NIGER DELTA UNIVERSITY
WILBERFOCE ISLAND, BAYELSA STATE.

32ND Inaugural Lecture

TITLED

BEST EVIDENCE: BEST CARE FOR NEWBORNS, THE PROSPECTS IN BAYELSA STATE.

BY

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DEDICATION

First- This lecture is dedicated to God Almighty.

Second – This lecture is dedicated to my Friend, Brother and Confidant, Late Mr. Onaworio Wilson Sam-Edgar.

Third – This lecture is dedicated to my precious jewels-Nengimote, Enenimiete and Christopher.

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PROTOCOL

The Pro-Chancellor, Sir
The Ag.Vice-Chancellor,
Members of the Governing Council,
Deputy Vice-Chancellors (Academic and Administration)
Registrar and other Principal Officers of the University,
Provost, College of Health Sciences,
Dean, Postgraduate School
Deans of other Faculties,
Heads of Departments,
Staff and students of NDU,
Staff of NDUTH.
Distinguished Guests
Ladies and Gentlemen

Preamble

I am grateful to God, who in His infinite mercies has kept me all through the stages of life and granted me the blessing of divine wisdom. I appreciate the Niger Delta University authorities under the leadership of our Acting Vice –chancellor, Professor Samuel Edoumiekumo for the honour and privilege given me to deliver this inaugural lecture.

This is the first inaugural lecture from the department of Paediatrics, one of the 13 departments of the Faculty of Clinical Sciences, College of Health Sciences, Niger Delta University, Bayelsa State. I have captioned the title of this Inaugural lecture "**BEST EVIDENCE: BEST CARE FOR NEWBORNS, THE PROSPECTS IN BAYELSA STATE".** I intend to share the facts known to my colleagues and I, as well as present the challenges faced by the newborns and those involved in their care. It is my hope that as I share these experiences/evidence, we will have a better understanding of the current situation of newborn care in Bayelsa State and take a collective responsibility on improving newborn health outcomes. We, as stakeholders are expected to show a commitment to a shared concern which in this case is insuring best care for newborns, thereby improving newborn survival. This is very important because a shared concern will lead to a shared vision and irrespective of our social class, religious inclinations and affiliations, it will bring us to a place where we give the same attention and not divergent opinions on the best approach to newborn health" *We are each of us angels with only one wing, and we can only fly by embracing one another" Luciano De Crescenzo(1928).*

INTRODUCTION

1.0 Brief historical perspective of Paediatrics:

Mr.Ag. Vice Chancellor Sir, the word Paediatrics means healer of children; it is derived from two Greek words: παῖς (child) and ἰατρός (doctor or healer).

Paediatrics as a discipline deals mainly with the health of infants including newborns, young and older children (adolescents), their growth and development .Peadiatrics emerged as a Medical Specialty when there was an increasing awareness that the health problems of children differ significantly from that of the adult population both in their clinical presentation and body's response to illness (Richard, Robert &Jenson, 2003). It was also observed that the way children respond to stressful events e.g. wars, internal displacement of persons (IDP) due to insurgency as witnessed in recent times especially in the Northeast of Nigeria differ from the adults e.g. diarrhoeal diseases and malnutrition which occur among children may not occur in the adult population who share the same stressful environment i.e. IDP camps. In addition, some factors which are inter- related such as occurrence of some infectious diseases e.g. the recent outbreak of Cerebro- spinal meningitis in Northern Nigeria , the socio-economic and educational status of parents, norms and beliefs of various communities among others do have significant influence on the general well-being(health) of children . It was the combination of these factors that gave rise to the need to address this group (children) as a separate entity and not a sub-unit of the adult population (Richard, Robert &Jenson, 2003).

The first generally accepted Paediatric Hospital in the western world is the Hôpital des Enfants Malades (French = Hospital for Sick Children) shown in Fig.1. It was established by the *Conseil général des Hospices* (General Hospices Council) and opened in Paris in June 1802, on the site of a previous orphanage.

Fig.1 Front view of Enfants Malades 600-bed capacity.

This example was gradually followed in other European countries e.g Berlin in 1830 Vienna and Breslau (now Wroclaw), in 1837. The English-speaking world waited until 1852 when the first Paediatric hospital, (the Hospital for Sick Children, Great Ormond Street, London) (Fig.2) was established, some fifty years after its namesake in Paris.
(http//en.m.wikipedia.org/wiki/Pediatrics)

Fig.2 The Great Ormond Street Hospital for Children, London. 389-bed capacity.

In USA, the such similar institution was the Children's Hospital of Philadelphia, opened in 1855, and then Boston Children's Hospital in 1869. (http//en.m.wikipedia.org/wiki/Pediatrics)

1.2 Brief historical perspective of Neonatology.

Neonatology is one of the sub-specialties of Paediatrics and according to the Miriam-Webster dictionary is the branch of medicine concerned with the care, development and diseases of newborn infants (1960). The Harper Douglas “Neonatal “ online Etymology dictionary defined the word "neonatology" as words stuck together from several root words and basically means "science of the newborn" -- "*neo" = new, "natal" = birth, "ology" = science of*.

Neonatal Care began with French midwives and Obstetricians, (figs. 3&4) the Paediatricians were not involved. Prior to the 19th century, newborn care was traditionally regarded as the responsibility of mothers. The first physicians who attempted to treat premature babies found gaining the mother's confidence and cooperation as challenging. Even the doctors themselves were divided as both Obstetricians and Paediatricians claimed that their specialty was better situated to deal with problems of prematurity.

Fig. 3 The French midwives involved in early neonatal care.

Fig.4 Pierre-Constant Budin (November 9, 1846 – January 22, 1907)

Dr.Budin, French obstetrician was a pioneer in the care of at risk babies and devoted his career to reducing infant mortality by educating new mothers about proper nutrition and hygiene for their babies. He also stressed the importance of the use of breast milk instead of cow's milk. He brought gavage (the process of feeding through a tube that went directly to the stomach) which helps premature infants who had difficulty in feeding. Budin started his career as an assistant to Etienne Stephane Tarnier, who developed the first incubators in 1880, a development that changed the course of neonatology.

Fig.5a Etienne Stephane Tarnier

Fig.5b. Tarnier's incubators in the Maternite´ Hospital,Paris,1884

Tarnier (fig. 5a) sought to find a means to warm the numerous premature infants who routinely succumbed to hypothermia on the wards of Paris's Maternite´ hospital. He was inspired after a visit to the chicken incubator display in the Paris zoo to have the zoo's instrument-maker install a similar device for the care of infants in 1880 (fig. 5b). The invention of the incubator set into motion a three-way contest between mothers, obstetricians, and Paediatricians regarding who should care for the premature infant. Worthy of note however is prior to this time metal warming tubs heated by means of a double-walled jacket of warm water had been in use in some European maternity hospitals for 20 years. Tarnier's technology was picked up by a student of Budin's, Dr. Martin Couney.In the late 19th century (1890's) in Nice, France, Alexandre Lion developed a more sophisticated incubator than that of Tarnier, a thermoregulated incubator, which was later manufactured by Paul Altmann in Berlin (Fig.5c) who worked with American neonatologist Dr. Couney (Fig.5d). The first premature infant incubator station which was the most sustained attempt to incorporate a Lion-style incubator station into an actual hospital was established in 1898 in Chicago, Illinois by Dr. Joseph De Lee.

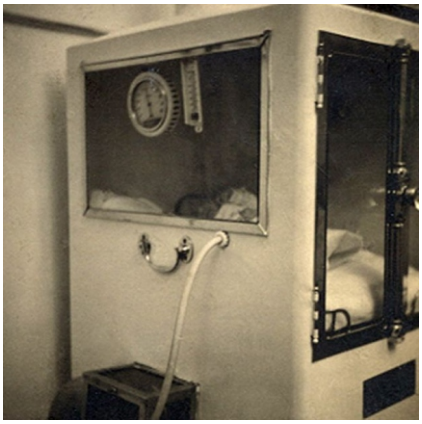
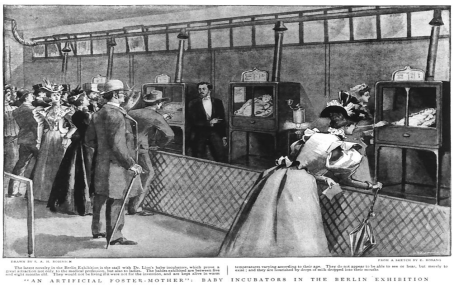


Fig.5c. The Lion-style incubator

Fig. 5d. Dr.Martin Couney (1869-1950)



"AN ARTIFICIAL FOSTER-MOTHER." BABY INCUBATORS IN THE BERLIN EXHIBITION

Fig.6a. The Incubator Baby Side-Show

Fig.6b.Incubator baby"graduate"reunion organized by Alexandre Lion,1894

Because caring for premature babies was expensive, incubator shows and expositions were set up to raise funds. Dr. Couney's exhibitions (Figs.6a&6b) put the spotlight on the effectiveness of the incubator, which encouraged hospitals to adopt the technology. In 1914, while exhibiting in Chicago, Couney met a local Paediatrician, Julius Hess (Fig.7), who was later known as the father of American Neonatology.

Fig.7 Dr Julius Hess, (1876–1955)

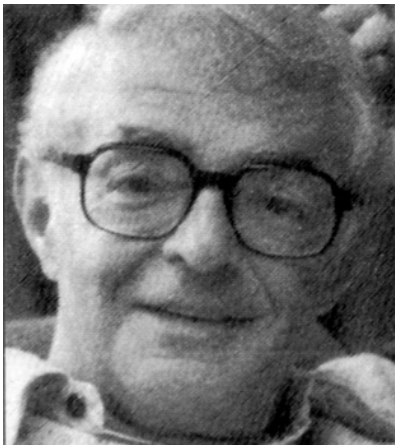


Fig. 8. Gluck Louis, MD (1924 – 1997)

Dr Hess at the Reese Hospital in Chicago invented the Hess incubator which in addition to providing heat and humidity for babies, delivered oxygen to the infants. Hess also invented the first transport incubator for newborns in 1922.

Another milestone in neonatal care was attained after Gluck's (Fig.8) research revealed that infections were more likely to be caused by poor hand hygiene than other infants, he designed the modern neonatal intensive care unit in 1960, at Yale University-New Haven Hospital, New Haven, Connecticut.

