Small Victories, New Challenges
Two Decades of Maternal Mortality Surveillance in Jamaica

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ABSTRACT

Objectives: *The paper summarizes the changing epidemiology of maternal mortality and the new challenges as Jamaica seeks to contribute to the international goal to reduce maternal mortality by 75% worldwide between 1990 and 2015.*

Methods: *This is a review of Jamaica's two decades of maternal mortality surveillance experience.*

Results: *Jamaica began episodic reproductive age mortality surveys between 1981 and 1983. In order to move to continuous surveillance, maternal deaths were made a Class 1 notifiable event in 1998. Reporting has steadily improved with over 80% of deaths notified, however events in the first trimester and after the first week post-partum were less likely to be reported. While gestational hypertension remains the leading cause of death, the cause-specific mortality rate has declined in response to specific efforts to reduce its prevalence and consequences. Haemorrhage and infection also declined significantly in prevalence and rank. HIV disease moved rapidly to become the fourth-ranked cause of maternal death. Another lifestyle problem is the growing prevalence of obesity, with its contribution to deaths from heart disease, diabetes mellitus and gestational hypertension.*

A national maternal mortality surveillance committee has been established to monitor national trends and address policy issues. One of its first tasks will be to develop clinical guidelines to standardize management of the leading direct and indirect complications of pregnancy.

Conclusion: *Jamaica has the capacity to achieve MDG5, however, local and national maternal mortality committees and health teams will have to systematically address the deficiencies identified.*

Pequeñas Victorias, Nuevos Desafíos:
Dos Décadas de Vigilancia de laMortalidad Materna en Jamaica

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RESUMEN

Objetivos: *El presente trabajo resume la epidemiología cambiante de la mortalidad materna y los nuevos desafíos en el momento en que Jamaica busca contribuir a la meta internacional de reducir la mortalidad materna en un 75% a nivel mundial entre 1990 y 2015.*

Métodos: *Éste es un examen de la experiencia de Jamaica durante dos décadas de vigilancia de mortalidad materna, en el que se resumen los hallazgos claves del estudio durante el período, junto con la evidencia internacional.*

Resultados: *Jamaica empezó las encuestas episódicas de mortalidad en la edad reproductiva entre 1981 y 1983. Con el propósito de pasar a una vigilancia continua, las muertes maternas comenzaron a ser tratadas como eventos notificables de clase 1 en 1998. Se ha producido un mejoramiento constante en el número de reportes, con la notificación de más del 80% de las muertes. Sin embargo, los eventos en el primer trimestre y después de la primera semana postnatal, presentaron una probabilidad menor de ser reportados. Si bien la hipertensión gestacional sigue siendo la causa principal de muerte, la tasa de mortalidad específica por causa ha disminuido en respuesta a los esfuerzos específicos por reducir su prevalencia y sus consecuencias. Las hemorragias e infecciones también disminuyeron significativamente en prevalencia y rango. La enfermedad de VIH pasó rápidamente a ocupar la cuarta posición como causa de muerte materna.*

Otro problema de estilo de vida es la creciente prevalencia de la obesidad, con su contribución a las muertes por enfermedad cardíaca, diabetes mellitus e hipertensión gestacional. Se ha creado un comité nacional de vigilancia de la mortalidad materna a fin de monitorear las tendencias nacionales y abor-dar los problemas de las políticas a seguir. Una de sus primeras tareas será desarrollar lineamientos clínicos a fin de estandardizar el tratamiento (manejo) de las principales complicaciones directas e indirectas del embarazo.

Conclusión: *Jamaica tiene la capacidad de lograr MDG5. Sin embargo, los comités de mortalidad materna y equipos de salud a nivel nacional y local, tendrán que abordar sistemáticamente las deficiencias identificadas.*

INTRODUCTION

Jamaica has been monitoring maternal mortality for over 20 years, given established difficulties worldwide with case ascertainment from vital registration (1–3). The global safe motherhood campaign, born out of an enquiry by Rosenfield and Maine of what happened to the M in MCH (4), and launched at the epic 1987 Nairobi conference, has been energized by the inclusion among the millennium development goals of the target to reduce the incidence of maternal mortality by 75% between 1990 and 2015.

Represented in Nairobi, Jamaica has actively pursued the Safe Motherhood agenda. It has developed its own process of maternal mortality surveillance, responded to findings by undertaking operations research and implementing interventions, including training, to address some of the deficiencies. This paper is a review of that experience, focussing on 1998–2003.

METHODS

The paper is a review of published work and data from studies undertaken by the lead author and collaborators covering the period 1981–2003 which include studies of maternal morbidity (11, 12) and mortality (1, 5, 6, 9, 14), including audits (13, 18). The most recent investigation (1998–2003) and the details of which are published elsewhere (9, 7) involved independently visiting each public hospital and state pathologists (hospital and forensic) to review all deaths among women 10–50-years of age to identify those who had died within one year of the end of a pregnancy. The study was approved by the Ethics Committee, Faculty of Medical Sciences, The University of the West Indies/the University Hospital of the West Indies. Data were analysed using SPSS 12.0 for Windows and EpiInfo.

