Institute of Quality Assurance in Obstetrics
Kano State, Kaduna State, FCT State Abuja, Nigeria

Maternal and Child Health Hospital – Report 2011

Supported by The Rotary Foundation (TRF), Federal Ministry for Economic cooperation and Development (BMZ), Aventis Foundation, International Association of Maternal and Neonatal Health (IAMANEH) and the Ministry of Health of Kano State and Ministry of Health of Kaduna State and the Ministry of FCT Abuja

Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung

"Quality improvement is the effort to improve the level of performance of a key process. It involves measuring the level of current performance, finding ways to improve the performance, and implementing new and better methods".

Berwick DM, Godfrey AB, Roessner J. "Curing Health Care": New Strategies Quality Improvement, San Francisco: Jossey-Bass Publishers, 1990

Imprint

Editor:	Institute of Quality Assurance Ministry of Health of Kano State and Kaduna State
Chairman:	Dr. Hadiza S. Galadanci, MBBS, Msc, FWACS MRCOG, AKTH Kano
Deputy Chairman:	Dr. Oladapo Shittu, MBBS, FWACS, ABUTH Zaria, Kaduna State
Statistician:	Sadiq Abdul-Mumin
Chief Midwife:	Zainab H.S. Pawa, RN/RM/CHO
Consultants:	Prof. Dr. Wolfgang Künzel, FRCOG, FEBCOG, Medical advisor and statistics Prof. Dr. Robert Zinser, Past District Governor (PDG) Rotary International, Shahon of Zazzau Dr. Manfred Gruhl, MPH Dr. Björn Misselwitz, MPH Institute of Quality Assurance
Coordinator Stakeholders:	Dr. Kola Ajao Owoka, PDG
Senior Advisor:	Prof. Dolapo Lufadeju, PDG

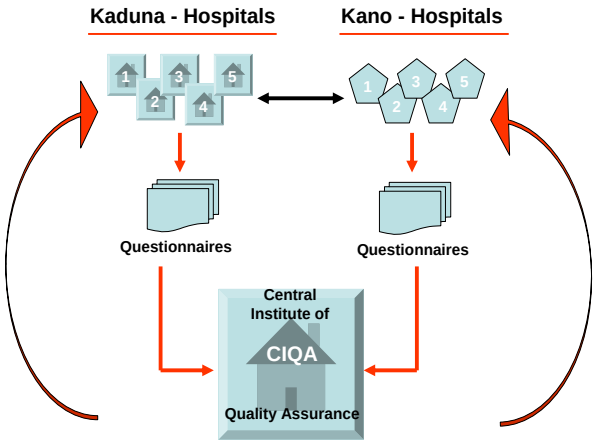
As of February, 2012

Content:

I. Organization

1. The Institute of Quality Assurance: Data collection and evaluation

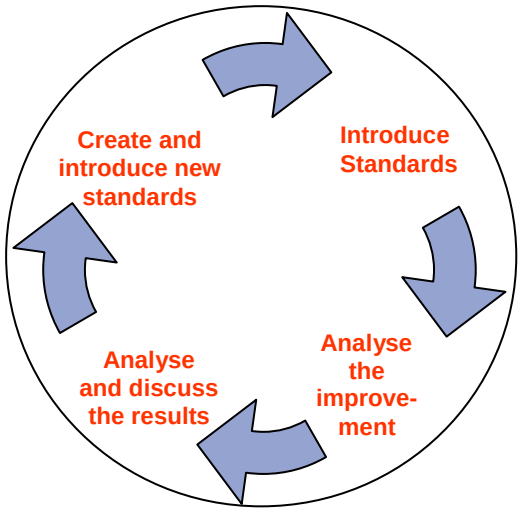
The Institute is located at the Aminu Kano Teaching Hospital (AKTH) in Kano. Questionnaires with obstetrical data are routinely collected by the chief midwife Zainab M.S Pawa and evaluated according to defined principles by the statistician Sadiq Abdul-Mumin. The data evaluation is supervised by Dr. Hadiza Galadanci and Dr. Oladapo Shittu. The data are regularly presented to the participating hospitals at half year meetings alternating between the Aminu Kano Teaching Hospital in Kano and Amadu Bello University Teaching Hospital Zaria.
The data flow takes place according to the graph below:



2. Principles of Quality Assurance

Basic principles of Quality Assurance in a hospital are based on three parameters: 1*. Quality of infrastructure, 2. Quality of process* and 3. *Quality of outcome*. All three parameters are interdependent and closely connected. *Quality of infrastructure* comprises the condition of the hospital building: water supply, power supply, hygienic conditions, number of staff and the equipment available. The *quality of process* is predominantly dependent on a sufficient structure, but also on trained and well functioning experienced personnel and on professional performance. This can be achieved by a continuing evaluation of the results and by benchmarking. The necessary interventions will lead to a spiral of reduction of maternal and infant morbidity and mortality and consequently improvement of *quality outcome*.

3. Circle of continuous quality improvements (Quality circle)



Quality Circle: Introduction of standards and the continuous analysis of progress will improve the outcome and lead to the definition of new standards

4. Hospitals participating in Quality Assurance in obstetrics

Ten hospitals, five from Kano State and five from Kaduna State participate since 2008 in the data collection and quality assurance in obstetrics (red circles). Federal capital territory (FCT) joined in late 2010 and is added into the data collection and quality assurance in 2011.Ondo State (green circle) will join in 2012 and Bauchi State (grey circle) has shown interest.

Kano State Hospitals

Aminu Kano Teaching Hospital (*AKTH), Kano*

General Hospital Gaya
General Hospital Sheik Jiddah Kano
General Hospital Sumaila
General Hospital Takai
General Hospital Wudil

Referral Hospitals

Murtala Mohammed Hospital
Nassarawa Hospital in

Kaduna State Hospitals:

Amadu Bello University Teaching Hospital (ABUTH), Zaria

General Hospital Birnin Gwari
General Hospital Yusuf Dantosho Kaduna
General Hospital Kafanchan
General Hospital Saminaka
Gambo Sawaba Hospital Kofan Gaya Zaria
St. Martins de Porres Hospital, Wusasa, der Catholic Diocese of Zaria,

Referral Hospitals

Barau Dikko Hospital
Gwamma Awan Hospital.

FCT Abuja

University Teaching Hospital
NN

Abaji General Hospital
Kwali General Hospital
Kuje General Hospital
Karshi General Hospital
Kubwa General Hospital
Karshi General Hospital,

Referral Hospitals

Nyanya Hospital
Asokoro Hospital
Wuse Hospital
Maitama Hospital

Ondo State

Universtity Teaching Hospital
NN

Arakale Comprehensive Health Centre
Akure, Okedogbon Basic Health Centre Owo
Basic Health Centre Ifon,
Ute Basic Health Centre Ose
Moferere Oja Comprehensive Health Centre Ondo.

Referral Hospitals

Mother and Child Hospital Akure,
Wesley Guild Hospital Ilesha.

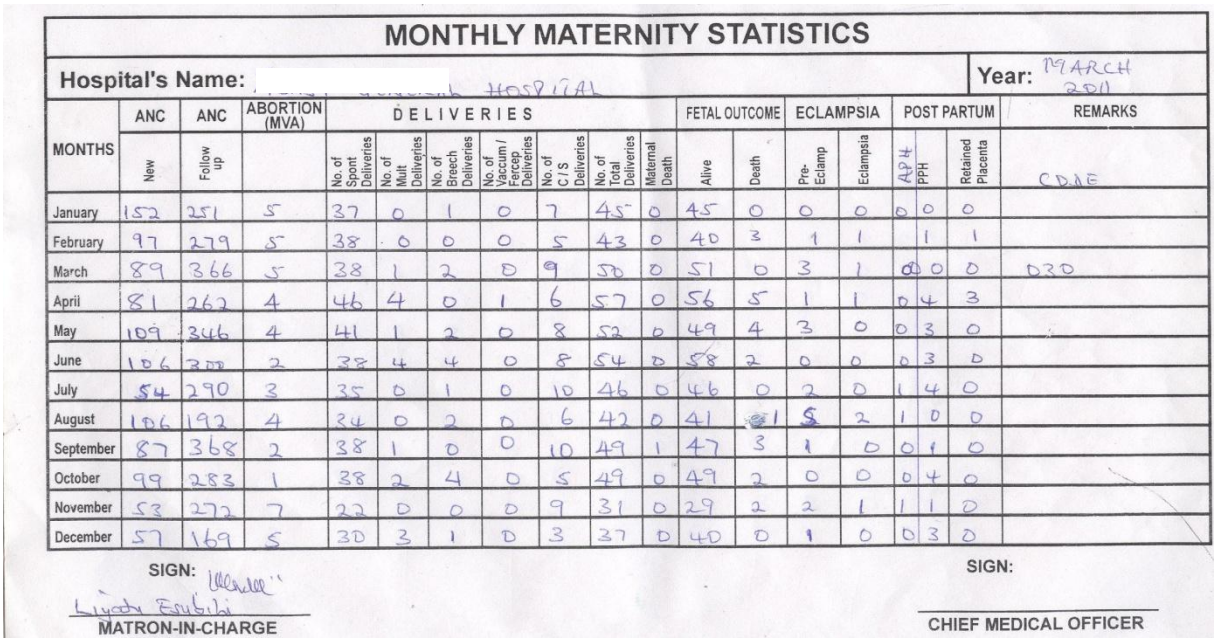
BauchiState

showed interest to participate in the quality assurance system in obstetrics in 2012.

