

# AUDIT OF DATA QUALITY OF THE NATIONAL OBSTETRIC INFORMATION SYSTEM (NOIS) REGISTER WITHIN THE DEPARTMENT OF HEALTH INFORMATION (DHI)

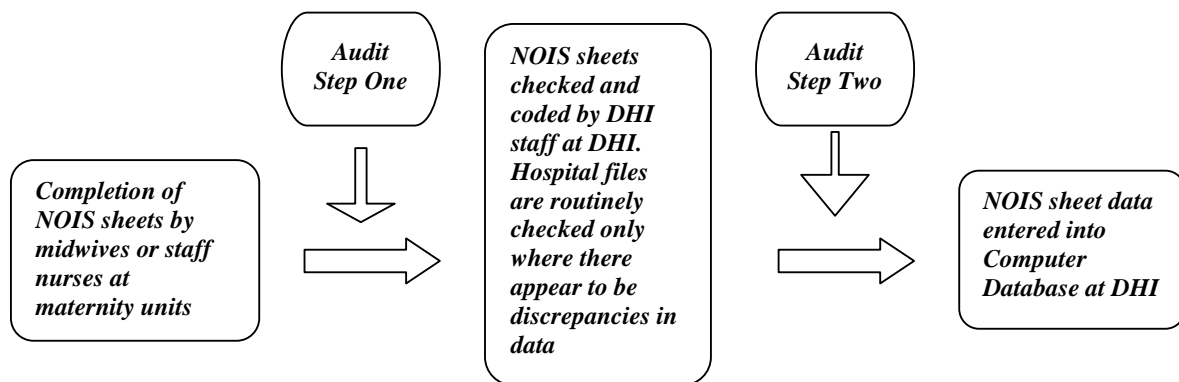
## Executive Summary

This audit was carried out from June to September 2006, using the National Obstetric Information System (NOIS) data sheets (Annex One) collected and registered in the system between July and December 2005.

The aim of this audit was to assess the completeness and accuracy of i) the filling in of NOIS data sheets and (ii) the data entry from the NOIS sheets into the NOIS computer database. The audit aimed to develop evidence based recommendations for improving the system.

The *modus operandi* of the NOIS and the points at which the two steps of this audit were carried out are shown in the flow chart below.

### *Process of NOIS Data Collection, Processing and Data Entry and points of Audit*



### *Step One of Audit*

At this step, a sample of 168 NOIS data sheets was selected by taking every tenth NOIS sheet registered in the July-December 2005 period. The data contained in these sheets were then cross-checked with the information in the respective mothers' hospital files. For 13 data sheets of the selected sample, the corresponding mother's file was not traced and therefore these cases were excluded from the analysis. A total of 155 NOIS sheets were checked.

### *Step Two of the Audit*

For Step Two of this audit, a computer generated random sample of 152 NOIS records was selected out of all the records entered between July and December 2005 from all maternity units on the Maltese Islands. The data in these computer records were cross-checked with the data on the corresponding NOIS data sheets.

The findings from both steps of the audit were recorded and analysed using Microsoft Excel.

### *Results of Step One of the Audit*

After cross checking with mothers' hospital files, data inaccuracies in one or more fields of the total of the 118 fields in each NOIS sheet were found in 60 (38.7%) out of the 155 NOIS sheets checked. However, the total number of data completion fields with inaccuracies was 103 out of a total of 18,290 data fields in all 155 NOIS sheets. This amounts to 0.56% of data fields with inaccuracies (95% CI – 0.46%-0.66%). The number of fields requiring amendments in any one NOIS sheet ranged from 1 to 6. Analysis of the data completion fields with inaccuracies showed that a small number of these fields had a higher rate of inaccuracy occurrence than others (See Annex Two). The percentage inaccuracy rate for any one data field ranged from 0.6-7.1%.

### *Results of Step Two of Audit*

The results of the second step of the audit showed that there were one or more inaccuracies in data entry in 19 (12.5%) out of the 152 records checked. The maximum number of inaccurate fields encountered in any one record was that of 2 fields out of the total of 118 fields in each record. The percentage of inaccurate fields, out of the total number of 17,936 fields in all 152 NOIS records was calculated and found to be 0.13% (95% CI – 0.08-0.2%). The percentage inaccuracy rate for any one data entry field ranged from 0.7% - 1.3% (See Annex Three).

These results show that overall, data collection and entry is highly accurate. Comparison of the results indicate somewhat more inaccuracy at Step One (data completion into the NOIS sheets at the maternity units) 0.56% (95% CI – 0.46-0.66%), as compared to Step Two (data entry from the NOIS sheets into the computer database) 0.13% (95% CI – 0.08-0.2%).

