



Data Explained

Maternal mental health & emergency department utilisation in ECHILD

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Summary

This Data Explained summarises experiences and learning from working with the ECHILD linked datasets while producing research into the impact of mothers' mental health and emergency department utilisation on children's educational outcomes at Key Stage 1. This publication is intended to help guide future researchers using this data and to provide feedback into future dataset development and documentation. It is correct at the point of publication.

The administrative data discussed in this Data Explained was made securely available through [MATCHED](#), as part of an ADR UK fellowship. The data used in this research project comes from University College London and was accessed through the Office for National Statistics (ONS) Secure Research Service. The data was not originally collected for research, and it is expected that there are gaps and inconsistencies in its recording, several of which are detailed in the following.

Project details

The purpose of the project was to explore the impact of maternal mental health on emergency department access during pregnancy and the subsequent outcomes on children, born in 2012 in England, and assessed at Key Stage 1 in 2018/19. This stemmed from work that was undertaken previously [1] which showed that self-reported mental health scores on the EQ5D-5L and PHQ-9 predicted emergency department access during the perinatal period. However, this work included only a small sample of mothers from four areas in England and follow up was for one year. It is important to understand emergency department use during the perinatal period, how this is related to prior mental health issues and how these health service interventions may be associated with children's outcomes. The potential to intervene early and most appropriately is an important aspect to this work and has been informed by involvement and engagement of members of the public. The ECHILD dataset has made it possible to explore patterns of health care utilisation for mothers/birthing parents. Details of how the ECHILD dataset was created are available at www.echild.ac.uk.

Initial research questions

1. What factors drive mothers'/birthing parents' engagement with mental health services before and during pregnancy?
2. What factors influence mothers'/birthing parents' use of emergency department during pregnancy?
3. Are perinatal mental health issues and emergency department visits during pregnancy linked to subsequent child health, development and educational outcomes?

Research methodology

First, some basic facts about the mothers, parents, and their children were gathered using the de-identified data, such as ages or other characteristics like the region they lived in. Simple mathematical tools (like averages and percentages) were used, and charts were created to understand this information more clearly. It was also possible to analyse geographical differences to see if certain areas have different outcomes in terms of health or education.

Next, more detailed analyses were performed to see if outcomes could be predicted. For example, to check if mothers who visited the emergency room during pregnancy were more likely to have children who did well in terms of their development and early educational outcomes. Methods were also used to break down the data into specific groups who might be at risk and find patterns that could help us predict these outcomes more accurately.

How was the data collected?

Mental Health Minimum Dataset (MHMDS)

It is useful to understand the context of how the data was collected. For the years preceding the birth of children in the cohort chosen for this project (2012), when the [MHMDS data](#) was collected, integrated systems were not commonplace. This meant when NHS Trusts merged they had to consider different information arrangements for different areas. Patient identifiers for different services were also different, so, Jane Doe might be patient 1234 for an inpatient spell but patient ABCD for day care attendance. The following diagram shows how data was matched and merged.

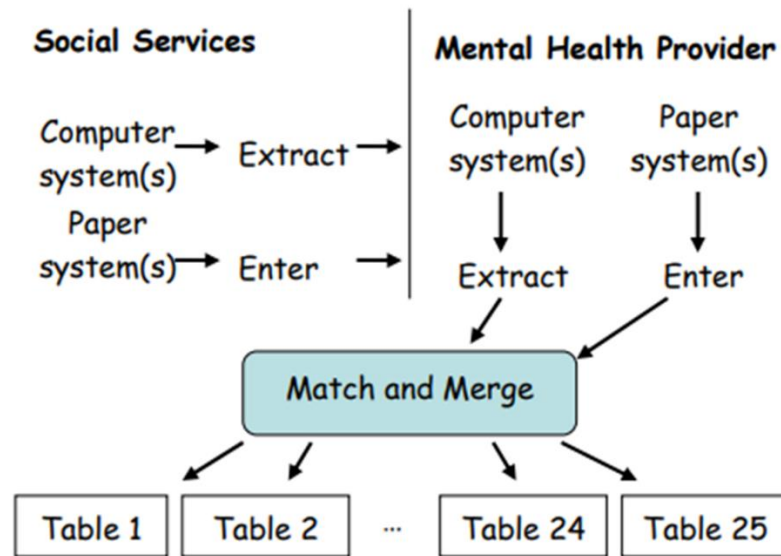


Figure 1: The process of matching and merging data in MHMDS [2] p.9

The result of this is that earlier years of this dataset have a lot of missing data. There is also a change in how data is presented, i.e. from one data table to three data tables so consistent variables over the years can be challenging for researchers.

Accident and Emergency Dataset (HES-A&E)

The [2010/11](#) and [2011/12](#) years were experimental and not all providers of services completed data submissions (187/327 providers for 2010/11; 200/273 providers for 2011/12) and subsequent years did not have sufficient detail for diagnosis at the time of visit to the emergency department.

Key variables

To understand prior maternal health care utilisation, it was necessary to link tables available within ECHILD together. The table below shows the linkage between variables in the ECHILD dataset.

