Audit report

Use and recording of folic acid to prevent neural tube defects in pregnancy: South West Region, 2003-2004

South West Congenital Anomaly Register
Bristol Directorate of Public Health

October 2006

Audit project team

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Copies of this audit report are available from: www.swcar.org.uk/FolicAcid

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Background

In 1991 the Medical Research Council Vitamin Study published evidence that folic acid could prevent the recurrence of neural tube defects (NTD)[1]. In 1992 an Expert Advisory Group reported evidence to the Department of Health indicating the reduced incidence of neural tube defects in women regularly taking folic acid whilst planning pregnancy and during the first 12 weeks of pregnancy. This finding became Department of Health recommended policy the same year[2]. A reduction in affected pregnancies of between half and two thirds was predicted assuming uptake of health education advice. In the UK as in other countries, rates of neural tube defects were already falling prior to 1992, but despite extensive health education campaigns the incidence of neural tube defects has not fallen as far as expected[3-6]. This has led to calls for more active public policy, such as food fortification, however, there is no current government plan to change existing recommendations[7].

Studies assessing the reported use of folic acid pre-pregnancy and during pregnancy have suggested variable uptake, though they suggest that uptake has gradually increased with time. A study in Glasgow in 1997 of 487 women who had recently delivered healthy babies reported that 57% mothers stated they had taken folic acid supplements at some stage during the pregnancy and 21% took folic acid pre-pregnancy[8]. Studies of women attending antenatal clinics between 2000 and 2002 in English towns[9-11] have shown variable reporting of folic acid use at any stage of their pregnancy of between 67% and 89%, and of folic acid use pre-pregnancy of between 43% and 48%. Uptake has been repeatedly shown to be reduced in women of lower socio-economic groups[8-10;12] and in women of ethnic minority groups[12;13].

The South West Congenital Anomaly Register (SWCAR) has collected information about risk factors for congenital anomalies, such as smoking, alcohol and drug use, and pregnancy-related folic acid consumption since its inception in January 2002. The risk factor data available from SWCAR and a number of other regional registers is not currently collated at a national level. To date there has been no review of the quality of the risk factor data collected in the South West region. An audit was therefore indicated to understand the quality of the data within the Register. It was anticipated that the findings might indicate areas for development of the Register.

Objectives

1. To establish the completeness of the recording of folic acid use pre-pregnancy and during early pregnancy in recently registered cases of neural tube defect in the South West Region

2. To validate the accuracy of recording of folic acid use in cases of NTD on the SWCAR database with information on folic acid consumption recorded in antenatal records

3. To enable SWCAR to enhance its ability to collect useful information on risk factors for NTD

Methods

Audit standards

The standards used for this audit are those of the Expert Advisory Group for the Department of Health, published in 1992 that state:

"to prevent the recurrence or the first occurrence of neural tube defects, all women who wish to become pregnant, or who are pregnant, should take daily supplements of folic acid, continued until the 12th week of pregnancy"

The Expert Advisory Group recommended that

i. To prevent the recurrence of NTD women should take 4.0mg of folic acid daily
ii. To prevent the first occurrence of NTD women should take 0.4mg of folic acid daily

This audit reviewed the recording of the use of folic acid but did not attempt to collect data on the dose of folic acid taken.

Data sources

SWCAR receives notifications of congenital anomalies from a number of sources including medical and midwifery staff in maternity units, paediatric medical staff, and pathology sources. The SWCAR database was used to identify cases of neural tube defect according to the following criteria:

Cases of neural tube defect were included if they:

1. Occurred in the South West region
2. Were reported to SWCAR during the period 1st January 2003 to 31st December 2004
3. Were classified as either Anencephaly, Encephalocoele, or Spina Bifida
4. Were Confirmed, Probable or Suspected cases (Suspected cases were re-classified to either confirmed or probable wherever possible)

For each case identified demographic data and information on the use of folic acid both pre-pregnancy and during early pregnancy was determined by examination of records from 3 sources:

1. Information already held on the SWCAR database, chiefly from the notification form and subsequent follow up
2. Any computerised antenatal records available
3. Any handwritten antenatal records available

In the South West region, the majority of maternity units reporting to the SWCAR (9 out of 14) record information on pregnancies using a computerised system known as the STORK Maternity System (EDS Computing Solutions). Computerised records from STORK were accessible to staff at the Congenital Anomaly Register in Bristol.

