Each year 99% of the estimated 529,000 maternal deaths and 98% of the estimated 5.7 million perinatal deaths occur in the developing world (1). The Kenya Demographic and Health Survey 2003 estimated there are 414 maternal deaths per 100,000 live births resulting mainly from haemorrhage, hypertensive diseases, obstructed labour, sepsis and unsafe abortion (2).

One of the pillars of safe motherhood as defined by the Ministry of Health Kenya is to provide a safe and clean delivery and this can be achieved best by using an evidence based tool the partograph, during the intrapartum period. The partograph is a graphical tool for monitoring of the progress of labour as well as maternal and foetal well being which has been in use since 1970 and serves as an “Early warning system” and assists in early decision making for intervention or transfer (3). In 1995 the Ministry of Health Kenya...
introduced as a policy a modified partograph for use in managing labour.

A WHO multicentre study involving over 35,000 women showed that the partograph is beneficial in reducing prolonged labour, augmented labour, emergency Caesarian section (c/s) and intrapartum still births (4,5). A local study by Wasike (6) noted similar findings.

Training is proven to increase use of the partograph as was demonstrated by the Safe motherhood Demonstration Project (SMDP) in Western Kenya 2000-01 where the partograph was used in 11% patients before SMDP and 85% during SMDP (7).

In Kenya in spite of standardisation of the partograph and its adoption, its use countrywide has been very limited. This study was conducted to assess utilisation of the partograph in labour management in selected health facilities in Kenya.

MATERIALS AND METHODS

This was a descriptive cross-sectional study using both qualitative and quantitative methodologies. A rapid assessment on the utilisation of the partograph was carried out in 2002 at nine health facilities in four provinces. The facilities were conveniently selected due to cost constraints covering a cross section of public, private, faith based and ranging from health centre to national referral hospital with a view to provide insight in to partograph use by different providers and facilities.

The coverage of facility was as follows:- Kenyatta National Hospital (KNH), Pumwani Maternity Hospital (Public hospital), Avenue Hospital (private), District Hospitals Kiambu, Machakos and Kajiado, Kikuyu Mission Hospital, Masii and Langata Health Centres.

Methods used were:- a checklist for observations of use of partographs during labour and delivery, review of obstetric records of the previous three months, in-depth interviews with Medical superintendents, Matron in charge, Obstetrician / gynaecologist, Medical officer, midwives and facility inventory.

In each facility thirty files were randomly selected from among those who had delivered in the previous three months and analysed for the partograph recordings. The researchers / assistants also observed the entire process of labour and delivery and the actual use of the partograph by midwives during the study.

An exit interview of five randomly selected mothers who had delivered in each unit was conducted to find out about their recollection of the monitoring they received during labour. The mothers included were those in labour at time of site visit, mothers who had delivered normally within the previous six hours of the visit and consented to participate in the study.

The number of files analysed and mothers interviewed was based on convenience sampling for rapid assessment. The pilot study to finalise the data collecting tools was conducted at Thika District Hospital.

Ethical considerations: Ethical clearance was obtained from the Kenyatta National Hospital Ethics and Scientific Committee. Permission to do the study was obtained from the Ministry of Health for its facilities and the individual private and faith based institutions.

RESULTS

Table 1

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Kenyatta National Hospital (KNH)</th>
<th>Pumwani Maternity Hospital (PMH)</th>
<th>Kiambu District Hospital</th>
<th>Machakos District Hospital</th>
<th>Kajiado District Hospital</th>
<th>Kikuyu Mission Hospital</th>
<th>Langata Avenue Hospital</th>
<th>Masii Health Centre</th>
<th>Total deliveries /month</th>
<th>SVDs</th>
<th>C/S</th>
<th>%C/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Province</td>
<td>Nairobi</td>
<td>Eastern</td>
<td>Central</td>
<td>Rift Valley</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly Admissions</td>
<td>455</td>
<td>1946</td>
<td>362</td>
<td>334</td>
<td>66</td>
<td>44</td>
<td>70</td>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total deliveries /month</td>
<td>488</td>
<td>1800</td>
<td>377</td>
<td>290</td>
<td>48</td>
<td>40</td>
<td>65</td>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVDs</td>
<td>288</td>
<td>1632</td>
<td>233</td>
<td>205</td>
<td>43</td>
<td>28</td>
<td>45</td>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C/S</td>
<td>154</td>
<td>225</td>
<td>27</td>
<td>78</td>
<td>5</td>
<td>11</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%C/S</td>
<td>34.4</td>
<td>12.5</td>
<td>7.1</td>
<td>26.9</td>
<td>10.4</td>
<td>27.5</td>
<td>27.7</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The average monthly admission and delivery statistics in the nine study facilities are given in Table 1.