II. Quality Assurance in obstetrics

1. Instruments for data collection

In consideration of the high maternal and infant mortality it was not advisable to use a difficult and comprehensive questionnaire for data collection. The present questionnaire was combined with the introduction of a maternity record book with simple indicators of maternal and child health. The data are routinely collected every month by the chief midwife. The questionnaire comprises the following data:



MONTHLY MATERNITY STATISTICS

Hospital's Name: [illegible] HOSPITAL Year: MARCH 2011

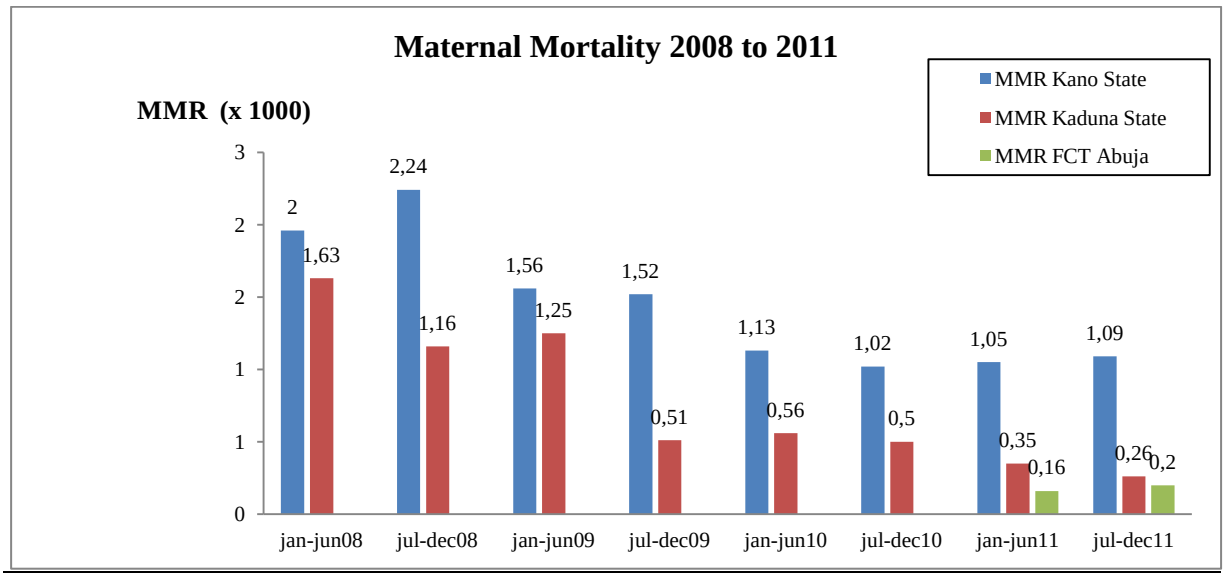
MONTHS	ANC	ANC	ABORTION (MVA)	DELIVERIES							FETAL OUTCOME		ECLAMPSIA		POST PARTUM			REMARKS
	New	Follow up		No. of Spont Deliveries	No. of Mult Deliveries	No. of Breech Deliveries	No. of Vaccum / Fercep Delivries	No. of C / S Deliveries	No. of Total Deliveries	Maternal Death	Alive	Death	Pre-Eclamp	Eclampsia	APH	PPH	Retained Placenta	
January	152	251	5	37	0	1	0	7	45	0	45	0	0	0	0	0	0	CDAE
February	97	279	5	38	0	0	0	5	43	0	40	3	1	1		1	1	
March	89	366	5	38	1	2	0	9	50	0	51	0	3	1	0	0	0	D30
April	81	262	4	46	4	0	1	6	57	0	56	5	1	1	0	4	3	
May	109	346	4	41	1	2	0	8	52	0	49	4	3	0	0	3	0	
June	106	308	2	38	4	4	0	8	54	0	58	2	0	0	0	3	0	
July	54	290	3	35	0	1	0	10	46	0	46	0	2	0	1	4	0	
August	106	192	4	34	0	2	0	6	42	0	41	1	5	2	1	0	0	
September	87	368	2	38	1	0	0	10	49	1	47	3	1	0	0	1	0	
October	99	283	1	38	2	4	0	5	49	0	49	2	0	0	0	4	0	
November	53	272	7	22	0	0	0	9	31	0	29	2	2	1	1	1	0	
December	57	169	5	30	3	1	0	3	37	0	40	0	1	0	0	3	0	

SIGN: [illegible] Liyatu Ezekiel
MATRON-IN-CHARGE

SIGN:
CHIEF MEDICAL OFFICER

Information regarding number of antenatal clinic (ANC) visits (new cases and follow up) and abortions. Further information is provided by important indicators of maternal and child health: maternal death and infant death, eclampsia and postpartum haemorrhage. All these indicators will be related to the total number of deliveries which allows comparison of the management and outcome among the hospitals.

2. Obstetrical management in 2008 - 2011



The graph above shows the results of the key quality indicators for 2008, 2009, 2010 and 2011. MMR shows a continuous fall from 2008 to 2011. More information can be obtained by looking at the graphs of individual hospitals.

3. Incidence of maternal and fetal mortality of the fifteen hospitals

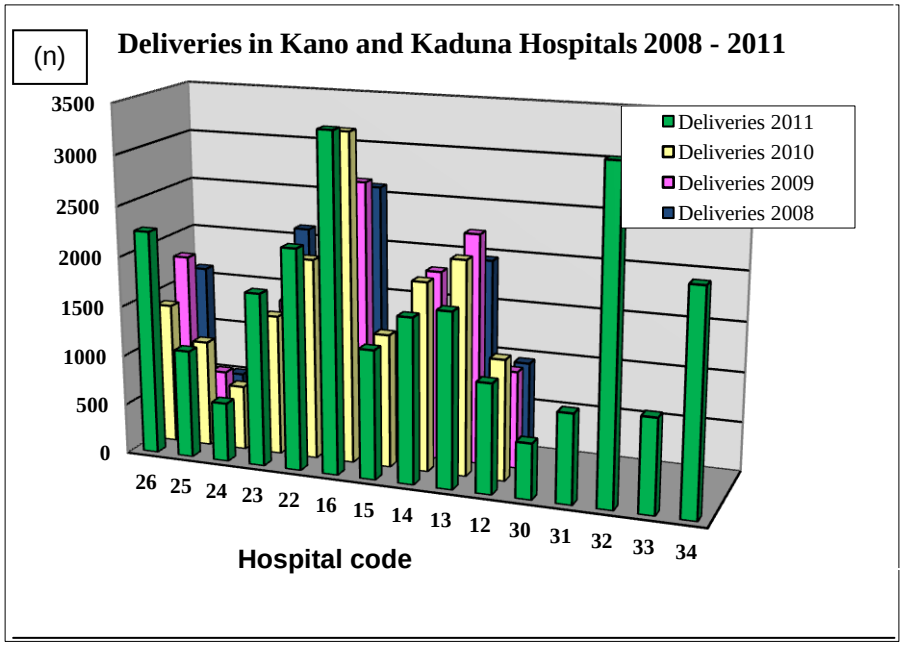


Fig 1: Number of deliveries in Kaduna and Kano hospitals in 2008 to 2011

The blue columns indicate the year 2008, followed by red for 2009, yellow for 2010 and green for 2011. The hospitals show a considerable variation in the number of deliveries. The hospital code represents the various hospitals and guarantees confidentiality of the data collection.

