionary (DHCW, Data Standards Team, n.d.) contains nationally agreed standard codes used for recording within critical care data and is therefore a useful resource for understanding and interpreting the CCDS. Some useful fields are listed below but full structural metadata is provided via the HDR Gateway (HDRUK, n.d.).

Field name	**Description**	**Use**
ALF_PE	Anonymised linkage field (person ID)	Data linkage with other SAIL data sources and combines with other fields to identify a unique critical care period
HOSP_SPELL_NUM_PE	Anonymised hospital spell identifier	Combines with other fields to identify a unique critical care period
ADMIS_TYPE_CD	Admission type code	Indication of whether the critical care initiation was planned or unplanned, local or transferred.
ADMIS_DT	Admission date	Critical care period start date. The date the patient first occupies a designated critical care bed
ADMIS_TM	Admission time	Critical care period start time. The time the patient first occupies a designated critical care bed.
PROV_ORG_NAME	Provider Organisation Name	The organisation name of the health care provider responsible for managing the patient's treatment.
DUR_BASIC_RESPIRATORY_SUPPORT_DAYS *DUR_ADVANCED_RESPIRATORY_SUPPORT_DAYS* *DUR_BASIC_CARDIO_SUPPORT_DAYS* *DUR_ADVANCED_CARDIO_SUPPORT_DAYS* *DUR_RENAL_SUPPORT_DAYS* *DUR_NEUROLOGICAL_SUPPORT_DAYS* *DUR_DERMATOLOGICAL_SUPPORT_DAYS* *DUR_GASTROINTESTINAL_SUPPORT_DAYS* *DUR_LIVER_SUPPORT_DAYS*	Duration of organ system support days	Total number of days that the patient received specified system support during the critical care period, with a separate field for each organ system support.
DUR_LEVEL2_SUPPORT_DAYS	Duration of level 2 support days	Total number of days a patient received level 2 care during the critical care period.
DUR_LEVEL3_SUPPORT_DAYS	Duration of level 3 support days	Total number of days a patient received level 3 care during the critical care period.
TREAT_SPEC_CD	Treatment function code	The speciality under which the patient will be or is treated.

ORGAN_SUPPORT_MAX	Maximum organs supported	The maximum number of organ systems supported on any one day during a Critical Care Period, ranging from 0-7.
DIS_DT	Discharge date	The end date of a critical care period, indicating the date that the patient was transferred out of the unit or died.
DIS_TM	Discharge time	The end time of a critical care period, indicating the time that the patient was transferred out of the unit or died.
DUR_ADMIS_DISCH_HRS	Hours between admission and discharge	The duration of the critical care period in hours. The time between admission and discharge.

Table 1 - Key fields available in CCDS.

What can the data be used for?

As a result of all critical care units in Wales submitting information, the CCDS is a rich data source (Welsh Government, 2019). It is therefore a useful source for identifying patients who have received critical care treatment and the organ system support provided.

As the CCDS is patient-level data containing ALF_PE, it can be linked to wider SAIL data, enabling critical care to be included as an outcome, risk factor, or covariate within research projects. Trends in critical care can be studied as well as variation across populations and regions.

The CCDS contains detailed timing information including time admitted, time ready for discharge and time discharged. This enables precise calculation of critical care period duration. However, discharge information is less complete than admission information, and discharge-ready recording is also less complete (see data limitations encountered).

The CCDS records details of the organ systems supported as well as the duration of the support throughout the critical care period, enabling researchers to identify the type of support received by patients.

There are seven organ systems for which support can be recorded:

- respiratory,
- cardiovascular,
- dermatological,
- gastrointestinal,
- liver,
- neurological,
- and renal.

Cardiovascular and respiratory support are further subdivided into basic or advanced support.

