



A guide and tools for  
maternal mortality programme assessment

**MODULE 4, Tool 2**

# **Rapid Ascertainment Process for Institutional Deaths (RAPID)**

**Version 2.0**

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## List of Acronyms

CDC	Centers for Disease Control and Prevention
Epi Info	epidemiology data entry and analysis software
RAPID	Rapid Ascertainment Process for Institutional Maternal Deaths
SSS	Sampling at Service Sites
TRACE	Inquiry to trace favourable events in pregnancy care

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## INTRODUCTION

Under-reporting of maternal deaths is common in both developing and developed countries. Even in countries where all or most deaths are medically certified, institutional maternal mortality can still be grossly underestimated. Hospital studies have shown that routine methods of identifying maternal deaths underestimate the number by one-half to two-thirds (Berg et al, 1998; Bouvier-Colle et al, 1991; Atrash et al, 1995; Salanave et al, 1999), the main problem being the misclassification of indirect maternal deaths as non-maternal.

Accurate estimates are important for several reasons: in the context of evaluation it is essential that any changes attributable to an intervention can be quantified precisely; and, in general, it is necessary to define the scale of the problem so that adequate resources can be allocated to address it.

This tool describes a technique for measuring pregnancy-related mortality in health institutions. The information is intended to help anyone in the process of commissioning a study of maternal death to decide whether the Rapid Ascertainment Process for Institutional Deaths (RAPID) will be a useful method, and if so, to help researchers with the design and execution of the study.

### 4(2).1 What is RAPID?

RAPID is a tool that reviews institutional records of deaths to identify unreported maternal deaths, and to identify mechanisms for improving the reporting of maternal deaths.

RAPID involves a review of institutional records for all deaths of women aged 15–49 years to identify all pregnancy-related deaths, including those that may have been missed from routine reports. Information is extracted from registers and case notes to determine the level of under-reporting, whether it is possible to improve the reporting using existing sources of data, and, if so, where such an improvement should be targeted. [Figure 1](#) shows this process schematically.

### 4(2).2 Why use RAPID?

1. To identify under-reporting of maternal deaths in hospitals;
2. To identify weaknesses in the reporting system and opportunities for improvement;
3. To provide a more complete listing of institutional pregnancy-related deaths that can be used: (a) to evaluate specific interventions designed to reduce institutional maternal mortality; (b) as a monitoring tool (when linked with population estimates of the proportion of maternal deaths occurring in hospitals – see the SSS tool for more details); and (c) as a resource-planning tool for institutions.

At the simplest level, RAPID provides an estimate of the numbers of pregnancy-related deaths omitted from routine reports. This is calculated by comparing the numbers of routinely reported maternal deaths and the numbers obtained by RAPID over the same time period.

It may be useful for the investigators to find out which deaths have been missed from the routine reports in order to identify weakness in the existing system. If this is the case, identifying details for the reported maternal deaths should be collected from the health institutions or the district office, where possible. These records can then be compared with RAPID data and the 'missing' maternal deaths identified.

When RAPID is used in the context of an evaluation, it may be useful to collect other supplementary information to help with interpretation. For example, in the evaluation of an intervention to improve access to delivery care, it would be useful to interpret numbers of deaths in the light of some measure of caseload. In addition to the numbers of women attending for delivery care, there would ideally be a measure of the condition in which each

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of them arrived and the quality of the care they received. This would assist in the interpretation of any changes (or lack of change) in the numbers of deaths.

Another Impact tool, TRACE (Tool 3), complements RAPID in this way by allowing the case notes that have been retrieved to be further analysed in order to find adverse and favourable factors relating to quality of care. TRACE can be conducted after a RAPID study, either by the same research team, or by different researchers.

RAPID is most useful for evaluating interventions that might be expected to affect death rates in health facilities; another example would be an intervention to improve the quality of care.