### *Recommendations*

It is recommended that future audits be carried out every two years, this will serve as a data quality control exercise and highlight any emerging problems with the register. With regard to target values for future audits, the rate of 5% or less of inaccuracy in any one data field is recommended. This is currently not being reached in four data fields in Step One of the audit (Annex Two). The attention of the staff completing NOIS sheets is to be drawn to highlight this fact and discuss possible ways of improving the situation. The percentage rate of inaccuracy in any one data field at Step Two of the audit is already well below 5% and the target is to keep the rate of inaccuracies below 2% (Annex Three).

### *Conclusion*

This Audit process showed that the data completion of the NOIS sheets at the maternity units is quite accurate whilst the data entry from the NOIS sheets into the computer database is highly accurate.

This audit has highlighted areas of strengths and weaknesses within the NOIS and showed some areas which need further strengthening.

# **AUDIT OF DATA QUALITY OF THE NATIONAL OBSTETRIC INFORMATION SYSTEM (NOIS) REGISTER OF THE DEPARTMENT OF HEALTH INFORMATION**

## **Full Report**

### **INTRODUCTION AND BACKGROUND**

The National Obstetric Information System (NOIS) is one of the information systems within the Department of Health Information (DHI). The system as it is today was set up at the beginning of 1999. The medical birth data of all the deliveries taking place in all maternity units on the Maltese Islands are collected within this information system.

#### **Data Collection and Data Analysis**

The maternity centres actively participating in this information system are: St. Luke's/ Mater Dei Hospital, Gozo General Hospital, St. James Hospital Sliema and Zabbar and St. Philip's Hospital, Sta. Venera.

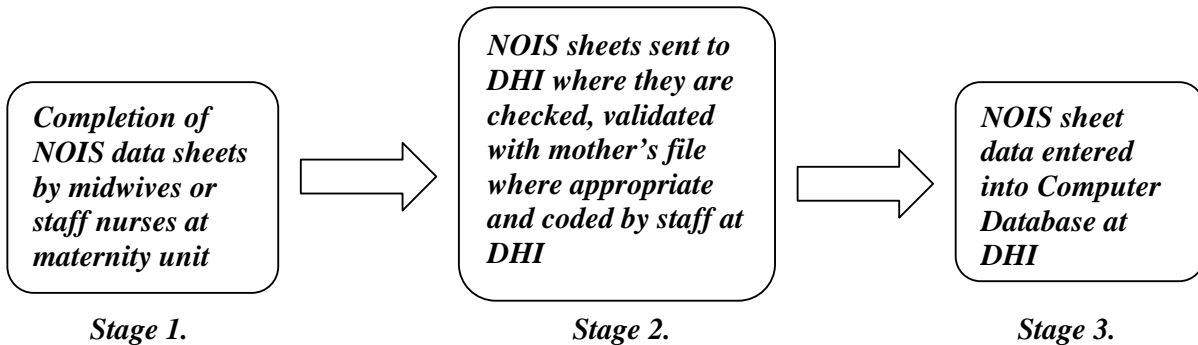
Systematic data collection starts once the mother delivers the baby. Information regarding the course and outcome of each pregnancy is recorded on a standard NOIS sheet (Annex One) by the midwife or staff nurse at the maternity wards. Once the data are recorded, the data sheets are regularly forwarded from the different maternity centres to the DHI (Flow chart 1 - Stage 1). The accuracy and completeness of the data collected is the responsibility of the maternity centre collecting and sending the data.

At the DHI the NOIS data sheets are checked for clarity and completeness of data. If any gross difficulties are encountered at this step, the data is routinely crosschecked with the mother's hospital file. ICD-10 coding is then applied to the fields within the NOIS sheet where appropriate (Flow chart 1–Stage 2) before data is entered into the NOIS computer database (Flow chart 1 - Stage 3). Once every three months routine computer validation programmes are run and any highlighted problems are checked and amended accordingly. All data is kept in accordance with the Data Protection Act of 2001.

The data collected and registered in the NOIS is regularly analysed and presented as Quarterly Reports and Annual Reports. Where appropriate the data in these reports is compared to the data of the same quarter of the previous year, or the data of the previous year respectively. These reports are posted on the DHI web site. The Quarterly Reports are circulated to all contributors, Obstetricians and Gynaecologists and Paediatricians. The Annual Reports, which are more comprehensive, are more widely distributed and are also sent to the media through the Communications Office of the Health Division.

Flow chart 1 below depicts the processes that take place in the collection, processing and data entry into the NOIS.

*Flow Chart 1. Process of NOIS Data Collection, Processing and Data Entry*



## **AIM**

The aim of this audit was to evaluate the completeness and accuracy of (i) completion NOIS data sheets and of (ii) data entry from the NOIS sheets into the NOIS computer database. Results of this audit were aimed to highlight strengths and weaknesses of the system and indicate possible improvements.