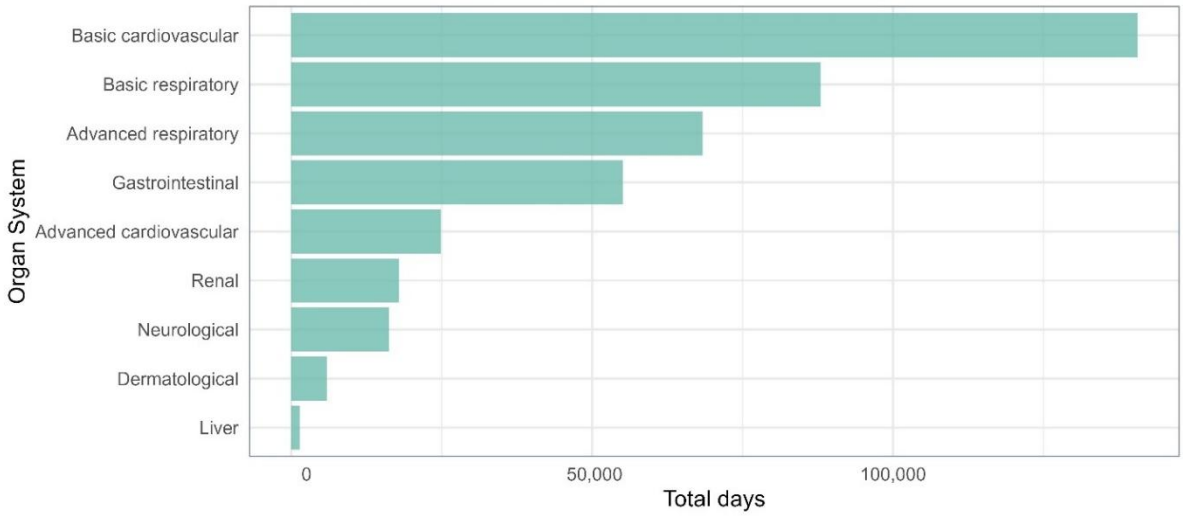


Figure 2 - Total support days recorded for each organ system.

There is no specific field to record the severity of patient illness in the CCDS; however, the maximum number of organ systems supported on any single day during the critical care period is recorded. This could be used as a proxy measure to provide information about multi-organ failure.

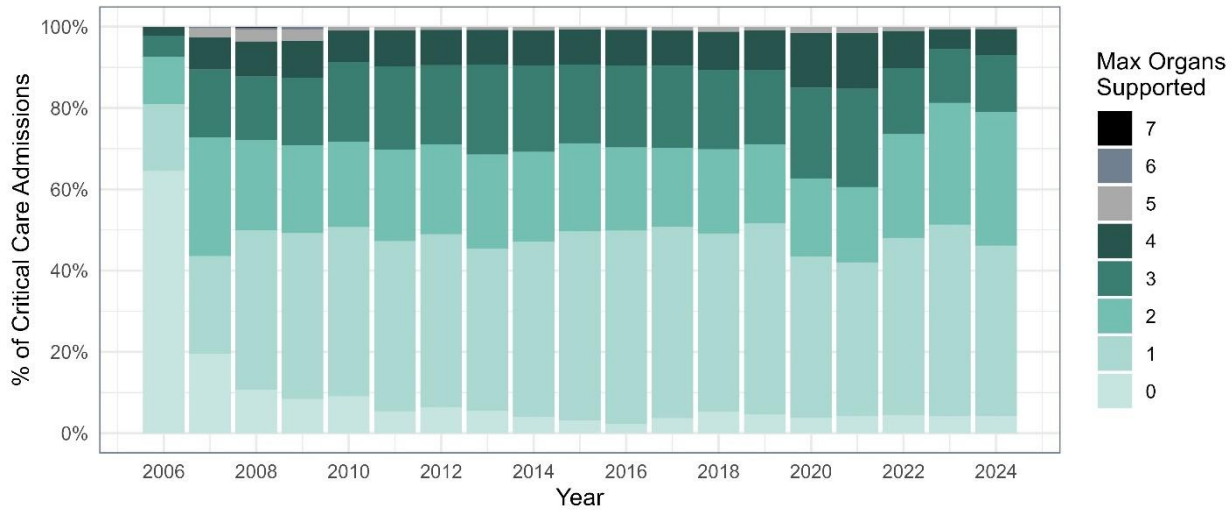


Figure 3 - Count of CCDS critical care admissions per year by the maximum number of organ systems supported on any single day (excludes null values and any counts fewer than 10).

The level and duration of support are also recorded, which could serve as an indication of the severity of the patient's condition.

