Outline

- A very brief introduction to HES data

- Developing and validating code lists in HES

- Developing and validating cohorts in HES

Data Resource Profile

Data Resource Profile: Hospital Episode Statistics Admitted Patient Care (HES APC)

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What is HES?

- HES is the national hospital database for England

- Data on all patient encounters with NHS Hospitals in England and all secondary care paid for by NHS

- HES Admitted Patient Care dataset contains data on all inpatient and daycase admissions (including delivery & births)

- HES data are collected for purposes of reimbursing hospitals for the care they provide, not for research purposes

- NHS Digital link patient episodes together (using NHS number, DoB, hospital number, sex & postcode) to create individual identifier – **the HESID**

Coding in HES Admitted Patient Care Data

Diagnoses

Procedures & operations
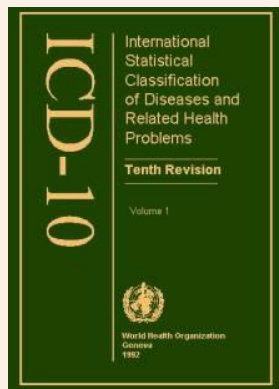
Healthcare Resource Groups

National Casemix Office

The National Casemix Office (NCO) designs and refines classifications used to describe NHS healthcare activity in England. These classifications underpin the national reimbursement system from costing through to payment, and support local commissioning and performance management.
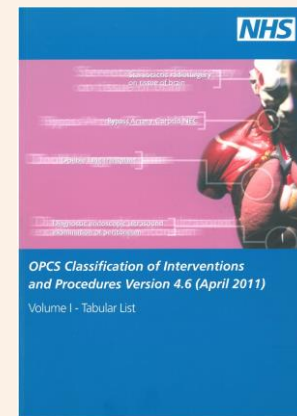
Codes entered by clinical coders based on patient notes, discharge summaries etc

Approaches for validating code lists

▶ External validation:

   ▷ Linkage to disease registry

   ▷ Comparisons with published data (eg from vital statistics, audits, surveillance)

▶ Internal validation (examples of)

   ▷ Compare procedures & diagnoses

   ▷ Compare episode/admission types and diagnoses/procedures

   ▷ Variation in coding over time/by season

Prevalence of chronic conditions in children who die

Child Health Reviews - UK
Clinical Outcome Review Programme

Overview of child deaths
in the four UK countries

Report
September 2013

Commissioned by the Healthcare Quality Improvement Partnership

RCPCH
Royal College of
Paediatrics and Child Health
Leading the way in Children's Health

HQIP
Healthcare Quality
Improvement Partnership

https://www.rcpch.ac.uk/system/files/protected/page/CHR-UK%20MODULE%20B%20REVISED%20v2%2015112013.pdf