## **METHOD**

In view of the nature of the process of data collection, processing and data entry into the NOIS, this audit was divided into two steps

### **Audit - Step One**

Step One of this audit consisted of a validation process which involved checking the completeness and accuracy of NOIS sheets arriving at DHI. This was carried out on NOIS sheets collected between July 2005 and December 2005. Every tenth NOIS sheet collected from St. Luke's maternity unit during this six-month period was selected for the sample. This sample amounted to 168 NOIS sheets and represented 8.6% of the total number of NOIS sheets collected during the above-mentioned period. The data on these NOIS sheets sampled were checked by re-viewing the mothers' hospital files. For each NOIS sheet validated at this step, all inaccuracies were recorded and entered in a Microsoft Excel worksheet for analysis.

### **Audit - Step Two**

In Step Two of this audit, a computer generated random sample of 152 NOIS records, out of a total of 1958 records entered for July to December 2005, was selected. This sample constituted 7.7% of the total number of records for this period.

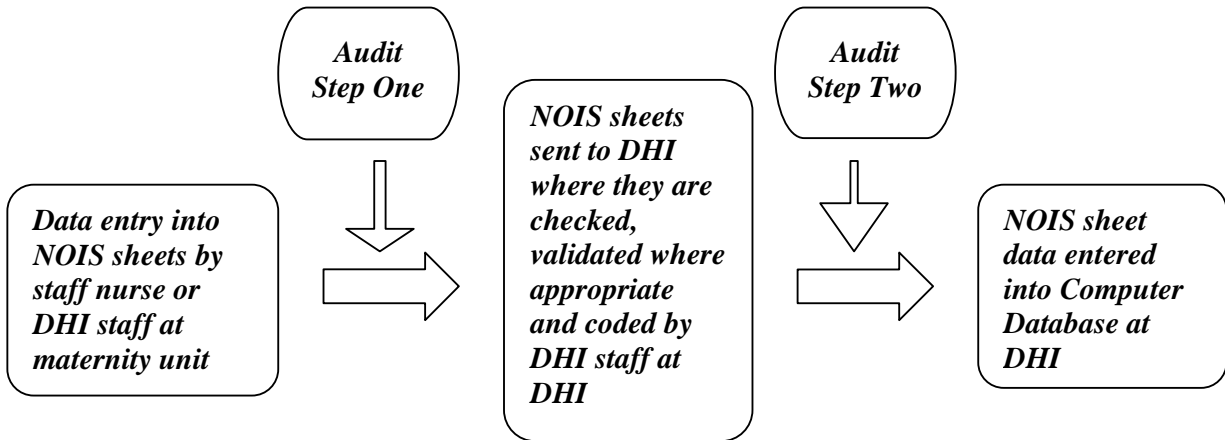
The data written on the respective NOIS sheet within the random sample was cross-checked with the data that had been entered into the computer database.

A Microsoft Excel worksheet was also used for entry and analysis of the data of this step of the audit. Each field of data entry in the NOIS sheet was given a number code.

There were 118 fields of data entry for each NOIS record (See Annex One). Any errors of data entry encountered with at Step Two of the audit were recorded in code form in an Excel spreadsheet.

Flow chart 2 below depicts the process of collection, processing and entry of the NOIS data. It also shows the points within this process at which the two steps of the audit were carried out.

*Flow chart 2. Process of NOIS Data Collection, Processing and Data Entry, and points of Audit*



The current audit was run on the system after all routine checking, coding and validation had been completed, thus auditing the final database information.

Ethics approval was deemed not necessary for this audit as this was an audit of regular functioning of the Registry. The daily running of the Registry already has, within its remit, the faculty to validate data by viewing mothers' files. At no point was it needed to contact the mothers.

## **RESULTS**

### ***Results of Audit – Step One***

Of the 168 NOIS sheets identified for this step of audit, 13 (7.7%) did not have the corresponding mother hospital file and were excluded from analysis. Further analyses of results of Step One of the audit were therefore carried out on the remaining 155 NOIS sheets of this sample. After cross check with mother hospital file, data inaccuracies in one or more fields of the total of the 118 fields in the NOIS sheet were found in 60 *ie* 38.7% (95% CI - 30.7 – 46.7%) out of the 155 NOIS sheets. However, the total number of data fields with inaccuracies was 103 out of a total of 18,290 fields in all 155 NOIS sheets. This amounts to 0.56% (95% CI – 0.46-0.66%) of data fields with inaccuracies. The number of fields with inaccuracy in any one NOIS sheet ranged from 1 to 6 fields.

