London Measure of Unplanned Pregnancy (LMUP)

Imputation of Missing Data
INSTRUCTIONS

If women do not answer all the LMUP items, it is not possible to simply total the items that they have and consider this as the total LMUP score - imputation of missing data must be considered. In the main LMUP development and evaluation paper (Barrett et al, 2004) it explains that the method used by the SF-36 may be used, i.e. where a subject has completed 50% of the items the mean score for their completed items may be used to calculate a total score. The instructions below explain one way this may be done.

1) Identify the number of items that a woman has missed.

2) Ensure that a woman is only considered eligible if she has answered three or more items.

> *If a woman has answered 0, 1, or 2 items, imputation of missing data CANNOT be carried out. A total LMUP score cannot be calculated.*

> *If a woman has answered three or more items, imputation of missing data can go ahead.*

FOR WOMEN WHO ANSWERED THREE, FOUR, OR FIVE ITEMS, THE FOLLOWING STEPS APPLY:

3) Calculate the total of (i.e. add up) the LMUP items that have been answered

4) Calculate the mean of the items answered

5) Calculate the imputation value, which is the mean of the items (step 4) multiplied by the number of missing items (step 1).

6) Add the imputation value (step 5) to the total of the answered items (step 3). This will give a total score, probably to several decimal places rather than a whole number.

7) Round the final value (step 6) up or down to a whole number. This is the LMUP score after imputation of missing data.

The SPSS syntax and an extract of the spreadsheet is shown in appendix A.

Reference
Barrett G, Smith SC, Wellings K. 2004 Conceptualisation, development and evaluation of a measure of unplanned pregnancy *Journal of Epidemiology and Community Health* 58:426-433

Geraldine Barrett, 12th August 2010

Example SPSS syntax for imputation of missing data

The LMUP items are coded 0,1,or 2 and are named q1, q2, q3, q4, q and q6.

****Tot1*****
the following command only calculates a total for women who have full data on all 6 items

```
COMPUTE tot1 = q1+q2+q3+q4+q5+q6 .
EXECUTE .
```

****Misqus*****

Add in the number of missing questions on 'misqus' manually.

****Eligimp*****

```
RECODE
 misqus
 (1 thru 3=1)  (4 thru 6=0)  INTO  eligimp .
EXECUTE .
```

******Shortot********
Total of LMUP items answered

```
IF (eligimp = 1) Shortot = SUM(q1, q2, q3, q4, q5, q6) .
EXECUTE .
```

******meanitem********
mean of items answered

```
IF (eligimp = 1) meanitem = MEAN(q1, q2, q3, q4, q5, q6) .
EXECUTE .
```

*******impvalue********

```
IF (eligimp = 1) impvalue = misqus * meanitem .
EXECUTE .
```

******totcimp********
LMUP total after imputation of missing data, just for those who required imputation of missing data
data held as calculation, i.e. to many decimal places

IF (eligimp = 1) totcimp = Shortot + impvalue .
EXECUTE .

*****totcimpr******
rounds the totcimp value to an integer

COMPUTE totcimpr = RND(totcimp) .
EXECUTE .

******Tot2*******

Copy of tot1, with totcimpr values added.

Extract of SPSS spreadsheet showing the variables associated with the syntax above.

*imputationexample.sav [DataSet1] - SPSS Data Editor

File   Edit   View   Data   Transform   Analyze   Graphs   Utilities   Window   Help

29 : q1

Visible: 15 of 15 Variabl

	q1	q2	q3	q4	q5	q6	tot1	misqus	eligimp	shortot	meanitem	impvalue	totcimp	totcimpr	tot2
1	2	1	2	2	1	0	8	.	.	.	.	.	.	.	8
2	2	0	0	1	0	2	5	.	.	.	.	.	.	.	5
3	.	2	2	2	2	1	.	1	1	9	1.80	1.80	10.80	11	11
4	0	1	0	0	0	.	.	1	1	1	.20	.20	1.20	1	1
5	2	1	0	1	1	0	5	.	.	.	.	.	.	.	5
6	2	2	2	2	2	2	12	.	.	.	.	.	.	.	12
7	2	2	2	2	2	2	12	.	.	.	.	.	.	.	12
8	2	1	2	1	.	1	.	1	1	7	1.40	1.40	8.40	8	8
9	1	2	1	1	1	1	7	.	.	.	.	.	.	.	7
10	2	2	2	1	1	1	9	.	.	.	.	.	.	.	9
11	1	1	0	0	0	0	2	.	.	.	.	.	.	.	2
12	2	1	2	2	1	0	8	.	.	.	.	.	.	.	8
13	.	2	2	2	2	1	.	1	1	9	1.80	1.80	10.80	11	11
14	2	1	0	1	2	1	7	.	.	.	.	.	.	.	7
15	2	1	1	2	2	0	8	.	.	.	.	.	.	.	8
16	2	2	0	1	1	2	8	.	.	.	.	.	.	.	8
17	1	1	0	2	1	0	5	.	.	.	.	.	.	.	5
18	2	1	1	1	0	2	7	.	.	.	.	.	.	.	7
19	1	0	0	0	.	0	.	1	1	1	.20	.20	1.20	1	1
20	2	2	2	2	2	0	10	.	.	.	.	.	.	.	10
21	2	1	2	2	1	0	8	.	.	.	.	.	.	.	8
22	2	.	0	.	0	.	.	3	1	2	.67	2.00	4.00	4	4
23	2	2	2	2	2	1	11	.	.	.	.	.	.	.	11
24	.	2	2	2	2	2	.	1	1	10	2.00	2.00	12.00	12	12
25	2	2	2	2	2	1	11	.	.	.	.	.	.	.	11
26	.	2	.	.	.	.	.	5	0	.	.	.	.	.	.
27	.	.	2	.	.	1	.	4	0	.	.	.	.	.	.
28	2	2	2	2	2	1	11	.	.	.	.	.	.	.	11
29															
30															
31															

Data View   Variable View

SPSS Processor is ready