Five maternity units do not use the STORK system, but may have other computerised antenatal record systems, accessible only to staff within those units. All the maternity units maintain some form of handwritten maternity record. The computer print out produced by the computer system available at that maternity unit may provide the main contribution to the handwritten maternity record in some units. Information on handwritten antenatal records was only accessible to staff within those units, except for the two maternity units in Bristol, where staff from SWCAR were able to access handwritten records. Staff within each maternity unit were identified by SWCAR and recruited to participate in the audit, agreeing to complete audit forms relating to cases arising within the maternity units in which they worked. The majority of the information on the use of folic acid was recorded at the booking visit, typically made at 9-14 weeks gestation.

Data were extracted from the SWCAR records on:

- Age, parity, ethnicity and maternity unit of mother of case
- Whether this mother already had an existing pregnancy with a NTD
- Classification of type of NTD and ICD-10 coding
- Classification of NTD as Confirmed, Probable or Suspected
- Sex of case (where known)
- Use of folic acid as currently classified in the Register

The classification of use of folic acid in the Register uses 8 descriptors:

1. Not taken
2. Taken pre-conceptually
3. Taken weeks 1-4
4. Taken weeks 5-12
5. Taken – started after first trimester
6. Taken – not known when started
7. Not known
8. Not specified

Data were extracted from the handwritten and / or computerised antenatal records using an agreed data extraction form, piloted on 5 sets of computerised case records in Bristol (Appendix 1). Data extracted included

- Age, parity, ethnicity and maternity unit of mother of case
- Whether this mother had already had an existing pregnancy with a NTD
- Sex of case (where known)
- Fetal gestational age at which information on folic acid use was collected
- Use of folic acid pre-pregnancy, during weeks 1-4, weeks 5-8, weeks 9-12 and after 12 weeks of pregnancy
- Whether the mother was asked how often she took folic acid

Ethical and clinical governance considerations

Named case details were required in order to ensure that the correct clinical records were identified. To ensure case anonymity, each case was allocated a code unique to the existing SWCAR identification code. The list of cases and their allocated codes were kept securely within SWCAR offices. The audit proposal was discussed with the Bristol South and West PCT Audit Facilitator and formally submitted to the Bristol South and West PCT Clinical Effectiveness and Audit Committee, where approval was given. There was no direct patient involvement at any stage of this audit.

Analysis

All data were entered onto a database anonymously. SPSS v12 software (SPSS Inc.) was used to conduct analyses.

Extension of audit to review records of pregnancies unaffected by NTDs

Initial examination of data from the records of cases of NTD indicated that only limited information on the recording of folic acid use would be available. It was not known whether the recording of folic acid use in a pregnancy affected by a NTD would be different to that in a pregnancy unaffected by a neural tube defect. It could be speculated that the records of women with neural tube defects might be more likely to contain information on folic acid use, as the diagnosis of NTD triggers questioning of the mother and retrospective updating of the records. Alternatively, the converse may be true, that when counselling a woman with a new diagnosis of a pregnancy affected by a NTD, the discussion of folic acid use is not raised for fear of causing increased distress at such a difficult time. It was therefore considered important to know the pattern of recording of folic acid use in women with pregnancies unaffected by NTDs, since this would influence the interpretation of findings regarding folic acid use in women with NTDs and would, in turn, influence recommendations resulting from the audit.

We therefore attempted to identify two pregnancies unaffected by any congenital anomaly for every case of NTD. We used the STORK Maternity System, and other accessible computer systems where available, to identify women with pregnancies unaffected by NTDs, matched for maternity unit and date of end of pregnancy with each case of NTD. The audit facilitator at Bristol South and West PCT contacted the clinical audit teams in the hospitals of all the maternity units to request support to audit the handwritten maternity records of these unaffected pregnancies. Four clinical audit teams agreed to assist within the timescale requested. A modified data extraction form (Appendix 2) was sent to the audit facilitation teams in those four hospitals. Staff from SWCAR examined the computerised records of unaffected pregnancies using remote computer access, where possible.