FINDINGS

Vital registration underestimates maternal mortality in Jamaica by 76%, necessitating direct survey methodologies (5–6). As voluntary reporting was not a successful case identification process, in 1998 maternal deaths were made a Class I notifiable event, requiring that cases be reported to public health authorities. A review of 1998–2003 indicated that compliance improved over time increasing from 23% in 1998 to 79% in 2000 to 84% in 2003. Selected cases, however, were under-represented, especially women dying in the first trimester (abortion, ectopic pregnancy) and more than one week after delivery (7) [Table 1]. In addition, deaths were less often reported from the western and southern regions and if no post mortem examination had been undertaken, a recommendation of the maternal mortality surveillance committee. Post mortem rates have improved (p [trend] = 0.019) from 58% (1993–95), falling to 48% in 1998–2000 with the entry of HIV/AIDS, but recovered to 62% in 2001–03. Necropsy rates have been consistently higher in the south-east region (59–75%) and lowest in the southern region (30–53%).

Registration of maternal deaths

Comparing data from a 1998 mortality study (8) with maternal deaths for that year, show that under-reporting and misclassification of maternal deaths persist. Of 50 identified deaths, 36 were registered, and far less, 13, appropriately documented so that they could be identified as maternal deaths, yielding maternal mortality ratios (MMR) for 1998 of 111.9/100 000 (all known deaths), 80.6/100 000 (the 36 registered deaths, assuming correct classification), or 29.1/100 000 (the 13 correctly classified deaths). For 1998, the Registrar General reported 18 deaths, five more than we identified – and may include registered occurrences from previous years, deaths at home or in the private sector. The additional cases bring the official MMR to 40.3/100 000. Table 2 compares registered maternal deaths for 1998–2003, with the cases we identified for 1998–2003. The number of registered deaths range from zero in 2001 to 21 in 2000, averaging 13 over the six-year period. The only clear trend is that on average less than one third of maternal deaths were documented appropriately.

Surveillance and completeness of reporting

From 2004–2006, the Weekly Surveillance Bulletin of the Ministry of Health reported between 29 and 47 maternal deaths, with the average for the 2004–6 triennium (n = 40) higher than 2001–3 (n = 31), indicating hopefully improved reporting, not increased mortality (Table 2).

Table 1: Predictors of non-reporting of pregnancy-related deaths, Jamaica: 1998–2003

Variable	Category	Odds ratio	95% Confidence interval	*p* value
Region of residence				
	Southeast	1.00		
	Northeast	1.88	0.55 – 6.44	–
	West	11.89	3.71 – 38.09	< 0.001
	South	4.97	1.82 – 13.57	0.002
Post mortem done				
	Yes	1.00		
	No	6.58	2.73 – 15.88	< 0.001
	Not known	4.57	1.23 – 16.97	0.023
Weeks gestation when pregnancy terminated	37+ weeks	1.00		
	29 – 36 weeks	0.66	0.23 – 1.83	–
	15 – 28 weeks	1.62	0.54 – 4.85	–
	≤ 14 weeks	4.71	1.45 – 15.27	0.010
Duration between pregnancy termination and death	Died undelivered	1.00		
	< 24 hours	0.67	0.11 – 4.13	–
	1 – 6 days	3.54	1.08 – 11.57	0.036
	7 – 41 days	6.05	1.80 – 20.37	0.004
	42 – 364 days	10.69	3.04 – 37.63	< 0.001

N in model: 216/329

Source: McCaw-Binns *et al,* Maternal mortality surveillance in Jamaica. *Int J Gynaecol Obstet* 2008; **100 (1):** 31–36.

Table 2: Deaths registered and reported by the Registrar General as occurring among females 10–49 years old and as maternal deaths, 1998–2003, compared to those identified by the review team, 1998–2003, and maternal deaths reported to the Ministry of Health 1998–2003

Year of occurrence	Deaths registered and reported by the Registrar General		Deaths identified by review team			Deaths reported to Ministry of Health surveillance system
	Registered deaths, females, 10–49 years[1]	Registered Maternal deaths	**Total maternal deaths**	Maternal deaths[2]	Late maternal deaths[3]	
2003	1114	14	**45**	39	6	32
2002	1234	12	**53**	47	6	30
2001	1138	0	**48**	44	4	31
2000	1111	21	**46**	45	1	30
1999	1171	13	**39**	35	4	19
1998	1108	18	**40**	36	4	7

Sources: *Demographic Statistics* (STATIN): 2000–2007
Weekly Surveillance Bulletin, Jamaica: (Ministry of Health) week 52, 1998–2006[1]
Revised by STATIN (2007) to adjust for under-reporting of deaths
[2]Direct and indirect maternal deaths, during pregnancy and up to 42 days after delivery
[3]Direct and indirect maternal deaths, more than 42 days after delivery

Interval between delivery and death

While reporting of late deaths (more than 42 days post delivery) was not required by the Ministry of Health, the 1998–2003 review found that increased access to tertiary intensive care (5.3%, 6.5%, 8.0% of deaths, for 1993–95; 1998–2000, 2001–03 respectively; albeit restricted mainly to residents of the south-east region (7.0%, 11.3%, 13.6%) while improving survival, also increased the duration between delivery and death such that the prevalence of late maternal mortality ≥ 42 days past partum increased from 4% for 1993–95 to 7.5% between 1998–2000 to 11% from 2001–3. Given this change in the epidemiology of maternal deaths, surveillance should be expanded to include late maternal deaths (Table 3).