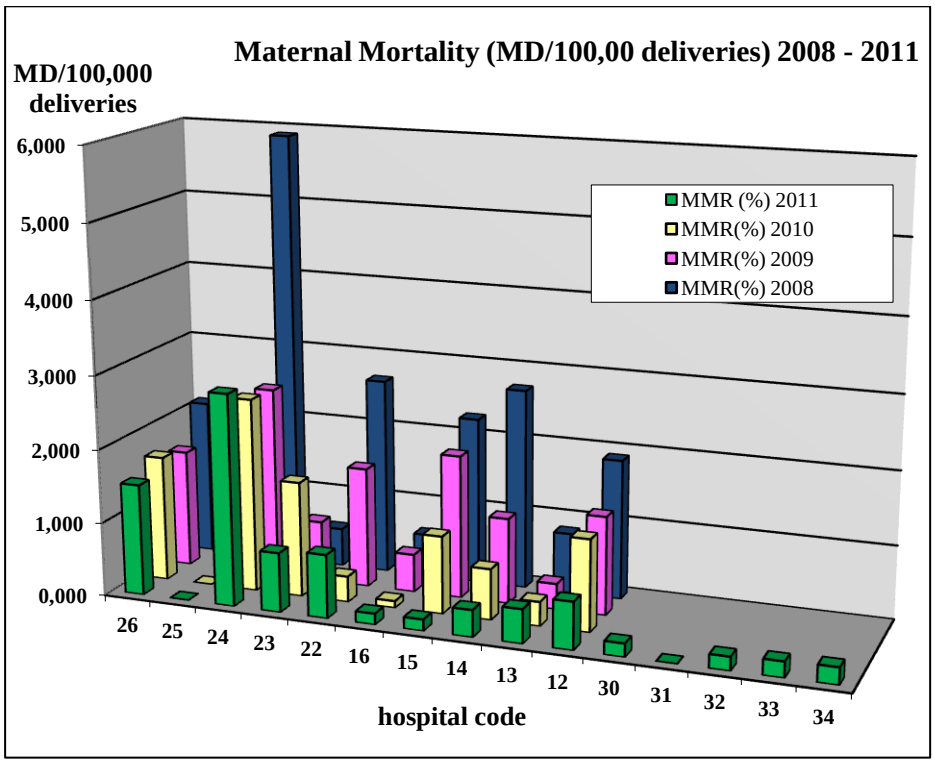


Fig. 2: Maternal mortality ratio (MMR x 1000/100 000 life birth) in 2008 to 2011

There is a consistent reduction of MMR in all the hospitals from 2008 to 2010 except one. The hospital code represents the various hospitals and guarantees confidentiality of the data collection.

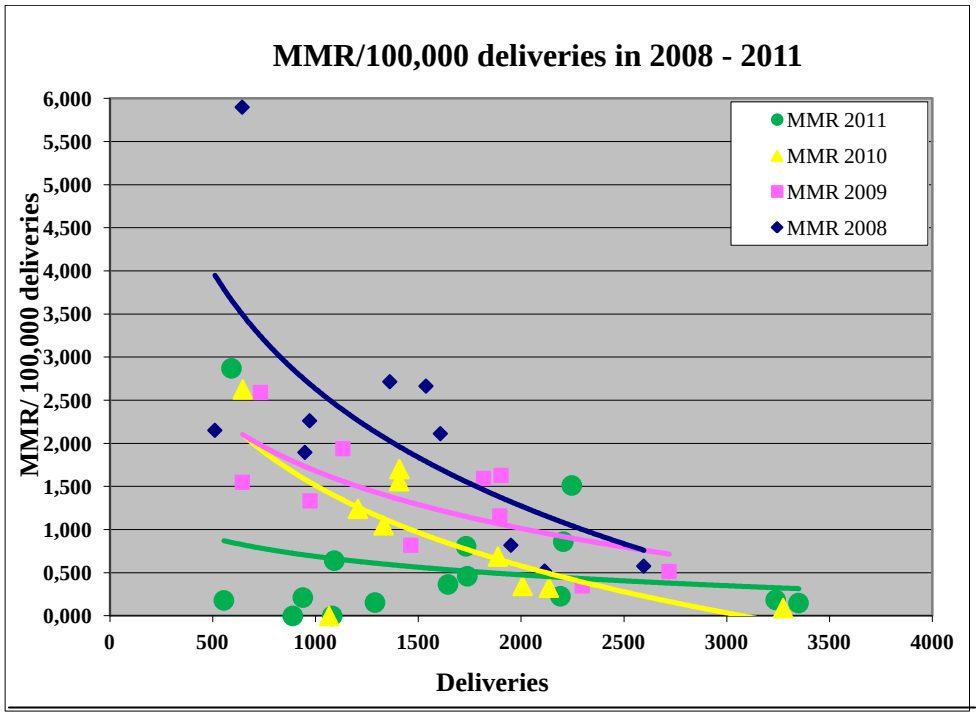


Fig. 3: Maternal Mortality Ratio (x1000/100 000 live birth) in relation to the number of deliveries in Kaduna, Kano and in 2011 in FCT Abuja State hospitals.

It is of significance to recognize that hospitals with low delivery rates have higher MMR. This has however significantly changed from 2008 t0 2011

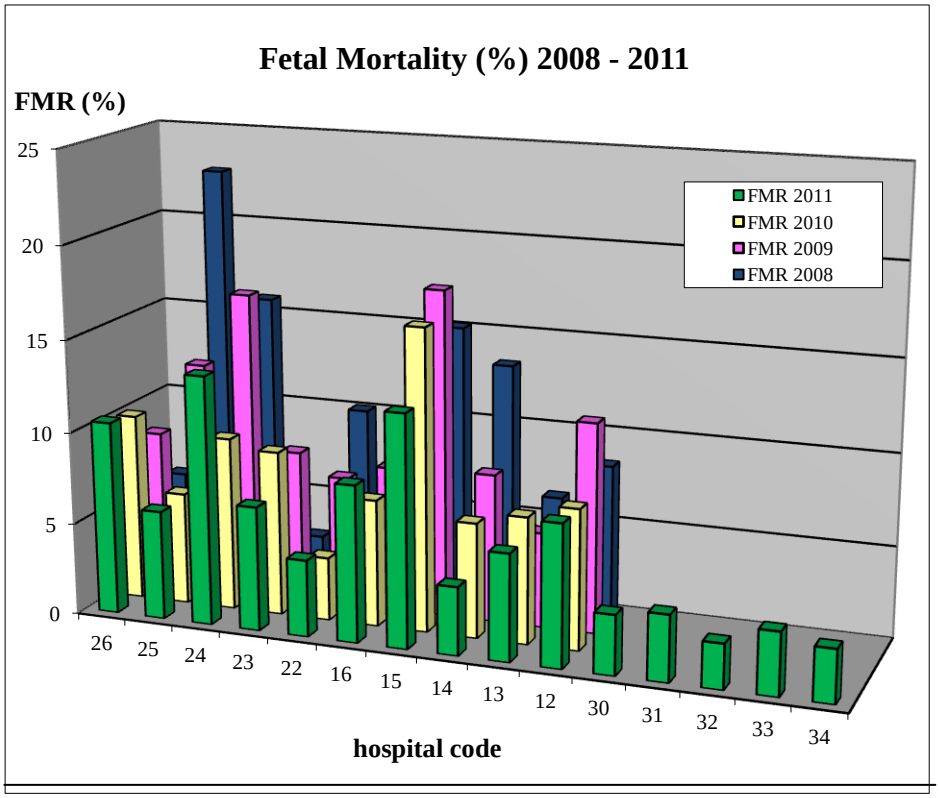


Fig. 4: Fetal Mortality Ratio (%) in 2008 to 2011.

There is a considerable variation of fetal mortality ratio (FMR) over the past three years. In four hospitals there was a reduction of FMR whereas in the remaining hospitals no change or even an increase (26,23) could be observed was observed.