Data from these unaffected pregnancies were allocated a code and entered anonymously onto a separate database for analysis.

Results

Coverage of the audit

117 cases of NTD were reported to SWCAR between 1st January 2003 and 31st December 2004 from 14 reporting maternity units across the region. One of these cases was identified during the audit as not having had a NTD. Data extraction forms were returned for 111 of a possible 116 cases (95.7%). All of the 111 completed forms had been reviewed for folic acid information held on computerised antenatal records, and 93/111 (83.8%) cases additionally had handwritten antenatal records reviewed for folic acid use.

Audit of folic acid use in pregnancies unaffected by NTD was possible at 11 of the 14 reporting maternity units. For five units the audit involved a search of the computerised antenatal record only, for a further five units both computerised and handwritten antenatal records were audited, and for one unit the audit involved a review of the handwritten antenatal records only. This resulted in 196 antenatal records of unaffected pregnancies being included in the extended audit of folic acid use in early pregnancy. In total 176 of these pregnancies had a review of computerised antenatal records, and 74 had a review of handwritten antenatal records.

Demographic details of mothers

The demographic details of mothers of cases of NTD and mothers of normal pregnancies are indicated in Table 1.

Table 1: demographic details of mothers included in audit

	Pregnancies affected by NTD (N=111)			Pregnancies unaffected by NTD (N=196)		
Maternal Age (yrs)	n	Median	Range	n	Median	Range
	108	29.0	16-42	196	30.0	17-44
Ethnic group N (%)	n	White	Non-White	n	White	Non-White
	102	100 (98.0)	2 (2.0)	193	185 (95.9)	8 (4.1)
Was mother primiparous? N (%)	n	Yes	No	n	Yes	No
	103	33 (32.0)	70 (68.0)	196	77 (39.3)	119 (60.7)

Note: percentages may not total 100 where decimal places have been rounded

There is no statistically significant difference in the age of mothers of cases and the age of mothers of pregnancies unaffected by NTDs (p=0.09, Mann Whitney U test), or between ethnic groups of mothers (p=0.32, chi square test) or whether mothers were primiparous or not (p=0.22, chi square test).

Pregnancies affected by neural tube defect

The classification of the 111 cases of neural tube defect is detailed in Table 2. 85/111 (76.6%) cases were confirmed spina bifida or anencephaly. Only three cases (2.7%) were suspected NTDs that could not be reclassified after seeking further information. In both of the cases of complex NTD there was mixed anencephaly and spina bifida. 52/111 (46.8%) cases were spina bifida, and 44/111 (39.6%) cases were anencephaly.

Table 2: Classification of cases of NTD and status of notification

		Status of notification			Total
		Confirmed	Probable	Suspected	N (%)
Classification of NTD	**Spina Bifida**	42	8	2	**52 (46.8)**
	Encephalocoele	9	3	0	**12 (10.8)**
	Anencephaly	43	0	1	**44 (39.6)**
	Not known	0	1	0	**1 (0.9)**
	Complex NTD	2	0	0	**2 (1.8)**
Total: N, (%)		**96 (86.5)**	**12 (10.8)**	**3 (2.7)**	**111 (100)**

Note: percentages may not total 100 where decimal places have been rounded

33 of the gestations were male, 40 were female and 38 were either of indeterminate sex or the sex was not recorded. The outcome of pregnancy of these gestations was 11 live births, 1 stillbirth, 2 spontaneous abortions and 97 induced abortions.

Use of folic acid during pregnancy and recording of use

1) Pregnancies affected by NTD

Use of folic acid

41/111 (36.9%) notification forms recorded that folic acid had been taken during that pregnancy (Table 3). In 10 cases (9.0%) it was recorded that folic acid was not taken, and in the remaining 60 cases (54.1%), the notification form stated that folic acid use was either ‘not known’ (n=22) or ‘not specified’ (n=38).