Non-hospital deaths

Deaths at home or in the private sector have been documented on an *ad hoc* basis and reported to community

Table 3: Interval between delivery and death, Jamaica: 1993–2003# and by category of death*, 2001–3

Time of death	1993–95# (%)	1998–00# (%)	2001–3# (%)	Direct* (%)	Indirect* (%)	Co-incidental** (%)
Undelivered	26.7	17.8	35.9	35.9	36.0	16.0
< 24 hours	23.3	18.6	16.2	21.7	6.0	–
1–3 days	25.3	25.4	13.4	17.4	6.0	4.0
4–6 days	6.2	11.0	6.3	6.5	6.0	–
7–41days	14.4	19.5	16.9	14.1	22.0	8.0
42+ days	*4.1*	*7.6*	*11.3*	*4.4*	*24.0*	*72.0*
Total	100	100	100	100	100	100
(n)	(146)	(118)	(142)	(92)	(50)	(25)

#Direct and indirect deaths only
***Direct deaths** – deaths attributable to complications of the pregnancy *eg* eclampsia, haemorrhage
***Indirect deaths** – deaths due to medical complications exacerbated by pregnancy *eg* AIDS, heart disease
****Co-incidental deaths** – deaths due to accidents, violence or causes not exacerbated by the pregnancy *eg* motor vehicle accidents, but also includes other medical conditions more than 6 months after delivery

midwives and the forensic pathologists; nine for 1998–2000 and 14 from 2001–03. While they represent a range of complications, conditions most likely to be missed were ectopic pregnancy, and additional cases of abortion, HIV/AIDS and violence (Table 4).

Table 4: Non-hospital pregnancy-related deaths in Jamaica, by cause: 1993–95, 1998–2003

Cause of death	2001–03 (n)	1998–2000 (n)	1993–95 (n)
Non hospital deaths	**14**	**9**	**3**
Direct deaths	**6**	**5**	**2**
Gestational hypertension	1	2	–
Haemorrhage	–	1	1
Embolism	1	1	–
Abortion	1	–	1
Ectopic pregnancy	3	1	–
Indirect deaths	**5**	**2**	**1**
HIV/AIDS	2	1	–
Cardiac disorders	1	1	–
Epilepsy	1	–	–
Asthma	1	–	–
Infection	–	–	1
Co-incidental deaths	**3**	**2**	**0**
Accidents/violence	2	–	–
Neoplasm	–	1	–
Other co-incidental	1	1	–

Source: McCaw-Binns A, Lindo J, Alexander S, Escoffery C, Spence K, Lewis-Bell K, Lewis G. . Epidemiologic transition in maternal mortality and morbidity: new challenges for Jamaica. Int J Gynaecol Obstet 2007; 96(3): 226–232.

Epidemiological transition: maternal mortality – impact of surveillance

The 1998–2003 study documented an epidemiological transition in maternal mortality in Jamaica, with a significant decline in direct deaths ($p < 0.001$), unfortunately negated by an increase ($p = 0.057$) in indirect deaths (9) [Table 5].

Direct deaths

Recognition of the hypertensive disorders as the leading cause of maternal (1–2) and a significant contributor to perinatal mortality (10) led to specific targeted interventions (11–12). While these conditions still retain their first place rank, cause-specific mortality rates have declined since those interventions began in 1996, from approximately 31/100 000 to 22–24/100 000 live-births. Despite the decline, a recent review highlighted deficiencies that still need to be addressed such as more efficient evaluation of patients on presentation to hospital; more consistent use of antihypertensive agents and more aggressive management of severe pre-eclampsia (13). Changes in clinical practice have resulted in a significant decline in haemorrhage and infection mortality, with the latter no longer among the 10 leading causes of maternal death. Increased obstetric trauma, ranked 5th in 1993–95, was noted to be principally due to inappropriate use of misoprostol (14). Issuing of clinical guidelines has led to a decline in observed cases. Diagnosis of embolism has improved with increased necropsy rates. Clinical guidelines and training are needed to reduce mortality from this complication.

Indirect deaths

The introduction of HIV disease into the antenatal population has led to its meteoric rise in importance as an indirect cause of death, now the leading indirect cause and ranked fourth overall. The increasing prevalence of obesity, among young women in the reproductive age has contributed to increased complications associated with this lifestyle disorder, with all deaths between 2001–3 from cardiac disease and diabetes mellitus occurring among obese women, including 2/3 of the cases of gestational hypertension. Many deaths from these conditions occur beyond the traditional puerperium, suggest-

Table 5: Changes in the ranking of the ten leading causes of maternal death (to 42 days postpartum) per 100 000 live births: Jamaican hospitals, selected periods 1981–2003 *(indirect causes in italics)*

Rank 01–03	Cause of death	2001–03 n	2001–03 ratio	Rank 98–00	1998–00 n	1998–00 ratio	Rank 93–95	1993–95 n	1993–95 ratio	Rank 81–83	1981–83 n	1981–83 ratio
1	Gestational hypertension	30	23.5	**1**	30	22.0	**1**	44	30.9	**1**	40	31.8
2	Embolism	17	13.3	**4–7**	7	5.1	**3**	19	13.4	**5**	10	8.0
3	Haemorrhage	15	11.7	**2**	15	11.0	**2**	26	18.3	**2**	26	20.7
4	*HIV/AIDS*	*10*	*7.8*	**3**	*9*	*6.6*	#	*0*	–	#	*0*	–
5	Abortion	6	4.7	**4–7**	7	5.1	**4–7**	4	2.8	**7**	7	5.6
6–7	*Cardiac disorders*	*5*	*3.9*	**4–7**	7	*5.1*	**6**	*6*	*4.2*	**10**	*2*	*1.6*
6–7	*Sickle cell disease*	*5*	*3.9*	**4–7**	7	*5.1*	**7–9**	*4*	*2.8*	**6**	*8*	*6.4*
8–10	Obstetric trauma	4	3.1	**9–10**	4	2.9	**5**	7	4–9	**8–9**	3	2.4
8–10	Ectopic pregnancy	4	3.1	**9–10**	4	2.9	**10**	2	1.4	**4**	13	10.4
8–10	*Diabetes mellitus*	*4*	*3.1*	#	*1*	*0.7*	**7–9**	*4*	*2.8*	**8–9**	*4*	*2.4*
#	Puerperal infection	3	2.3	**8**	5	3.7	**4**	8	5.6	**3**	15	11.9
	Direct deaths (total)	**84**	**65.8**		**75**	**55.0**		**114**	**80.1**		**124**	**98.7**
	Indirect deaths (total)	***3.7***	***29.0***		***35***	***26.4***		***23***	***16.9***		***21***	***16.7***
	Maternal deaths (total)	**121**	**94.8**		**111**	**81.4**		**137**	**97.0**		**149**	**115.4**
	% live births in hospital	**93%**			**92%**			**82%**			**70%**	