The number of different data completion fields in which inaccuracies were found was 32. Annex Two shows the data fields in the NOIS sheet in which inaccuracies were encountered and the number of times that inaccuracies were found in each of these fields. The fields in which inaccuracies were found most frequently were “most senior attendant” and “breast feeding within 30 minutes of delivery”, both these fields were noted to have errors in 11 validated NOIS sheets. This means that for each of these two fields, errors occurred in 7.1% of the NOIS sheets. The fields “details on present pregnancy – number of scans” and “details of present pregnancy – weight at delivery” were also found to have a relatively high rate of inaccuracy of 5.8% and 5.2% respectively. Details of the frequencies and percentage values for errors in the other data entry fields are given in Annex Two.

At this step of the audit, it was noted that often certain NOIS sheet data fields were left unfilled at the maternity unit. These incompleting fields were usually assumed at data entry to signify a nil (no) response (code – 0). These assumptions inadvertently resulted in inaccuracies of data entered into the system.

A summary of the results of the first step of the audit are presented in Table 1.

*Table 1. Results of Audit – Step One*

*Validating data written on NOIS sheet with information in hospital file*

Total number of NOIS sheets entered into database between July – December 2005	1958
Total number of NOIS sheets validated with mothers’ hospital file	168
Number of NOIS sheets whose corresponding files were not available or not found	13
Total number of NOIS sheets actually analysed	155
% of total number of NOIS sheets collected between July-December 2005 and validated for audit	7.9%
Total number of data entry fields in each NOIS sheet	118
Total number of data entry fields in all 155 NOIS sheets	18290
Total number of fields with inaccuracies in all NOIS sheets	103
% data field inaccuracies of the total number of data entry fields in all NOIS sheets audited.	0.56%
Number of NOIS sheets with no inaccuracies in NOIS sheet data	95 (61.3%)
Number of NOIS sheets with one or more inaccuracies in NOIS sheet data	60 (38.7%)
Range of number of inaccurate fields in any one NOIS sheet	1 to 6
Number of NOIS sheets with inaccuracies in one field only	30 (50.0%)
Number of NOIS sheets with inaccuracies in two fields	21 (35.0%)
Number of NOIS sheets with inaccuracies in three fields	7 (11.7%)
Number of NOIS sheets with inaccuracies in four fields	1 ( 1.7%)
Number of NOIS sheets with inaccuracies in six fields	1 ( 1.7%)

### ***Results of Audit - Step Two***

Step Two of this audit involved checking the data on the NOIS sheet with that which had been entered into the computer database. Analysis of the results of the second step of the audit showed that there were one or more inaccuracies in 19 (12.5% - 95% CI = 7.5% – 17.5%) of the 152 sheets checked. The maximum number of incorrect fields in any one record was that of 2 fields out of the total of 118 fields in the record. There were 15 (9.9%) records in which inaccuracies in data entry in 1 field were found and 4 (2.6%) records with inaccuracies in data entry in 2 fields. The percentage of inaccurate data entry fields, out of the total number of 17936 fields in all 152 records was found to be 0.13% (95% CI – 0.08-0.2%).

A summary of the results of the second step of the audit are presented in Table 2.

*Table 2. Results of Audit - Step Two  
Validating Data Entry of NOIS sheets into Computer Database*

Total number of NOIS records entered into database between July – December 2005	1958
Total number of records in audit sample	152
% sample of total number of records	7.7%
Total number of data entry fields in each NOIS record	118
Total number of data entry fields in all 152 NOIS records sampled	17936
Total number of data entry fields with inaccuracies in all NOIS records sampled	23
% of all data entry fields with inaccuracies	0.13%
Number of sheets with no inaccuracies in data entry	133 (87.5%)
Number of sheets with inaccuracies in data entry	19 (12.5%)
Range of number of inaccurate fields in any one record	1 to 2
Number of records with inaccuracies in one field	15 (9.9%)
Number of records with inaccuracies in 2 fields	4 (2.6%)

The types of inaccuracies in data entry encountered with in the 19 NOIS sheets with inaccuracies were of four main types;

- a. Mistaken data entry in 14 (73.7%) sheets
- b. Switched fields during data entry in one 1 (5.3%) sheet,
- c. Data from NOIS sheet not inputted in computer database in 2 (10.5%) sheets
- d. Inaccurate data entry due to unclear handwriting in NOIS sheets in 2 (10.5%) sheets.

There were 4 fields where inaccuracies were encountered in 2 different NOIS sheets, whilst inaccuracies in the other fields were each found in only 1 NOIS sheet. See Annex Three for detailed breakdown of the data entry fields with inaccuracies.

## **DISCUSSION**

### *Comparison of Step One and Step Two of this Audit Process of the NOIS*

The results of Step One of the audit as compared to the results of Step Two indicate a higher rate of inaccuracy in data completion of the NOIS data sheets at the maternity unit of 0.56% (95% CI – 0.46-0.66%), as compared to data entry from the NOIS sheets into the computer database 0.13% (95% CI – 0.08-0.2%).