93 out of the 111 cases had handwritten antenatal records reviewed. 37/93 (39.8%) recorded that folic acid had been taken during that pregnancy, 3/93 (3.2%) recorded that it had not been taken, and 53/93 (57.0%) recorded folic acid use as ‘not known’.

89 of the 111 cases had computerised antenatal records reviewed. 35/89 (39.3%) recorded that folic acid had been taken during that pregnancy, 0/89 recorded that it had not been taken, and 54/89 (60.7%) recorded folic acid use as ‘not known’.

All sources suggest that between 36-40% of mothers took folic acid during their pregnancy, but that for a large proportion of women this information was not recorded.

Table 3: recording of folic acid use in 111 cases of NTD reported to SWCAR, and recording of folic acid use in available handwritten and computerised antenatal records.

Folic acid use recorded	SWCAR notification record [N=111] n (%)	Handwritten antenatal records [N=93] n (%)	Computerised antenatal records [N=89] n (%)
Taken	41 (36.9)	37 (39.8)	35 (39.3)
Not taken	10 (9.0)	3 (3.2)	0 (0.0)
Not known	60 (54.1)	53 (57.0)	54 (60.7)

Note: percentages may not total 100 where decimal places have been rounded

Cases notified to the SWCAR are categorised by 8 descriptors for the use of folic acid during that pregnancy. The number of occasions each descriptor was used is shown in Table 4.

Table 4: recording of folic acid use in 111 cases of NTD, by descriptor of use for notifications, handwritten antenatal records and computerised antenatal records.

Folic acid use descriptor used by SWCAR	SWCAR notification record (N=111)	Handwritten antenatal records (N=93)	Computerised antenatal records (N=89)
Not taken	10	3	0
Taken, pre-conceptually	1	8	0
Taken, weeks 1-4	2	5	1
Taken, weeks 5-12	0	12	1
Taken, started after first trimester	1	4	0
Taken, not known when started	37	8	33
Not known	22	53	54
Not specified	38		

This suggests that some additional information on the timing of folic acid use is available in the handwritten antenatal records, but that this information is not always transferred to either the computerised antenatal record or to the SWCAR notification form.

Recording of frequency of taking folic acid

In seven of the 93 (7.5%) handwritten antenatal records reviewed it was recorded that the mother had been asked about the frequency that she took folic acid. In five records (5.4%) it was recorded that this was not asked, and in the remaining 81 (87.1%) this information was not recorded. In none of the computerised antenatal records reviewed was this information recorded.

Accuracy of SWCAR information

a) Inaccurate negative recording of folic acid use
A review of the 10 cases of NTD in the Register where folic acid was recorded as 'Not taken' indicated that in two cases this was inaccurate and that folic acid had been taken. In one case the computerised antenatal record stated that folic acid was 'Taken, not known when started'. In a second case, the handwritten antenatal record indicated that folic acid was not taken preconception or during the first 4 weeks of pregnancy, but had been taken during weeks 5 to 8. The remaining eight cases contained no additional information on folic acid use in either the computerised or handwritten antenatal records.

b) Inaccurate positive recording of folic acid use
The 41 cases in the Register that recorded any folic acid being taken during the pregnancy were reviewed to examine if further or alternative information on folic acid use was available from either the computerised or handwritten antenatal records. In none of the 41 cases was it identified that the mother did not in fact take folic acid. However, in 9 of these cases (22.0%) the information on the notification form was incomplete, and the time period during which folic acid had been taken was available from either handwritten or computerised antenatal records.

2) Pregnancies unaffected by NTD

Use of folic acid

The antenatal records of 196 pregnancies unaffected by NTD or any other anomaly were audited. 74 sets of handwritten records and 176 sets of computerised antenatal records were available. Of 74 handwritten antenatal records reviewed, 15 (20.2%) indicated that some folic acid had been taken during the pregnancy. Of 176 computerised antenatal records reviewed, 81 (46.0%) indicated that folic acid had been taken but in all of these this was recorded as simply "Taken, not known when started" (Table 5).