### 4(2).3 Limitations of RAPID

By itself, RAPID will not give a population-based estimate of maternal mortality because it only searches for pregnancy-related deaths among women who die in a health institution (usually a hospital). Also, as socio-economic information is not usually recorded on institutional records, there is no way of assessing to what extent the women who die are representative of the community as a whole.

If RAPID data is collected in a geographical area where a population-based survey of maternal mortality has been recently completed, it may be possible to obtain a population-based estimate of maternal mortality. If a question has been asked about the place of death in such a survey, it should be possible to calculate the proportion of maternal deaths occurring in hospitals and then combine this with a RAPID estimate of maternal deaths in health institutions to produce a population-based estimate of maternal mortality.

**If you are looking for a hospital maternal mortality rate before and after an intervention, it is essential to also collect data on the number of deliveries by facility and month.**

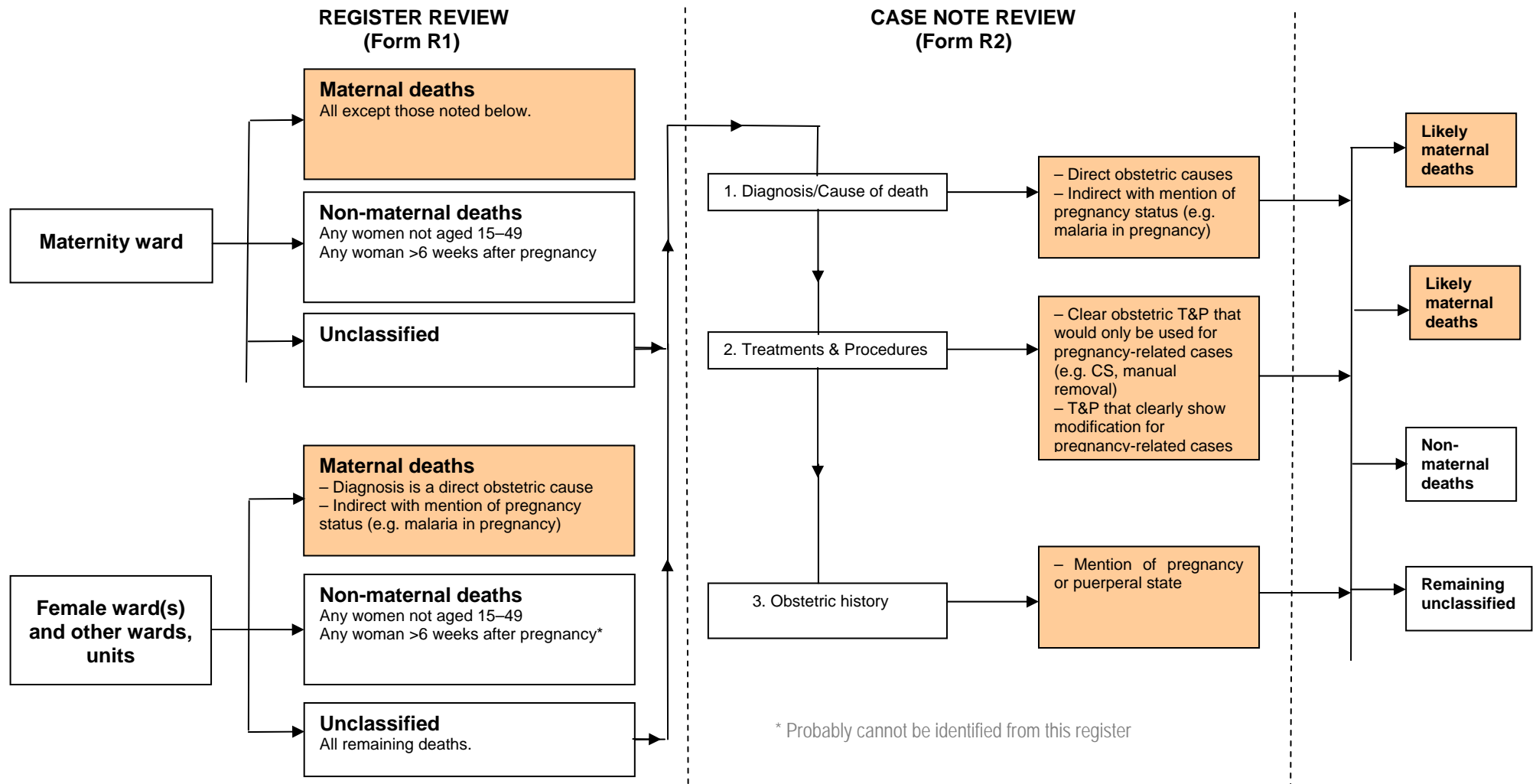


Figure 4(2).1 (fig1): Identifying maternal deaths using RAPID

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## 4(2).4 Using RAPID

The process of carrying out a RAPID study involves seven steps. In most cases this method will need to be adapted to the particular national/socio-economic/cultural setting, which should be analysed, including a gender perspective, at the outset. Therefore it is recommended that all these steps be considered before commencing the study.

### Step 1: Design your study

#### *Identify health facilities by collecting reported mortality data*

Firstly, identify which institutions it will be useful to visit by looking at centralized mortality records to see where deaths to women of reproductive age occur. If no centralized record exists containing the number of deaths disaggregated by age and sex, then visit each district health office or, in some places, each facility, to gather the information. For the purposes of identifying whether reported maternal death figures are incomplete, Impact only visited facilities reporting a minimum of ten deaths in women aged 15–49 years. The records need to contain adequate clinical detail to permit identification of pregnancy-related deaths. If you wish to estimate institutional maternal mortality for a certain area, then it will be necessary to visit every facility reporting any deaths in women of reproductive age.

### Step 2: Obtain permissions

Seek permissions from the ethics committees of collaborating institutions, from the regional health administrations in country, and from the participating hospitals and health centres.