All units had admission and delivery registers but many other registers to record various activities were not consistent. Also, it was not possible to obtain information on maternal morbidity and medical disorders. From the calculations it was evident that date entry was not very accurate since many of the figures could not be verified such as numbers of admissions being less than deliveries and the numbers of total deliveries also not adding up to 100%.

Table 2 shows skilled care attendants in the different health facilities at the time of study. Kenyatta National Hospital had the largest number of consultants, two consultants and four post graduate residents on duty to cover a 24 hour period while the rest of the hospitals had zero to three consultants and one to three medical officers.

Pumwani Maternity Hospital had 15 medical officers who were mostly locum doctors and according to the Medical Superintendent did not show much interest in the partograph. In all other hospitals medical officers covered all departments of the hospital at any given time and only one would be on duty to cover labour ward.

The average number of shifts was four with the smallest number of workers in the night shift usually 6.30 pm to 7.30 am. The PMH had an afternoon shift from 2 pm to 8.30 pm which on some days would have only three midwives on duty to man a 49 bed labour ward.

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**Table 2**

*Manpower in maternity wards and working shifts*

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Kenyatta National Hospital (KNH)</th>
<th>Pumwani Maternity Hospital (PMH)</th>
<th>Kiambu District Hospital</th>
<th>Machakos District Hospital</th>
<th>Kajiado District Hospital</th>
<th>Kikuyu Mission Hospital</th>
<th>Avenue Health Centre</th>
<th>Langata Health Centre</th>
<th>Masii Health Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>2*</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Registrars</td>
<td>4*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Intern / COs</td>
<td>2*</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Midwives/Nurses</td>
<td>40</td>
<td>47</td>
<td>24</td>
<td>7</td>
<td>14</td>
<td>13</td>
<td>6</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

- No. of midwives/shift (average)
- No. of shifts
- Mothers under observation
- Ratio

*Delivery statistics covering the previous three months which were used to calculate an average for one month n/a=no records available, SVD’s= spontaneous vertex delivery, C/S =Caesarean section, FSB =Fresh Still Birth, MSB= Macerated Still Birth, APH =Ante Partum Haemorrhage, PPH =Post Partum Haemorrhage

*to cover a period of 24 hours

** only where staff were specific for labour ward
The providers were interviewed to find out if they were aware of the tool, use, usefulness, training, availability, competence and need for training. As shown in the Table 3 all providers interviewed had heard of the partograph and most had ever used it except a few staff at PMH and at the Langata Health Centre. At the time PMH was using case records to record observations and they were in the process of introducing the use of the partograph. The senior nurses’ knowledge of the partograph was better than for those who were working in the labour wards as seen during the observational exercise.

Those who were using the tool -used their pre-service training while others had been informally updated by their colleagues. During the in-depth interviews we learnt that the older senior midwives did not feel comfortable learning from their junior younger colleagues. It was only at Kajiado District Hospital where the staff had undergone training by a Non Governmental Organization. Midwives expressed the need to have doctors and midwives trained and the need for the doctors to use the tool for decision making. Most staff at the district hospitals stated their frustration when they called in the doctors to review patients and noted that the doctors were not taking note of the recording on the partographs to make decisions about subsequent labour management, which they felt negated the entire reason for the use of this tool. Also there was conflict between the providers as to their roles in plotting and interpretation of the partograph to quote from an intern “this job is for the nurses and not doctors”.

The fine print on the available partograph from the Ministry of Health was a deterrent to the older midwives who could not easily fill out the values if they did not have their reading glasses on.

During interview with the staff it was noted that there was no regular audit of the partograph. This instrument was reviewed only when there was a bad outcome such as maternal or perinatal mortality.