Not among ten leading causes for that period

ing the need to refer high risk cases to the medical team for continued management post-delivery (Table 3).

Millennium Development Goal #5

Jamaica, a co-signatory to the Millennium Development project, has implicitly agreed to pursue the fifth goal (MDG5) to improve maternal health, particularly the target of reducing maternal mortality by 75% from its 1990 level. This means that Jamaican has agreed that it can/will reduce the maternal mortality ratio from 105/100 000 (1990) to 27.5/100 000 by 2015. In the Figure, data from 1998–2003 are plotted against

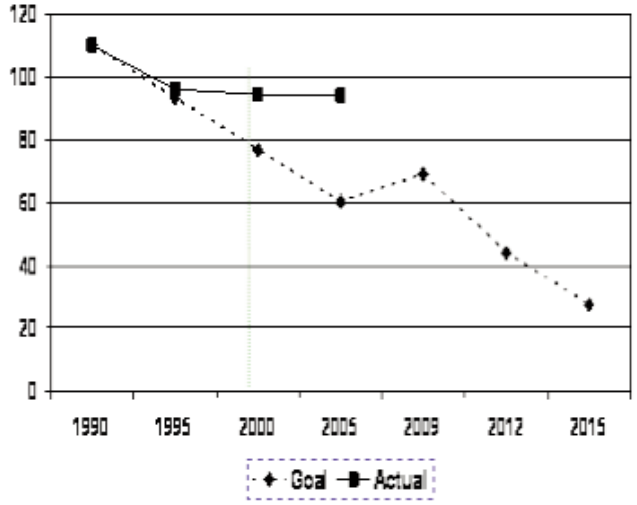

Figure: Maternal mortality reduction: Jamaica can we get back on track to achieve MDG5?

a linear assumption of maternal mortality reduction between 1998 and 2015; documenting that we are off-target. Table 6 outlines how rapidly maternal mortality must decline in each health region if the MDG5 target is to be achieved. Routine monitoring and evaluation provides an opportunity to identify constraints to progress and make corrections so that the goal remains achievable.

Table 6: Goal, total annual maternal deaths by region, if maternal mortality declines linearly, from 2007 to 2015

Actual /GOAL	Maternal Mortality Ratio	Total Deaths	Health Region S East	N East	West	South
2003	*94.2*	*57*	*29*	*7*	*8*	*13*
2009	69.2*	29	13	4	6	7
2012	44.2*	19	8	3	4	4
2015	27.5*	12	5	2	2	3

*Estimate based on 42 500 expected births per year

DISCUSSION

Surveillance

Jamaica has demonstrated that it is possible to establish a maternal mortality surveillance system in a developing country and achieve relatively good reporting compliance. The practice of identifying and reporting on maternal deaths in Jamaica has contributed to an increased awareness by health teams of the importance of case review to prevention. In at least 3 of the four regions, annual or more frequent case reviews routinely occur. Continued evaluations are needed to identify and plug the gaps in reporting at the field level.

The establishment of a national maternal mortality surveillance committee to monitor trends and assist regions to develop appropriate action plans to further reduce deaths will complement the surveillance process. As health teams reported, some problems have policy implications not easily resolved at the local level. One such urgent need is the development/revision of clinical guidelines for the leading complications of pregnancy, particularly gestational hypertension, pulmonary embolism, haemorrhage, complications

of abortion, HIV/AIDS, sickle cell disease, heart disease and diabetes mellitus to standardize the management of the more common complications. Given the growing importance of indirect complications, more collaboration is needed with the medical team to improve care to women with medical problems exacerbated by pregnancy.

Public education programmes need to be developed to ensure that women and their families prepare for pregnancy and recognize the signs and symptoms of pregnancy complications in order to seek timely and appropriate care.

Surveillance and completeness of reporting

Improved reporting of maternal deaths by the Weekly Surveillance Bulletin suggests willingness of health teams to monitor these events. As teams were interested in monitoring late and co-incidental deaths, the national committee has to develop new guidance to facilitate the identification of these cases. Teams must widen their active surveillance to all female wards and the Accident and Emergency departments as post-partum deaths, especially those occurring among women discharged after the birth and then readmitted, are usually managed on non-obstetric wards. Appendices 1–5 present the forms that have been approved by the national maternal mortality surveillance committee for use.

Registration of maternal deaths

The persistence of poor documentation of the incidence and causes of maternal deaths requires specific training of medical officers. The addition to the medical certificate of a tick box to prompt physicians to note whether a female decedent was recently pregnant should help improve the identification of these cases by the Registrar and if necessary request corrections. Appendix 5 represents the effort from the national committee to develop a tool for use by regional health authorities to inform the Registrar of all maternal deaths reviewed on a quarterly basis. It is hoped that this process will facilitate the two-way sharing of information on cases, especially those which occur outside of institutions and may not come to the attention of the health team.