### Step 3: Prepare for the survey

The third step in the application of RAPID involves all the essential work preparatory to data capture.

#### *Design and pre-test data extraction forms*

Data extraction forms for register and case note review should be designed and pre-tested (see examples in section 4(2).6). The register review form ([Form R1](#)) should include: the source of the data (e.g. female ward register); identifiers of each dead woman (e.g. hospital number, date of birth, name, age, study number, date of admission and death); causes of death and any diagnoses; and whether a case extraction form was completed. The case extraction form ([Form R2](#)) should include two main sections: identification details; and indicators of pregnancy status in last admission.

It is essential that the data from individuals can be linked between the two forms. One way of doing this is to ensure that the same study number is used on each form for each woman. Additional questions can be added to the forms to address particular research needs. For example, if your intervention is specifically delivery-related (such as the evaluation of free delivery care in Ghana), the researcher will be most interested in delivery-related deaths. These deaths will usually be defined within a specific time-frame e.g. within 24 hrs of delivery. In this case, you may therefore choose to add more questions on the timing of the death in relation to delivery (e.g. number of hours/days after delivery) if this seems feasible. Another example of modification could be if you wanted to evaluate the introduction of a particular drug, then you could add questions to determine if the woman required or obtained this drug.

#### *Recruit and train fieldworkers*

Fieldworkers need to be recruited and trained in the extraction of data using the forms once they are designed. It is important that the fieldworkers have some obstetric clinical background, and at least one person in each team should be a midwife or a doctor. In Part 2 of the case extraction form (Form R2) the data collectors are asked to give their opinion on whether a death was pregnancy-related.

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Guidelines should be written down so that the fieldworkers can refer back to them once agreement on the appropriate ways to extract data has been reached. The forms may need to be amended following pre-test to facilitate accurate and efficient data collection.

**Tip:**

Impact found that a training workshop of between two and four days was appropriate, familiarizing fieldworkers with the details of procedures and forms and finalizing questions and field manuals. This included one morning in a health facility both as training for the data collectors and to pre-test the extraction forms.

