

Menopausal status

Age Cohorts	Mid-age
Surveys	Surveys 1 to 4
Derived Variable	MENOPAUSE
Definition	Menopausal status
Source Items (Index Numbers)	Hyster1: m1q16a (MEDH-016), m3q27a (REPH-077) Hyster2: m2q21a (MEDH-057), m3q36a (MEDH-234) Ovaries1: m1q16b (MEDH-017) Ovaries2: m2q21b (MEDH-058), m3q36b (MEDH-235) Bleed12: m1q31a, m2q27a, m3q27b (REPH-015) Bleed3: m1q31b, m2q27b, m3q27c (REPH-016) Irregular: m1q32, m2q28, m3q28 (REPH-017)
Statistical form	Categorical variable
Index Number	REPH-109
Derived Variable	MENOPAUSER
Definition	Re-coded menopausal status
Source Items (Index Numbers)	Menopausal status (REPH-109)
Statistical form	Categorical variable
Index Number	REPH-119
Derived Variable	MENOPRGP
Definition	Grouped variable for re-coded menopausal status
Source Items (Index Numbers)	Re-coded menopausal status (REPH-119)
Statistical form	Categorical variable
Index Number	REPH-120
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Source Items

Hyster1	Have you (ever) had a hysterectomy?
Hyster2	Have you had a hysterectomy in the <ul style="list-style-type: none">- Past 2 years (Survey 2)- More than 2 years ago (Survey 2)- Past 3 years? (Survey 3)
Ovaries1	Have you (ever) had both ovaries removed?
Ovaries2	Have you had both ovaries removed in the <ul style="list-style-type: none">- Past 2 years (Survey 2)- More than 2 years ago (Survey 2)- Past 3 years? (Survey 3)
Bleed12	Have you had a period or menstrual bleeding in the last 12 months?
Bleed3	Have you had a period or menstrual bleeding in the last 3 months?

Code	Response
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1	Yes
2	No

Irregular Compared with 12 months ago, are your periods:

Code	Response
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1	Less frequent
2	About the same
3	More frequent
4	Changeable

Derived Variable

The survey items used to define menstrual status were not included in the short survey of Mid-age women at Survey 3 (n=6) and there were no short surveys from Survey 4 onwards. Consequently, categories for menopausal status were able to be defined for Mid-age women who completed either the full or the short version of Survey 2, the full version of Survey 3 and all subsequent surveys.

Prior to April 2006, the menopause variable, at various times, based on survey responses alone or revised so that the sequence across surveys was biologically plausible; at different times a category for hormone replacement therapy (HRT) was also included.

In 2006 the decision was taken to include two variables for menopause at each survey: the first is based on responses to the survey alone (*menopause*) and the second is re-coded using the values for *menopause* from all surveys so that the values form a biologically plausible sequence (re-coded *menopause*, *menopauseR*). Use of HRT was not considered in these definitions.

Both definitions assume that once a woman has had surgical menopause her status cannot revert to pre-menopausal. Women who have had both a hysterectomy and an oophorectomy or who have had an oophorectomy alone will simultaneously go through spontaneous menopause (if they haven't already), regardless of age.¹ If only a hysterectomy is performed, menstrual bleeding ceases although hormonal production may continue for several years.

Three categories for surgical menopause were defined; hysterectomy (removal of the uterus) only, oophorectomy (both ovaries removed) only, and hysterectomy and oophorectomy. To avoid misclassification, surgically menopausal women were assigned menopausal status before other women. As hysterectomy and oophorectomy are both irreversible operations, responses at earlier survey/s are used to correct assignment with respect to these operations at later surveys, for example, status at Survey 2 is based on hysterectomy and oophorectomy data at Surveys 1 and 2. This ensures consistency across surveys.

Menopausal status for the remaining women was based on the definitions of Guthrie et al.² Women were defined as premenopausal if they had menstruated in the last 3 months and reported no change in menstrual frequency in the last 12 months; peri-menopausal if they reported changes in menstrual frequency or 3-11 months of amenorrhea; and naturally postmenopausal if they reported amenorrhea for 12 consecutive months or more.

Also, so that some women with missing data could be classified, the following cases were categorised as peri-menopausal: had a period in the last 12 months and the frequency of periods was missing; had not had a period in the last 3 months; and the frequency of periods was variable (i.e. Not 'about the same').