Training at the Registrar's General Department (RGD) may also be needed to ensure that coders are able to evaluate cases and code them correctly, especially indirect deaths, for which different codes exist for the same condition to distinguish between those that are pregnancy related and those that are not. A manual on death certification has been produced and should be available to guide physicians and midwives on the proper completion of the medical and fetal death certificates (15).

Non-hospital deaths

Given that certain complications are more likely to occur outside of hospital *eg* ectopic pregnancy, complications of abortion, accidents and violence, including suicide, efforts to identify and report on these deaths are commendable. The *ad hoc* reporting of these deaths can be formalized by monitoring funeral parlours, the police, the local district registrar as well as by inviting private practitioners, especially in districts/regions where private hospitals or nursing homes attend births, to participate in the routine clinical review meetings. Once practitioners understand that the process is not punitive, willingness to report will develop.

Achieving Millennium Development Goal #5

The western health region has demonstrated that it is possible for maternal mortality to decrease, even under existing constraints. In regions such as the west and the north-east where the number of deaths are low due to lower incidence or smaller populations, interest can be maintained by auditing complicated cases where the women survived, defined as severe acute maternal morbidity or SAMM(16). There are lessons to be learnt from these women, including their views on how their condition was managed, to ensure that the quality improvement process is ongoing.

Careful identification of both the causes of maternal death and underlying determinants of these deaths (17) at the community level (knowledge of the signs of pregnancy complications, where to seek care, the importance of responding immediately and not delaying until the next clinic visit) and ensuring that mothers are compliant with referrals by monitoring adherence can help reduce maternal mortality. In addition, with repeat visits the following week supported by home visits if necessary, careful review of the systemic deficiencies in quality (18) and timeliness of care within facilities and addressing these deficiencies in a meaningful way can all contribute to reducing maternal mortality in Jamaica and ensuring that we do achieve MDG5. All regions except the western region (25% decline required) need to halve between 2003 and 2010 the number of deaths occurring in their region (Table 6). Do we have the political will (commitment) and technical determination to take on the challenge?

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APPENDICES

1. **MATERNAL MORTALITY CASE REVIEW SUMMARY** (FORM 1 OF 5) – summarizes information from forms 2 to 4 for entry into the database.
2. **MATERNAL MORTALITY CLINICAL SUMMARY** (FORM 2 OF 5) – summarizes data from the hospital clinical record.
3. **MATERNAL MORTALITY HOME VISIT AND ANTENATAL REPORT** (FORM 3 OF 5) – for use by the community midwife/public health nurse to do the home visit and document information from the health centre/private practitioners antenatal service record
4. **MATERNAL MORTALITY POST MORTEM SUMMARY** (FORM 4 OF 5) – for use to summarize information from the post mortem report
5. **MATERNAL MORTALITY RGD NOTIFICATION LIST** (FORM 5 OF 5) – for use by regional health authorities to notify the local district registrar of the findings of the regional review panel regarding the cause of the death of the mother, in the parish of occurrence where the death will be registered. This may not be consistent with what is on the registered medical certificate and is intended to encourage registrars to review and if necessary request corrections from the certifying officer.

MINISTRY OF HEALTH

JAMAICA

MATERNAL MORTALITY CASE REVIEW SUMMARY (FORM 1 OF 5)

INSTRUCTIONS: To be completed on all deaths during pregnancy or within one year after termination of pregnancy once case review has been completed. The summary, with supporting documents are then shared with (1) institution in which the death occurred (2) parish of residence of the mother (3) the Ministry of Health.

DEMOGRAPHIC DATA

PATIENT'S INITIALS_____ AGE AT DEATH _____ TOTAL PREGNANCIES, INCL THIS ONE _____

DATE OF DEATH ___/___/___ DATE OF DELIVERY ____/____/____ DAYS DELIVERY-DEATH _____
day mon yr day mon yr

PARISH OF RESIDENCE_____ PLACE OF DEATH _____/_____ HOME [ ]
DISTRICT / PARISH

ANTENATAL INFORMATION

SOURCE OF ANTENATAL CARE: [1] HEALTH CENTRE [2] HOSPITAL [3] PRIVATE DOCTOR [9] NOT KNOWN

TOTAL NUMBER OF ANTENATAL VISITS, ALL SITES _____ (ENTER ZERO IF NO ANTENATAL CARE)

Was patient referred to high risk clinic? [1] yes [2] no NUMBER OF VISITS TO HIGH RISK CLINIC_____

REASON FOR REFERRAL _____

CLINICAL INFORMATION

PLACE OF DELIVERY (CHECK ONLY ONE)

[1] Type A public hospital [2] Type B public hospital [3]Type C hospital
[4] Cottage hospital [5] Public maternity centre [6] Private maternity centre
[7] Private hospital [8] Home [9] Other (specify) _____

METHOD OF DELIVERY (CHECK **ONLY ONE**)

[1] Vaginal-spontaneous [2] Vaginal-induced [3] Caesarean-emergency [4] Caesarean-elective [5] Undelivered

WAS ANAESTHETIC USED: [0] No [1] Yes, local [2] Yes, general

OUTCOME OF THIS PREGNANCY (CHECK **ONLY ONE**)