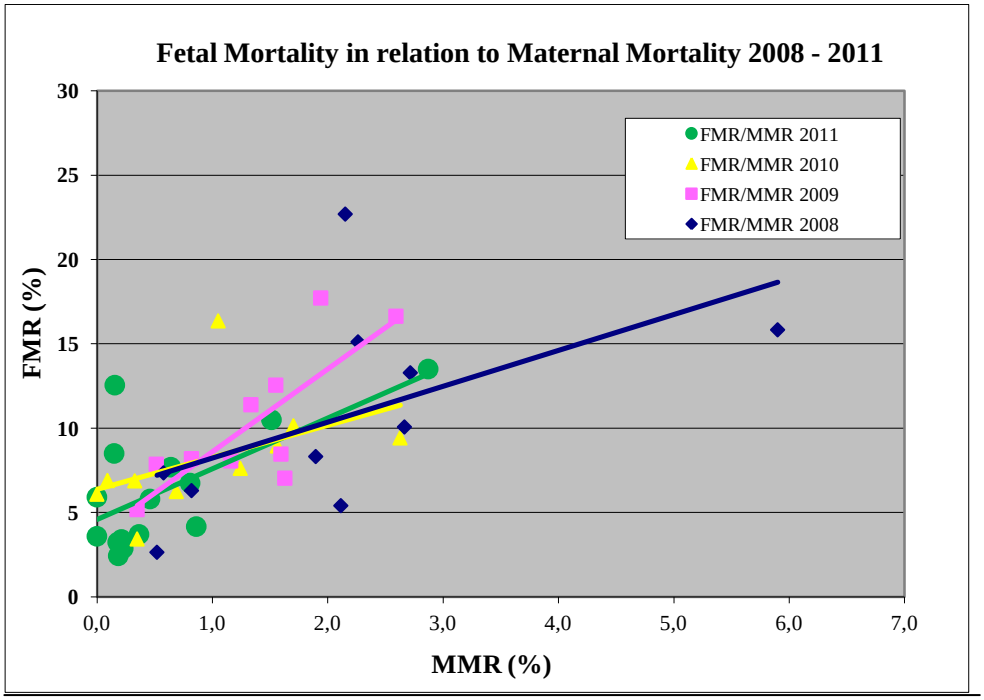


Fig. 5: Fetal mortality ratio (FMR %) in relation to maternal mortality (MMR x1000 /100 000 life birth) in 2008 to 2011.

There is a strong relationship between the MMR and the FMR showing that high MMR is associated with elevated FMR.

4. Influence of interventions on fetal mortality

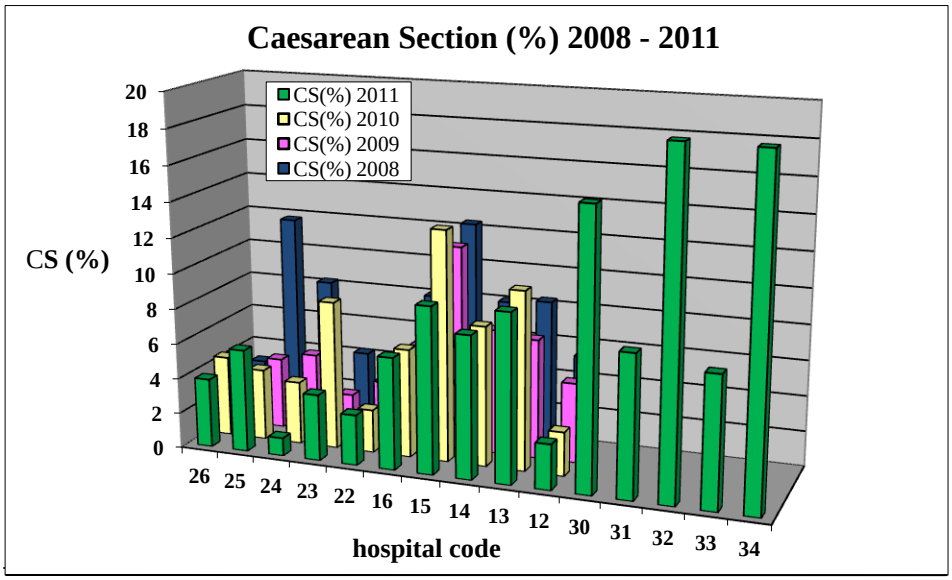


Fig. 6: Caesarean section rate (%) in Kaduna, Kano and FCT Abuja State hospitals.

As shown in this figure there is considerable variation in the CS rates in the different hospitals and there is no clear pattern over the four years, but adding FCT Abuja State hospitals in 2011 it is shown very clearly that higher numbers of CS are achieved.

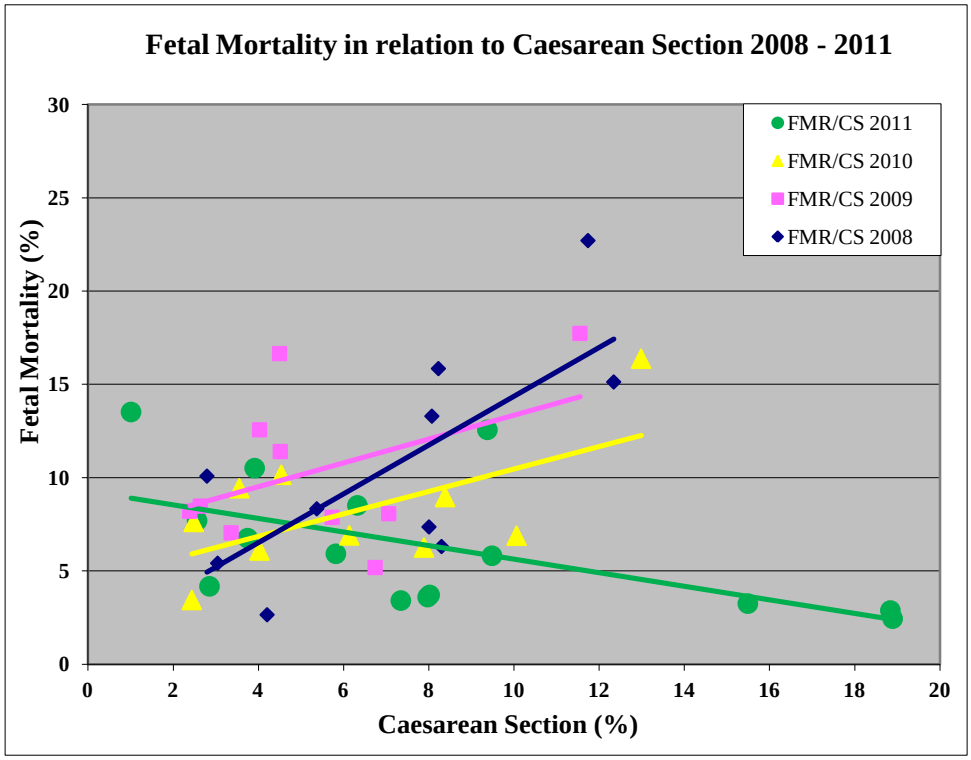


Fig. 7: The relationship between CS-rate and fetal mortality ratio in 2008 to 2010.

There exists in 2008 to 2010 the paradoxical observation of increasing FMR with rising CS-rates. It is assumed that in cases of severe complication to the mother a CS has been conducted to save the life of the mother although the fetus is already dead. In 2011 a fall of FMR goes in parallel with rising CS rates.

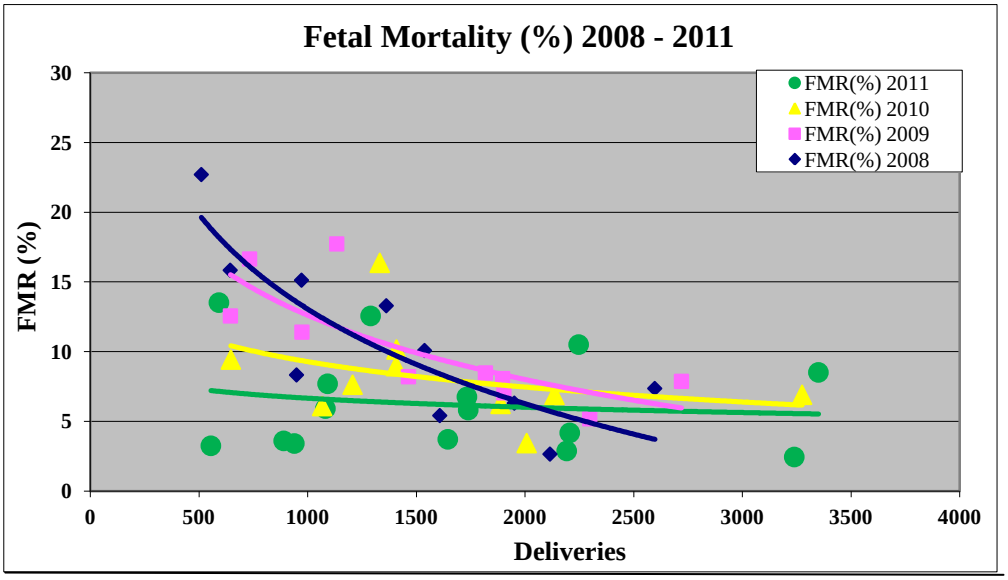


Fig.8: The relationship between the number of deliveries in a hospital and fetal mortality.