Women were categorised as missing if they did not answer any relevant items at a particular a survey. All women who had completed the survey and whose menstrual category remained unassigned were considered unclassifiable.

In addition, for the re-coded variables, the following rules were applied:

- assignment to the categories pre-, peri- and postmenopausal assumes that the natural order of menopause is pre → peri → post. A woman can remain at the same menopausal status from one survey to the next, or can move 'up' in the model (i.e. pre → peri or peri → post), but cannot move 'down' in menopausal status (i.e. peri → pre or post → pre)
- A woman can progress to surgical menopause from categories pre-, peri-or post-menopause
- Generally the last reported value for menopause will take precedence and other values will be aligned with this
- When menopausal status is missing the value may be re-coded *only* in the following two cases:
 - Menopausal status is the same at the surveys before and after the survey with missing data: Re-code the missing value to the value from the survey before
 - Menopausal status is missing at Survey 1 and premenopausal at Survey 2: Re-code menopausal status at Survey 1 to premenopausal.

The codes and the category labels for the menopause variables are:

Code	Category
1	Pre-menopausal
2	Peri-menopausal
3	Post-menopausal
4	Hysterectomy only
5	Oophorectomy only
6	Hysterectomy & Oophorectomy
7	Missing
8	Unclassifiable

Table 1 shows the distribution for the re-coded menopausal status for Surveys 1 to 4. There was no re-coding for the vast majority of women (90%) as the sequence reported was biologically plausible. One of the 4 values was re-coded for 7.5% of women, 2 were re-coded for 1.9%, 3 for 0.4% and all 4 values for less than 1%. Re-codes were mainly for combinations of pre-, post- and/or peri-menopause to consistent peri-menopause.

Table 1 Distribution of re-coded menopausal status (percent) at Surveys 1 to 4 among all women who completed Surveys 1 (n = 14 099)

Survey:	1	2	3	4
Pre-menopausal	40.4	23.8	9.0	1.9
Peri-menopausal	29.1	36.0	29.9	13.6
Post-menopausal	6.7	13.8	31.4	52.3
Hysterectomy only	16.9	17.7	19.4	20.6
Oophorectomy only	0.7	0.7	0.7	0.8
Hysterectomy & Oophorectomy	5.9	7.6	8.9	9.9
Data missing	0.1	0.0	0.1	0.03
Unclassifiable	0.3	0.4	0.8	0.9
Total Number for this Survey	14 099	12 338	11 194	10 905
<i>Survey not completed</i>		1 761	2 905	3 194
<i>– Number (Percent)</i>		(12.5%)	(20.6%)	(22.7%)

Generally in statistical analysis, the missing and unclassifiable categories will be excluded and the 3 types of surgical menopause will be aggregated (codes 4, 5 and 6). This summary variable is included as *menopRgp* with the following codes:

Code	Category
1	Pre-menopausal
2	Peri-menopausal
3	Post-menopausal
4	Surgical menopause

The distribution of *menopRgp* is shown in Table 2.

Table 2 Distribution of re-coded menopausal status (percent) at Surveys 1 to 4 among all women who completed Surveys 1 (n = 14 099) and could be classified

Survey:	1	2	3	4
Pre-menopausal	40.6	23.9	9.0	1.9
Peri-menopausal	29.2	36.1	30.1	13.8
Post-menopausal	6.8	13.9	31.6	52.7
Surgical menopause	23.5	26.1	29.2	31.6
Total Number	14 048	12 293	11 101	10 805

The SAS code defining menopausal status is shown below. The length of the SAS program for recoding menopause is too large for inclusion here but may be viewed on request.

Survey 1

```
/*mid 1 hyst*/ m1hyst=m1q16a ;
/*mid 1 ooph*/ m1ovaries = m1q16b

/* Mid 1 Menopausal Status */;
/*ov and hyst*/
if m1hyst=1 and m1ovaries =1 then m1menopause = 6;
/*hyst only*/
else if m1hyst = 1 then m1menopause = 4;
/*ovaries only*/
else if m1ovaries =1 then m1menopause = 5;
/*no bleed*/
else if m1q31a = 2 then m1menopause = 3;
/*regular bleed*/
else if (m1q31a=1 and m1q31b=1 and m1q32=2) or (m1q31b=1 and m1q32=2) then
m1menopause= 1 ;
/*irregular bleed*/
else if (m1q31a=1 and m1q31b=2) or (m1q31b=2 and m1q32 in (1,3,4)) or
(m1q31a=1 and m1q32 in (1,3,4,.)) or (m1q31b=2 or m1q32 in (1,3,4)) then
m1menopause=2 ;
/*missing*/
else if m1hyst = . and m1ovaries = . and m1q31a = . and m1q31b = . and m1q32
= . then m1menopause = 7;
/*unclassifiable*/
else m1menopause = 8;
```