Table 5: Recording of folic acid use in 196 pregnancies unaffected by NTD.

Folic acid use recorded	Handwritten antenatal records [N=74] n (%)	Computerised antenatal records [N=176] n (%)
Taken	15 (20.2)	81 (46.0)
Not taken	0 (0.0)	0 (0.0)
Not known	59 (79.7)	95 (54.0)

Note: percentages may not total 100 where decimal places have been rounded

The level of recording of taking of folic acid is less in the handwritten records of pregnancies unaffected by NTDs (20.2%) than in pregnancies affected by NTDs (39.8%, Table 3). In contrast, the recording of taking folic acid is greater in the computerised antenatal records of pregnancies unaffected by NTDs (46.0%) than in pregnancies affected by NTDs (39.3%, Table 3).

Recording of frequency of taking folic acid

Only one of 176 computerised antenatal records and one (different) handwritten antenatal record (of 74) recorded that the mother had been asked about the frequency that she took her folic acid.

Discussion

Completeness of audit

This audit has reviewed the recording of folic acid use in pregnancies affected by NTD reported to SWCAR, and in a group of pregnancies unaffected by NTD, for comparison. 111 cases of NTD reported to SWCAR during 2003 and 2004 were included in the audit.

The percentage of cases audited (95.7%) was very high. Five of the six cases that were not included came from one maternity unit that stated early in the audit process that it would not be able to participate. The findings relating to the cases are therefore highly representative of the case series to which the findings are applied.

The records of pregnancies unaffected by NTD were an important comparison group. We were able to review the computerised antenatal records of 176 pregnancies unaffected by NTD, and the handwritten antenatal records of 74 normal pregnancies. The review of the handwritten antenatal records was dependent on the involvement of staff from the audit facilitation teams of the hospital in which the maternity unit was sited. It was not possible to engage more audit facilitation teams in the time available, hence the reduced number of normal pregnancies that had a review of handwritten antenatal records.

Women and cases sampled in this audit

The age, ethnic group and primip status of the mothers of pregnancies affected by NTD was not statistically significantly different to that of mothers of pregnancies unaffected by NTD, suggesting that any differences in folic acid use identified in the audit are unlikely to be due to differences in age, ethnic group or primiparous status.

The age distribution of mothers of pregnancies unaffected by NTDs is very similar to the age distribution of mothers of live births across the SW region, suggesting that our sampling technique has not produced a sample unrepresentative by age (Table 6).

Table 6: Percentage of mothers with pregnancies unaffected by NTDs in 5 year age groups compared with the mothers of live births across the SW region in 2004

	Age of mother (years) (% of mothers in different age groups)						
	≤ 19	**20-24**	**25-29**	**30-34**	**35-39**	**≥ 40**	**Total**
Sample of pregnancies unaffected by NTDs (n=196)	6.1	15.3	25.0	33.2	17.3	3.1	100.0
Live births in SWCAR region in 2004* (n=44811)	6.6	17.3	24.9	30.8	17.2	3.3	100.1

Note: percentages may not total 100 where decimal places have been rounded
* Office of National Statistics

In this case series 46.8% cases were due to spina bifida, 39.6% were due to anencephaly and 10.8% were due to encephalocoele. This compares with figures from the National Congenital Anomaly System reports for 2004, of 45.7% of NTDs nationally being due to spina bifida, 45.4% being due to anencephaly and 9.0% being due to encephalocoele[14]. Numbers of cases of neural tube defects remain relatively small, and will vary from year to year and from region to region.

Use of folic acid in early pregnancy

In this audit 36.9% of cases of NTD record folic acid as having been taken during pregnancy or pre-pregnancy, and 46.0% of the computerised antenatal records of pregnancies unaffected by NTD recorded any use of folic acid being taken pre-pregnancy or in early pregnancy. These figures are lower than other published reports of uptake of folic acid during pregnancy[8-11]. Reasons for this difference include uptake of folic acid being lower in the SW region than elsewhere in the UK, or that the recording of use of folic acid in the region could be improved. The identification of the proportion of women who take folic acid during pregnancy and in whom this is not recorded in any antenatal records, is beyond the scope of this audit.