[0] died undelivered [1] full term live birth [2] premature live birth [3] stillbirth
[4] spontaneous abortion [5] induced abortion [6] ectopic pregnancy [7] trophoblastic disease
[8] multiple gestation (specify all outcomes using code numbers from above) [8] twin 1 _____ [9] twin 2 _____
If liveborn, did infant survive: [1] Yes [2] No If no, date of death_____

WAS PATIENT ADMITTED BEFORE GOING INTO LABOUR: : [1] Yes [2] No

REASON FOR ANTEPARTUM ADMISSION _____

DATE OF MOST RECENT ADMISSION (1) _____

Reason: [1] delivery [2] other specifiy_____

DISHCARGE DIAGNOSIS_____

COMPLICATION/RISK FACTOR 1_____

COMPLICATION/RISK FACTOR 2_____

COMPLICATION/RISK FACTOR 3_____

WAS PATIENT TRANSFERRED [1] NO [2] YES, SPECIFY FROM WHERE_____

DATE TRANSFERRED _____ TIME OR ARRIVAL _____

PLACE OF DEATH: [1] ICU [2] TYPE A HOSPITAL [3] TYPE B HOSPITAL [4] TYPE C HOSPITAL
[5] PRIVATE FACILITY [6] HOME [7] OTHER, SPECIFY_____

CAUSE OF DEATH

TIME OF DEATH [1] MATERNAL (pregnant – 42 days post partum) [2] LATE MATERNAL DEATH (43–364 days)

SOURCE OF INFORMATION (_ALL THAT APPLY) Death Certificate [1] Autopsy Report [2] Clinical Diagnosis [3]

UNDERLYING CAUSE_____

INTERMEDIATE CAUSE_____

IMMEDIATE CAUSE_____

CLASSIFICATION OF DEATH [1] DIRECT [2] INDIRECT [3] CO-INCIDENTAL [9] not classified

QUICK CODES – DIRECT DEATHS

[11] GESTATIONAL HYPERTENSION [12] HEMORRHAGE [13] EMBOLISM [14] ABORTION

[15] INFECTION [16] OTHER DIRECT (specify)_____

QUICK CODES – INDIRECT DEATHS

[21] CARDIAC DISORDER [22] SICKLE CELL DISEASE [24] DIABETES MELLITUS [25] HIV/AIDS

[26] RESPIRATORY DISORDER [27] SUICIDE [28] OTHER INDIRECT (specify)_____

QUICK CODES – CO INCIDENTAL DEATHS

[31] HOMICIDE [32] MVA [33] OTHER CO-INCIDENTAL including non pregnancy related medical complications

EVALUATION OF THE ASSESMENT TEAM

AVOIDABLE FACTORS PRESENT: [1] NO [2] YES , IF YES, SPECIFY ALL THAT APPLY

[1] DELAY 1 (PATIENT DID NOT RECOGNIZE PROBLEM)

_____

[2] DELAY 2 (PATIENT DELAY SEEKING CARE)

_____

[3] DELAY 3 (DELAYED ACCESS TO CARE – COST, TRANSPORTATION, OTHER COMMUNITY ISSUES)

_____

[4] DELAY 4 (DELAY RECEIVING APPROPRIATE CARE ONCE IN THE INSTITUTION)

_____ _____

DETAIL SOURCES BELOW IF DELAY 4

[41] providers of care at time of death (training, quality, availability)

_____

[42] decision making process (recognition of serious problem, correct diagnosis, consultation process)

_____ _____

[43] actions taken (e.g. referral, emergency obstetric care, appropriate treatment)

_____

[44] delays in referral (e.g. transport, money, permission, physical environment)

_____

[45] facilities (e.g. quality, blood, anaesthesia, supplies, drugs)

_____

REVIEW TEAM DATE OF REVIEW ____/____/____

Obstetrician _____ [1] Midwife_____ [2]

Epidemiologist_____ [3] MO(H)_____ [4]

MO(H)_____ [5] Other_____ [6]

Other_____ [7] Other_____ [8]

DATE SUMMARY SENT TO MO(H) PARISH OF RESIDENCE____/____/____

DATE SUMMARY SENT TO HOSPITAL OF DEATH____/____/____

DATE SUMMARY SENT TO MINISTRY OF HEALTH____/____/____

MINISTRY OF HEALTH

JAMAICA

MATERNAL MORTALITY CLINICAL SUMMARY (FORM 2 OF 5)

Data will be collected on all deaths that occur during pregnancy or within one year after termination of pregnancy

DEMOGRAPHIC INFORMATION

HOME/HOSPITAL_____ DOCKET NO._____

PATIENT'S INITIALS_____ RESIDENCE _____
DISTRICT / PARISH

DATE OF DEATH ___/___/_____ AGE AT DEATH _____ DATE OF DELIVERY ___/___/___
Day mon yr day mon yr

TIME OF DEATH_____am/pm

PLACE OF DELIVERY (circle **ONLY ONE**)

Type A public hospital [1] Type B public hospital [2] Type C hospital [3]
Cottage hospital [4] Public maternity centre [5] Private maternity centre [6]
Private hospital [7] Home [8] Other [9] (specify) _____

AUTOPSY REQUESTED : Yes [1] No [2] Unknown [9]