It is evident that smaller hospitals with low number of deliveries have the highest frequency of fetal mortality. There has been a slight change over the past four years, i.e. FMR fell in hospitals with lower number of deliveries. (see green correlation curve 2011)

5.Associations between post partum haemorrhage, preeclampsia/eclampsia, the number of deliveries and maternal mortality

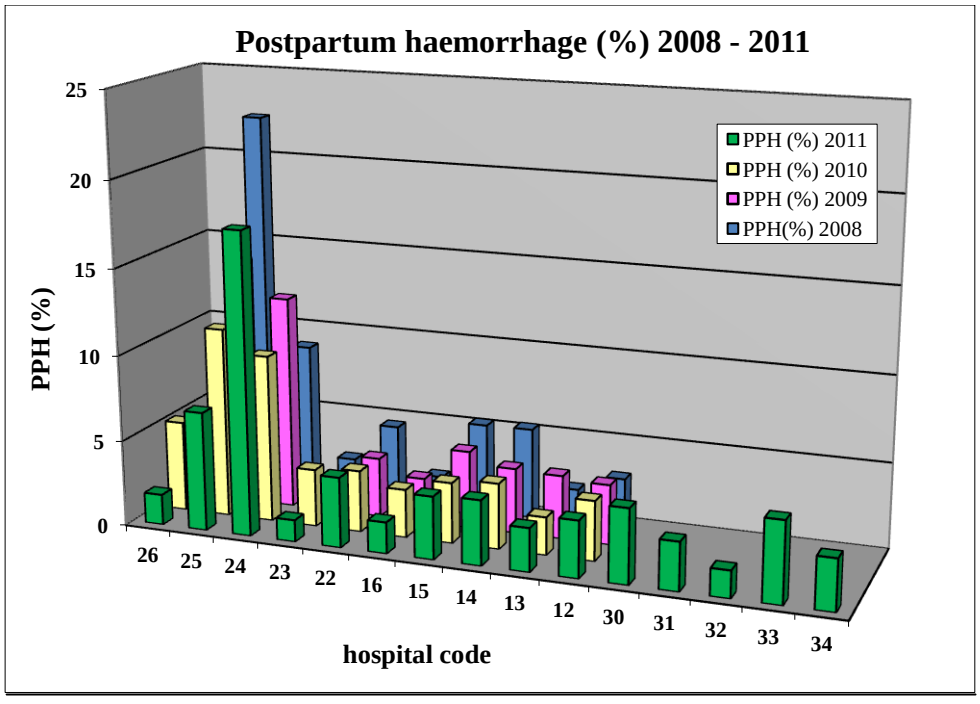


Fig. 9: The incidence of post partum hemorrhage (PPH) in Kaduna, Kano and FCT Abuja State hospitals.

There exists a tremendous variation among the hospitals, especially in hospitals 25 and 24. Further investigations have to clarify this observation. However in 7 hospitals there are fewer cases of PPH in 2011 as compared to 2008, 2009 and 2010.

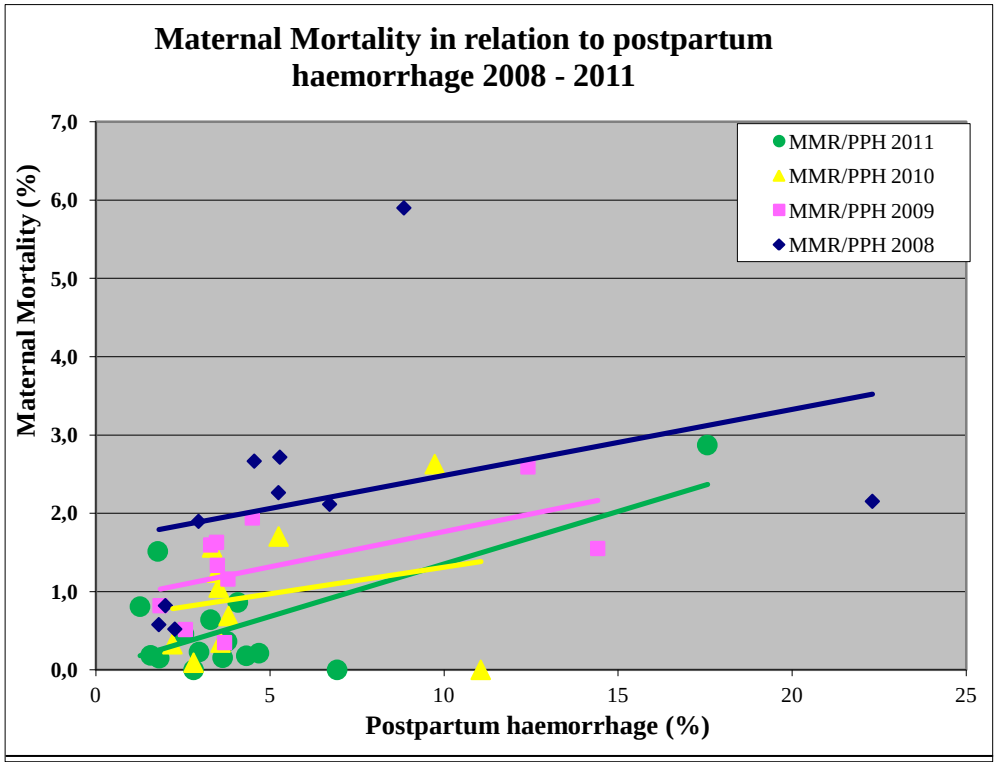


Fig. 10: The relation between post partum hemorrhage and maternal mortality.

There exists a weak relationship between the rate of PPH (%) and MMR. It is clearly shown, that MMR in relation to PPH fell over the years. This needs further investigation.

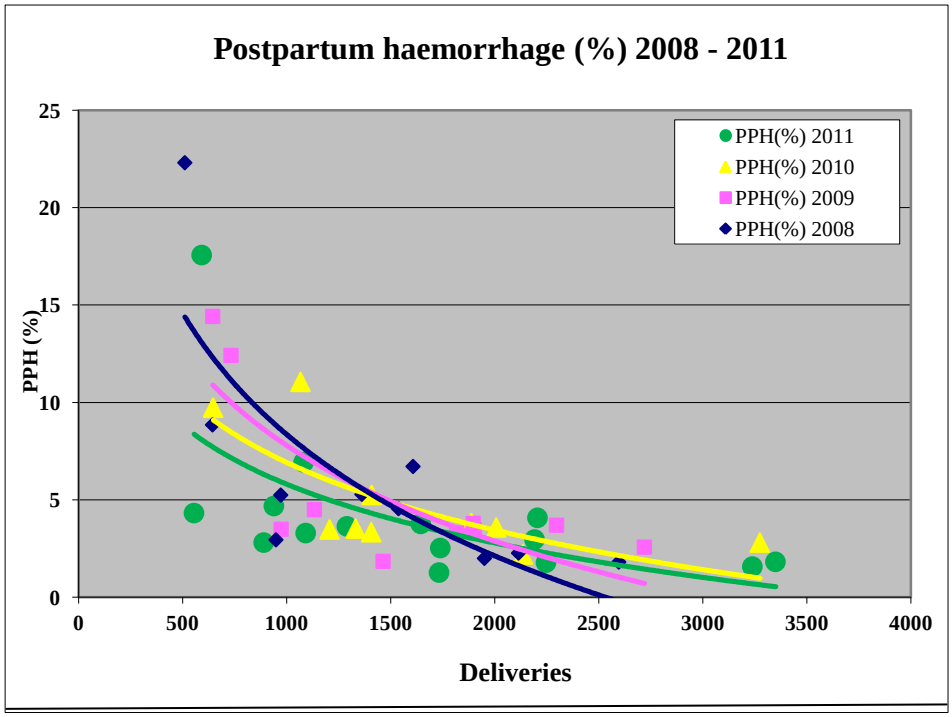


Fig. 11: Post partum hemorrhage (PPH%) in relation to the number of deliveries in the hospitals in 2008 to 2011.

PPH was highest in hospitals with low delivery rates in 2008 (blue line). In 2011 the incidence of PPH in relation to the number of deliveries fell (green circles). Further investigation have to resolve the causes and problems behind this observation.