This new design i.e. the neonatal intensive care unit encouraged the use of isolettes and incubators in one room as opposed to keeping babies sectioned off in isolated cubicles. This allowed the doctors, nurses and caregivers easy access to the babies. Gluck additionally designed the L/S ratio test, which determines the maturity of infant's lungs which predicts their chances of developing respiratory diseases.

Table 1: Timeline of some notable historical events in neonatology.

1922	Julius Hess	First "premature station" at Sarah Morris Hospital, Chicago
1922	Hess	First transport incubator for newborns
1948	Committee on Fetus and Newborn, AAP	First edition of "Standards and Recommendations for Hospital Care of Newborns" published.
1952	Virginia Apgar	Describes a scoring system for assessment of infants at birth, now known as the Apgar Score.
1953	Rickham	First neonatal surgical unit, Alder Hey Children's Hospital, Liverpool
1960	Alexander Schaffer	First use of terms "neonatologist" and "neonatology" in textbook (Diseases of the Newborn, Saunders, 1960)
1962	Koop	First neonatal surgical intensive care unit in the USA at Children's Hospital in Philadelphia
1964	Eickhoff	First report of Group B streptococcus in neonatal sepsis
1969	Lucey	Controlled trial: phototherapy treatment of hyperbilirubinemia
1971	Gregory	Use of continuous positive airway pressure (CPAP) for respiratory distress syndrome (RDS)
1975	American Board of Pediatrics	Neonatology subspecialty certification begins (pediatrics)
1983	American Academy of Pediatrics, American College of Obstetrics and Gynecology	AAP and ACOG publish "Guidelines in Perinatal Care"
1987	American Academy of Pediatrics, American Heart Association	Neonatal resuscitation training program launched by AAP and AHA
1991	Ballard	New Ballard Score (NBS) for gestational age, extended for extremely premature infants <26 weeks gestation
2009	Multiple authors	Mild therapeutic hypothermia for perinatal asphyxia is recommended as the standard of care
2010	Nelson	Reports fetal exposure to MgSO4 reduces cerebral palsy rates. Later, an NIH-sponsored controlled trial confirms the findings.
2017	American College of Obstetrics and Gynecology	Recommends the use of antenatal steroid in women with threatened late preterm birth.

Source: http://www.neonatology.org/history/timeline.html

1.3 Paediatrics in Nigeria

It is pertinent to note that before the advent of orthodox medicine in Nigeria, there were various patterns of care for the sick child including the newborn, practiced commonly by communities with shared beliefs and traditional inclinations. Such practices include application of herbal leaves such as *Bryophyllum Pinnatum* (Never Die, Resurrection leaf (Fig.9a) for umbilical wound healing where the leaves are squeezed or blanched in some cases and the juice extracted from it is applied to the newly born baby's umbilical cord daily for five days, an act that is believed to facilitate the healing process. Use of cow's dung (Fig.9b) ashes, and soot for umbilical dressing were also common practices by indigenous midwives and traditional birth attendants (Yvonne 1998, China et al. 2013).

Fig 9a: *Bryophyllum Pinnatum* (Never Die leaves)

Fig 9b: Cow's dung

Also the oral administration of *Bos Taurus* urine (cow's urine Fig.10a) to treat fevers and the application of palm kernel oil(Fig.10b) on the skin of a convulsing child to stop the convulsion as well as treat the accompanying fever is still practiced till date. A study by Oyedeji (2016) (Table 2) reported the efficacy of cow's urine in the treatment of convulsion, rheumatism and viral infections (measles, smallpox, chicken pox). The aforementioned are some of the traditional practices for the care for the sick child, in various communities in Nigeria.

Fig. 10a: Urine from these cows

Fig. 10b: A bowl of palm kernel oil (dark coloured)

Table 2:Traditional ingredients used for various ailments in Southern Nigeria.

Convulsion	Distilled urine Tobacco Leaf, Crinum jagus, Bridelia micrantha
Fever	Urine, Allium cepa
Stomach pain	Urine, Croton pendulifiorus
Sore throat	Fresh urine
General infection	Bile, alcohol, lemon, honey
Stomach pain	Bile, Aframomum melegueta
Infertility	Bile, lime, Citrus, honey and Harungana madagascariensis
Pesticide	Dung, Sand and ashes
Haemorrhoid	Dung, vitex grandifolia

The Portuguese, British and Scottish traders and sailors to the West Coast of Africa were accompanied by doctors who rendered services exclusively to them. The Missionaries on the other hand established medical institutions and built dispensaries and General hospitals e.g the Sacred Heart Hospital, Abeokuta 1885 by the Roman Catholic Mission. The colonial government

established medical stations especially in the north. The first medical training, Yaba Medical Training which came into operation in 1939 was for the training of medical assistants and was later upgraded to training of medical officers. The University College Hospital (U.C.H) was established as an annex of U.C.H London in 1957. It was shortly after Nigeria's Independence in 1962 that the first children's Hospital (Fig. 11) was established at Massey Street in Lagos. Massey Street Children's Hospital (MSCH) trained the first indigenous Paediatricians in Nigeria.

Fig. 11. The Premier Children's Hospital owned by Lagos State Government (MSCH).

Prominent Nigerian pioneers at UCH include Drs Animashaun, Ajenifuga, Fadahunsi Ekpechi, Professor Colis (an expatriate), Profs. Olikoye Ransome-Kuti, Hendriske, Antia among others(Yakubu 2012).

It will interest us to know that as we speak, Paediatric services and training take place in all the Teaching Hospitals and Federal Medical Centres across the 36 states of the Federation.

Two key associations worthy of mention are:

(a)Paediatrics Association of Nigeria (PAN) which was founded in 1968 and comprise of all medical doctors who are specialists in the care of children PAN engages in influencing policies and programmes that impact on the well-being of every child through advocacy and strategic interventions that promote and protect the survival, growth and development of children

(b)Nigerian Society of Neonatal Medicine (NISONM) founded in 2008, consist of Neonatal Paediatricians who care for newborn babies and seek to improve the standard of newborn care in Nigeria at every level especially at the community.

These associations have contributed immensely to child survival through capacity building, commitment of technical skills, and collaboration with national and international partners among other activities.

1.4 Paediatrics and Neonatology Practice

Paediatrics has the following subspecialties:

General Paediatrics
Emergency Paediatrics
Paediatric Cardiology
Endocrinology
Gastroenterology
Haematology-Oncology
Dermatology
Social Paediatrics

Nephrology
Infectious Diseases
Pulmonology
Neurology
Allergy and Immunology
Adolescent Paediatrics and
Neonatology

Who is a Paediatrician?

Mr.Ag. Vice-Chancellor Sir, since this is the first inaugural lecture by the department of Paediatrics, it is pertinent that I define who a Paediatrician is. A Paediatrician is a medical doctor who has completed a post graduate training in the field of Paediatrics. In our Nigerian setting, the doctor- trainee (Resident) enrolls in an accredited teaching hospital for the postgraduate training which spans a minimum period of six (6) years. During this period the Resident is expected to be successful in all the three stages of the professional examinations namely the Primary, Part 1 and Part 11 with defense of a dissertation (a research work that meets the standard both in content and quality under the supervision of senior colleagues) as part of the requirement for the award of the Fellowship. It also involves training and continuous evaluation in all the sub-specialties of Paediatrics while being supervised by specialists in those areas. These trainings are on a rotational basis for a specified period ranging from 3-6 months each as required by the curriculum of the Postgraduate Colleges. The Resident is also involved in the teaching of undergraduate medical students, junior residents and other allied health professionals as well as participation in Medical research. At the completion of the Part 11 Paediatric Fellowship examination of either the West African College of Physicians or the National Postgraduate Medical College, the medical doctor is duly certified to practice as a Consultant Paediatrician.

The training of a Neonatologist:
The Consultant Paediatrician commences training in newborn medicine at an approved center over a specified period ranging from six months to two years.
Neonatologists generally provide the following care:

- Diagnose and treat newborns with conditions such as breathing disorders, infections, and birth defects.
- Coordinate care and medically manage newborns born prematurely i.e. before 37 completed weeks of gestation, critically ill, or in need of surgery (such as those with diaphragmatic hernia, cleft lip and palate, congenital volvulus etc).
- Ensure that critically ill newborns receive the proper nutrition for healing and growth.
- Provide care to the newborn at a caesarean or other delivery that involves medical problems in the mother or baby that may compromise the infant's health and require medical intervention in the delivery room.
- Stabilize and treat newborns with any life-threatening medical problems (Meconium aspiration syndrome, severe Respiratory distress syndrome, multi-organ systemic failure following severe sepsis etc).
- Consult with obstetricians and families about conditions affecting the newborn infant.

Settings where neonatologist work:
Most of the neonatologists practice in Teaching Hospitals affiliated to a Medical school (training institution) such as ours - NDUTH and College of Health Sciences, Niger Delta University. Also a good percentage of this cadre of staff work in Federal

Medical Centers that may be affiliated to a training institution and only a few are in Private hospitals and are mostly engaged in group practice with other specialties such as Obstetrics/ gynaecology , General Practice, e.t.c. The major sources of referrals to the neonatal unit are from obstetricians, deliveries from other health facilities, self referrals and home deliveries including those attended by Traditional birth attendants.
Within a typical hospital setting such as ours, the neonatologist's time is divided between the Special Baby Care Unit (SCBU), the labour room, the labour theatre, the high risk infant follow-up clinic, some administrative meetings, educational conferences, as well as teaching of undergraduate medical students, interns, and Resident doctors.

1.5 My journey into the world of Paediatrics and Neonatology

The story of my journey into this noble profession was a Father's wish to see his dream fulfilled by his offspring. My dad, who by all standards was exceptionally brilliant and very good in the sciences, had his educational career truncated just a few months to his final exams in the secondary school as a result of lack of foresight by those involved in his training because education was not given a priority. When I wrote the famous" **What I want to become**" in class five, I proudly wrote **Architect**. However, because of the close relationship I share with my father this was extensively discussed by us. He chose this time to tell me some of his " not so good experiences", his desire to study Medicine and in his usual persuasive manner asked if I could change my mind and fulfill this age long desire of his. "Why not" I responded and that was the beginning of my journey into the world of medicine.
I was fortunate to be among the pioneer thirty-two students "class of 79" of the College of Health Sciences, University of Port Harcourt. The "class of 79" was privileged to have renown scholars such as late Professors T. Francis, K.K Diete-Koki,

Datubo-Brown, Obuoforibo, Jaja, Late Drs. Mangete, Uche, Elechi. Prof. K Harrison, Prof. Anah, Drs C T John, N.D Briggs, R. Oruamabo, F. Eke (as they were then) among others as our teachers.