Completeness and accuracy of folic acid data held on the SWCAR

Folic acid was recorded as having been taken during pregnancy or pre-pregnancy in 41/111 (36.9%) cases of NTD on the SWCAR database. The two main alternative sources of information on folic acid use regionally, i.e. the handwritten and computerised antenatal records, both indicate very similar percentages of overall use of folic acid (39.8% and 39.3% respectively). This suggests that the majority of cases where folic acid use is recorded are reaching the Register.

Nine of the 41 cases in the SWCAR that record some folic acid use contained information that was either incomplete (8 cases) or incorrect (1 case) when the Register data was compared with the handwritten and the computerised antenatal records. This suggests that the process for obtaining information on folic acid use for cases of NTD in the Register could be improved. The handwritten antenatal records contained more additional information than the computerised antenatal records.

The SWCAR database currently categorises information on folic acid use into 8 descriptive categories; ‘Not taken’, ‘Taken pre-conceptually’, ‘Taken weeks 1-4’, ‘Taken weeks 5-12’, ‘Taken – started after first trimester’, ‘Taken – not known when started’, ‘Not known’, and ‘Not specified’. Two particular issues were identified with this system. The first relates to the exclusivity of these categories, i.e. a mother can only be recorded within one category. For example, it is not possible to record that a mother took folic acid both preconception and during the first few weeks of pregnancy. The second issue relates to the categories of ‘Not known’ and ‘Not specified’. There appears to be no consistent use of these categories, and in practice both are used to indicate that the use of folic acid is not known.

Limitations of this audit

This audit has not attempted to assess the dose of folic acid taken during pregnancy or the frequency of taking folic acid. It has been assumed that once commenced, folic acid is then taken daily, until consumption ceases. In practice it is likely that compliance with daily folic acid will not be consistent.

It may have been informative to have examined the recording of folic acid use by reporting maternity unit, however the small numbers of cases involved and the paucity of information available mean that any findings are likely to have arisen by chance and not represent true differences between maternity units. Therefore this analysis has not been attempted.

Unanticipated findings

During the audit it became apparent that if a notification form is sent to the SWCAR that does not contain information regarding the parity of the mother, then the database would record a default setting of G1P0, i.e. primiparous, rather than leaving the parity field blank.

Conclusions

This audit of the use and recording of use of folic acid during pregnancy in cases of neural tube defect reported in the South West during 2003 and 2004 has reached the following conclusions:

- Comprehensive audit of cases presenting to the South West Congenital Anomaly Register is both feasible and informative
- 36.9% cases of NTD on the SWCAR record folic acid as having been taken during pregnancy or pre-pregnancy. Review of the handwritten and computerised antenatal records of cases suggest that where folic acid has been recorded, then this information is transferred to the Register accurately in the majority of cases.
- 9/41 (22%) of cases of NTD in the SWCAR database contained information on folic acid use that was either incomplete or inaccurate in details, when additional sources of information were reviewed
- The handwritten antenatal record appeared to be a more useful secondary source of information than the computerised antenatal record for additional information on folic acid use.
- The facilities available at the Register, and the established networks of contacts around the region, would suggest that if greater information on folic acid use could be collected at booking then it should be possible to accurately transfer such information to the Register.
- The mothers of cases of NTD in the SWCAR whose records contain no information on folic acid use should not be assumed to have not taken folic acid, only that information on folic acid use remains unknown.
- Comparison with the recording of folic acid use in pregnancies unaffected by NTD suggests that the recording of folic acid use is equally low in all booked pregnancies.
- The data on risk factors for anomalies that is currently collected by SWCAR should only be interpreted if it can be demonstrated to be of good quality. The data on folic acid does not meet this requirement currently due to the low level of recorded information on folic acid in maternity records

Recommendations

The audit team proposes the following recommendations:

1) Given the current concerns regarding failure to reduce the incidence of NTD, ongoing debate regarding food fortification with folic acid, and concern regarding uptake of folic acid pre-pregnancy and during early pregnancy, it would be appropriate to encourage enhanced recording of folic acid use within the South West Region

2) The most appropriate time to collect information on folic acid use is at the booking antenatal visit. The ongoing development of a regional computer system by the NHS Southern Cluster Connecting for Health will enable the opportunity for consistency in the recording of risk factors for anomalies such as folic acid at the booking visit, across the South West Region.