In Step One of the audit, two data fields were found to be incorrect significantly more often, and two others were repeatedly incorrect to a lesser degree. This highlights that these fields may be encountering a recurrent problem which merits being looked into.

On the other hand, in Step Two of the audit, no fields were highlighted as having a significantly increased rate of inaccuracy. There are therefore no particular data entry fields which cause repeated difficulty during computer data entry. This indicates that these inaccuracies are more probably due to human error as opposed to systematic error. These results show that the data entry from the NOIS sheets into the NOIS computer database is highly accurate.

### **Limitations of this Audit Process**

Limitations of this audit process included the sample sizes selected. These sample sizes were 8.6% for Step One and 7.7% for Step Two of the total number of NOIS sheets collected between July and December 2005. The generally recommended size of a sample for analysis is that of 15% of the total data, such a sample size is widely accepted as being statistically good practice. In view of time and human resource constraints half the recommended sample size was selected.

Another limitation of this study was that the NOIS sheets selected for Step One of the audit were selected from data sheets received from St. Luke's maternity unit only. This was necessary due to accessibility of hospital files, hospital files being most accessible from St. Luke's Hospital. Accessibility to Gozo General Hospital files was possible but logistically more difficult and accessibility to files from the other maternity units was extremely difficult in view of data confidentiality issues.

## **RECOMMENDATIONS**

Following the results of this audit, it is recommended that:

1. Future audits be carried out every two years, adopting similar methods of analysis. This would make repeated audits comparable and trends in accuracy of data processing within the NOIS could be evaluated
2. The size of the samples for future audits would ideally be 15% of the total number of NOIS sheets or as close to that size as possible in order that the audit results would be more reliable.
3. NOIS sheets for future audits would be selected from all maternity units. The issue of accessibility to the mothers' hospital files would have to be tackled according to the different situations at the various hospitals and always respecting data confidentiality issues.



4. It is to be strongly encouraged that all the fields in the NOIS sheet are completed in order to avoid assumptions having to be made when field is left empty. This would thus minimise the possibility of inadvertent inaccurate data entry.
5. Protocols for completion of the fields where a relatively high inaccuracy rate was found are to be drawn up following discussion with all staff involved in order to minimise difficulties and inaccuracies, these fields include the fields: “most senior attendant”, “breast feeding within 30 minutes of delivery”, “details on present pregnancy – number of scans” and “details of present pregnancy – weight at delivery” .

These recommendations are made with the intention of further improving data collection and entry into the NOIS.

### **Targets**

#### *Step One of Audit*

A target rate of 5% or less inaccuracy is generally considered as acceptable. Consequently, inaccuracy rates higher than 5% would be considered unacceptable. This audit has highlighted that for the period studied, rates of higher than 5% inaccuracy were found in 4 out of the 118 data entry fields (see Annex Two).

The target for this step in the NOIS process for future audits would be that all data entry fields reaching an inaccuracy rate of less than 5%.

#### *Step Two of Audit*

If the target values taken in Step One, that is a maximum of 5% rate of inaccuracy in any one data field, are applied to the results of Step Two of the audit, it is noted that this level of accuracy is already being achieved. The target for future audits would be to maintain this high degree of accuracy at this step of the NOIS process.

### **CONCLUSION**

In conclusion, this audit process has shown that data completion of the NOIS sheets at the maternity units is quite accurate, whilst the data entry from the NOIS sheets into the computer database is highly accurate.

It has also highlighted the areas of strengths and weaknesses within the NOIS, indicating the actions needed to further strengthen the successful aspects of the NOIS and support the areas which need further strengthening.

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**Past Obstetric History** (before the present pregnancy/confinement)

- 16. Spontaneous miscarriages (b.wt. under 500g and below 22 wks gestation) ..... |\_\_|\_\_|
- 17. Induced abortions ..... |\_\_|\_\_|
- 18. Ectopic pregnancies ..... |\_\_|
- 19. Vaginal deliveries ..... |\_\_|\_\_|
- 20. Caesarean sections ..... |\_\_|\_\_|
- 21. Number of live born (in all) ..... |\_\_|\_\_|
- 22. Number of live born who died in 1<sup>st</sup> week of life ..... |\_\_|\_\_|
- 23. Number of live born who died in 2<sup>nd</sup>, 3<sup>rd</sup> or 4<sup>th</sup> weeks of life ..... |\_\_|\_\_|
- 24. Number of still born (b.wt. 500g or more, or gestation 22 wks or more)..... |\_\_|\_\_|
- 25. Number of preterm deliveries (before completing 37 wks of gestation) ..... |\_\_|\_\_|