The curriculum of the College of Health Sciences as at then was structured in a way that students, in addition to the curriculum of the medical and dental council for medical students were also required to obtain a first degree (bachelor of Medical Sciences) at the completion of four year training in any of the following sciences namely, Pharmacology, Physiology and Anatomy. It is at the completion of the four years and success at the second MB.BS examination, students were allowed to proceed to the clinical sciences.

My interest in Paediatrics was kindled by two unrelated events. Firstly, I had lecturers like Dr. Oruamabo, Dr. F.Eke (as they were then) and others who were committed to imparting knowledge to the students as well as emphasizing the fact that they (Paediatricians) are the voice for the voiceless and vulnerable children. This singular act, to a large extent, influenced some of us in our choice of this specialty. The second reason which I hold very dear to my heart was the fact that Paediatrics was the only clinical course I failed as a medical student because I forgot to take the temperature of a sick child during the clinical examinations (long case). The preparation for my resit examination in Paediatrics gave me the opportunity to be more thorough in my approach to patient care and this tremendously improved my learning and clinical skills.

During my National Youth Service Corp (NYSC) year in 1988, I was posted to the Department of Paediatrics at Braithwaite Memorial Hospital Port Harcourt, where I worked under a very versatile German -trained Paediatrician, Dr Madueke, whose passion for care of children was second to none and every parents wish was for him to attend to their sick child. Under his tutelage and having committed nurses such as Matron West and others, I

acquired some skills in the management of sick children. I must also commend the efforts of Prof. Oruamabo and Dr Alice Nte (as she was then) who did not relent in their continual persuasion for me to start the postgraduate training despite my initial unwillingness. Thus, in 1995, I enrolled for the postgraduate training at the University of Port Harcourt Teaching Hospital (UPTH). At the start of the training the heartwarming welcome I received from Drs Nkanginieme , Alikor and Nte (as they were then) gave me the assurance that I had made the right decision.

During the Residency training programme, I had the privilege of interacting with residents whose academic prowess awakened the sleeping giant so to speak in me. It was indeed a fulfilling journey as I was able to complete the training at the stipulated time.

On my return to Bayelsa State in 2001, I was among those who were sent as a team (courtesy of the Bayelsa State government and Dr. Tare Biu) for a short course on Neonatal Medicine at Wishaw General Hospital, Scotland which is a level III Regional facility with referrals from other hospitals in Scotland(Figs.12a-12f).

Fig 12a: Wishaw General Hospital, Scotland

Fig12b: Some of the team members at Wishaw G H

Fig 12c:Dr. Sam Ibhanesebhor

During this period I was exposed to various aspects of care for the critically ill neonate in the Neonatal Intensive Care Unit (NICU) which included ventilatory support, care of extreme low -birth weight (ELBW) preterm births among others. Part of this training involved visiting the Regional Ambulance Service Centre in Glasgow where neonatal transportation challenges and solution were demonstrated. Dr Sam Ibhanesebhor who was the Lead Consultant Neonatologist in collaboration with other consultants ensured adequate exposure through clinical presentations, ward rounds and simulation exercises.

Fig 12d:Dr. Sam Ibhanesebhor and some members of the team.

One of the highlights during this period was the Neonatal resuscitation simulation session and certification at the Royal Sick Children's Hospital in Glasgow.

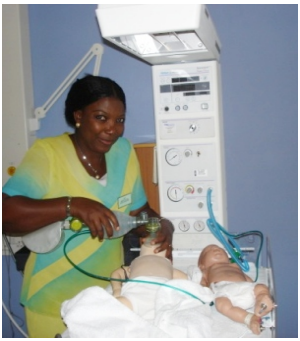


Fig12e: Simulation session on neonatal resuscitation at Royal Sick Children's Hospital, Glasgow

Fig 12f: Newborn unit of Wishaw General Hospital, Scotland

Armed with this knowledge, I was able to set up the Special Care Baby unit (SCBU) at the then General Hospital, Okolobiri which has metamorphosed to present day Niger Delta University Teaching Hospital.

At various stages of these trainings (Residency and newborn medicine), I was exposed to life-saving and teaching skills which have proven to be of immense benefit to me here in academia. My training as a Paediatrician provided a platform for acquiring a wide range of highly specialized skills, opening up opportunities to contribute in decision making on child health and advocacy on child's rights.

While trying to get a topic for this Lecture I had to rub minds with my colleagues, took a close look at our Newborn Care in Bayelsa State as well as recalling the birth of my grandson at Oregon Health Sciences University (OHSU) Portland USA

At his birth a lot of "**WHAT Ifs**" crossed my mind:

- What where his chances of survival if his birth took place here in Bayelsa State?

- What about the mother, taking into cognizance the challenges (post date, big baby with failed induction) during the delivery process?
- How many people are as fortunate as we were?
- What lessons were learnt?
- Is it possible for me to change the story in my own setting here in Bayelsa State?

Every pregnant woman, whether the pregnancy was planned or not is full of expectations, in some cases there are fantasies (conscious/unconscious) bothering on the preferred name and sex of the unborn baby, what the child will become in the future –lawyer, doctor, engineer, teacher, politician etc. the list is endless. There are also some accompanying changes in social role/identity where some mothers may now be allowed to become members of women's clubs in their community (according motherhood as a reflection of maturity). Names may change-Iya begi (mother of twins), Mama Stephen among others. Even the smile on a pregnant woman's face as she attends the antenatal clinic tells the story of her expectation.

Also the importance of newborn health is summed up in the following statement by Her Excellency Mrs. Toyin Saraki, Founder and President of the Wellbeing Foundation Africa (WBFA)-"*We were all, at one time, vulnerable newborns, soon after our birth, the circumstances surrounding our birth may differ however the common thread that runs through all of us is the fact that newborn signals the hope of a new life, desirous of the most effective care and protection" (2017).*

Mr.Ag. Vice- chancellor Sir, I will be discussing newborn care from my professional point of view, taking into cognizance the fact that the first 28 days of life, referred to as the neonatal period, is also known to be a critical period for the survival of the newborn

child. This is because the baby who all the while was protected in the mother's womb and cared for by the mother, a proverbial "**Lacking no good thing"** (fig.13a) suddenly finds himself living outside the mother's womb(fig.13b) in an environment that does not bear any semblance to what he/she is used to and is now saddled with the responsibility of caring for self, such as breathing, keeping warm, feeding among others. It is these sudden changes that make the anticipated adaptation to the life outside the mother's womb, which all of us have taken for granted a difficult task for the baby especially during the delivery process and in the immediate post delivery period.

Figs. 13a & 13b Photo credit: Time-Drama of life before birth: Lennart Nilsson's landmark 1965

Indeed for families all over the world, the birth of a child is a time of celebration for both parents and their families as evidenced by the feasting and dancing during the baby's dedication service. However, for millions of families especially in developing countries like ours, available records have shown that this anticipated period of celebration may actually become a time of

grief, as a family may lose the newborn, the mother or both mother and child during the birthing period, a very sad occurrence indeed. Such occurrences are accompanied with lots of "whys"- why did God allow this to happen to me, what was my offence, how many witches were involved in this act etc. Such families experience excruciating pain-"*Do not call me Naomi, call me Mara(bitterness),for the Almighty has dealt very furiously with me, I went out full but am coming back empty(Ruth 1:20 NKJV)"*
For the mother, her full breast which may even be dripping milk, big tummy, items bought for the baby etc. complicates the emotional trauma experienced by her.

It is my strong belief that Policy and Decision makers need to have accurate and detailed information on the various aspects of the Newborn's health, their survival, available resources for their care which include but not limited to the cost and impact of interventions that will improve their survival rate. It has been said" *Other Things Being Equal, Policy Makers Prefer To Devote Their Resources To Causes They Perceive To Be Serious*" and this I intend to pursue with the ultimate aim of getting Newborn Health matters on the Bayelsa State developmental agenda and where possible keep it there until positive health outcomes are achieved in the state.

A story told several times in different fora by different groups and which we as healthcare providers will not stop discussing, is the sad story of the number of women and children dying in the first 28 days of life. What happens to our women and children especially during childbirth is actually a reflection of our societal values and rules. As adults, we unintentionally forget the fact that without investing in the survival of these newborns, our existence i.e. the human race is threatened because it is the newborn that will eventually become the adult that we are today and all of us at some point in time will leave the scene and they (newborns) will take over.

2.0 MEDICAL AND SOCIAL PROBLEMS IN THE NEONATES

In the African traditional settings, the circumstances of the child's birth is usually reflected in the traditional name given- such as Abayomrunkoje-God won't allow humiliation, Azubuike-strength gained from experiences of the past, Chisimdi-God says I shall live, Ayomide(Yor)- my joy has arrived, Ebipadei-something good has happened, Numoipre- stay alive for me etc. Such names depict the importance of various issues and their relationship to the birthing process, the newborn and the experience of the family.

For us to fully understand the topic of our discussion I shall briefly mention some of the medical and social problems our newborns face and why we as stakeholders must pay attention to them and where possible be part of the solution.

Birth Asphyxia

Some babies fail to breathe on their own immediately after birth and such babies are said to be asphyxiated using the APGAR scoring system where various parameters (such as breathing, heart rate, baby's response to stimulation, colour and tone are assessed). Events like umbilical cord tied round the baby's neck (Fig.14a), prolonged labour which makes the baby exhausted while in the mother's womb before delivery, etc. are some of the known causes of birth asphyxia. Birth asphyxia is known to cause a lot of problems such as convulsions (Fig.14b), death of the newborn and where the baby survives, may cause child disability in later childhood.

Fig. 14a. Cord round the baby's neck
Photo credit: birth without fear-2011

Fig. 14b. Baby convulsing due to birth asphyxia.

In a retrospective study by Kunle-Olowu O.E , Immananagha, K.K et al,(2008) on childhood mortality including the neonates at the Federal Medical Centre, Yenagoa, we found that severe birth Asphyxia was the second leading cause of newborn deaths(Fig.15) among babies admitted to the Special Care Baby Unit (all babies were cared for in one room i.e. both inborn and outborn during the study period) contributing 25% of all newborn deaths over the period studied.