3) It is recommended that information on folic acid use should be collected in a consistent manner, specifically:

   FOLIC ACID

   1. Taken at any time this pregnancy? Yes / No

   2. Taken pre-conceptually? Yes / No
   If not, number of weeks pregnant when folic acid was started ___ wks

   3. Once started did you take folic acid every day? Yes / No

4) Such information entered onto the new regional computerised maternity recording system, would enable it to be accessible by SWCAR in the event of an anomaly subsequently being identified in that pregnancy.

5) SWCAR should review the current coding of folic acid use in cases referred to the Register. Coding categories should reflect variable folic acid use, and categories should not be unique. A single category to identify when information is ‘not known’ is required.

6) SWCAR should review the default setting for parity of the mother of a case notified to the Register, such that it no longer defaults to G1P0.

7) This audit should be repeated to assess changes in the light of these recommendations. The timing should be such that at least 12 months worth of notifications can be audited following the commencement of the new regional computerised recording system for antenatal care.

8) The suspected incompleteness and inaccuracy of folic acid recording identified by this audit should preclude the interpretation of this data field until such time as the completeness and accuracy of the information can be demonstrated to be improved.

9) The continued collection of other risk factor information by SWCAR, such as smoking, alcohol and drug consumption etc, should be supported. Such data can inform the surveillance of anomalies for which preventative strategies exist, and this information is not reported nationally at this time. However, the findings of this audit highlight the importance of assessing the accuracy and completeness of data on such risk factors.

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Audit of folic acid use & recording in cases of Neural Tube Defect registered with the South West Congenital Anomaly Register

This audit is designed to assess the quality of the information on folic acid use currently contained within the South West Congenital Anomaly Register, for cases of neural tube defect.

Instructions for completing this form:

SWCAR team to complete Part A.
Staff in maternity units participating in the audit to check the information in Part A and amend if necessary, and to complete Part B and Part C.

Part A: Case Information:

SWCAR identification number: ☐☐☐☐ ***EDD:***

Mother surname: ***Mother forename:***

Mothers date of birth: ***Mother NHS number:***

Postcode of residence: ***Ethnicity of mother:***

Booking Hospital: ***Booking hospital number:***

Mother referred to: ***Mother Ref Hosp no:***

Age of mother at end of pregnancy: ***Hospital where pregnancy ended:***

Date of end of pregnancy: ***Outcome of pregnancy:***

Baby / fetus sex: ***Baby Hosp Number where applicable:***

Date of death if baby / fetus deceased:

History of Anomalies in previous pregnancies:

Anomaly details:

Anomaly currently: ***First suspected:***

Confirmed on: ***by:***

Part B: Use of folic acid during pregnancy

Please complete this section by looking at both the computerised maternity records and the handwritten maternity records. We are interested to find any differences between the information stored in these two sources.

Q1) Is there any record of folic acid being taken during this pregnancy, in these records? (please tick boxes as appropriate)

Computerised maternity records		Handwritten maternity records	
Yes ☐	No ☐	Yes ☐	No ☐

If you have answered Yes to either or both questions, please go on to Q2
If you have answered No to both questions, please go on to Part C

Q2) At what gestational age was the information on folic acid use collected? *(E.g. if the information is taken from the antenatal records at the booking visit then the gestational age at the booking visit should be recorded here)* (please tick one box in the computerised maternity records section and one box in the handwritten maternity records section).

Computerised maternity records			Handwritten maternity records		
Before 12/40 □	After 12/40 □	Not known or not recorded □	Before 12/40 □	After 12/40 □	Not known or not recorded □

Q3) For each stage during this pregnancy please tick whether the mother took folic acid according to that information source.