Survey 2

```
/*mid 2 hyst*/
if m1hyst = 1 or (m2q21a in (1,2,3)) then m2hyst = 1;
else if m1hyst=2 and m2q21a = 0 then m2hyst = 2;
```

```

/*mid 2 ooph*/
if m1ovaries = 1 or (m2q21b in (1,2,3)) then m2ovaries = 1;
else if m1ovaries = 2 and m2q21b = 0 then m2ovaries = 2;

/* Mid Menopausal Status */;
/*ov and hyst*/
if m2hyst=1 and m2ovaries = 1 then m2menopause = 6;
/*hyst only*/
else if m2hyst=1 then m2menopause = 4;
/*ovaries only*/
else if m2ovaries = 1 then m2menopause = 5;
/*no bleed*/
else if m2q27a=2 then m2menopause = 3;
/*regular bleed*/
else if (m2q27a=1 and m2q27b=1 and m2q28=2) or (m2q27b=1 and m2q28=2) then
m2menopause= 1 ;
/*irregular bleed*/
else if (m2q27a=1 and m2q27b=2) or (m2q27b=2 and m2q28 in (1,3,4)) or
(m2q27a=1 and m2q28 in (1,3,4,.)) or (m2q27b=2 or m2q28 in (1,3,4)) then
m2menopause=2 ;
/*missing*/
else if m2hyst = . and m2ovaries = . and m2q27a = . and m2q27b = . and m2q28
= . then m2menopause = 7;
/*unclassifiable*/
else m2menopause = 8;

```

Survey 3

```

/*mid 3 hyst*/
if m1hyst =1 or m2hyst = 1 or (m3q27a = 1 or m3q36a = 1 ) then m3hyst=1;
else if m1hyst=2 and m2hyst=2 and (m3q27a=2 and m3q36a=0) then m3hyst=2;
/*mid 3 ooph*/
if m1ovaries=1 or m2ovaries=1 or (m3q36b = 1) then m3ovaries =1;

```

```

else if m1ovaries=2 and m2ovaries=2 and m3q36b=0 then m3ovaries=2;

/* Mid 3 Menopausal Status */;
/*ov and hyst*/
if m3hyst=1 and m3ovaries =1 then m3menopause = 6;
/*hyst only*/
else if m3hyst = 1 then m3menopause = 4;
/*ovaries only*/
else if m3ovaries = 1 then m3menopause = 5;
/*no bleed*/
else if m3q27b=2 then m3menopause = 3;
/*regular bleed*/
else if (m3q27b=1 and m3q27c=1 and m3q28=2) or (m3q27c=1 and m3q28=2) then
m3menopause= 1 ;
/*irregular bleed*/
else if (m3q27b=1 and m3q27c=2) or (m3q27c=2 and m3q28 in (1,3,4)) or
(m3q27b=1 and m3q28 in (1,3,4,.)) or (m3q27c=2 or m3q28 in (1,3,4)) then
m3menopause=2 ;
/*missing*/
else if m3hyst = . and m3ovaries = . and m3q36b = . and m3q27b = . and
m3q27c = . and m3q28 = . then m3menopause = 7;
/*unclassifiable*/
else m3menopause = 8;

/** Menopause as 4 categories: pre/peri/post/surgical ***/;
array menopfull {4} m1menopauseR m2menopauseR m3menopauseR m4menopauseR ;
array menopgp {4} m1menopRgp m2menopRgp m3menopRgp m4menopRgp ;

do i = 1 to 4 ;
    if menopfull{i} in (1,2,3) then menopgp{i} = menopfull{i} ;
else if menopfull{i} in (4,5,6) then menopgp{i} = 4;
end ;

```

References

1. The Hysterectomy Association: www.hysterectomy-association.org.uk [Accessed 2004 February 15]
2. Guthrie JR, Dennerstein L, Dudley EC. Weight gain and the menopause: a 5-year prospective study. *Climacteric* 1999;2:205-211