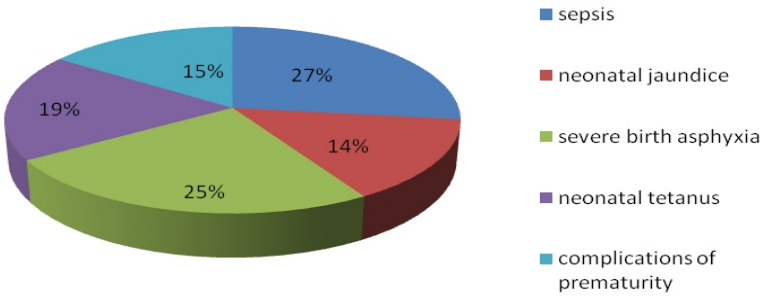


Fig15: The leading causes of newborn deaths (percent) Federal Medical Centre, Yenagoa (kunle-Olowu O.E et al.2008)

Prematurity.

Everything that has a beginning is expected to have an end; the same goes for a pregnancy which is expected to last between 38 to 42 weeks after the mother's last menstrual period. However some babies for some reasons, decide to come to our beautiful world earlier than the expected time, more or less like elections holding 3-8 or more weeks before the scheduled date, a situation where the Independent National Electoral Commission official (mother) and the voters (health workers) have little or no control and such babies are described as *born too soon, born too small* but in the medical parlance they are referred to as preterm births (Fig.16a). The challenges faced by these premature babies are that they are not fully developed and some vital organs might not be functioning at optimal levels; some may not be ready to operate at all. The accompanying medical problems in this instance (prematurity) include inability to successfully adapt to our world (outside the mother's womb) as evidenced by moderate-to-severe breathing problems, inability to control their body temperature, feeding difficulties among others.

Fig.16a:A preterm neonate receiving supplemental oxygen through the oxygen hood.

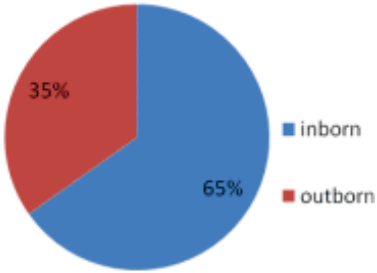


Fig. 16b:Pie chart showing percentage of preterm births by place of delivery

The study by Kunle-Olowu O.E and Peterside O. (2012) on the prevalence and outcome of preterm admissions in the neonatal unit of NDUTH, found that twenty-four percent (24%) of all admissions in the unit were preterm births and place of delivery was a significant factor as shown in Fig.16b. The outcome for the preterm babies in this study was as follows: 34.1% deaths, 10.9% discharged against medical advice, while 55.1% were successfully managed and discharged home and are attending the follow-up clinic. The survival rate was highest (65.7%) among the mild- preterm with no complications while deaths was highest among the extreme preterm(less than 28 weeks of gestation). From our study we highlighted the fact that respiratory problems and infections when they co-exist with prematurity in the newborn, the risk of dying is also increased .i.e. they are significant contributors to deaths in these newborns.

Infections including neonatal tetanus

Everyone sweeps their homes using either the all-purpose broom or vacuum cleaner to keep dirt and germs away. Unfortunately for most deliveries attended by Traditional Birth Attendants (TBAs) and sometimes in remote PHCs, the deliveries take place under very unhygienic conditions. The story of many newborns dying from infections including neonatal tetanus is a sad one because their immature immune systems at birth notwithstanding, when certain measures are put in place during the birthing process such as clean birthing practices, it is a known fact that the total number of neonatal deaths from infections will be markedly reduced. The aspect of concern to us as healthcare providers is the constant utilization of these unhygienic places especially the TBAs when approx. 83.8% of their clientele are aware of the fact that these places are not clean and services are suboptimal (Oshonwoh, 2014).Common harmful practices in the state

include:

- Unhygienic birthing place where either plantain leaves or mother's wrapper is spread on the floor.
- Insertion of native herbs into the mother's vagina (believed to hasten the delivery process and stop bleeding).
- Not practicing hand hygiene (washing of hands with soap and water) or wearing of hand gloves during the delivery process etc.
- Also the instrument used in cutting the umbilical cord (new or old razor blade, clean scissors etc.) and its immediate care (methylated spirit , never die leaves or cow dung etc.)

These aforementioned practices, expose the newborn baby to infections, especially the care of the umbilical cord which may become contaminated with germs. Figs. 17a-17c show various birthing places and our experience at NDUTH from interactions with the patients relatives especially those whose babies are referred to us from the rural communities or self- referrals show that most of these practices take place in home deliveries attended by TBAs.

Fig. 17a: Arrow showing the uncut umbilical cord and placenta on the bare floor-Home delivery (TBA)

Fig. 17 b: Delivery suite at Wishaw General Hospital, Scotland

Fig. 17c: Labour ward at NDUTH OKOLOBIRI

Neonatal sepsis (27%) and neonatal tetanus (19%) were reported in our study on clinical causes of childhood deaths (data specific for deaths occurring during the newborn period- newborn deaths) at Federal Medical Centre, Yenagoa as major contributors of newborn deaths (Kunle-Olowu O.E et al 2008). In our centre neonatal sepsis constituted 8.2% of all Paediatric admissions and 28.1% of neonatal unit admissions over a two year period(2016-17) and a study on the bacteriological profile of all newborns screened for sepsis at the newborn unit of NDUTH by Peterside O(2012) yielded 43.5% of positive blood cultures, out of which 53.6% grew gram positive organisms and 46.4% gram negative organisms. This vividly showed the magnitude of neonatal sepsis in newborns seen in our facility at the period of the study. This report served as a wakeup call for the unit and strict infection control measures were put in place including regular audit in collaboration with the clinical microbiology and parasitological department of the hospital.

In a retrospective study by Kunle-Olowu O.E and Emeka U (2012) on the Immunization coverage of antenatal and immunization clinic attendees in Azikoro Comprehensive Health Center, a semi-urban outreach centre affiliated to the Niger Delta University Teaching Hospital , we found that the maternal immunization coverage rate of TT among antenatal attendees using the immunization register showed that out of the 601 pregnant women, 151(25.2%) and 82 (13.6%) had

TT1 and TT2 respectively while 368(61.2%) had both TT1 and TT2 in the index pregnancy(Fig.18).

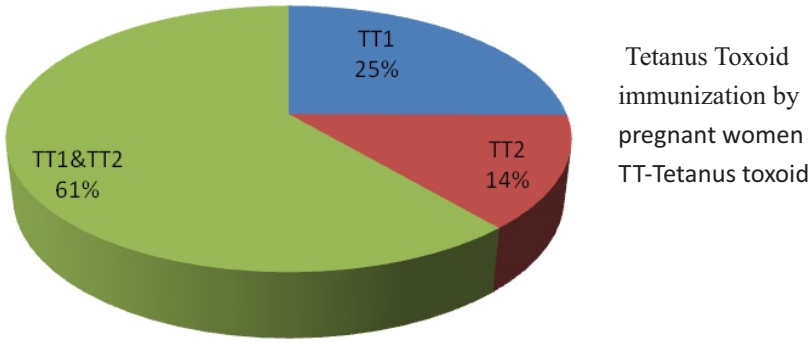


Fig.18 Pie-chart showing the percent of maternal tetanus toxoid immunization pattern in index pregnancy.

This study highlighted the gaps in our immunization coverage and the risk of occurrence of neonatal tetanus in our state since the incidence of neonatal tetanus in any community is significantly related to the immunization coverage of the tetanus toxoid (TT) of pregnant women (EPI update 1998). We recommended that innovative awareness strategies about the importance of immunization including tetanus toxoid for the reduction of the risk of acquiring neonatal tetanus be implemented taking into cognizance the fact that neonatal tetanus is a totally preventable disease by means of two complementary strategies: the administration of two doses of tetanus toxoid to the pregnant woman and ensuring hygienic/clean practices during and after delivery especially in the area of cord care. Peterside, Duru and George (2012) highlighted the burden of neonatal tetanus in the

Paediatric unit of NDUTH where neonatal tetanus accounted for 0.84% of all admissions but contributed 3.5% of all Paediatric deaths and 9.0% of neonatal deaths. Razor blade was used to cut the umbilical cord in 37.5% of the cases, hair thread was used to tie the cord in 15%. In this study over 77.3% of mothers had no antenatal care and delivery was outside health facilities and supervised by untrained health personnel. Neonatal infections as shown in Figs. 19a - 19c are common occurrences in our setting.

NEONATAL INFECTIONS

Fig.19a. A newborn with severe neonatal sepsis

Fig. 19b: Omphalitis

Fig. 19c:Neonatal Tetanus

Photo credit: Alice Nte

Congenital malformations (CM)

In the Holy Bible Genesis1:13a (King James Version) it is written: God saw everything that He had made, and behold, it was very good". Unfortunately in the life of some babies this verdict may not hold as some babies are born with congenital anomalies commonly defined as obvious abnormality of structure or form (Figs.20a-20c) which is present at birth or noticed within a few days after birth and this contributes to 6 percent of newborn deaths Bayelsa State and Nigeria. We had earlier reported a case of Arthrogryposis Multiplex Congenital(Mukoro,Fente,Ogugua and Kunle-Olowu O.E 2003) where a baby is born with joint contracture in two or more areas of the body here at NDUTH. (Fig

20a) Studies by Murtar -Yola et al.(2005) , Herbert(2012)and Oyiriuka (2016) reported a prevalence of 5.5/1000 live births,2.8/1000 live births and 7.3 per 1000 live births respectively. Murtar- Yola reported that CM contributed an overall perinatal mortality of 1.3/ 1000 births. A preliminary study on the prevalence of congenital anomalies at Federal Medical Centre, Yenagoa (2017) reported CM as contributing 5.6% of all admissions into the neonatal unit. Common congenital malformations seen in our centre include cleft lip/cleft palate, abdominal wall defects (Fig 20b & 20c), tracheoesophageal fistula and/or esophageal atresia, and anencephaly (Fig 20d). Lee et al. (2001) had reported that CM contributed to 22.1% of infant mortality in 1997 as against 15.1% in 1970 in the US. The occurrence of congenital anomaly usually brings grief, guilt, misunderstanding and stress to the parents. In addition, the financial burden of medical/surgical care brings a lot of untold hardship to the family.

