

Introduction:

Analysis of routinely collected data has the power to drive local and national improvements in quality of care. The way in which maternity data are collated, managed and processed is complex, and seldom understood by frontline maternity staff. Over the last 10 years, there has been a transition in English maternity data management, from locally stored maternity information systems (MIS) to a nationally administered maternity service datasets (MSDS). This transition was driven by the Maternity Transformation Programme and National Maternity Review,^[1] bringing English maternity data in line with that of the other devolved nations. Such largescale transformations will have consequential impacts upon maternity data, and the way data are analysed. The National Maternity Perinatal Audit (NMPA) is commissioned to analyse population-level maternity data, publish annual reports and provide recommendations for enhancing maternity care.^[2] This poster aims to depict the changes to the maternity data landscape, highlighting the pros and cons of this new model. The NMPA reflects upon their experience of conducting national maternity data analyses using both systems, challenges encountered with MSDS, and considerations for future development.

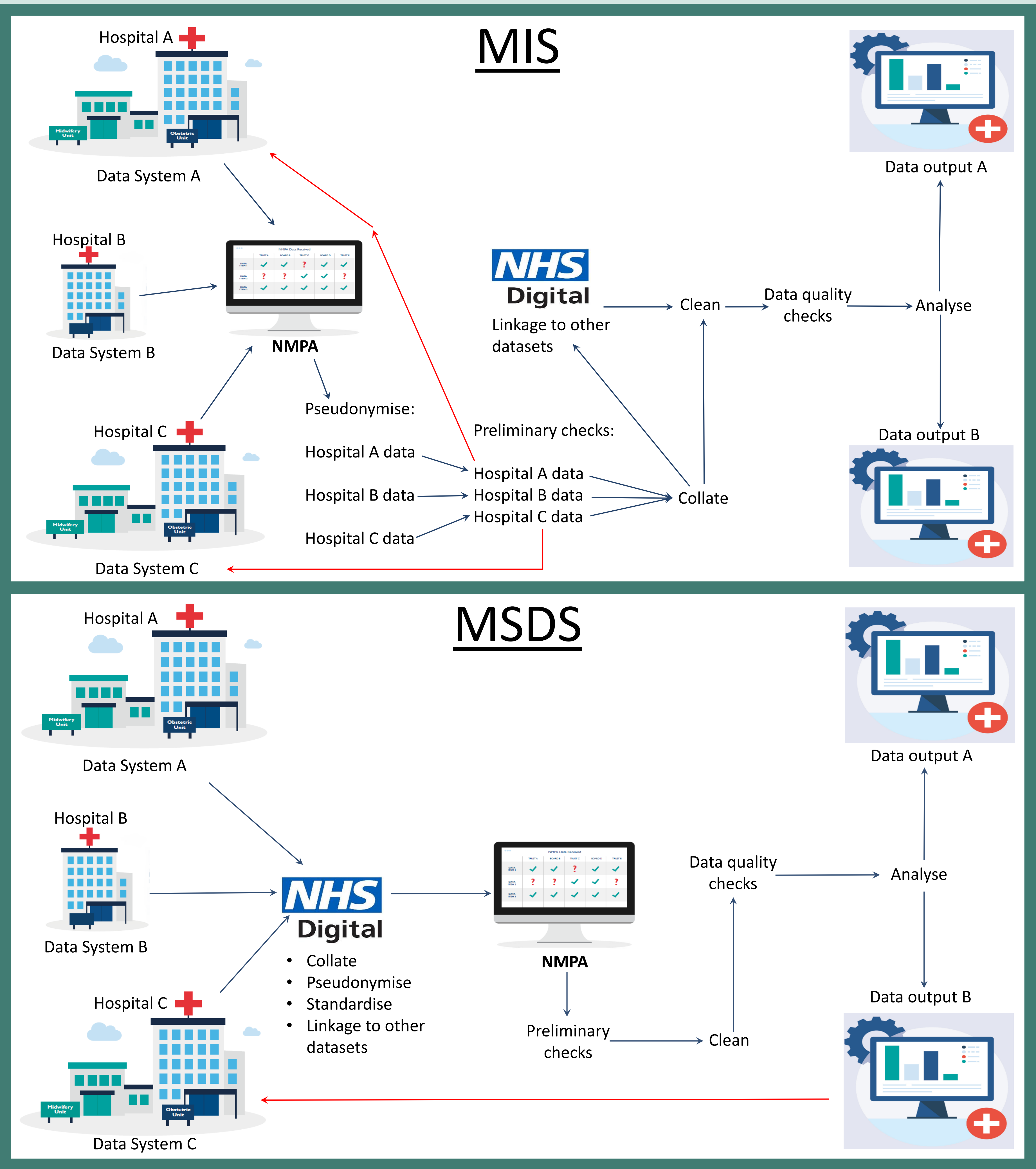
Understanding England's maternity data flow: MIS vs MSDS