Hospital records

Death certificates

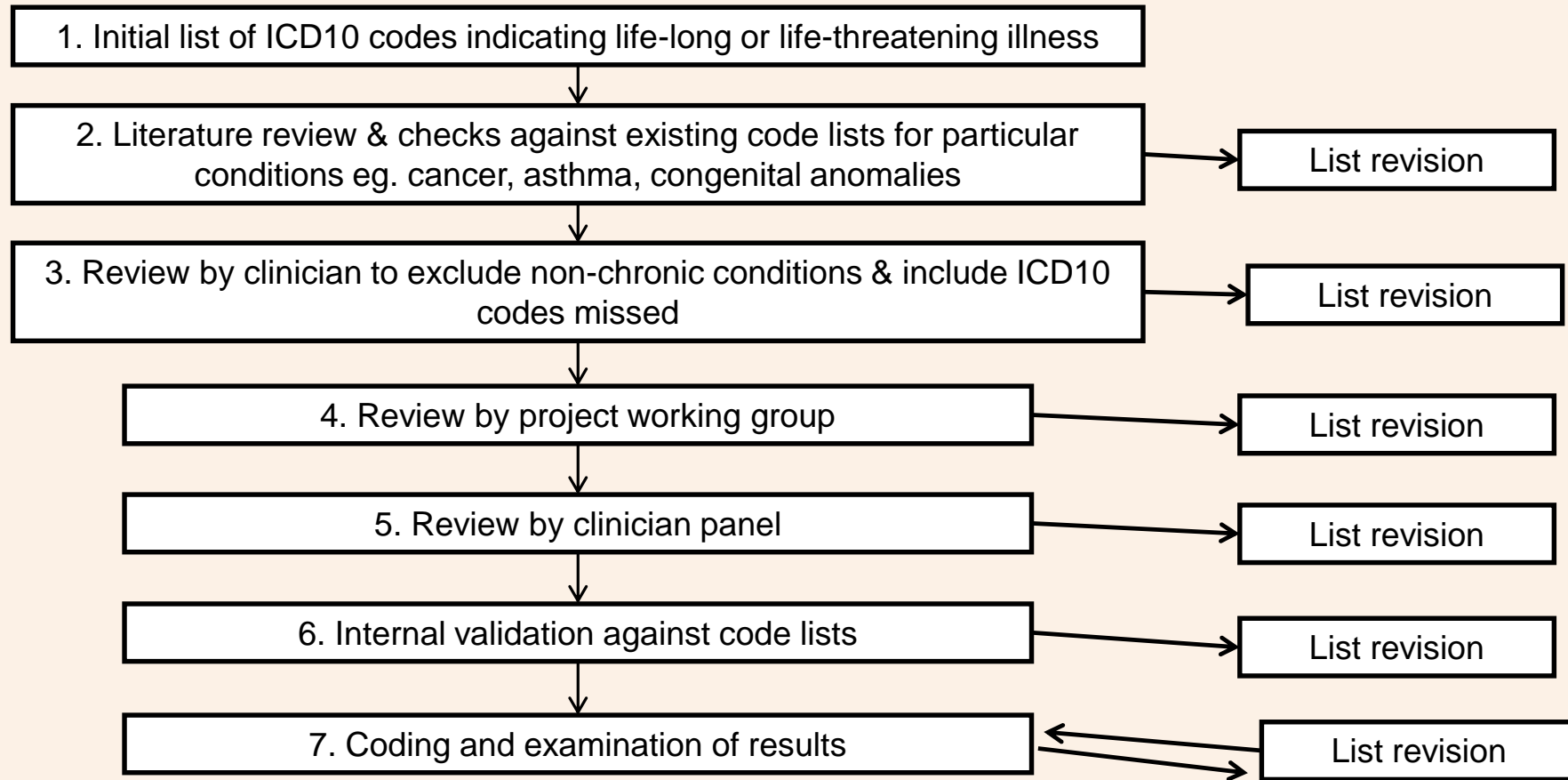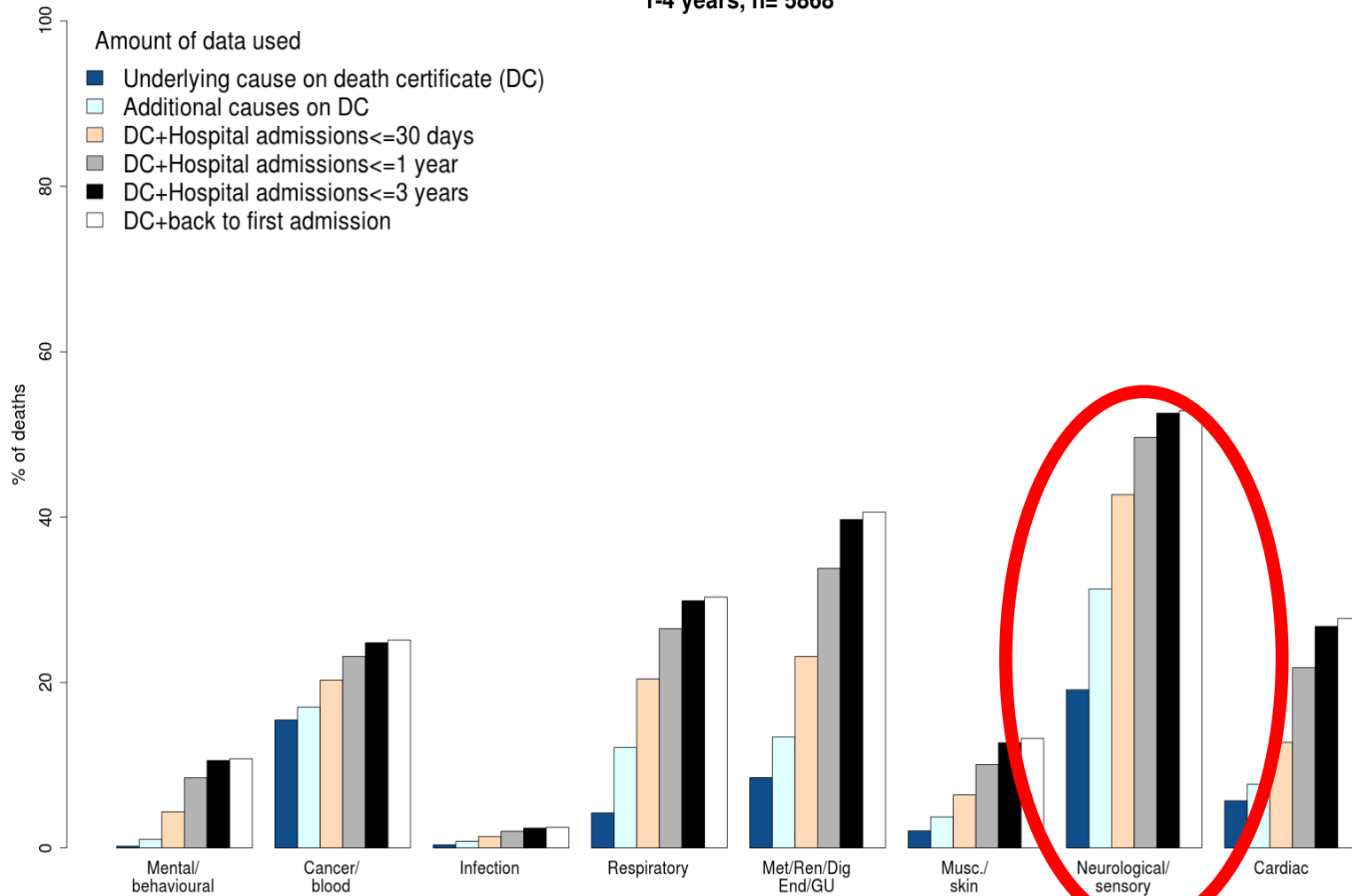

Linkage
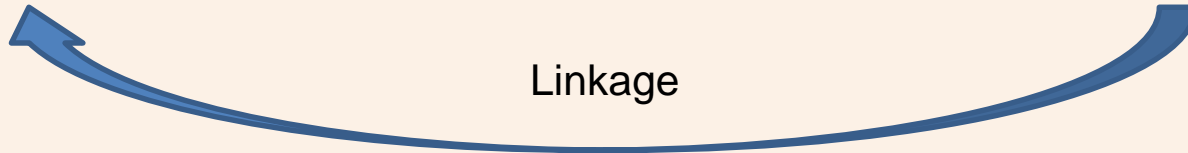
Developing a code list for chronic conditions in children UCL

1. Initial list of ICD10 codes indicating life-long or life-threatening illness

2. Literature review & checks against existing code lists for particular conditions eg. cancer, asthma, congenital anomalies → List revision

3. Review by clinician to exclude non-chronic conditions & include ICD10 codes missed → List revision

4. Review by project working group → List revision

5. Review by clinician panel → List revision

6. Internal validation against code lists → List revision

7. Coding and examination of results → List revision

1-4 years, n= 5868

Amount of data used
- Underlying cause on death certificate (DC)
- Additional causes on DC
- DC+Hospital admissions<=30 days
- DC+Hospital admissions<=1 year
- DC+Hospital admissions<=3 years
- DC+back to first admission

% of deaths

Mental/behavioural | Cancer/blood | Infection | Respiratory | Met/Ren/Dig End/GU | Musc./skin | Neurological/sensory | Cardiac

- Can a suitable inception point be found in HES?

Vaginal birth after caesarean section: a cohort study investigating factors associated with its uptake and success

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Comparison of child mortality by characteristics at birth in England and in Sweden using linked administrative data

Ania Zylbersztejn, Ruth Gilbert, Anders Hjern, Linda Wijlaars, Pia Hardelid

How to identify birth episodes?