**Conduct orientation visits**

Orientation visits should be made to each participating health facility to introduce the study to staff and assess the information flow. Seek advice from staff on the identification and retrieval of registers and case notes, and on suitable venues in which to conduct case extraction while maintaining confidentiality. Seek advice from clinical personnel on which registers to consult – these should be all registers that may contain information on deaths of women aged 15–49 years.

**Step 4: Collect the data**

To conduct the data capture, teams of fieldworkers should visit each health facility on days previously agreed with staff working there. Team supervisors should be responsible for allocating fieldworkers different tasks or clinical areas. The time required for each case note extraction tends to decrease over the first week as data collectors become more skilled at picking out the relevant information. At the end of the first week, supervisors should re-calculate the amount of time needed to extract all the data required. This is still subject to variation, as not all case notes requested will be available.

**Tip:**

In Impact's experience, the overall average rate is ten case note extractions per fieldworker per day. This includes the time needed to retrieve the case note from storage.

The supervisor should also cover quality control of the data capture, observing each fieldworker at regular intervals, being available for fieldworkers to raise queries as they fill in the forms, and cross-checking the forms before they are submitted for data entry. All queries arising should be passed back to the fieldworker concerned. For more information on quality control for data collection see Module 5, Technical Annex A.

**Register review (Form R1)**

A representative of the RAPID team identifies all the possible register sources of deaths in women aged 15–49 at each of the participating hospitals for the past year. These sources are listed and then searched for deaths, until all deaths among women aged 15–49 are recorded with details of the diagnosis/cause of death. Using this information, as many deaths as possible are classified as 'maternal' or 'non-maternal'. All the deaths that cannot be classified as either maternal or non-maternal progress to the next stage of investigation: case note review.

**Case note review (Form R2)**

Information on diagnosis/cause of death, treatments, procedures, obstetric history and demographics will be extracted from the individual notes of women whose pregnancy-related status is not clear following register review. Using the information from the case notes, as many deaths as possible will be classified as 'maternal' or 'non-maternal'. The purpose of this extraction is not to review clinical management or procedures, but simply to gauge the likelihood that a woman was pregnant or recently pregnant when she died.

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## Step 5: Data management and analysis

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First of all, data entry templates must be set up using suitable software. One suitable package is Epi Info, which can be downloaded free from the CDC (Centers for Disease Control and Prevention) website. ([www.cdc.gov/epiinfo/](http://www.cdc.gov/epiinfo/)) The older version (Epi 6) is available via a link from the same web page and can be run on even a very basic PC.

A regime for regular (e.g. weekly) data transfer from the field sites to a central location (e.g. the coordinating office) should be planned. Entering and checking at least some of the data during the first week of the survey can help to identify mistakes in field procedures.

Ideally, data should be entered, checked for consistency and cleaned (i.e. internal inconsistencies identified and checked) as the study progresses. We have found double entry (two people independently entering the data then a comparison of the two data files) to be the most efficient way to eliminate data entry errors. Epi Info includes routines to facilitate this process.

A data analysis plan should be drawn up before the study begins and cross-checked against the extraction forms to ensure all necessary questions have been asked. Analysis will normally include:

1. a comparison between the numbers of routinely reported maternal deaths and the numbers obtained by RAPID over the same time period;
2. identification of those maternal deaths that have been missed in routine reports. A detailed example of an analysis plan can be found in the SSS tool (Tool 1).

## Step 6: Disseminate findings and recommendations

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In the final step in the application of RAPID, the findings are interpreted and disseminated using appropriate local dissemination mechanisms. These may include local and regional workshops, policy briefs, and other forms of publication. An important step in the interpretation is to compare the results with those from other studies in or near to the same area and to consider the reasons for any differences (e.g. changes over time, artefacts of methods, differences in the area or population covered).