Fig.20b: A baby with cleft lip/cleft palate

Fig.20c: A baby with abdominal wall defect (exomphalos)

Fig. 20d: A baby delivered with part of the brain absent

Maternal death: It is the hope of every pregnant woman to give birth to her baby safely at the due time. Unfortunately complications do occur during labour and in some instances such complications may result in the death of the woman and the newborn if he or she survives is faced with the lots of problems such as the risk of not being breastfed, loss of emotional support and may not have someone who is willing to take good care of the child. The newborn's health in this situation may be compromised with the risk of death becoming very high.

Poverty: No one has the fortune of choosing his or her parents, whether they should be rich or poor, educated or not. The plight of the newborn is that he/she bears the burden of poor choices made by the parents especially if they are poor or are undergoing financial crisis at the time of his / her birth. Lack of funds for payment of services at the point of care is a major barrier to how well people utilize even the available health services and this imparts negatively on the family by preventing them from having access to quality care and in some instances 'no care' at all and this may include antenatal services and choice of a place

where the child will be delivered (Bolatilo A Lanre-Abass 2008). In their study of TBAs and women's health using various parameters including the women's perception of TBAs practice, Oshonwoh (2014) reported that 82.1% of the respondents cited low cost of care as a reason for utilizing traditional birth attendants.

Deadly Delays for ill neonates.

Most babies are brought to the hospital at a time when the illness has become very serious i.e. late presentation. Adetola, Tongo, Orimadegun and Osinusi(2010) reported that 83.3% of sick babies who later died were taken for medical care in primary and secondary facilities prior to their presentation at their facility(UCH) and that average duration of symptoms before presentation was 3.4 days. In this study, about 67.6% of sick neonates had received home remedies including traditional medications before presentation. Herbert et al, (2012)identified multiple factors that may delay a caregiver's decision to seek care for their newborn, (Fig.21) ranging from poor recognition of signs of illness, sociocultural practices regarding newborn seclusion, distance to facility or provider, poor quality of care at facilities, lack of financial resources to access care or transport, and the opportunity cost of missed work or child care.

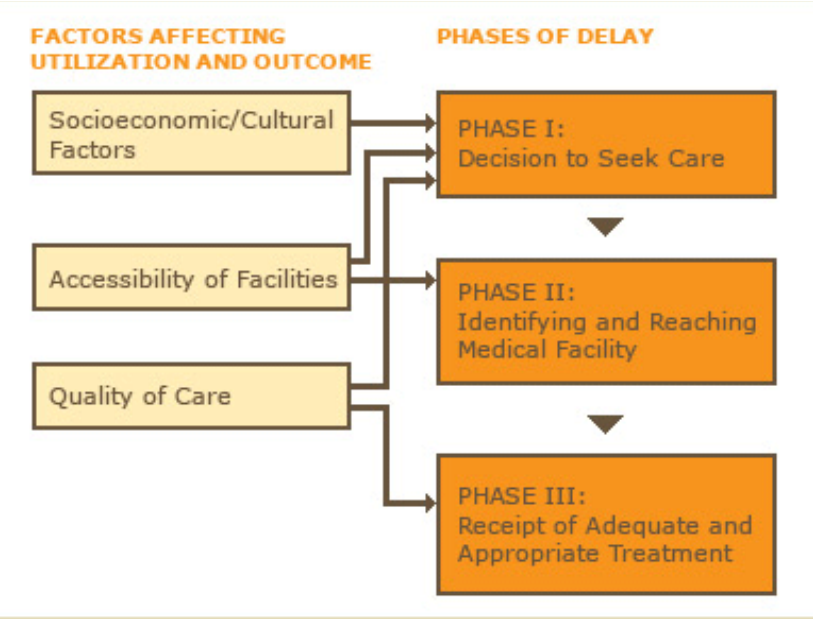


Fig.21: Delay model for maternal health.
Source – United Nations Population Fund Oct.2014.

Mr.Ag. Vice-Chancellor Sir, I have highlighted some of the problems faced by these precious ones as they arrive this world of ours. However, there are also other issues that make us to utter statement like "*must we say welcome and say goodbye"* to them. This statement is based on the fact that the day a baby is born is believed to be the most dangerous day of his/her life due to the sudden change and need for successful adaptation- from the womb-to-the world. Globally, available data have shown that over 2.6 million babies died in the first four weeks of life, approximately 7,000 newborn deaths everyday-most of which occurred in the first week, with about 1 million dying on the first and only day of their life (Nigeria contributes 9% of global first day deaths, Fig 22& Table 3) and close to 1 million dying within the next six days.

Table 3 The ten (10) countries with the most first-day deaths.

Top 10 countries with the most first -day deaths	Number of first-day deaths(annually)	Share of global first-day deaths
India	309,300	29%
Nigeria	89,700	9%
Pakistan	59,800	6%
China	50,600	5%
DR.Congo	48,400	5%
Ethiopia	28,800	3%
Bangladesh	28,100	3%
Indonesia	23,400	2%
Afghanistan	18,000	2%
Tanzania	17,000	2%

Source : State of Worlds Mothers,2013.

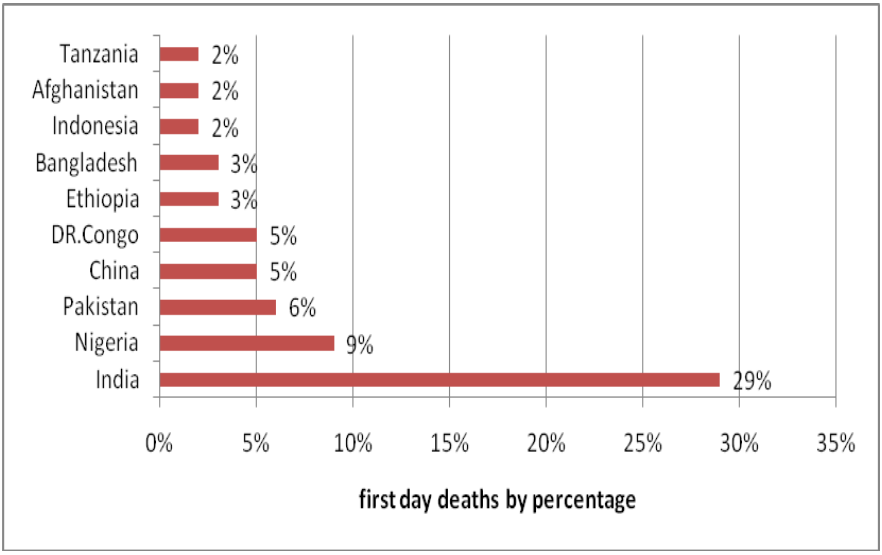


Fig. 22: Histogram showing the countries contributing two-thirds of first-day deaths in newborn

Sadly deaths in newborn account for 46% of under-five deaths globally, increasing from 41% in 2000(MCEE-2017). Currently neonatal deaths contribute 34 percent of under-5-child deaths in Nigeria(FMOH 2016) .The main causes of newborn deaths globally are:(a) preterm births complications (35%),
(b) intrapartum related events (24%) and (c) sepsis -15%(Fig.23a) The identified causes are similar to what has been documented in Nigeria, with a slight variation in proportion and they account for 80% of the 11 identified causes of newborn deaths(FMOH2016) as shown in Fig.23b &23c. The data for Bayelsa State is shown in Fig.23d and more worrisome is the fact that these leading causes of death in the newborn have been attributed to quality of care around the time of birth (State of World's Mothers, 2013). Fig.23e shows the pattern of leading causes of newborn deaths globally, Nigeria and Bayelsa State.

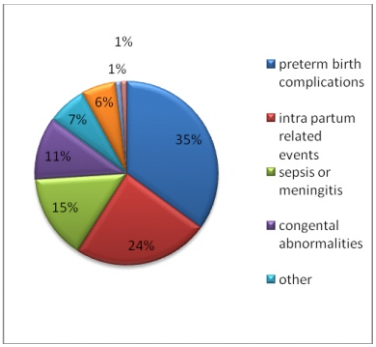


Fig. 23a Global distribution of deaths among Newborns by cause.
Source: (MCEE-2017)

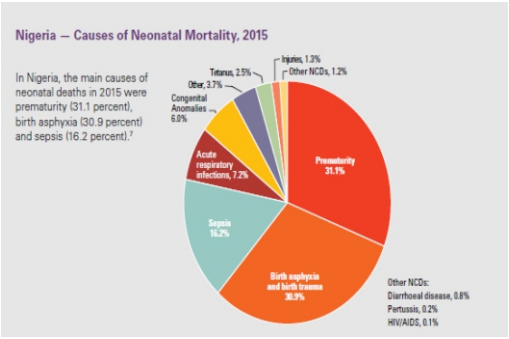


Fig.23b Distribution of deaths among newborns by cause in Nigeria (2015).
Source: Federal Ministry of Health (2016)

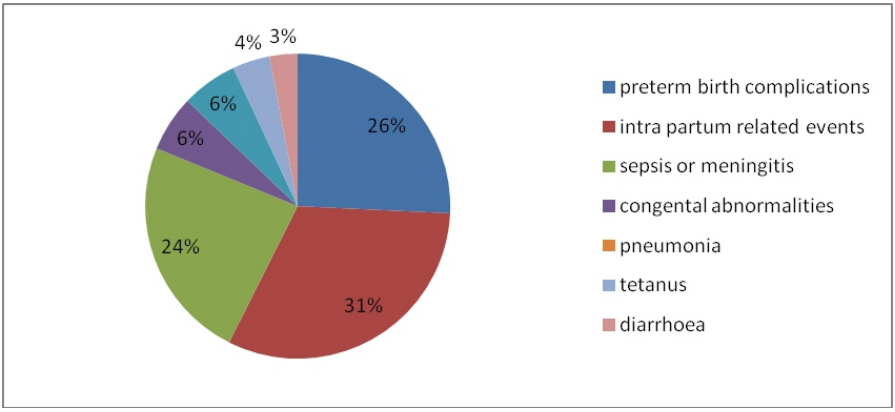


Fig.23c: Distribution of deaths among newborns by cause in Bayelsa State (FMOH-2016)