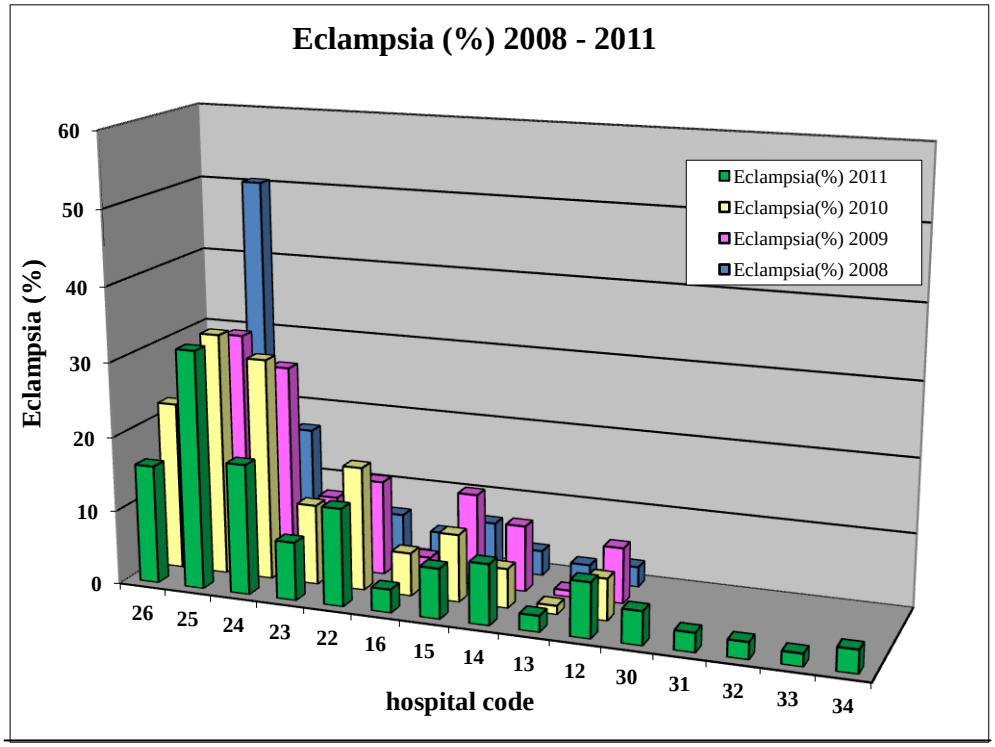


Fig. 12: Incidence of eclampsia and pre-eclampsia in Kano, Kaduna and FCT Abuja State hospitals in 2008 , 2009, 2010 and 2011

The different incidence in the various hospitals is remarkable. Further analysis shows that those hospitals with high PPH also have high eclampsia rates and high MMR.

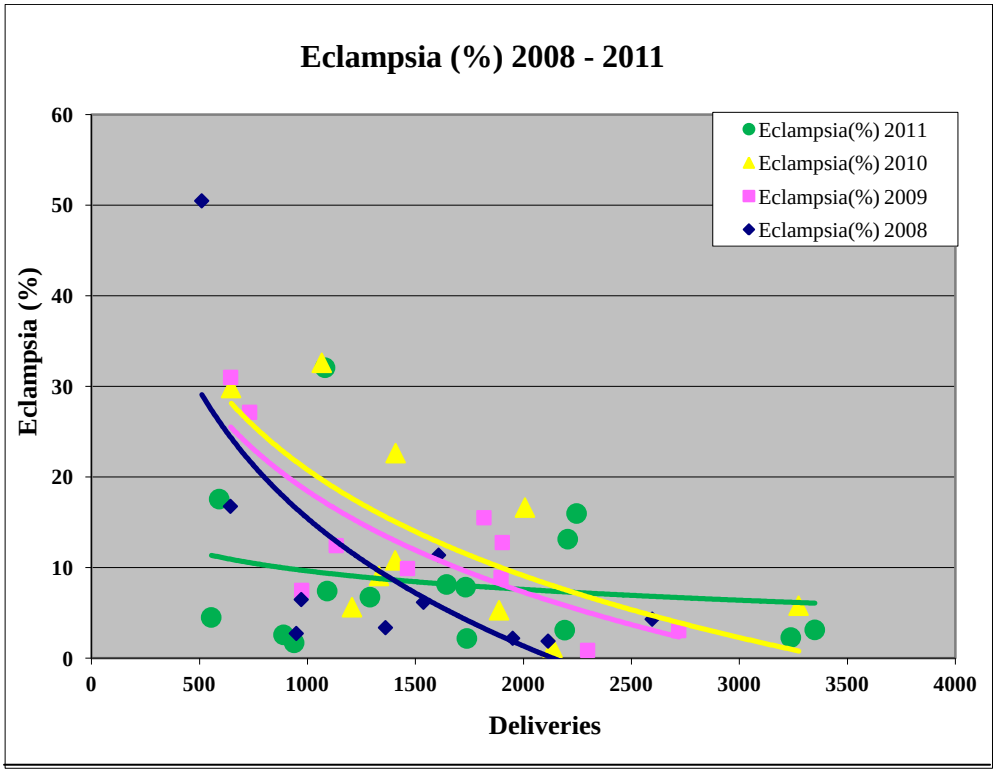


Fig. 13: The incidence of eclampsia in relation to the number of deliveries in Kaduna, Kano and FCT Abuja State hospitals in 2008 to 2011.

The graph demonstrates the close relationship of eclampsia to the number of deliveries, e.g. the size of the hospital. This interesting observation needs further investigations to find out, why the incidence of eclampsia is elevated in smaller hospitals. There is however an improvement over the past years

6. Instruments to tackle the problem of high fetal mortality

Fig 14: Checking the maternity record book by the chief midwife

Fig 15: Fetal heart rate observations during labor by FHR doppler and partograph

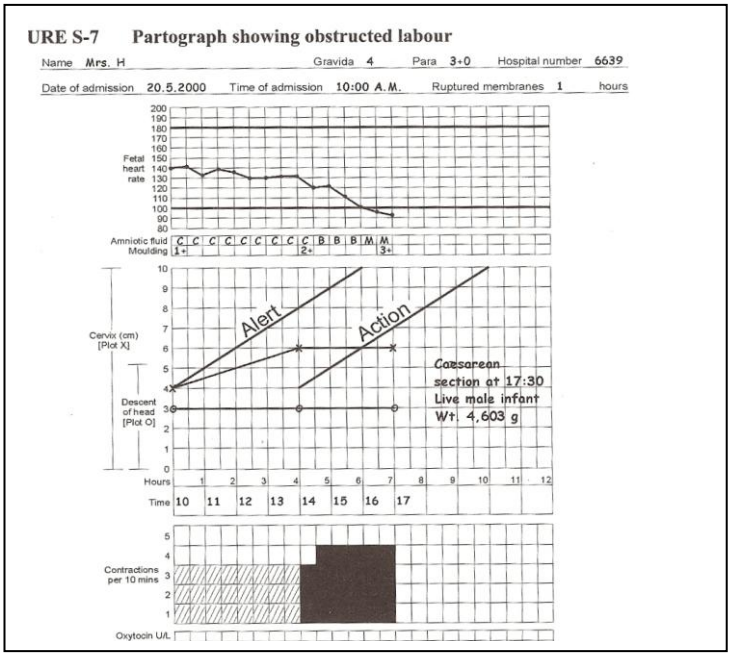


Fig. 16 : Partograph and **Fetal Heart Rate Doppler**:
are mandatory instruments to reduce the death of the fetus before and during labor and also in the neonatal period.

Demonstration of the application of the “Pocket Fetal Doppler” during a “Review meeting”.

III. Audit of hospitals

1. Evaluation:

For the evaluation "**Score criteria for general status"** and **"Score criteria for hygiene condition"** have been used**.** Each of the five items:

1. Operating theatre
2. Delivery room
3. Neonatal unit
4. Delivery ward/Antenatal clinic
5. General Conditions

have been valued from one (excellent) to six (very poor) *(see table 2 Instrument for auditing)*. The total score ranged according to the points given for each subdivision from minimum five points to maximum thirty points for general status and from five to thirty points for hygiene condition, in total from ten to sixty. The score points were used to correlate a relationship between maternal mortality as the worst outcome of facility management and the score for each hospital.(see Fig. 15 and Fig 16)

2. Instrument for auditing

Score criteria for general status:	**Score criteria for hygiene condition:**
Operating theatre:	
• **Anesthesia Apparatus**	• **Condition of the floor**
• **Operating table**	• **Cleanness of sink**
• **Resuscitation equipment**	• **Cleanness of apparatus**
• **Instruments for operations**	• **Dust distribution**
• **Intubation set**	• **Blood stained equipment**
• **Suction machine**	• **Cleanness of resuscitation equipment**
• **Anti shock garments**	• **Filled suction machines**
• **Oxygen availability**	• **Sterilizing condition**
• **Ambu bags**	• **Blood stained walls**
• **Caesarian section set**	• **Availability of operating shoes**
• **Theatre lamp**	• **Unorganized storage of material**
• **Sterilizer**	• **Cleanliness of record books**
Delivery room	
• **Delivery beds**	• **Dust distribution**
• **Delivery instruments**	• **Blood stained delivery beds**
• **Specula**	• **Rusted instruments**
• **Vacuum extractor**	• **Rusted delivery beds**
• **Episiotomy set**	• **Conditions in bowls for sterilizing**
• **Delivery set**	• **Condition of mattresses**
Baby scale	• **Hand disinfection**
Gloves	• **Resuscitation units for newborns**
Neonatal unit:	
• **Incubator**	• **Dust distribution**
• **Instruments for intubation + resuscitation**	• **Rusted instruments**
• **Baby scale**	• **Condition of mattresses**