**Details on Present Pregnancy**

- 26. Last menstrual period (dd/mm/yyyy) ..... |\_\_|\_\_| |\_\_|\_\_| |\_\_|\_\_| |\_\_|\_\_|
- 27. Certainty of LMP (0 = No, 1 = Yes, certain) ..... |\_\_|
- 28. Regular menstrual cycle (0 = No, 1 = Yes) ..... |\_\_|
- 29. Expected date of delivery (EDD) (dd/mm/yyyy) ..... |\_\_|\_\_| |\_\_|\_\_| |\_\_|\_\_| |\_\_|\_\_|
- 30. Basis for EDD (1 = LMP, 2 = US) ..... |\_\_|
- 31. First antenatal visit (week of gestation) ..... |\_\_|\_\_|
- 32. Height (nearest cm) ..... |\_\_|\_\_|\_\_|
- 33. Weight at delivery (nearest kg) ..... |\_\_|\_\_|\_\_|
- 34. Weight before pregnancy (nearest kg) ..... |\_\_|\_\_|\_\_|
- 35. Cigarette smoking during pregnancy (0 = None, 1 = 1 to 3/day, 2 = More than 3/day) ..... |\_\_|
- 36. Alcohol use during pregnancy (0 = No, 1 = Up to 1 unit/day, 2 = More than 1 unit/day) ..... |\_\_|
- 37. Drug abuse during pregnancy (0 = No, 1 = Yes) ..... |\_\_|
- 38. Multiple gestation detected (week) (88 = Not applicable) ..... |\_\_|\_\_|

**Ultrasound scans during pregnancy**

- 39. Number of scans ..... |\_\_|\_\_|
- 40. First scan (week of pregnancy) ..... |\_\_|\_\_|
- 41. Last scan (week of pregnancy) ..... |\_\_|\_\_|
- 42. Second-level qualified scan for malformations (0 = No, 1 = Yes) ..... |\_\_|

## Pathology during pregnancy

43. Threatened abortion (before 22 wks gestation) (0 = No, 1 = Yes) .....|\_|
44. Threatened premature labour (between 22 and 37 wks gest.) (0 = No, 1 = Yes) .....|\_|
45. Antepartum haemorrhage (APH) (0 = No, 1 = Yes) .....|\_|
46. Gestational hypertension (persistently > 140/90) (0 = No, 1 = Yes) .....|\_|
47. Pre-eclampsia (0 = No, 1 = Yes) .....|\_|
48. Eclampsia (0 = No, 1 = Yes) .....|\_|
49. Placenta praevia (0 = No, 1 = Yes) .....|\_|
50. Abruptio of placenta (0 = No, 1 = Yes) .....|\_|
51. Suspected IUGR (0 = No, 1 = Yes) .....|\_|
52. Assisted fertilisation (ART) (incl. IVF, ICSI, ovulation stimulation) (0 = No, 1 = Yes) .....|\_|
53. Blood group immunisation (0 = No, 1 = Yes) .....|\_|
54. Infection (0 = No, 1 = Yes) .....|\_|
55. Cardiovascular disease (0 = No, 1 = Yes) .....|\_|

## Diabetes in pregnancy

56. IDDM before pregnancy (0 = No, 1 = Yes) .....|\_|
57. NIDDM before pregnancy (0 = No, 1 = Yes) .....|\_|
58. Preconceptional treatment for DM (0 = No, 1 = Yes, 8 = DM not diagnosed before pregnancy) .....|\_|
59. Vascular complications of DM (0 = No, 1 = Yes, 8 = DM not diagnosed before pregnancy) .....|\_|
60. Gestational diabetes (0 = No, 1 = Yes, not treated with insulin, 2 = Yes, treated with insulin) .....|\_|
61. **Other** pathology during pregnancy ... \_\_\_\_\_
- (Office use: ICD-10 code) ..... |\_|\_|\_|\_|.|\_|

**Case identification code** (same as on page 1) ..... | | | | | | | | | | | | | | | | | | | | | |  
(A separate and unique code is to be given for each infant delivered, according to the agreed format)