HES Specific Fields

- Episode type
- Patient Classification
- Admission method
- Neonatal Care

Healthcare Resource Group (HRG) Code
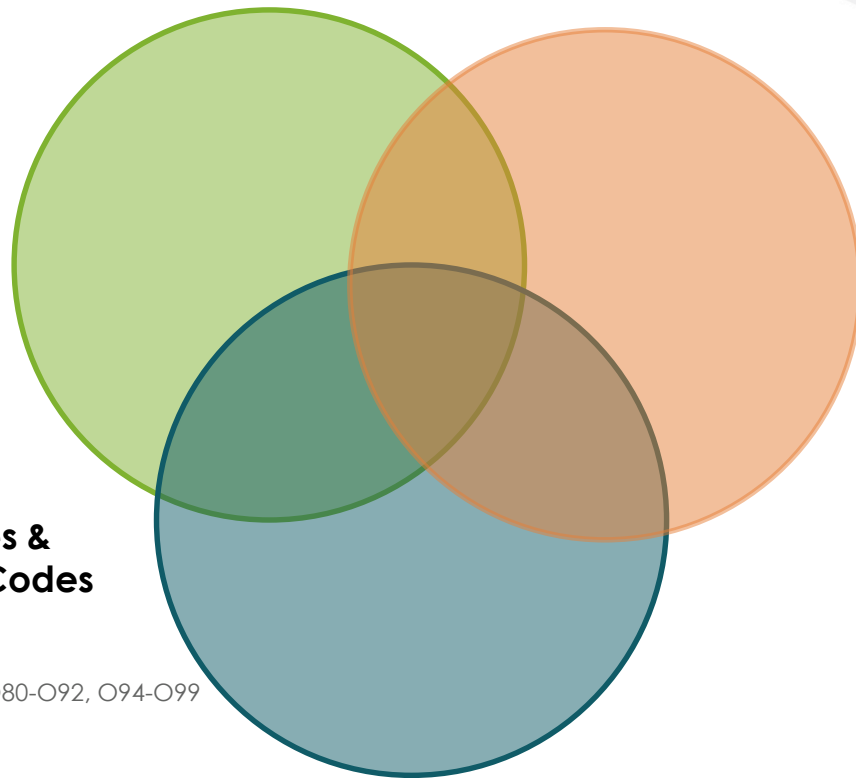