ECHILD dataset	Variable(s)
Key Stage 1	Month/Year of birth for the child, gender, KS1 outcomes
Child link	Echild pupil ref matching anonymous
Mother-baby link	Mother id, Child id
MHMDS	Mother id
Emergency department dataset	Mother id

These were the variables used to link the datasets together. The Key Stage 1 data was used to define the initial 'spine', then the child's education data were linked to their health data, the child's health data was linked to their mothers and their mothers' utilisation of mental health and emergency department services were then explored.

Mental Health Minimum Dataset (MHMDS)

To answer the research question 1 and to explore what factors drove mothers'/birthing parents' engagement with mental health services before and during pregnancy there were very few variables that were available to use to answer this question. There were no attendance dates, no maternal mental health diagnosis codes or other detailed socio-demographic variables that could be included. The only variables of potential use were age and the marital status of the mother at the time of mental health service utilisation.

Accident and Emergency Dataset (HES-A&E)

It is known that diagnosis was completed [for only about 60%](#) of those visiting emergency departments and when it was completed it was largely marked as 'other' or 'not known' so was not usable. Additionally, although treatment might have been completed more extensively, the actual treatment most recorded was 'guidance/advice only'. Therefore, to answer research question 2, again limited data were available. However, as it was possible to join the mental health dataset to the emergency department data and to the child outcomes data further understanding could be gleaned.

Summary of comments on specific variables

Variable name(s)	Comments
HES-MHMDS Ethnicity (mhd_ethnicity)	The ethnicity variable was very poorly recorded with a lot of variation in the way different providers coded ethnicity. 65 different codes used and some did not conform to the NHS dictionary codes
HES-A&E Ethnicity (ethnos)	The ethnicity variable was very poorly recorded and likely to be very unreliable especially in cases where different ethnicities were reported for different episodes of care for the same person.
HES-A&E Diagnosis (diag)	This is poorly completed and where diagnosis has been included it is recorded as 'other'.
HES-MHMDS (mhd_start_date_mhcs)	This variable is defined as the 'start date (mental health conditional discharge)', so is not actually the start of an episode of care but rather the end date of the episode of care.
MB_id_list (delmeth_clean)	This delivery variable is incorrect and should not be used.

How you dealt with data limitations

Mental Health Minimum DataSet (MHMDS)

Ethnicity

Whilst ascertaining the ethnicity of mothers in the dataset was problematic, joining with mothers' delivery records, which are available in the HES-APC, can be used to fill the gaps missing in the dataset.

Attendance date

To deal with the lack of attendance date, the calendar year in which the attendance occurred was used as a proxy. To understand whether the mental health referral was during the perinatal period, a pregnancy variable was created which took the 15th of the month of birth of the child and subtracted the known recorded gestational age in weeks to give an approximate date of the pregnancy period. I defined the perinatal period as birth plus 12 months (version 1) and also considered the period from 3 months before birth, birth plus 24 months (version 2) as per the NHS Long Term Plan.

Accident and Emergency Dataset (HES-A&E)

Ethnicity

Whilst ascertaining the ethnicity of mothers in the dataset was problematic, joining with mothers' delivery records, which are available in the HES-APC, can be used to fill the gaps missing in the dataset.

Diagnosis

As there was insufficient data to ascertain what the diagnosis was, the *aepatgroup* variable was used which is a coded classification to identify the reason for the A&E episode.

MotherBaby link (MB_id_list)

In order to determine whether the delivery method was associated with mental health or emergency department utilisation the delivery method (delmeth) variable from the HES-APC data was used.

Suggested improvements recommended to data owners

The data documentation for the MHMDS appears to require updating as variable labels seem to be out of sync with the variables in the spreadsheet. The ECHILD team have been made aware of these errors and are currently updating the catalogue to make the appropriate corrections. In addition, the data change from year to year from one to three datasets. While this is acknowledged in the 'Years' columns of the ECHILD Data Catalogue v.3.1, some variables that appear to be available in the data catalogue are not available in the actual data.

To improve feedback loops on data quality, a common area of the SRS, accessible by the ECHILD team and ECHILD data users, will be created. This will allow researchers to highlight any issues with the data in real time to enable these issues to be picked up.

Works cited

1. Mason-Jones AJ, Beltrán L, Keding A, Berry V, Blower SL, Whittaker K, Bywater T. Predictors of Mother and Infant Emergency Department Attendance and Admission: A Prospective Observational Study. *Maternal and child health journal*. 2023;27(3):527-37. DOI: <https://doi.org/10.1007/s10995-022-03581-5>
2. The Information Centre for Health and Social Care. National Datasets Service: Mental Health Minimum Dataset (MHMDS) v2.1 Specification and Guidance. <https://webarchive.nationalarchives.gov.uk/ukgwa/20080527221718/http://www.ic.nhs.uk/webfiles/Services/Datasets/MHMDS/MHMDSv2.1SpecificationAndGuidance.pdf>: 2008.



Disclaimer

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

This work uses research datasets which may not exactly reproduce National Statistics aggregates. National Statistics follow consistent statistical conventions over time.

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ADR UK is a partnership transforming the way researchers access the UK's wealth of public sector data, to enable better informed policy decisions that improve people's lives. By linking together data held by different parts of government and facilitating safe and secure access for accredited researchers to these newly joined-up and de-identified data sets, ADR UK is creating a sustainable body of knowledge about how our society and economy function – tailored to give decision makers the answers they need to solve important policy questions.

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