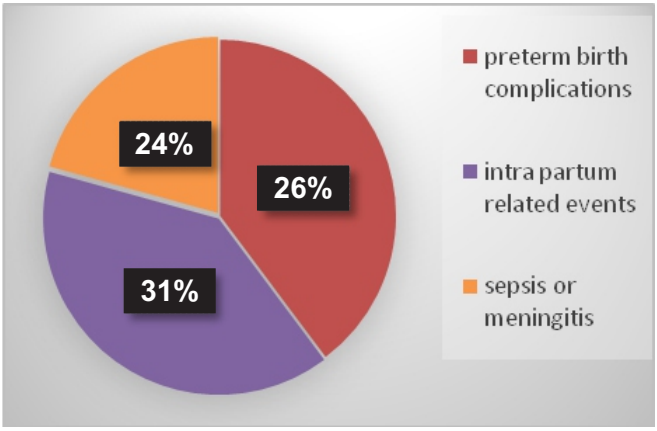
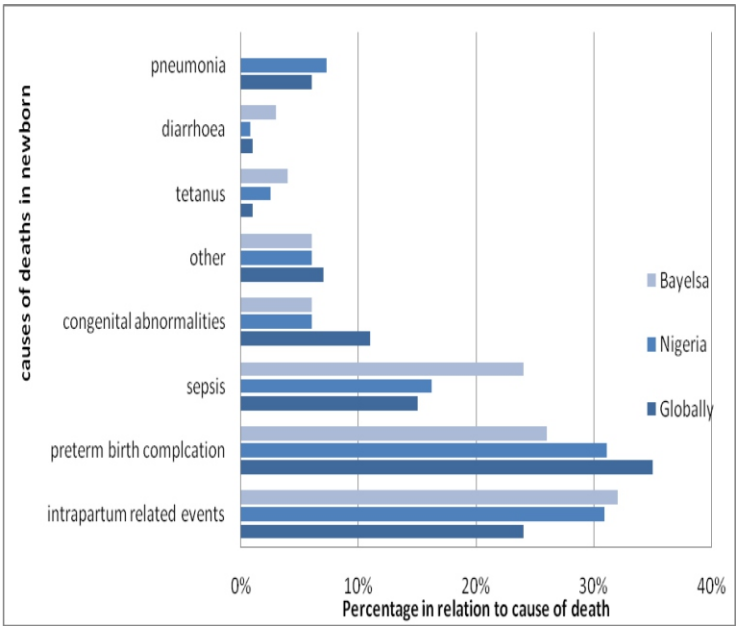


Fig. 23d: The three top neonatal problems accounting for almost 80% of all newborn deaths in Bayelsa State
Source: Federal Ministry of Health (2016)

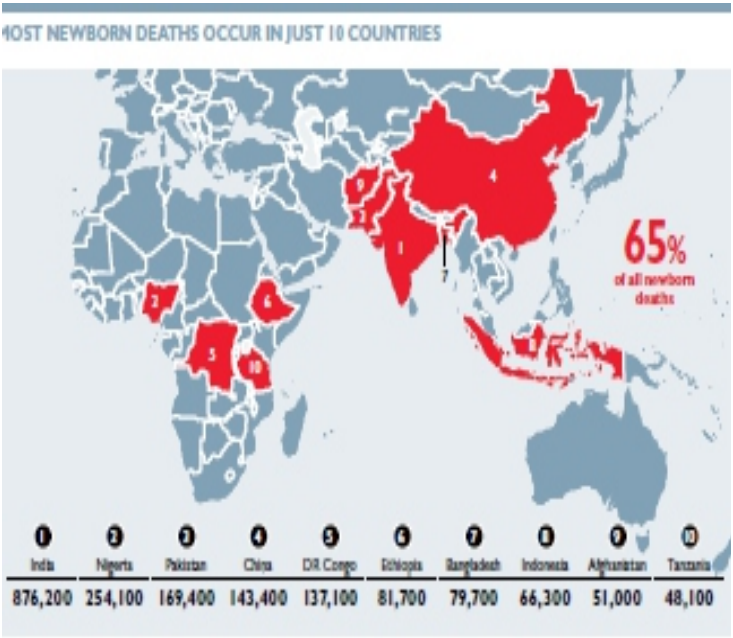


Causes of newborn deaths in different parts of the world.

Fig.23e : Showing the leading causes of neonatal deaths (Globally, Nigeria &Bayelsa State)

While newborn deaths occur all over the world , data from State Of Worlds Mothers (2013) reported that 65% of all the deaths occur in just ten (10) countries as shown in Fig.24, and unfortunately Nigeria has the second highest burden of these deaths.

This sad story shows wide disparities among countries, as some countries have made significant progress in ensuring that the newborns survive, thrive and achieve their full potential, which is one of the cardinal points on which the discipline of Paediatrics was established. Table 4 below shows comparative data from some countries



Ranking of countries contributing to first day neonatal deaths

Fig.24: showing the top ten countries contributing 65% of the global newborn deaths

Table 4. Comparative Neonatal deaths in some countries in the world.

Country	**Number of neonatal deaths annually**
Nigeria	246,475
South Africa	145,500
Ghana	23,545
United Kingdom	361
United States of America(USA)	14,943
Sweden	192

Source: United Nations Inter-Agency for Child Mortality Estimation (UN IGME). 2017

In Nigeria, some factors such as place of residence and geopolitical zones do play a role in the likelihood of a newborn dying in the first 28 days of life, being highest in north-west(45 per 1000 live births) and lowest in the south-south (22 per 1000 live births) as shown in the Fig. 25a and Fig. 25b.

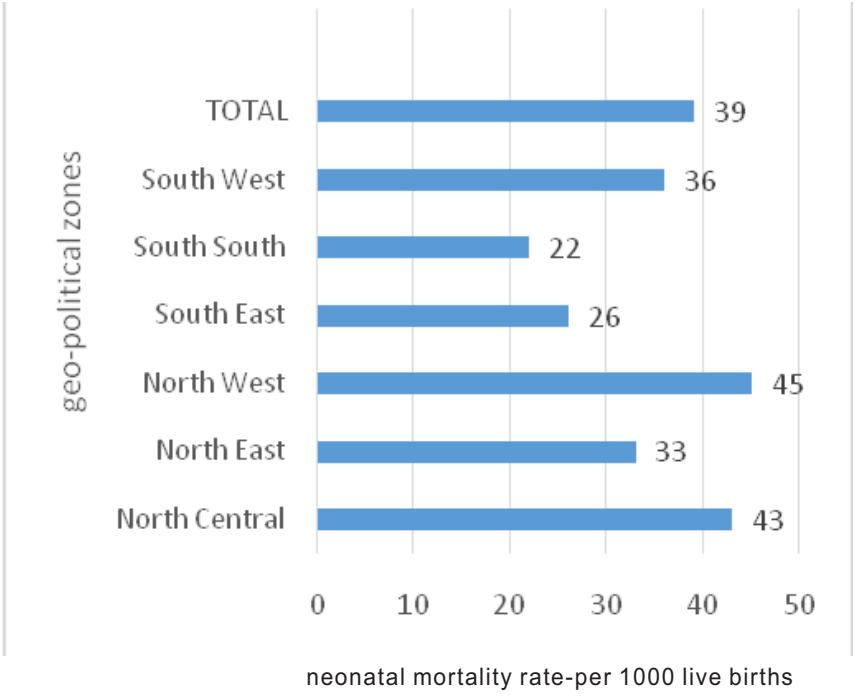
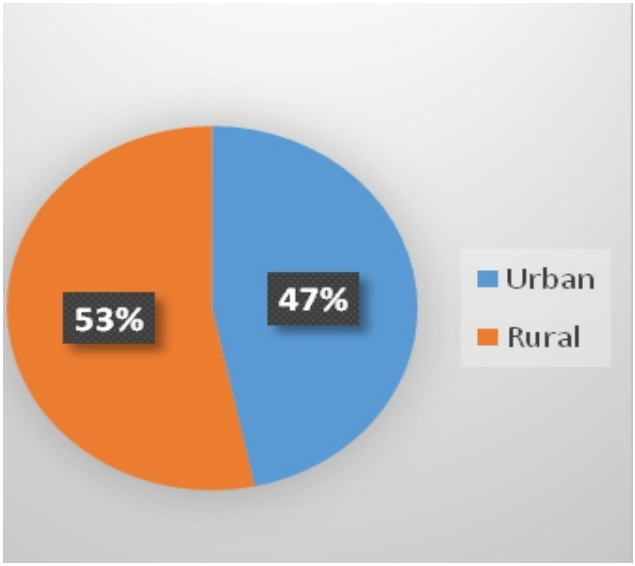


Fig. 25a The disparities in neonatal mortality rates across geo-political zones (UNICEF 2015)



Role of place of residence in neonatal death.

Fig. 25b: The percentages and disparity in neonatal mortality rates by place of residence (urban and rural areas)
(Source: MCIS,2017)

2.1 STEPS TAKEN TO ADDRESS PROBLEMS OF THE NEWBORN.

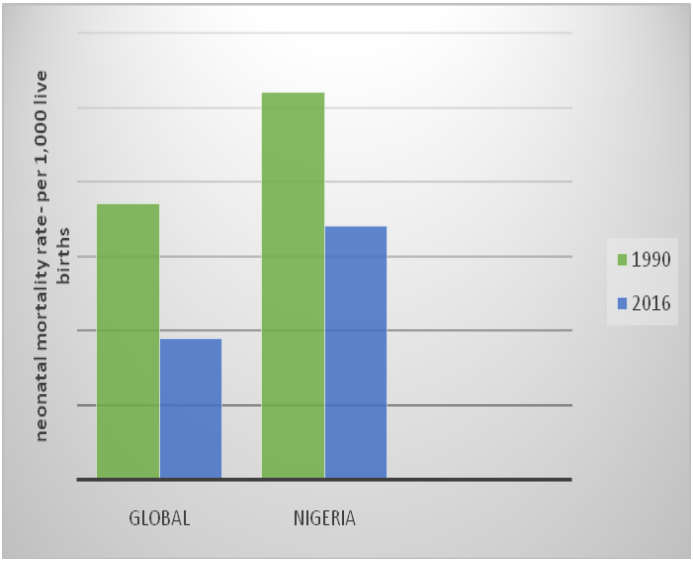
In the course of this lecture I have brought your attention to the magnitude of the challenges faced by the \ sick neonate, premature baby, those with congenital anomalies e.t.c, and the leading causes of deaths. I shall be discussing the steps taken globally, nationally and at the health facilities to proffer solutions to these problems, an effort aimed providing best care for the newborns. These steps as outlined in (Tables5,6&7) have resulted in significant decrease in childhood mortality rates as shown in Figs.26a &26b.