### ***Details on Delivery***

62. Date of delivery (dd/mm/yyyy) ..... | | | | | | | | | | | | | | | | | | | | | |
63. Site/type of delivery (1 = In hospital/clinic, 2 = At home, 3 = Underwater, 4 = Other site) ..... | |
64. Onset (1 = Induced by drugs or ARM, 2 = Spontaneous onset of contractions, 3 = Elective CS) ..... | |
65. Birth (1 = Vertex, 2 = Forceps, 3 = Ventouse, 4 = Breech, 5 = Elective CS before labour,  
6 = Emergency CS before labour, 7 = Elective CS during labour, 8 = Emergency CS during labour) ..... | |
66. Most senior attendant (0 = Unattended, 1 = Midwife/nurse, 2 = Houseman, 3 = SHO,  
4 = Senior registrar, 5 = Consultant, 6 = GP, 7 = Other) ..... | |
67. Midwife in charge of delivery (Reg No) ..... | | | |
68. Consultant responsible for delivery (Med Reg No) ..... | | | | | |
69. Analgesics (0 = None, 1 = Inhalation, 2 = Opioid, 3 = 1 & 2, 4 = Regional, 5 = 1 & 4,  
6 = 2 & 4, 7 = 3 & 4, 8 = Other) ..... | |
70. Anaesthesia (0 = None, 1 = General, 2 = Epidural/caudal, 3 = Spinal, 4 = Pudendal, 5 = Other) ..... | |
71. Rupture of membranes for more than 24 hours (0 = No, 1 = Yes) ..... | |
72. Episiotomy (0 = No, 1 = Yes) ..... | |
73. Lacerations (0 = No, 1 = Yes) ..... | |
74. Damage to cervix (0 = No, 1 = Yes) ..... | |
75. Hysterectomy after less than 48 hours (0 = No, 1 = Yes) ..... | |
76. Retained placenta or membranes (0 = No, 1 = Yes) ..... | |
77. Bleeding more than 1000ml within 2 hrs (0 = No, 1 = Yes) ..... | |
78. Blood transfusion (units) ..... | |
79. Haemoglobin level 7 g/dl (4.3 mmol/L) or less (0 = No, 1 = Yes, 8 = Not applicable) ..... | |
80. Haematocrit level below 21% (0 = No, 1 = Yes, 8 = Not applicable) ..... | |
81. Symptoms present (0 = No, 1 = Yes, 8 = Not applicable) ..... | |
82. Shoulder dystocia (0 = No, 1 = Yes) ..... | |
83. Other special conditions during delivery \_\_\_\_\_  
(Office use: ICD-10 code) ..... **O** | | | | . | |
84. Maternal discharge (1 = Home, 2 = Transferred to health facility, 3 = Dead) ..... | |
85. Discharge date (days after delivery) ..... | |

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### ***WHO/EURO Maternal Well-Being Score***

86. 5 weeks before expected delivery ..... | |
87. 4 to 6 weeks after delivery ..... | |
88. History of violence during pregnancy (0 = No, 1 = Yes) ..... | |

## ***Infant Details***

89. Birth order number (1 of 1, except in multiple gestation) .....|\_| of |\_|
90. Date of birth (dd/mm/yyyy) .....|\_|\_|||\_|\_|||\_|\_|\_|\_|\_|
91. Time of birth (hh:mm, 24hr clock) ..... |\_|\_|:|\_|\_|
92. Sex (1 = Male, 2 = Female, 3 = Indeterminate) ..... |\_|
93. Birth weight (grams) ..... |\_|\_|\_|\_|\_|
94. Length (nearest cm) ..... |\_|\_|
95. Head circumference (nearest cm) ..... |\_|\_|
96. Cord blood pH at delivery ..... |\_|.|\_|\_|
97. Cord blood source (1 = Artery, 2 = Vein, 3 = Unknown) ..... |\_|
98. Apgar score at 1 minute ..... |\_|\_|
99. Apgar score at 5 minutes ..... |\_|\_|
100. Breast feeding within 30 mins of delivery (0 = No, 1 = Yes) ..... |\_|
101. Respiratory distress syndrome/Hyaline membrane disease (0 = No, 1 = Yes) ..... |\_|
102. Other respiratory conditions (0 = No, 1 = Yes) ..... |\_|
103. Seizure within 7 days (0 = No, 1 = Yes) ..... |\_|
104. Breech presentation at delivery (0 = No, 1 = Yes) ..... |\_|
105. Transverse lie at delivery (0 = No, 1 = Yes) ..... |\_|
106. Hyperbilirubinaemia (leading to phototherapy or exchange transfusion) (0 = No, 1 = Yes) ..... |\_|
107. Sepsis (positive blood culture) (0 = No, 1 = Yes) ..... |\_|
108. Congenital malformations (most serious) \_\_\_\_\_
109. (Office use: ICD-10 code) ..... **Q**|\_|\_|.|\_|
110. Other pathology (incl. infections) \_\_\_\_\_
111. (Office use: ICD-10 code) ..... **P**|\_|\_|.|\_|
112. Feeding method at time of discharge(1 = Breast only,2 = Bottle only,3 = Mixed,8 = Other) |\_|
113. Discharge date (days after birth) ..... |\_|\_|
114. Method of infant discharge (1 = Home/Crèche, 2 = Transferred to health facility, 3 = Dead,  
4 = Still in hospital after 28 days) ..... |\_|
115. Outcome (1 = Born alive and lived at least 4 weeks, 2 = Antepartum stillbirth, 3 = Intrapartum  
stillbirth,  
4 = Stillbirth, not known whether AP or IP, 5 = Died in 1<sup>st</sup> week of life, 6 = Died in 2<sup>nd</sup>, 3<sup>rd</sup> or 4<sup>th</sup> week of life) .... |\_|
116. Date of death (if applicable) (dd/mm/yyyy) .....|\_|\_|||\_|\_|||\_|\_|\_|\_|\_|
117. Cause of death(1 = Congenital malformations,2 = Pregnancy-related disorders,3 = Birth  
asphyxia/trauma,  
4 = Immaturity-related disorder, 5 = Infection, 6 = Other, 8 = Baby alive) ..... |\_|
118. (Office use: ICD-10 code) ..... |\_|\_|\_|\_|\_|