Who the end users of the findings will be, should be taken into account at the planning stages of dissemination. Interested parties should be considered and possibly involved in the planning process to ensure that an estimate of maternal mortality produced using RAPID will meet the overall objectives of the survey.

If RAPID is being conducted as part of a broader evaluation on the quality of maternal health care, the findings from this arm of the evaluation should be integrated with other study results.

More information on dissemination of results and integration of research findings is contained in Module 3, Step 9.

### 4(2).5 Budget implications of using RAPID

Table 1 summarizes the areas of expenditure likely to occur in the use of RAPID. The resources shown are based on a large study conducted in Ghana in eight districts located in one region. Data was collected at nine hospitals (including one regional hospital) over a seven-week study period, utilizing two research teams, each of which comprised three field workers and one supervisor. In this study, 912 deaths of women of reproductive age were entered into the register review forms (R1), and 754 deaths were entered into the case note extraction forms (R2). The timings given are based on an assumption of full-time work, except where stated otherwise.

RAPID could easily be conducted on a much smaller scale, for example in one hospital; and might be completed on a part-time basis.

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**Table 4(2).1 (table1): RAPID resource implications**

	<i>Quantity</i>	<i>Time</i>
<b>Supplies</b>	Stationery (A4 paper, pencils, folders, clipboards, bags, erasers, staplers)	Not applicable
	Printing (register review form, case note extraction form, field manual)	Not applicable
	Analysis software (though this can be downloaded free from CDC)	
<b>Training</b>	Accommodation and refreshments	Not applicable
<b>Personnel</b>	Senior researcher	3–4 months (part-time)
	Data extraction team(s)	2 months
	Data entry clerks	2 clerks, 4–6 weeks each
	Data cleaning and analysis	2 people, 2–3 weeks each 1 person, 2–3 weeks
<b>Travel and communication</b>	Vehicle to travel to interview sites and to health facilities Travel reimbursement to study participants Phone calls, emails, postage	2 vehicles for 2 months
<b>Building operation and maintenance</b>	Shared premises with other research	Senior researcher's base

## 4(2).6 RAPID data collection instruments

This section contains example RAPID research instruments:

1. [RAPID Form R1](#): Register review summary form for female deaths aged 15–49;
2. [RAPID Form R2](#): Case note extraction form for deaths of women aged 15–49.

These example forms were used in Impact evaluations and should be adapted to the specific context and evaluation question.

**RAPID Form R1: Register Review Summary Form for Female Deaths Aged 15–49**

1. Name of fieldworker .....

2. Date   -   -

3a. Hospital name..... 3b. Hospital code

4a. Name of ward/unit ..... Ward code

5a. Name of register ..... 5b. Register code

No	In-patient number <i>888888=NR</i>	Name of deceased	Age (yrs) <i>88=NR</i>	Date of admission <i>88/88/8888=NR</i>	Date of death <i>88/88/8888=NR</i>	Form Extracted onto R2: <i>1=Y, 2=N</i>	Case ID from Form R2 (if extracted)	Final Diagnosis	Details Extracted from: <i>Yes=1; No=2</i>			Cause of death from case notes or death certificate	Maternal death? <i>1=Y, 2=N, 8=can't tell</i>
									Case note	Nurses Report Bk	Nil found		

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**RAPID Form R2: Case Note Extraction Form for Deaths of Women Aged 15–49**

Date of extraction (dd-mm-yyyy):   -   -

Field worker code:

Time extraction started:   -

**\*\*Check that the Case ID has been inserted against corresponding name on the form R1\*\***

No.	Questions and filters	Response categories	Response
<b>SECTION 1: IDENTIFICATION DETAILS</b>			
1.1a	Facility name		.....
1.1b	Facility code		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
1.1c	Ward or unit code	<b>See coding manual</b>	<input type="text"/> <input type="text"/>
1.2	Type of facility	1=government regional 2=government district 3=private hospital 4=mission hospital	<input type="checkbox"/>
1.3	First name		.....
	Surname		.....
1.4	Folder (In patient) number	Number Not recorded=88	
1.5a	Date of last admission	dd-mm-yyyy Not recorded=88-88-8888	<input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
1.5b	Time of admission	hh-mm Not recorded=88-88	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
1.6a	Date of death	dd-mm-yyyy Not recorded=88-88-8888	<input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
1.6b	Time of death	hh-mm Not recorded=88-88	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
1.7	Place of residence	Name of village/town	.....
1.8	District of residence code	District code <b>See coding manual</b>	<input type="text"/> <input type="text"/> <input type="text"/>
1.9	Type of residence	1=urban 2=rural 3=don't know	<input type="checkbox"/>



SECTION 2: INDICATORS OF PREGNANCY STATUS IN MOST RECENT ADMISSION			
2.1	Age	Years	<input type="text"/> <input type="text"/>
2.2	Chief complaints on admission		..... .....
2.3	Diagnosis on admission a) preliminary b) final	POSTCODED  Not recorded.....8	<input type="text"/> a) ..... ..... ..... b) ..... ..... .....
2.4	How many, days, months or years ago did most recent pregnancy end?	Not recorded=88 Not applicable=77	Hours <input type="text"/> <input type="text"/> Days <input type="text"/> <input type="text"/> Months <input type="text"/> <input type="text"/> Years <input type="text"/> <input type="text"/>
2.5	Were any of these complications recorded? a) Prolonged labour b) Obstructed labour c) Ruptured uterus d) APH e) PPH f) Pre-eclampsia g) Eclampsia h) Puerperal sepsis i) Abnormal foetal presentation j) Retained placenta k) Retained products l) Post-abortion	1=yes 2=no 7=not applicable 8=not recorded	a) <input type="text"/> b) <input type="text"/> c) <input type="text"/> d) <input type="text"/> e) <input type="text"/> f) <input type="text"/> g) <input type="text"/> h) <input type="text"/> i) <input type="text"/> j) <input type="text"/> k) <input type="text"/> l) <input type="text"/>

2.6	Were any of the following procedures performed? a) Caesarean section b) Hysterectomy c) Manual removal of placenta d) Repair of ruptured uterus e) Removal of retained products/EOU f) Dilatation & curettage g) Salpingectomy h) Culdocentesis i) Posterior calpotomy j) Laparotomy k) Other (specify)	1=yes 2=no 7=not applicable 8=not recorded	a) <input type="checkbox"/> b) <input type="checkbox"/> c) <input type="checkbox"/> d) <input type="checkbox"/> e) <input type="checkbox"/> f) <input type="checkbox"/> g) <input type="checkbox"/> h) <input type="checkbox"/> i) <input type="checkbox"/> j) <input type="checkbox"/> k) <input type="checkbox"/>
2.7	Cause of death (from death certificate or best available source)	8=not recorded	..... <input type="checkbox"/> .....
2.8	Records indicate woman's pregnancy status to be (Based on best judgement of field worker):	1=died pregnant 2=died during delivery 3=died within 6 weeks of end of pregnancy (postpartum) 4=died within 6 weeks of end of pregnancy (post-abortion) 5=death not pregnancy-related 6=pregnancy-related status unclear	..... <input type="checkbox"/>
2.9	Give a brief description of the evidence for this	POSTCODED	..... .....



2.10	Sources of information used: a) In-patient case notes b) Nurses' report book c) Operating theatre records d) Out-patient records e) Death certificate f) Post-mortem record g) Other (specify)	1=yes 2=no	a)	<input type="checkbox"/>
			b)	<input type="checkbox"/>
			c)	<input type="checkbox"/>
			d)	<input type="checkbox"/>
			e)	<input type="checkbox"/>
			f)	<input type="checkbox"/>
			g)	<input type="checkbox"/>
			.....	
			.....	
<b>Time extraction completed:</b>				<input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/>
<b>Checked by Supervisor:</b> .....				

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