Delivery ward/Antenatal clinic:	
• **Number of beds**	• **Conditions of beds**
• **Drip system**	• **Dust stained mattresses**
• **Mosquito nets**	• **Condition of the floor**
• **Maternity record book**	• **Availability of mosquito nets**
• **Ultrasound scanning room**	• **Cleanness of ultrasound probes**
• **Mother scales**	• **Dust stained instruments**
• **Sphygmomanometer**	
General Conditions:	
• **Water supply, bore hole**	• **Hygiene of sinks**
• **Electricity (power supply)**	• **Hygiene of toilets**
• **Window form and good seal**	• **Cobwebs**
• **Generator**	• **Gloves**
• **Refrigerator**	• **Aprons**
• **MG-Sulfate**	• **Masks**
• **Blood bank availability**	

3. Audit of Kaduna State and Kano State hospitals regarding the condition of equipment in the facilities and the hygienic condition in relation to MMR

Fig. 17: Relationship between hygienic rating and maternal mortality ratio (%). The hospitals were evaluated according to the hygienic state of the operating theatre, delivery room, neonatal unit, obstetrical ward/antenatal clinic and variable factors, such as water supply and others. Each unit was evaluated by a score from 1 (best result) and 6 (worst result). A score of 5 was equal with excellent conditions, and 30 was equal to worst conditions for both hygienic conditions. Hospitals with the lowest score of 5 – 20 had in three out of four cases the lowest MMR of lower than 10 maternal death / 100 000 deliveries and hospitals with the highest score of about 20-30 had the highest MMR in the year 2009.

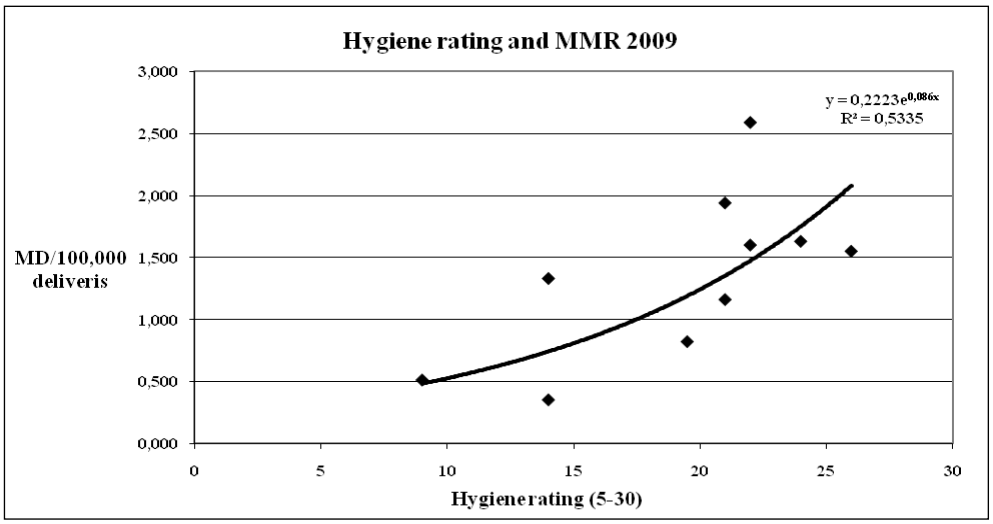


Fig 18: Relationship between the state of the hospital equipment in the obstetrical facility and MMR. The hygienic conditions are not taken into consideration. A good rating of the equipment is closely related to a low MMR of about 500 maternal eath per 100 000 deliveries , whereas high ratings are associated with a high MMR.

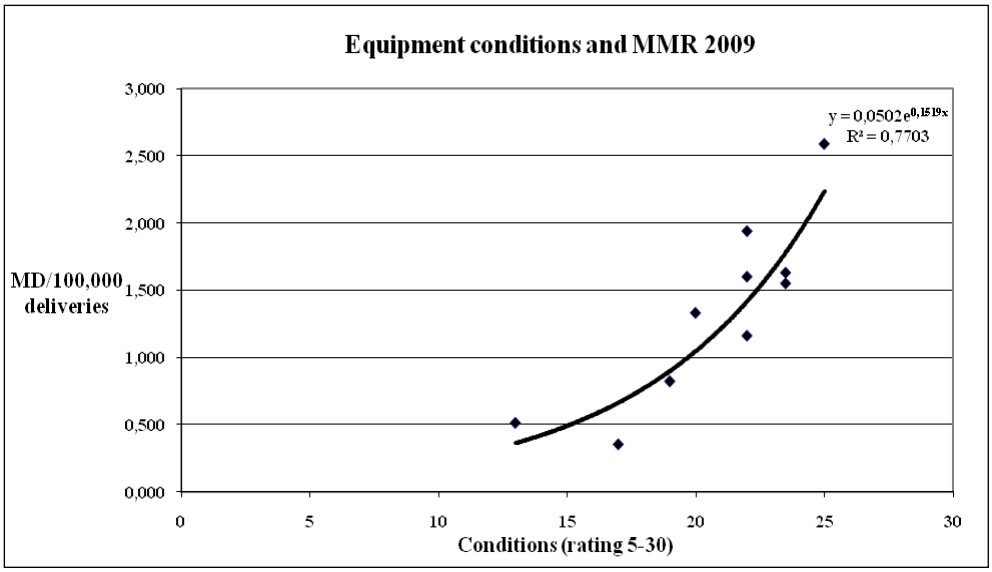


Fig. 19: Example of a well equipped and functional, clean operating theatre

IV. Clinical profile 2011

	Median	Range (min – max)	Reference Hospital *
Number of deliveries (n)	**1645**	**(555 - 3350)**	**3239**
Caesarean section (%)	**7.35**	**(1.01 – 18.89)**	**18.89**
Retained placenta (%)	**1.09**	**(0.63 – 5.57)**	**0.71**
Eclampsia/Preeclampsia (%)	**6.74**	**(1.70 – 32.07)**	**2.28**
Post partum haemorrhage (%)	**3.30**	**(1.27 – 17.57)**	**1.57**
Maternal mortality (pro 100.000 life birth)	**230**	**(0.00 – 2870)**	**190**
Fetal Mortality (%)	**5.81**	**(2.44 – 13.51)**	**2.44**

*The hospital with the lowest MMR and lowest FMR was selected as reference hospital

Half yearly Checklist

Items to be checked							
	1	2	3	4	5	6	
	Exc.					poor	
1. Delivery ward							
Maternity record book							
Delivery beds							
Availability Oxytocin							
Availability Ergometrin							
Availability Prostaglandines							
Long elbow gloves available							
Cleanness of Ambu bags							
Ultrasound machine (functioning)							
Fetal doppler (functioning) – filled batteries							
2. Neonatal unit							
Baby scale (functioning)							
Resuscitating equipments							
3. Operating theatre							
Blood stained equipment							
Cleanness of suction machine							
Cleanness of operating theatre							
Anaesthesia apparatus (functioning)							
Cleanness of operating table							
Dust – cleanness of the floor							
Theatre lamp working							
Resuscitating equipments							
Autoclave (functioning)							
Cobwebs							
4. Ante and postnatal clinic							
Availability MG-Sulfate							
Anti shock garments available							
Mosquito nets in use							
5. Neonatal unit							
Resuscitating equipments							
Incubator							
6. General conditions							
Water supply (bore hole, water tank)							
Power supply, Generator							

V. Activities

1. Publications and Abstracts

Zinser, R.: Rotary Project to reduce maternal Mortality.
Women deliver Conference, Ministers' Forum, October 18-20, London 2007.