Table 5: Showing the various intervention and their goals (globally)

Interventions	Goals	limitations	outcome
Millennium summit of the United Nations. Held 6 -8 September 2000 at UN HQ, New York	Millennium Development Goals *(MDGs)*-these were eight globally agreed upon targets to reduce extreme poverty and promote human rights by measureable time -bound targets (1990-2015). MDG 4 *seeks to reduce child (under - five) deaths by two thirds by the year 2015*	It failed to capture the enormous contribution of newborn deaths to child mortality which currently stands at 45% globally, thereby making no room for tangible investment in goods and services relating to newborn health.	The global under five death rate declined to more than half, dropping from 91 to 43 deaths per 1000 live births in 2015.
World health Assembly-WHA67.10: Newborn Health action plan 2014	EVERY N EWBORN-An Action Plan To End Preventable Deaths: A strategy where every pregnancy is wanted, every birth celebrated and women, babies and children survive, thrive and reach their full potential.		Addressing critical knowledge gaps in newborn health.
Transforming our world: the 2030 Agenda for Sustainable Development. UN General Assembly, September 25.2015, New York, USA.	the Sustainable Development Goals (SDGs) which are technically expansion of the MDGs over the next 15 years (2015 -2030) with 17 goals and 169 targets **SDG Goal 3** - which seeks to Ensure healthy lives and promote wellbeing for all at all ages has as *One of its target: to end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under 5 mortality as low as 25 per 1000 live births.*		ongoing
WHO/MCA/17.07 .WHO recommendations on newborn health guidelines- MAY 2017	a)Promotion of newborn and young infant health and prevention of young infant illness b) management of newborn and young infant illnesses		ongoing

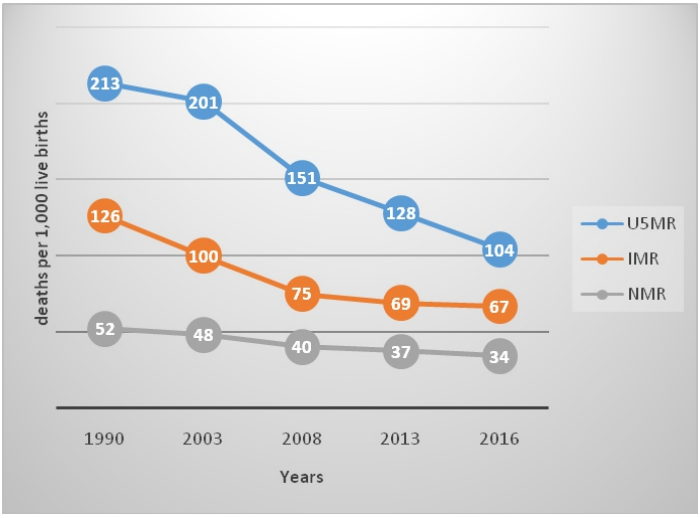
Table 6. Showing the various interventions and their goals (National level)

Interventions	Goals
Millennium summit of the United Nations. Held 6 -8 September 2000 at UN HQ, New York	Millennium Development Goals *(MDGs)*-these were eight globally agreed upon targets to reduce extreme poverty and promote human rights by measureable time -bound targets (1990-2015). MDG 4 *seeks to reduce child (under - five) deaths by two thirds by the year 2015*
National Reproductive health policy and strategy.2001	To achieve quality reproductive and sexual health for all Nigerians
Accelerated Child Survival & Development(ACSD):Strategic Framework &Plan Of Action, 2006-2010	Accelerate the reduction of maternal and child morbidity and mortality through implementation of evidence -based interventions essential to improve maternal and child survival. Focused on 4 key areas • Building on-going efforts of best practices • Generating and providing data on maternal and newborn deaths. • Mobilizing political commitment and support of key stakeholders. • Accelerating actions aimed at the reduction of maternal, infant and child mortality.
The Integrated Maternal, Newborn And Child Health Strategy. 2007	To provide a unique and understandable approach in addressing maternal, newborn and child mortality problems in Nigeria through the provision of a simplified framework for integrated health care service delivery by e ngaging families and communities in providing health care services for women and children.
The Roadmap for accelerating the achievement of MDGs Related to Maternal and Newborn Health. 2008	Stipulates various strategies to guide all stakeholders for matern al, newborn and child health, including the government, development partners, non -governmental organizations, civil societies, private health sector, faith -based organizations and communities, in working together towards the attainment of the MDGs as well as national commitments and targets related to maternal, newborn and child interventions.
Saving Newborn Lives In Nigeria-FMOH, ACCESS,Save the Children. 2009	Revitalize services in this area as well as identifying strategic opportunities to save newborn lives in Nigeria within the context of the IMNCH strategy which include the Family neonatal care -clean delivery and cord care, putting baby to breast within 30minutes of birth, universal community - based care for low birth weight infants among others. Th e strategy involves ensuring appropriate funding and accountability as well as orienting policies, guidelines and services to include newborn interventions
Maternal and Newborn Child Health week programme-2010	Held bi -annually. A program dedicated to heal th interventions on issues surrounding
Kangaroo training guidelines for low birth weight babies. 2010	Improving care outcomes for low -birth weight babies. The guidelines are to be adapted to specific circumstances and available resources at the national or local level.
National health insurance and community-based health scheme in some selected states. 2011	Ensure that every Nigerian has access to good health care and protect families from financial hardship of huge medical bills.
Saving one Million lives (SOML). 2014	Increase the utilization and quality of high impact reproductive, child health, and nutrition interventions.
Nigeria's call to Action to save Newborn lives. 2014	To build syner gy and commitment towards ending preventable deaths -Make Every Newborn Count.
National guidelines for Maternal and Perinatal deaths surveillance and response in Nigeria. March 2015	**a**) Improve the knowledge and skills of healthcare providers in providing q uality maternal and newborn care during birth and immediately after**.** **b)** Provide direction and instruction required for the establishment of Maternal Perinatal Deaths and surveillance in Nigeria. c) Prompt response to the recommendation made during the audi ts of maternal and perinatal deaths which will improve quality of care, reduce maternal and newborn deaths significantly in Nigeria.



The outcome of the various Interventions (Tables 5&6) and the subsequent reduction in childhood mortality (1990-2016).

Fig. 26a. Rate of reduction of neonatal mortality from 1990-2016.



U5MR -Under 5 mortality rate.
IMR - Infant mortality rate.
NMR - Neonatal mortality rate

Fig. 26b. Trends in U5MR,IMR and NMR in Nigeria-1990-2016. (Source UNICEF 2017).

Interventions at the Heath Facility

A concerted effort by the healthcare providers to give best care to the newborn led to the recommendation of categorizing levels of care with dedicated staff and equipment, multidisciplinary as well as multi-dimensional approach in their care at the health facilities (Table 7 &Figs. 27a-c).

Fig.27a. Preterm LBW intubated

Fig.27b Preterm LBW with oxygen head hood in an incubator

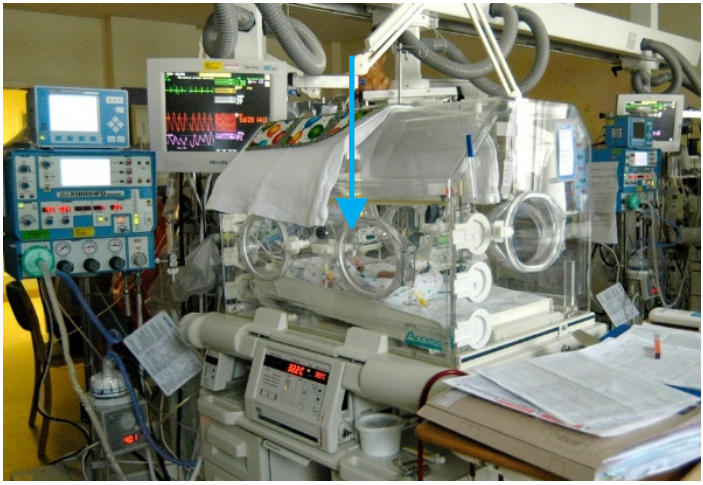


Fig.27c. Extreme preterm LBW on mechanical ventilation in NICU.

Table 7: Showing levels of Neonatal care within an Institution. (2003-2004)

Level I- neonatal care (basic)	Well-newborn nursery: has the capabilities • To provide neonatal resuscitation at every delivery. • Evaluate and provide care for infants born at 35-37 weeks who are physiologically stable. • Stabilize newborns who are ill and those born at< 35 weeks' gestation until transfer to a facility that can provide the appropriate level of care.
Level II (Specialty)	Special care nursery which are subdivided into 2 categories on the basis of their ability to provide assisted ventilation including continuous positive airway pressure(CPAP) Level II A: has the capabilities to • Resuscitate and stabilize preterm and /or ill infants before transfer to a facility at which newborn intensive care is provided. • Provide care for infants born at <32 weeks' gestation and weighing> 1500grams (1) who have physiologic immaturity such as apnea of prematurity, inability to maintain body temperature or inability to tolerate oral feeds or(2) who are moderately ill with problems that are anticipated to resolve rapidly and are not anticipated to need sub specialty services on urgent basis. • Provide care for infants who are convalescing after intensive care. Level IIB: Has the capabilities of a level IIA nursery and the additional capability to provide mechanical ventilation for a brief period(<24hrs) or continuous positive airway pressure(CPAP)
Level III	Level IIIA- provide comprehensive care for infants born at > 28 weeks' of gestation and weighing>1000grams • Provide sustained life support limited to conventional mechanical ventilation • Perform minor surgical procedures such as placement of central venous catheter or inguinal hernia repair. Level IIIB- provide care for extremely low birth weight infants (<1000g and<28 weeks' gestation. • Advanced respiratory support such as high-frequency ventilation and inhaled nitric oxide for as long as required. • Prompt and on-site access to a full range of paediatric subspecialists. • Advanced imaging, with interpretation on an urgent basis, including computed tomography (CT scan), magnetic resonance imaging (MRI) and echocardiography. • Paediatric surgical specialist and paediatric anaesthesiologists on site or at a closely related institution to perform major surgery such as ligation of patent ductus arteriosus and repair of abdominal wall defects, necrotizing enterocolitis, with bowel perforation, tracheoesophageal fistula and/or esophageal atresia, and myelomeningocele. Level IIIC- in addition has the capability to provide ECHM and surgical repair of complex congenital cardiac malformations that require cardiopulmonary bypass.