## ANNEX TWO

	<b>Code No. Assigned to and “Name” of NOIS sheet Data Entry Field</b>	<b>No. of Times Inaccuracy Found in Data Entry Field</b>	<b>% of Inaccurate Entry in all 155 NOIS sheets</b>
61	Diabetes in pregnancy - Other pathology during pregnancy	11	7.1
100	Infant Details - Breast feeding within 30 mins of delivery	11	7.1
39	Details on Present Pregnancy - Number of scans	9	5.8
33	Details on Present Pregnancy - Weight at delivery	8	5.2
110	Infant Details - Other pathology (incl. infections)	7	4.5
34	Details on Present Pregnancy - Weight before pregnancy	6	3.9
35	Cigarette smoking during pregnancy	6	3.9
83	Details on Delivery - Other special conditions during delivery	6	3.9
73	Details on delivery - Lacerations	4	2.6
112	Infant Details - Feeding method at time of discharge	4	2.6
29	Expected date of delivery (EDD)	3	2.0
32	Details on Present Pregnancy - Height	3	2.0
21	Past Obstetric History – Number of live born (in all)	2	1.3
51	Pathology during Pregnancy – Suspected IUGR	2	1.3
65	Details on Delivery – Birth	2	1.3
72	Details on Delivery – Episiotomy	2	1.3
104	Infant Details – Breech Presentation at Delivery	2	1.3
11	Marital Status	1	0.6
26	Details on Present Pregnancy – Last Menstrual Period (dd/mm/yy)	1	0.6
28	Details on Present Pregnancy – Regular Menstrual Cycle	1	0.6
30	Details on Present Pregnancy – Basis for EDD	1	0.6
37	Details on Present Pregnancy – Drug abuse during pregnancy	1	0.6
46	Pathology during Pregnancy – Gestational Hypertension	1	0.6
64	Details on Delivery – Onset (of delivery)	1	0.6
70	Details on Delivery - Anaesthesia	1	0.6
82	Details on Delivery – Shoulder Dystocia	1	0.6
91	Infant Details – Time of Birth	1	0.6
93	Infant Details – Birth Weight	1	0.6
113	Infant Details – Discharge date (days after birth)	1	0.6
114	Infant Details – Method of Infant Discharge	1	0.6
115	Infant Details – Outcome	1	0.6
117	Infant Details – Cause of Death	1	0.6

### ANNEX THREE

	<b>Code No. Assigned to and “Name” of NOIS sheet Data Entry Field</b>	<b>No. of Times Inaccuracy Found in Data Entry Field</b>	<b>% of Inaccurate Entry in all 152 NOIS sheets</b>	
3	Surname (of Mother)	2	1.3	
33	Details on Present Pregnancy – Weight at Delivery	2	1.3	
66	Details on Delivery – Most Senior Attendant	2	1.3	
93	Infant Details – Birth Weight	2	1.3	
1	Identity Number (of mother)	1	0.7	
19	Past Obstetric History – Vaginal Deliveries	1	0.7	
20	Past Obstetric History – Caesarean Sections	1	0.7	
31	Details on Present Pregnancy – First Antenatal Visit	1	0.7	
35	Details on Present Pregnancy – Cigarette Smoking during Pregnancy	1	0.7	
40	Details on Present Pregnancy – First Scan	1	0.7	
42	Details on Present Pregnancy – Second-level qualified scan for malformations	1	0.7	
51	Pathology during Pregnancy – Suspected IUGR	1	0.7	
60	Diabetes in Pregnancy – Gestational Diabetes	1	0.7	
61	Diabetes in Pregnancy – Other Pathology during Pregnancy	1	0.7	
76	Details on Delivery – Retained Placenta or Membranes	1	0.7	
83	Details on Delivery – Other Special Conditions During Delivery	1	0.7	
84	Details on Delivery – Maternal Discharge	1	0.7	
85	Details on Delivery – Discharge Date (days after delivery)	1	0.7	
114	Infant Details – Method of Infant Discharge	1	0.7	