AUTOPSY REPORT AVAILABLE: YES [1] NO [2] DATE AUTOPSY PERFORMED: ___/___/____

WHERE AUTOPSY PERFORMED: _____

DATE OF ADMISSION (1) _____ Reason: [1] delivery [2] other specifiy_____
DATE OF DISCHARGE (1)_____ DISHCARGE DIAGNOSIS_____
DATE OF ADMISSION (2) _____ Reason: [1] delivery [2] other specifiy_____
DATE OF DISCHARGE (2)_____ DISHCARGE DIAGNOSIS_____
DATE OF ADMISSION (3) _____ Reason: [1] delivery [2] other specifiy_____
DATE OF DISCHARGE (3)_____ DISHCARGE DIAGNOSIS_____
DATE OF ADMISSION (4) _____ Reason: [1] delivery [2] other specifiy_____
DATE OF DISCHARGE (4)_____ DISHCARGE DIAGNOSIS_____

COMPLICATION/RISK FACTOR 1_____
COMPLICATION/RISK FACTOR 2_____
COMPLICATION/RISK FACTOR 3_____

WAS PATIENT TRANSFERRED [1] NO [2] YES, SPECIFY FROM WHERE _____

DATE TRANSFERRED _____ TIME OF ARRIVAL _____

PLACE OF DEATH: [1] ICU [2]TYPE A HOSPITAL [3]TYPE B HOSPITAL [4]TYPE C HOSPITAL
[5] PRIVATE FACILITY [6] HOME [7] OTHER, SPECIFY_____

PREGNANCY HISTORY (enter number of events; if none, enter zero "0")

Number of **previous** pregnancies (**excluding** current pregnancy) ____

Outcomes 1. full term live births ____ 2. premature live births (< 2500 g) ____ 3. stillbirths ____

4. spontaneous abortions ____ 5. induced abortions ____ 6. ectopic pregnancies ____
7. trophoblastic diseases ____

PREVIOUS COMPLICATIONS OF PREGNANCY_____

_____

DELIVERY INFORMATION

DATE ADMIITED FOR DELIVERY ____/____/____ DATE THIS PREGNANCY TERMINATED ____/____/____

ATTENDANT AT DELIVERY (□ ONLY ONE Or the Most Highly Trained Attendant IF MORE THAN ONE)
nana/self [1] district midwife [2] registered nurse/midwife [3] obstetrician [4]
other med. pract. [5](specify)_____ other trained personnel [6] (specify)_____
_____

31. METHOD OF DELIVERY (□ ONLY ONE)
Vaginal-spontaneous [1] Vaginal-induced [2] Caesarean-emergency [3] Caesarean-elective [4] Undelivered [5]

32. PRESENTATION: Cephalic [1] Breech [2] Other [3](specify)_____ Not Known [9]

33. BIRTHWEIGHT: _____LBS/KG 34. SEX: Male[1] Female [2] Not Known [9]

35. WAS ANAESTHETIC USED: No [0] Yes, local [1] Yes, general [2]

36. IF YES, WHO ADMINISTERED IT: Nurse anaesthetist [1] Resident [2] Specialist [3]

25. GESTATION AT PREGNANCY TERMINATION/MATERNAL DEATH:_____ Weeks from LMP [99] not known

26. OUTCOME OF THIS PREGNANCY (□ ONLY ONE)
died undelivered [0] full term live birth [1] premature live birth [2] stillbirth [3]
spontaneous abortion [4] induced abortion [5] ectopic pregnancy [6] trophoblastic disease [7]
multiple gestation (specify all outcomes using code numbers from above) [8] twin 1 _____ [9] twin 2 _____

27. If liveborn, did infant survive: Yes [1] No [2] 28. If no, date of death_____

CLINICAL SUMMARY

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

SIGNED_____ POSITION _____DATE____/____/____

MINISTRY OF HEALTH: JAMAICA

MATERNAL MORTALITY HOME VISIT AND ANTENATAL REPORT (FORM 3 OF 5)

INSTRUCTIONS: To be completed by a PHN, community midwife covering the decedent's community of residence or hospital midwife[1] by visiting with next of kin of the deceased to determine what occurred prior to the patient's death.

Offer your condolences and explain to the relatives that in an effort to prevent maternal deaths we visit the relatives of all women who died during pregnancy and childbirth to better understand what problems the patient had and how the health services can better provide for these needs so that these problems can be avoided in the future.

DEMOGRAPHIC INFORMATION

PATIENTS NAME_____ RESIDENCE_____
DISTRICT / PARISH

DATE OF DEATH ___/___/___ AGE AT DEATH _____ DATE OF DELIVERY ____/____/_____
day mon yr day mon yr

MARITAL STATUS (_ **ONLY ONE**)

[1] Married [2] Common-law [3]Visiting [4] Other, specify _____ [9] Unknown

PLACE OF DEATH _____/_____ HOME [ ]
District/parish

NEXT OF KIN INTERVIEWED: (CHECK ALL THAT APPLY)

[1] spouse/consort [2] mother [3] father [4] sibling [5] other relative, specify _____
[6] other non relative, specify_____ [8] relationship not stated

Respondents knowledge:

a. Were you present when the patient died? [1] Yes [2] No
b. If no, How long before death did you see her? _____
c. Who told you about her death? [1] spouse/consort [2] relative [3] doctor [4] nurse [5] other_____
d. Was this person with her when she died? [1] Yes [2] No
e. How long after her death did you hear about it? _____
f. Before (name) was pregnant for the last time, was she generally well? [1] Yes [2] No [9] Not known

If no, what problems was she having_____
_____

Antenatal care:

1. Did (name) attend antenatal clinic [1] Yes [2] No [9] Not Known
2a. If no, do you know why she did not go? no [1] not known [9] yes [2] (specify)_____
_____
2b. If yes, where did she attend, specify name of :
a)_____ health centre b)_____ hospital c)_____ private doctor
3. How many visits did she make _____ 4. Date of last visit _____
5. Did (name) have a maternal record card: [1] Yes [2] No [9] Not Known
6. Had (name) been referred elsewhere to see a doctor: [1] Yes [2] No [9] Not Known
7. If yes, where was she referred _____
8. Did she go [1] Yes [2] No [9] Not Known
9. Was she seen by a doctor when she went [1] Yes [2] No [9] Not Known
10. Was she advised to enter hospital [1] Yes [2] No [9] Not Known
11. Was she admitted to hospital [1] Yes [2] No [9] Not Known
12. If Yes, where admitted _____
13. Was she told tat she had high blood pressure [1] Yes [2] No [9] Not Known

[1] **To complete antenatal care record of women seen in the high risk antenatal clinics at hsopital**

Prior to going into hospital (if died in hospital) or prior to the most recent illness, did the patient complain of any of the following symptoms:

before going into labour or before delivery (antepartum) (_ ALL THAT APPLY)

[01] severe headaches [02] visual disturbance (seeing spots, seeing double, blindness)
[03] epigastric pain (stomach aches) [04] fits (seizures) [05] severe abdominal pain
[06] swelling of face or hands [07] high fever [08] extremely short of breath
[09] yellow skin or eyes [10] vaginal bleeding [11] severe chest pain
[12] long labour (more than 12 hours) [13] coughing up blood [14] severe pain in calves or legs

if died after delivery, ask about (_ ALL THAT APPLY)

[15] severe bleeding [16] bad smelling discharge [17] if c-section, reopened wound
[18] red, swollen wound [19] severe abdominal pain

INFORMATION FROM THE ANTENATAL CARE PROVIDER(S) IDENTIFIED BY THE RELATIVES

[1] HEALTH CENTRE: date 1st visit ___/___/___ date last visit___/___/___ gestat 1st visit _____ no. visits _____
Blood Pressure (Last on Record)_____/_____ Oedema: [1] Yes [2] No [9] Not known
Albuminuria (Highest Level) _____
Other complications:_____
Was patient referred for additional care: [1] Yes [2] No [9] Not known If yes, date referred _____/____/____
Reason for referral_____
Was patient followed up to ensure attendance: [1] Yes [2] No [9] Not known

[2] PRIVATE MD: date 1ST visit ___/___/___ date last visit___/___/___ gestat 1st visit _____ no. visits _____
Blood Pressure (Last on Record)_____/_____ Oedema: [1] Yes [2] No [9] Not known
Albuminuria (Highest Level) _____
Other complications:_____
Was patient referred for additional care: [1] Yes [2] No [9] Not known If yes, date referred _____/____/____
Reason for referral_____
Was patient followed up to ensure attendance: [1] Yes [2] No [9] Not known

[3] HOSPITAL/high risk ANC: date 1st visit ___/___/___ date last visit___/___/___ gestat 1st visit _____ no. visits _____
Blood Pressure (Last on Record)_____/_____ Oedema: [1] Yes [2] No [9] Not known
Albuminuria (Highest Level) _____

COMPLICATIONS AND OTHER MEDICAL PROBLEMS (IF ANY):

_____

_____

SCREENING TEST RESULTS

HB: _____ [9] not known/not done
HIV test result: [1] positive [2] negative [9] not k known/not done
VDRL test result: [1] positive [2] negative [9] not known/not done

SIGNED (PHC RM) _____ POSITION_____ DATE____/____/____

SIGNED (SHC RM)[1]_____ POSITION_____ DATE____/____/____

MINISTRY OF HEALTH

JAMAICA

MATERNAL MORTALITY POST MORTEM SUMMARY (FORM 4 OF 5)

INSTRUCTIONS: To be completed by pathologist or regional surveillance officer from the post mortem findings on any death investigated of a female 10-50 years of age whose death is suspected as being pregnancy related.

DEMOGRAPHIC INFORMATION

PLACE OF DEATH_____ DOCKET NO._____

PATIENT'S INITIALS_____ DATE OF DEATH ___/___/___ AGE AT DEATH _____

CLINICAL INFORMATION

Complications

_____

_____

_____

Other Medical Problems/Risk Factors present

_____

_____

_____

CAUSE OF DEATH

IMMEDIATE CAUSE_____

INTERMEDIATE CAUSE_____

INTERMEDIATE CAUSE_____

UNDERLYING CAUSE_____

Other significant conditions

_____

_____

AUTOPSY DONE BY:

[1] DM PATHOLOGIST – MINISTRY OF HEALTH/UHWI [2] DM PATHOLOGIST – MINISTRY OF JUSTICE

[3] DMO [4] OTHER MEDICAL OFFICER DATE OF AUTOPSY ___/___/___

REPORT COMPLETED BY:

[1] INVESTIGATING OFFICER [2] SURVEILLANCE OFFICER [3] OTHER, SPECIFY _____

SIGNATURE _____ DATE COMPLETED ___/___/___

JAMAICA

MATERNAL MORTALITY RGD NOTIFICATION LIST (FORM 5 OF 5)

INSTRUCTIONS: To be completed by regional surveillance officer from the CASE REVIEW SUMMARY and forwarded to the CEO, REGISTRAR GENERAL'S DEPARTMENT on a quarterly basis

[1] FIRST QUARTER [2] SECOND QUARTER [3] THIRD QUARTER [4] FOURTH QUARTERR

REGION REPORTING	**[1]SE [2] NE [3] W [4]S**		**DATE REPORT**
NAME OF DECEDENT	DATE OF DEATH	PLACE OF DEATH	CAUSE OF DEATH Immediate Intermediate Underlying