Künzel, W., H. Galadanci, D. Shittu, M. Gruhl, R. Zinser: A model to reduce maternal mortality and fetal mortality in ten hospitals in Kaduna and Kano State, Nigeria – Continuously conducted quality assurance in obstetrics.(Abstract).
International Stillbirth Conference (ISC/NPF) November 5-7, Oslo 2008

Galadanci H, W. Künzel, D. Shittu, M. Gruhl, R. Zinser:
Quality Assurance in Obstetrics: A Model to reduce maternal and fetal Mortality and Morbidity in 10 Hospitals in Kano and Kaduna State, Nigeria (Abstract)
FIGO World Congress Cape Town , South Africa , October 2009

Shittu, Dolapo, W. Künzel, H. Galadanci, M. Gruhl, R. Zinser, St, Adams.
Prevention of obstetric fistula by quality assurance in obstetrics – a model of improved obstetrical service in Kano and Kaduna State (Abstract)
ISOFS Conference on obstetric fistula, November 25-27, Nairobi 2009

Adams, S., W. Künzel, H. Galadanci, O. Shittu, M. Gruhl, R. Zinser, Reduktion der mütterlichen Mortalität durch Qualitätssicherung in der Geburtshilfe in Kano und Kaduna State, Nigeria, Kongress der Deutschen Gesellschaft für Gynäkologie und Geburtshilfe, München 5.-8. Oktober 2010 (Poster-Präsentation)

Künzel, W. Quality assurance and audit in obstetric care in Nigeria – a model to guarantee sustainability. RCOG International Newsletter 3, (2010) 16-19

Galadanci , H. W. Künzel, D. Shittu, M. Gruhl, R. Zinser, St. Adams , Obstetric quality assurance to reduce maternal and fetal mortality in Kano and Kaduna State hospitals in Nigeria. Intern. J. Gynecol. Obstetrics 114 (2011) 23-28

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2. Meetings on Maternal and Perinatal audit

- I. Perinatal Conference Zaria August 2008
- II. Perinatal Conference Kano February 2009
- Maternal and Child Health Hospital – Report 2008
  Institute of Quality Assurance in Obstetrics Kano State and Kaduna State, Nigeria III.Perinatal Conference in Zaria September 2009
- IV. Perinatal Conference Kano February 2010
- Maternal and Child Health, Hospital – Report 2009
  Institute of Quality Assurance in Obstetrics Kano State and Kaduna State, Nigeria
- V. Perinatal conference in Kaduna February 2010
- Maternal and Child Health, Hospital – Report 2010
  Institute of Quality Assurance in Obstetrics Kano State and Kaduna State, Nigeria
- VI. Perinatal conference in Kaduna November 2010
- VII Perinatal conference Kaduna March 2011
- Maternal and Child Health, Hospital – Report 2011
  Institute of Quality Assurance in Obstetrics Kano State and Kaduna State, Nigeria

3. Reports in Media and Press

Rotary maternal health project receives royal recognition
Matthias Schütt, Rotary International News -- 29 August 2008

Keeping mothers healthy keeps kids healthy too
Diana Schoberg, The Rotarian -- December 2008

Rotary‘s Großprojekt in Nigeria - keine Zukunft ohne gesunde Mütter
Matthias Schütt, Rotary Magazin 1 | 2008

Warum die Familie Kande verstieß**…** Preis für frühe Geburten: Gynäkologische Fisteln –
Prof. Künzel informierte sich über Hilfsprojekt in Nigeria
Giessener Allgemeine, 2008-02-11

“Minütlich stirbt eine Frau im Kindbett”
Frankfurter Allgemeine Zeitung 2009, C.P. Müller von der Grün

Rotary Project MG 53403 - A model to reduce maternal and fetal mortality and morbidity in 10 hospitals in Kano and Kaduna State, Nigeria
Robert Zinser, PDG D1860 (Germany), RI-UN Day 2009

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Sterben ohne gelebt zu haben – Das Risiko Schwangerschaft in Nigeria
Thomas Kruchem 29.12.2009 Journal Panorama

Putting children first, Rotary’s special emphasis for 2008-09 ties in with major UN goals and reinforces work Rotarians are already doing– Brad Webber, Global outlook, A Rotary World Magazine Press supplement

Dying without having lived Thomas Kruchem, Rotary Magazine 4/2010

Maternal and Neonatal Health in Northern Nigeria – improvement by quality assurance in obstetrics. Blogging for HNN (Healthy Newborn Network)
by Wolfgang Künzel, Sept 22, 2011

4. Community dialogue

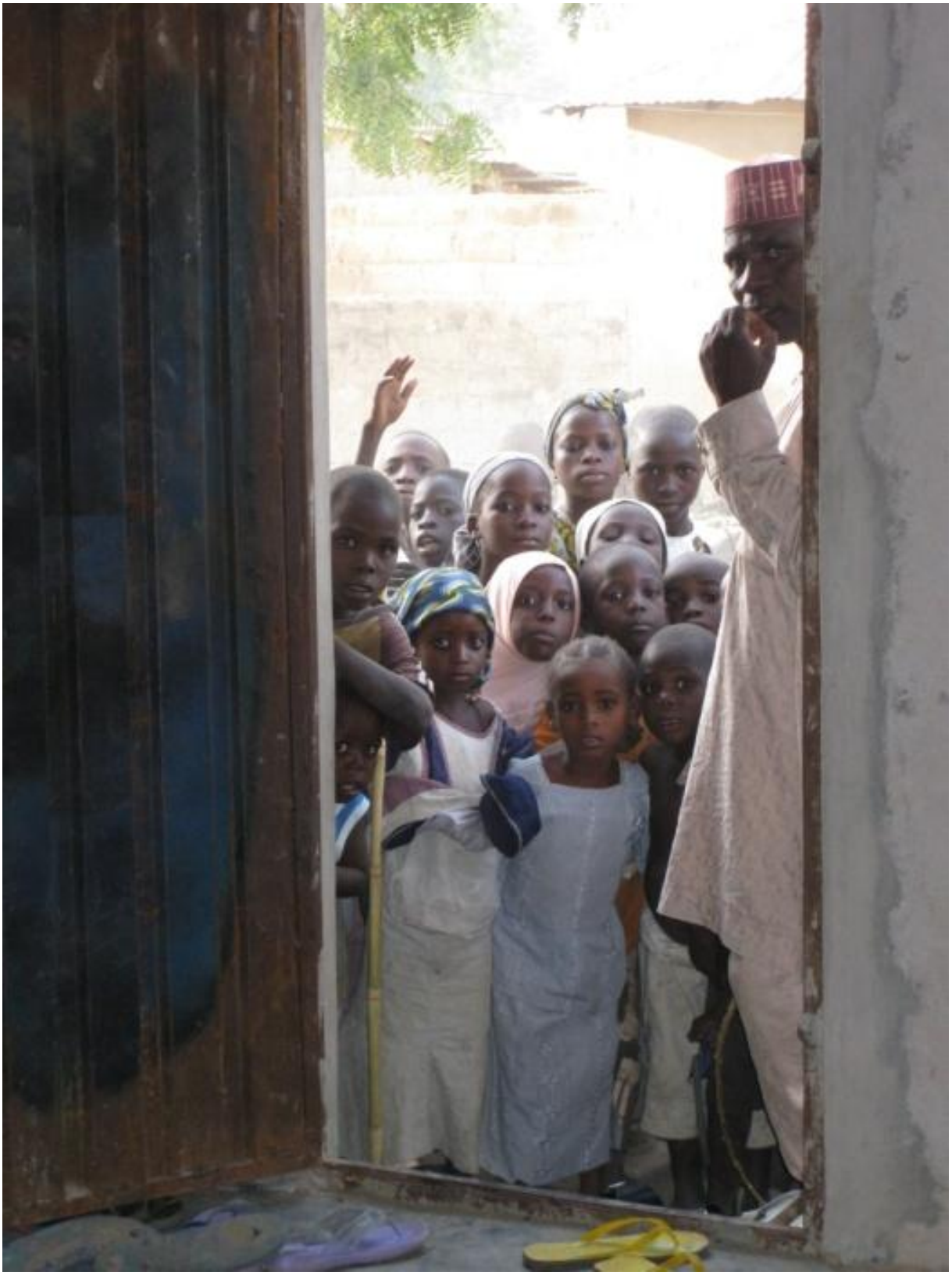
Conducted Community Dialogues in the villages adjacent to the ten selected hospitals in the states of Kano and Kaduna

KANO STATE

NAMES OF FACILITIES	NAMES OF VILLAGES
1. GAYA GEN. HOSPTAL	KAWARI ANGUWAR DAWA.
2. WUDIL GEN. HOSPITAL	DAN KAZA AJIKA.
3. TAKAI NYSC HOSPITAL	DURBUNDAI FAJEWA.
4. SUMAILA GEN.HOSPITAL	MAGAMA GALA.
5. SHIEKH JIDDA	SARINA RIMIN DADA

KADUNA STATE

NAMES OF FACILITIES	NAMES OF VILLAGES
1. GAMBO SAWABA ZANA	DUTSEN ABBA DAKACE
2. KAFANCHAN GEN. HOSPITAL.	TAKAN GINDA DANGOMA.
3. BIRNIN GWARIGEN.HOSPITAL.	KUYELLO GAYAM.
4. YUSUF DANTSOHO.	MAKERA KADUNA SOUTH.
5. SAMINAKA GEN. HOSPITAL.	KAYARDA DUTSEN ALHAJI.

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