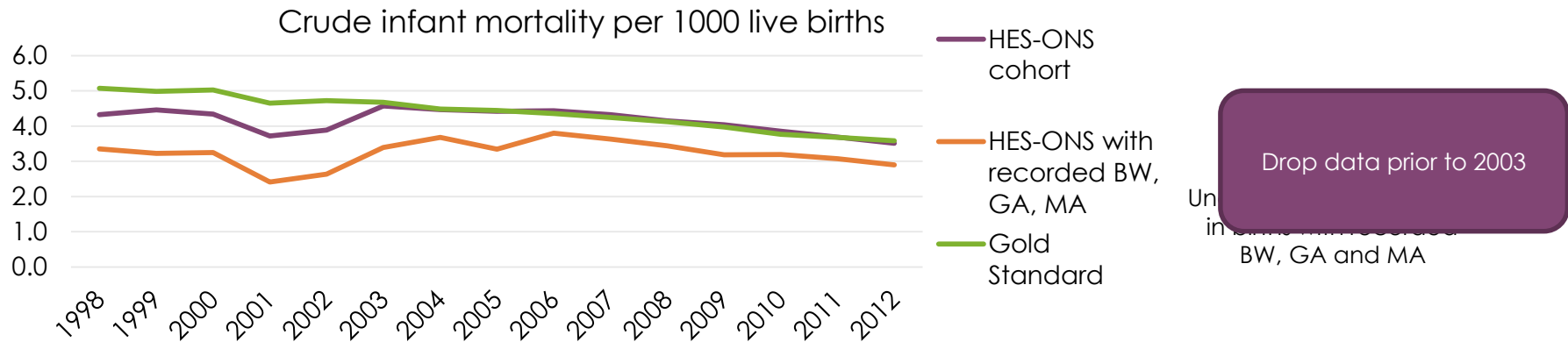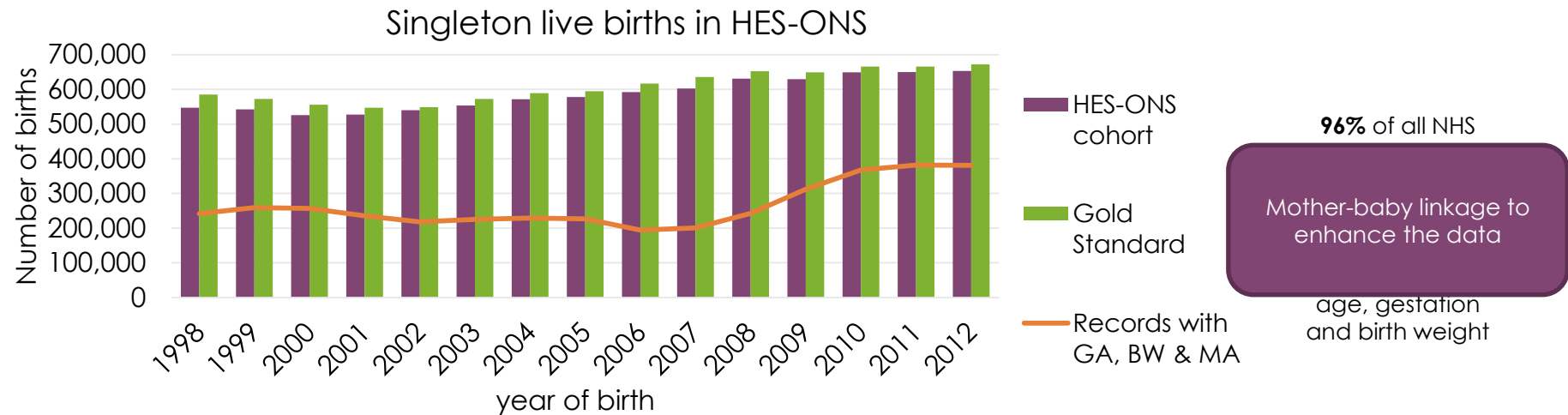
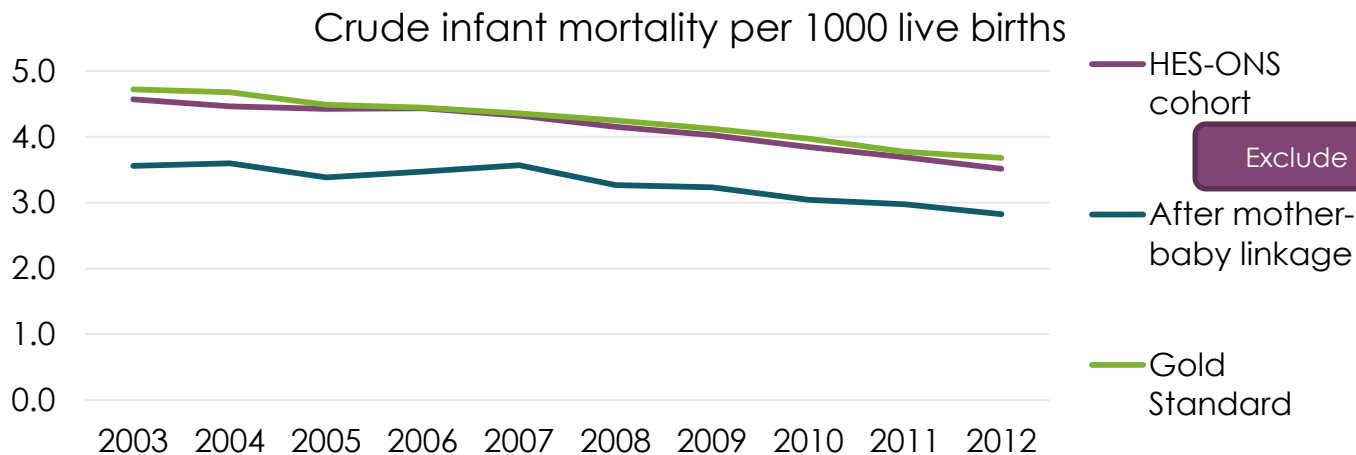= groupings of clinically similar treatments which use common levels of healthcare resource