Where the tool was available it was being printed/photocopied by the hospital authorities and was an integral part of the hospital file which the patients would pay for on admission, about US $1.3 (100 Kenya shillings) but at no time would a patient be denied this even when unable to pay.

### Table 3

**Availability and use of partograph at the maternity units**

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Kenyatta National Hospital (KNH)</th>
<th>Pumwani Maternity Hospital (PMH)</th>
<th>Kiambu District Hospital</th>
<th>Machakos District Hospital</th>
<th>Kajiado District Hospital</th>
<th>Kikuyu Mission Hospital</th>
<th>Avenue Hospital</th>
<th>Langata Health Centre</th>
<th>Masii Health Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider ever heard of it</td>
<td><strong>yes</strong></td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Ever-used</td>
<td>yes</td>
<td>yes/no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Useful</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes/no</td>
<td>yes</td>
</tr>
<tr>
<td>Ever-been trained</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>availability</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Tested Competence*</td>
<td>good</td>
<td><strong>n/a</strong></td>
<td>average</td>
<td>good</td>
<td>average</td>
<td>average</td>
<td>good</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Need for training</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

* Matron’s in-charge of obstetrics and gynaecology

*not available for interview
Thirty files were randomly selected from each facility among those who had delivered in the previous three months and analysed for the partograph recordings and the findings are shown in Table 4. Pumwani Maternity Hospital did not have partograph but they recorded information in the patient’s files -where the information was obtained from. Other units which used the partograph had more information in the patient’s notes which was not reflected on the partograph.

Most units had detailed admission records and the foetal heart rate recordings. Those who did not have admission details on the partographs had the details in the files within which the partograph was filed. The various parameters were recorded at least once on the partograph and not as per the frequency recommended for the optimal use of the partograph which is half hourly. The liquor state and moulding status at vaginal examination were minimally noted at facilities other than Kenyatta National Hospital. The contractions were noted in between 30-80 % of times and the descent of the head was documented in just over 50% of records. The maternal pulse and blood pressure, was not recorded at all in some facilities. It’s important to note that the parameters were not always documented according to accepted frequency.

During the observational exercise the partograph was not used to provide information to the staff taking over the patient care at hand over time when one’s working shift ended.

Mothers were interviewed about their recollection of the monitoring during labour and reported having been palpated for uterine contractions most but not half hourly with occasional vaginal examinations but almost no monitoring of blood pressure, temperature, pulse rate and urinalysis. Overall they were satisfied with the care provided.

The supplies required to aid complete and accurate documentation of the partograph are gloves, disinfectants for performing vaginal examinations, foetoscope, thermometer, blood pressure apparatus, and urinalysis test strips. In all public hospitals gloves were available at most times however the foetoscopes were not adequate, and thermometers, blood pressure apparatus were faulty or missing in some units. In almost all units, urinalysis could only be done in the laboratory. All units had high level disinfected or sterilised delivery kits/instruments for perineal repair and the very basic apparatus for neonatal and adult resuscitation was available. Although vacuum extraction sets were available in most units their use was negligible.
DISCUSSION

The partograph is a tool that if used accurately and consistently for the 41% of women utilising the health facilities then we can make progress towards reduction of maternal and perinatal morbidity and mortality which occurs from prolonged labour, cephalopelvic disproportion, obstructed labour and neonatal asphyxia.

Results of this study show that midwives/nurses provide most of the skilled care during delivery. This is in line with findings of Kenya Demographic Health Survey (KDHS) 2003 where midwives/nurses provided most of the care in supervised deliveries (2). Safe motherhood interventions including use of partograph must target this group.

Large numbers of deliveries were taking place in the institutions surveyed. However morbidity and mortality could not be assessed properly due to poor record keeping at most of these facilities. Caesarean deliveries ranged from 17 to 34% (keeping in mind the inaccuracy of the records) but use of vacuum was almost non existent despite equipment being present in all major facilities making one wonder if some Caesarean section’s were being performed where vacuum extraction could have sufficed. The under utilisation of vacuum was possibly due to lack of skills and negative attitude. However the reasons for non use were not assessed in this study. Also the number of midwives in the hospitals taking care of very large numbers of women was very small giving a ratio of one provider to five patients which makes use of the partographs almost very challenging.