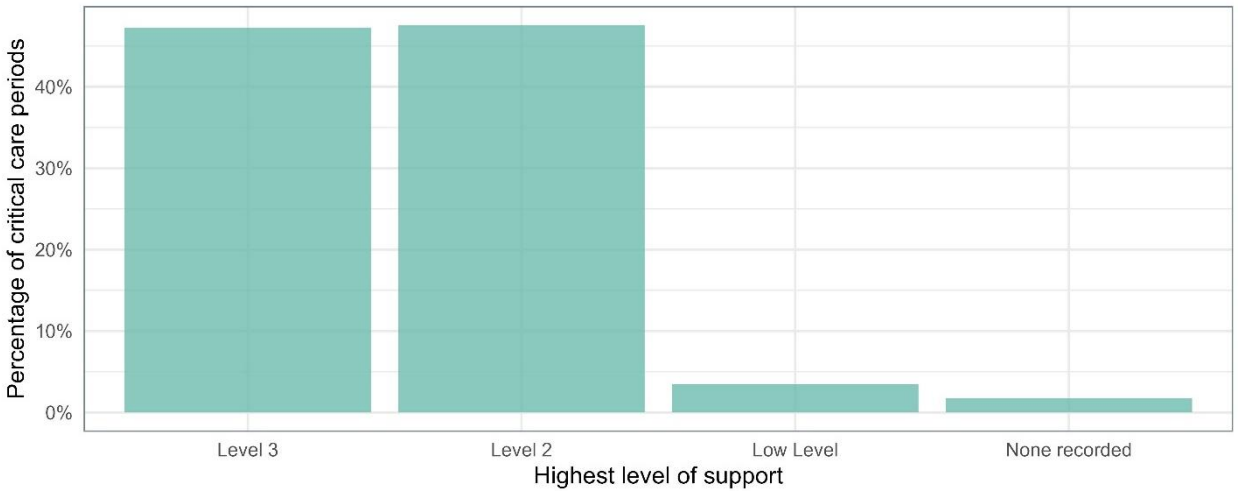


Figure 4 - Highest level of support recorded throughout the CCDS critical care period, as a proportion of all critical care periods (records with null ALF_PE, HOSP_SPELL_NUM_PE, ADMIS_DT or ADMIS_TM are excluded).

Data limitations encountered

The CCDS contains records for patients receiving treatment in a designated adult critical care bed. It is therefore possible to include children and patients who do not need critical care. According to Mussa and Muthuswamy (2025), critical care units "provide ad-hoc support for non-invasive ventilation services" due to limited capacity to support this outside critical care units, leading to "avoidable ICU admissions". There are also records for patients under the age of 18 within the data. Therefore, projects should apply relevant age and level of care filters to ensure they are studying the patients of interest.

Data on patients outside critical care are not captured, meaning that information is unavailable on unmet need or the outcomes of patients unable to access critical care (Welsh Government, 2019).

The CCDS is primarily an administrative data source; as such it contains little detail about a patient's condition. There is no diagnostic coding available within the CCDS, and no information about vital signs or laboratory results. While proxy measures can be used to establish patient severity, the lack of specificity about the patient's underlying condition means it may be difficult to make meaningful comparisons of outcomes and associated risk factors.

The discharge date is not always complete, with approximately 1% of records having either an invalid discharge date or no discharge date recorded. The discharge ready date was also blank or invalid in approximately 20% of records. This may limit researchers' ability to accurately calculate the duration of critical care received.

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Glossary

Abbreviation	Description
ADR UK	Administrative Data Research UK
ALF	Anonymous Linkage Field
DHCW	Digital Health and Care Wales
HB	Health Board
HDU	High dependency unit
ICU	Intensive care unit
IGRP	Information Governance Review Panel
NHS	National Health Service
NWDSS	NHS Wales Data Switching Service
SAIL	Secure Anonymised Information Linkage (SAIL) Databank
VASS	Validation at Source Service

Disclaimer

This work was produced using administrative data accessed through the SAIL Databank. The use of the data in this work does not imply the endorsement of the SAIL Databank or data owners in relation to the interpretation or analysis.

This work uses research data which may not exactly reproduce National Statistics aggregates.

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This Data Insight has been produced by the ADR Wales Ymateb research team. It provides a snapshot of informative research currently underway at ADR Wales but is not intended to provide a complete picture of work undertaken within this field or the ADR Wales programme of work. The information presented in this Data Insight has been reviewed by ADR Wales colleagues with expertise within this thematic area and accepted to be accurate at the point of publication. Views expressed in this Data Insight are those of the researchers and not necessarily those of ADR Wales partner organisations.

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Publication contact

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