Diagnoses & Operation Codes

Diagnoses:
- Births: Z38*, Z37*
- Deliveries: O60-O75, O80-O92, O94-O99

Procedures:
- R14-R27

Farr
·The Farr Institute of
Health Informatics Research

HES-ONS birth cohort

Singleton live births in HES-ONS

Legend:
- HES-ONS cohort (purple bars)
- Gold Standard (green bars)
- Records with GA, BW & MA (orange line)

Y-axis: Number of births (0 to 700,000)
X-axis: year of birth (1998–2012)

96% of all NHS

Mother-baby linkage to enhance the data

age, gestation and birth weight

Crude infant mortality per 1000 live births

Legend:
- HES-ONS cohort (purple line)
- HES-ONS with recorded BW, GA, MA (orange line)
- Gold Standard (green line)

Y-axis: 0.0 to 6.0
X-axis: 1998–2012

Un... in births with recorded BW, GA and MA

Drop data prior to 2003

Acronyms: BW: birth weight, GA: gestational age, MA: maternal age   Gold Standard: ONS publications based on birth and death registration data

HES-ONS birth cohort: with mother-baby linkage

Singleton live births in HES-ONS

Legend:
- HES-ONS cohort
- Gold Standard
- Using only baby record
- After mother-baby linkage
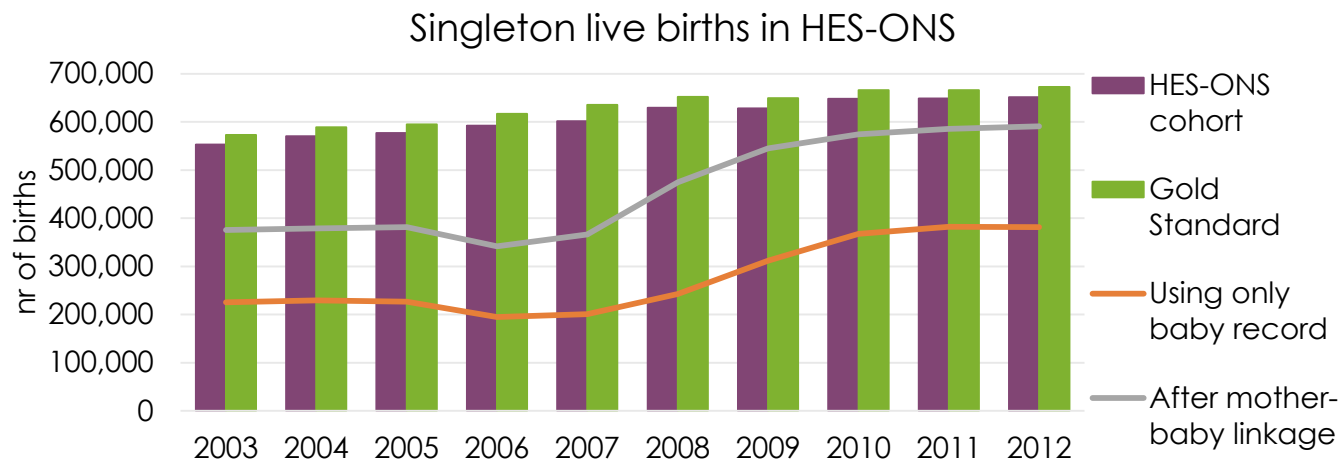
75% of records with maternal age, gestation and birth weight

Crude infant mortality per 1000 live births

Legend:
- HES-ONS cohort
- After mother-baby linkage
- Gold Standard

Exclude trusts with data quality issues

Harron K, Gilbert R, Cromwell D, van der Meulen J (2016) Linking Data for Mothers and Babies in De-Identified Electronic Health Data. PLoS ONE 11(10): e0164667. doi:10.1371/journal.pone.0164667

HES-ONS birth cohort: subgroup of trusts

- Selected trusts: **covered 71%** of all births
- **92%** of which had SES, gestational age, maternal age, birthweight & gender

England – subgroup of trusts		
Gold Standard	All data	Complete Case
0-1 days 1.61	1.58	0.83
2-6 days 0.54	0.59	0.49
7-27 days 0.64	0.70	0.61
28-364 days 1.33	1.39	1.28
1-4 years NA	0.59	0.57

Exclude deaths on day 0-1 from statistical models

International differences in registration practices (stillbirth vs livebirth)

Gold Standard: ONS publications based on birth and death registration data

- Development and validation of code lists for identifying conditions and operations in HES requires planning
- Work with clinicians
- Importance of validation (of code lists and cohorts): both internal and external validation are usually possible

Acknowledgements