	Computerised maternity records			Handwritten maternity records		
	Yes	No	Not known	Yes	No	Not known
Pre-conception	□	□	□	□	□	□
During weeks 1-4	□	□	□	□	□	□
During weeks 5-8	□	□	□	□	□	□
During weeks 9-12	□	□	□	□	□	□
After 12 weeks	□	□	□	□	□	□

Q4) Was the mother asked how often she was taking folic acid at any stage of this pregnancy? (please tick one box in the computerised maternity records section and one box in the handwritten maternity records section).

Computerised maternity records			Handwritten maternity records		
Yes □	No □	Not known or not recorded □	Yes □	No □	Not known or not recorded □

Part C: Completion information

Please print your name, sign and date the form

Print name _____ Signature _____ Date _____

That is the end of the audit. Thank you for completing this audit questionnaire.
Please return the completed forms to
Mrs Aileen McLoughlin, South West Congenital Anomaly Register, Institute of Child Health, UBHT Education Centre, Upper Maudlin Street, Bristol. BS2 8AE

Audit of folic acid use & recording in cases of Neural Tube Defect registered with the South West Congenital Anomaly Register – Extended audit to assess recording of folic acid use in normal pregnancies

This audit is designed to assess the quality of the information on folic acid use currently contained within the South West Congenital Anomaly Register for cases of neural tube defect. For comparison, the audit includes information on the recording of folic acid use in normal pregnancies in the region.

Part A: Information on Normal Pregnancy

Please complete this section and amend if necessary:

Mother's name: ***Mother's date of birth:***

EDD pregnancy: ***Ethnicity of mother:***

Booking Hospital: ***Mother Hospital Number:***

Mother's age at end of pregnancy: ***Parity of Mother:***

Date of Birth ***Outcome of pregnancy (e.g. Live birth):***

Baby/fetus sex: ***Baby Hospital Number:***

Confirmation of eligibility of normal pregnancy for this audit (Office use only):

SWCAR Case ID No ☐☐☐☐☐ ***Date of Birth of Case:***

(F represents a normal pregnancy, **following** audit case in computer records for given date end of pregnancy)
(B represents a normal pregnancy, **before** audit case in computer records for given date end of pregnancy)

CHECKED AGAINST DATABASE: NOT REPORTED TO SWCAR: ☐

POSTCODE OF RESIDENCE OF MOTHER WITHIN SW REGION: ☐

Part B: Use of folic acid during pregnancy

Please complete this section by looking at the handwritten maternity records.

Q1) Is there <u>any</u> record of folic acid being taken during this pregnancy, in these records? (please tick box as appropriate)

Handwritten maternity records	
Yes ☐	No ☐

If you have answered Yes to this question, please go on to Q2
If you have answered No to this question, please go on to Part C

Q2) At what gestational age was the information on folic acid use collected?
(E.g. if the information is taken from the antenatal records at the booking visit then the gestational age at the booking visit should be recorded here) (please tick one box as appropriate)

Handwritten maternity records		
Before 12/40 ☐	After 12/40 ☐	Not known or not recorded ☐

Date of record: _____

Q3) According to the handwritten records did the mother take folic acid in the following stages of pregnancy? (please tick one box in each row, as appropriate)

	Handwritten maternity records		
	Yes	No	Not known
Pre-conception	☐	☐	☐
During weeks 1-4	☐	☐	☐
During weeks 5-8	☐	☐	☐
During weeks 9-12	☐	☐	☐
After 12 weeks	☐	☐	☐
Taken, no details given	☐	☐	☐

Q4) Mothers are advised to take folic acid daily. Was the mother asked how often she was taking folic acid, at any stage of this pregnancy? (please tick one box as appropriate)

Handwritten maternity records		
Yes ☐	No ☐	Not known or not recorded ☐

Part C: Completion information

Please print your name, contact phone number and date the form

Print name _____ Contact Phone No _____ Date _____

That is the end of the audit. Thank you for completing this audit questionnaire.
Please return the completed forms (marked confidential) in envelope provided to
Ms Aileen McLoughlin, South West Congenital Anomaly Register, Institute of Child Health, UBHT Education Centre, Upper Maudlin Street, Bristol. BS2 8AE