In our study the knowledge was good for healthcare providers at Kenyatta National Hospital, Avenue Hospital and Kajiado Hospital. For the rest it was average to nil. Kenyatta National Hospital is a teaching institution hence good knowledge was expected there and Kajiado Hospital had undergone training - it was commendable that the staff at Avenue Hospital had kept abreast with the appropriate knowledge. The staff in all facilities wished to be updated on use of the partograph. A study conducted to look at the knowledge, attitude and practice related to the use of the partograph among personnel involved in management of labour in Nyandarua District Hospital in Kenya found that whereas the personnel had favourable attitudes towards the partograph, their knowledge was poor (8).

In our study data entry on the partograph was good for the admission of patient details. The parameters recorded well were the foetal heart rate, cervical dilatation, descent of the head, contractions and the summary of labour. Those least recorded were moulding, state of liquor, and the maternal parameters such as blood pressure, pulse rate and urine.

In this study documentation about moulding was poor in all facilities. Moulding is a diagnostic criterion for CPD especially if the head is high. Excessive moulding is one of the diagnostic criteria of obstructed labour but a point to note that the presence of caput may make appreciation of moulding difficult (3).

The state of liquor is important in monitoring the foetal status. Appearance or worsening meconium staining, scanty or absent liquor during artificial rupture may indicate foetal hypoxia and need to expedite delivery. In cases of abruption placenta and rupture of uterus the liquor may be blood stained. The liquor may be foul smelling or pus like in chorioamnitis (3). The state of liquor was documented satisfactorily on in Kenyatta National Hospital. The importance of this parameter needs to be emphasised.

The importance of urinalysis in monitoring maternal conditions needs to be reaffirmed. Blood pressure, maternal pulse was well recorded in Kenyatta National Hospital, Avenue Hospital and Langata Health Centre. Maternal monitoring helps in assessing the general condition and detect any problems with the mother.

Results of The Kenya Service Provision Assessment (KSPA) 2004 showed poor utilisation of the partograph in maternity units in Kenya with 39% of facilities offering delivery services having had blank partographs. Monitoring as per accepted frequency was as follows: Foetal heart monitoring and uterine contractions 20%, blood pressure 14% and pulse 8%. Overall all four parameters were only recorded in a dismal 5% of cases. Further only 17% hospitals and 10% maternities had documentation of all four critical practices (9). The findings also showed poor utilisation of the partograph in most of the study facilities. Completeness and utilisation of partograph in labour management in KNH was better than in other facilities studied most likely because the hospital serves as the main teaching hospital in Kenya for obstetricians, medical officers and nurses. The healthcare workers trained in this hospital are usually deployed all over the country facilitating knowledge and skills transfer to many parts of the country.

Shortage of staff was a constraint leading to inability to fill the partograph as required thus compromising effective labour monitoring. Other constraints noted in this study included lack of knowledge and skills and negative attitude among healthcare providers.

Most staff had not being trained on the partograph and felt that they would use it better if they were trained. Training can be achieved through updates and on job training. These two strategies have been shown to improve use and documentation of the partograph to monitor labour (7, 10).

All Medical Superintendents and obstetricians and medical officers’ in charge of maternity units were very supportive of the partograph. This opportunity should be seized to implement utilisation of the partograph to monitor labour. This cadre of staff may also be involved in day to day monitoring on its use.
In conclusion, the partograph was available in most units. However accurate recording of parameters to monitor the foetus, the mother and progress of labour as recommended was mostly not done. Shortage of staff, lack of knowledge, lack of teamwork and negative attitude were some of the obstacles noted to hamper partograph use. We recommend the partograph should be available in all facilities conducting births and adequate supplies availed to ensure appropriate utilisation. There is need for continuous medical education and on job training of all the staff involved in labour management to increase their knowledge base on use of partograph. There is need for teamwork among midwives and doctors to use this tool to monitor labour and make appropriate decisions. There should be regular audit of the partograph and facilitative supervision to ensure facilities adhere to set standards of care. Staff shortage in delivery units need to be addressed to improve monitoring of labour.

ACKNOWLEDGEMENTS

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REFERENCES