Maternity information systems (MIS):

Each trust would respond to individual data applications, with data being sent directly to the NMPA, often in varying formats. Data analysts must then clean and combine the data into a standardised format. Direct feedback could be provided to trusts when missing or nonsensical data was identified. Trusts were able to make amendments and resubmit their data, with this iterative communication leading to notable improvements in data quality and the validity of subsequent outputs. Data was then sent to NHS digital for pseudonymisation and linkage with other datasets (e.g. Hospital Episode Statistics HES). Data is then returned to the NMPA, for pseudonymisation, further cleaning and processing. Data is then analysed, leading to output generation (e.g. reports).

Maternity systems dataset (MSDS):

All trusts are required to send information to NHS Digital monthly. NHS Digital collate and remove identifiable information, ensuring data standardised and correctly formatted on the data. Data analysts must request data directly from NHS Digital. Data analysts must clean and format data before it can be analysed for outputs. Receipt of pseudonymised data prevents feedback being provided to NHS trusts, and data resubmission is not possible. Iterative improvements in data quality are therefore delayed, achievable indirectly by data outputs. It is unclear how much direct support NHS Digital provides to submitting trusts to improve data quality. Progression to MSDS V2.0 for maternity data from 2019 onwards is anticipated to being further improvements in maternity data.



MIS Advantages	MSDS Advantages
Data application + acquisition	
Timely data receipt (shorter birth to data receipt interval)	Single application for entire English data
Direct communication link between maternity trust and data processors	Data received in standardised MSDS format
Flexibility in data requests	
Data quality + content	
High submission rates – data representative of English maternity care.	Variables capture greater breadth of maternity care
	Data capture on antenatal care
Data management + processing	
Able to contact trust directly to resolve missing or nonsensical data	Centralised dataset with NHS Digital responsible for data storage
	Upstream pseudonymised data – improved information governance
	Data cleaning on aggregated English dataset – Reduced overall data processing time
	Easier linkage to other datasets
MIS Disadvantages	MSDS Disadvantages
Data application + acquisition	
Application to each individual trust for data	Bulk data delivery – less timely data receipt
Non-standardised data receipt – approximately 20 different formats	
Data submission response times vary from trust to trust	
Transfer of identifiable data – data security agreements with each trust	
Data quality + content	
Most data derived from booking + delivery episodes – Limited antenatal and postnatal data	Reduce case ascertainment – secondary to implementation of new system
	Loss of previously available variables postpartum haemorrhage (PPH), induction of labour indication and number of infants
	Loss of flexibility in acquiring additional data
Data management + processing	
Individualised data cleaning approach needed for each variable at trust level	Inability to query/correct erroneous data
Secure data server and robust information governance policies required to receive data	Data processors have less control over data
More challenging to link with other datasets	Less iterative data improvement

Recommendation:

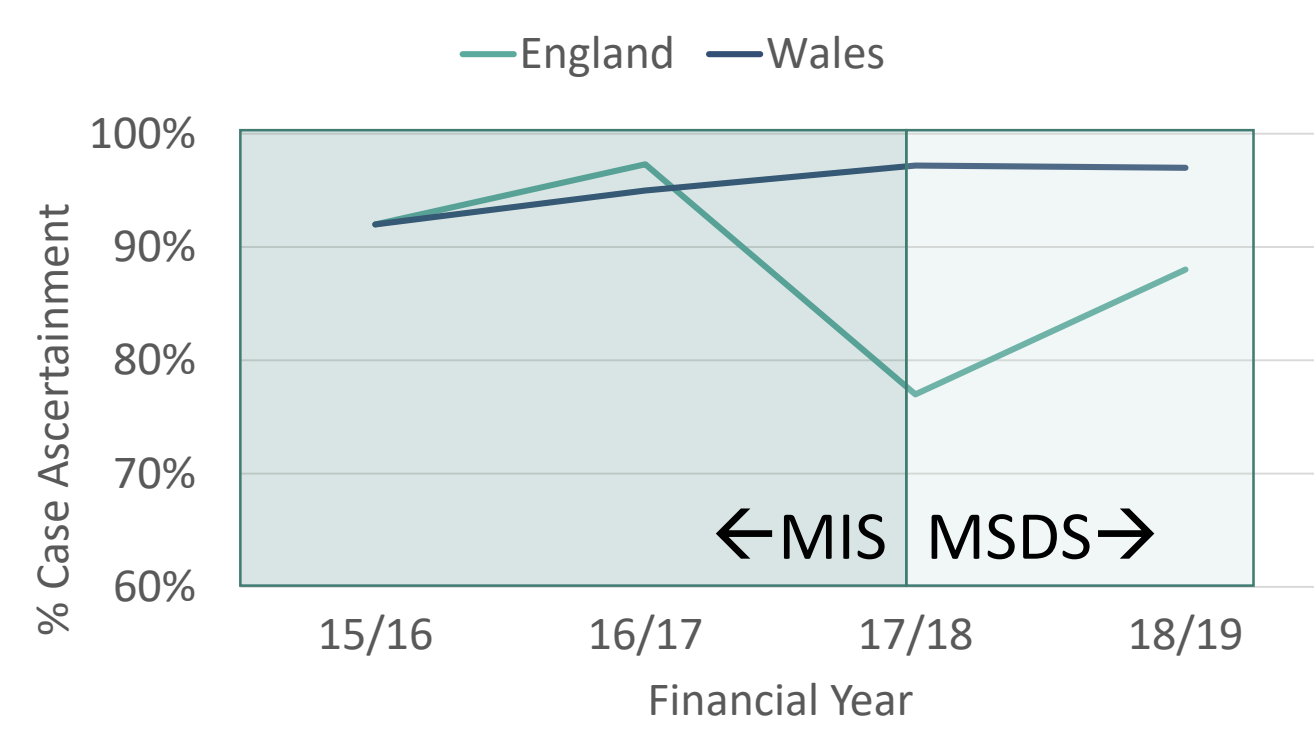
We would like to see the development of a clear feedback mechanisms and communication pathways between maternity data processors, NHS Digital and submitting organisations to ensure that data quality does not lag behind at the expense of data accessibility.

References

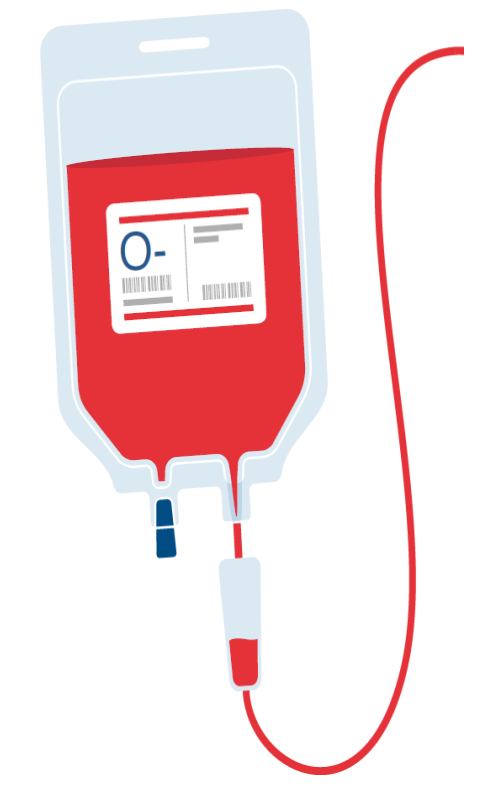
- [1] NHS England. (2016). *Better Births: Improving outcomes of maternity services in England – A Five Year Forward View for maternity care.*
[2] National Maternity Perinatal Audit. (2022). <https://maternityaudit.org.uk/pages/home>

MSDS transition challenges – NMPA examples

Proportion of births identified in dataset (compared to ONS data)



Transition to MSDS has been associated with a decrease in data quality and data capture. For 2017/2018, of trusts that submitted 12 months of data, only 77% of English births were identified through MSDS. Whilst this has improved, this is still not at the level of previous MIS data.



A change to the way in which estimated blood loss (EBL) was recorded (only capturing frequency of large EBLs as part of a critical incident variable) means that rates of PPH cannot be calculated.

The “number of infants variable” is no longer present in MSDS v1.5. The loss of this important variable means it is difficult to distinguish between singleton and multiple gestation pregnancies.



How do we improve data quality?