2.2 THE BAYELSA STORY: What is the status of newborn care in Bayelsa State?

I have chosen to speak on what obtains here in the state because Bayelsa State has potentials- being the glory of all lands, as well being in dire need of re-direction and re-strategizing for better healthcare for its citizens especially the newborns.

Mr. Ag. Vice Chancellor sir, I will give an overview of the available resources both in terms of man power and infrastructure as well as key practices relating to care of the newborn in Bayelsa State. I shall also be discussing the challenges faced by the healthcare personnel and the health facilities providing care for the newborns. It is my hope that we will be able to say" *Here are the lessons learnt*" and make a commitment to prioritize Newborn Health in all our policy framework and implementation.

Fig.28a: Map of Nigeria

Fig.28b: Map of Bayelsa State.

Bayelsa State, one of the six states that make up the south-south geopolitical zone was created in October 1, 1996 from the former Rivers state (Figs.28a & 28b). The terrain of the state is mainly riverine and lots of her communities are almost (in and some instances totally) surrounded by water making such communities inaccessible by road, thereby depending solely on water transportation.

Bayelsa State consists of eight (8) Local government areas viz: Brass, Ekeremor, Kolokuma/Opokuma, Nembe, Ogbia, Sagbama, Southern Ijaw and Yenagoa (the State capital). Bayelsa State has an estimated population of 2,023,000 with annual births of 66,000 and 2000 newborn deaths.(FMOH, 2015) (Table 8).

Table 8: The births and Deaths in Bayelsa State (2015)

BIRTHS AND DEATHS	
Population	2,023,000
Annual births	66,000
Birth registration (%)	24
Neonatal mortality rate per 1000 live births *	32
Annual number of neonatal deaths	2,000
Under-five mortality rate per 1000 live births *	91
Annual number of under-five deaths	6,000
Maternity mortality ratio per 100,000 live births (national)	576
Annual number of maternal deaths	400

Source: Nigeria States Data Profiles-FMOH 2015.

Since its inception in 1996 there has been significant development especially in the Health sector both in infrastructure and personnel(Table 9) however, the available data shows that health care workforce is grossly inadequate (Tables 10a &10b).

Table 9. Health workforce in the state (1999-2017)

Health personnel	1999	2006	2011	2017
Doctors	44	124	298	318
Nurses / Midwives	306	445	445	528

Source: Hospitals Management Board,2018.

Table 10a. Status of health care workers in Bayelsa State compared to WHO recommendation.

Cadre	No.	WHO recommended HCW/population density per 10,000	Actual HCW/population density in Bayelsa State (per 10,000)
Doctors	318	5.5	1.73
Nurses and midwives	528	17	11.3

The healthcare worker density to population of 13.03(doctors, nurses and midwives per 10,000) is grossly below the WHO ((2006) recommendation of 23 per 10,000.

In addition, health care workers in Bayelsa State are poorly distributed and this is in favour of the urban setting-Yenagoa which is the capital city as shown in Table 10b.

Table 10b. The distribution of health care workers per 10,000 population in the LGAs of Bayelsa State

`	LGA	No. PHC (functional)	No. General /Cottage Hospitals	No. of doctors /10,000 population	No. of Nurses /10,000 population
1	Yenagoa	21	4	0.9	6.6
2	Brass	14	4	0.12	0.6
3	Ekeremor	25	7	0.02	0.8
4	Southern ijaw	33	7	0.17	0.7
5	Ogbia	16	8	0.2	0.6
6	Nembe	22	2	0.12	0.8
7	Sagbama	29	4	0.1	0.6
8	Kolokuma / opokuma	9	4	0.1	0.6
	TOTAL	**169**	**40**	**1.73**	**11.3**

Mr. Ag.Vice-Chancellor sir, the data from the Federal Ministry of Health (2015) which reported 2000 newborn deaths in Bayelsa State is a sad one because this is a relatively young state, which is not heavily populated and losing this number of children is unacceptable. The survival of Newborns in any state or country is believed to be a sensitive marker of their health systems (Fig.29) (people, institutions and resources involved in delivering health care services) response to its most vulnerable citizens which in this case are Women and children.

Fig 29: The interrelationship between the components of health system.
Source : Alliance For Health Policy and System Research,2010

I had earlier mentioned the Interventions at global, national and Health facility levels to address problems of the newborn and I believe that you will agree with me that we do not lack policies concerning the care of newborns. The question that readily comes to mind is "why then is the story not changing" taking into cognizance the plethora of policies". Permit me at this point to highlight WHAT SHOULD BE IN PLACE FOR BEST CARE FOR THE NEWBORN here in Bayelsa State.

Once babies are born, they no longer enjoy the benefit of doing nothing but enjoying everything (provided for by the mother in the womb), and take personal responsibility for all activities for their survival. (figs. 30a & 30b) However some babies have difficulty in making this transition a successful one as I have mentioned earlier and such babies are cared for by the neonatal Unit of the Hospital. The Neonatal unit is a dedicated area in the hospital where children needing intensive or specialized care are admitted and it has trained health professionals and advanced technology to give appropriate care to those on admission as well as providing counseling for families.

Fig. 30a: Pregnant mother

Fig. 30b: Newly born baby

Facilities and policies for neonatal care:

Due to the various medical problems as highlighted in the categories/levels of care, certain policies guide the design and operation of the newborn unit such as:

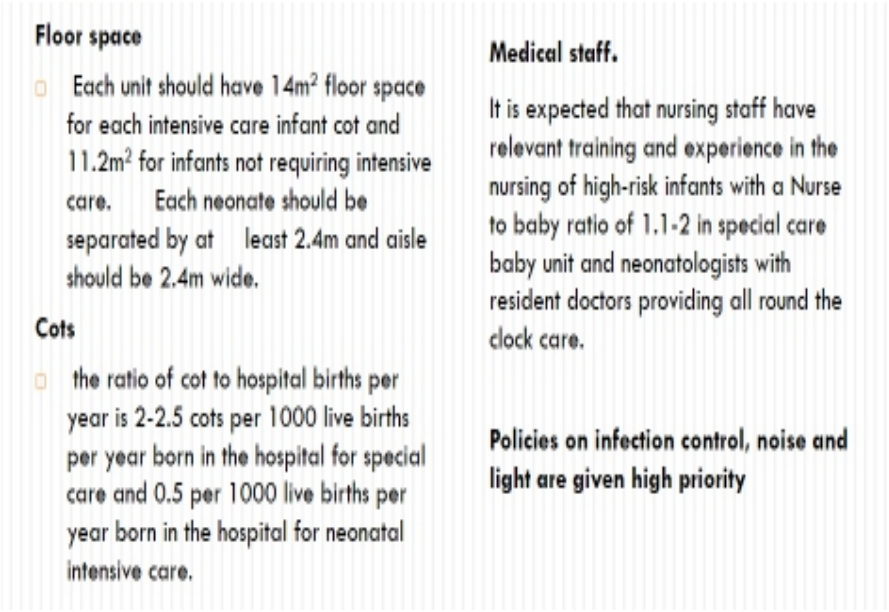
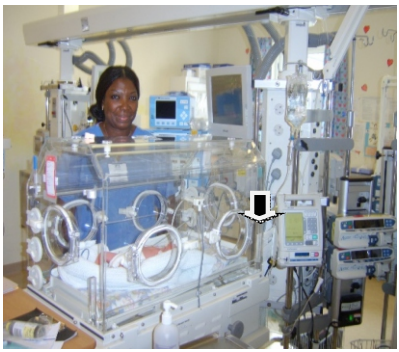


Fig30c: Some policies in Newborn Units

My brief stay at Wishaw General Hospital, Scotland, exposed me to what a neonatal unit should be and I have carefully selected some of the unit's flagship (Figs 31a- 31e) as a reminder that others have done it and here in Nigeria, some tertiary health institutions and a few private Hospitals have taken the bull by the horn and have established world class newborn units with full complement of well-trained medical staff and it is my sincere belief that in Bayelsa State WE SHALL BE COMMITTED TO DOING THE SAME.



ELBW Premature Baby in incubator

Figs. 31a &31b : Incubators, mechanical ventilators with multi-parameter monitors.

Incubators first designed by Tarnier in 1880 are rigid box-like enclosure as shown above in Fig.31a. They provide optimal growing environment for observation and care of the newborn by assisting in maintaining the right amount of heat, humidity, oxygen and carbon dioxide content needed by the baby. The main goal of the incubator is to maintain a semblance of the environmental condition the newborn enjoyed while he/she was in the mother's womb especially for premature babies.

Since delivery takes place in the labour room or labour theatre, the extreme preterm babies or high-risk births (babies) are usually moved from the delivery room to the neonatal unit using the transport incubator (incubator in a transferable form designed by Dr. Julius Hess in 1922) (Fig.31c) and on arrival at the unit, the baby is examined while been placed on the resuscitaire (Fig.31d), which combines various units that keep the baby warm, deliver oxygen, monitor temperature as well as provide a flat surface for emergency care and resuscitation (when necessary).

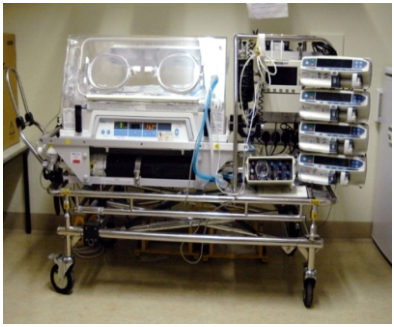


fig. 31c: Neonatal transport incubator

Fig.31d: Resuscitaire in NICU

Fig.34e: Nurses station and entrance to one of the NICU Neonatal unit, Wishaw General Hospital, Scotland

THE NEWBORN UNIT AT NIGER DELTA UNIVERSITY TEACHING HOSPITAL (NDUTH)

The Niger Delta University Teaching Hospital (NDUTH) is a tertiary referral Centre with a bed capacity of 200. The Paediatric unit has a total bed capacity of 60 (30 % of hospital bed space).The neonatal unit is located in close proximity to the labour room and theatre and has a bed space of seventeen (28% of total bed space in the Department of Paediatrics). There are two sections in the SCBU- one for babies born in our facility (inborn), the other one for babies delivered outside our facility but referred to us (outborn)(Figs. 32a-32f).

Fig.32a & 32b: Cross section of the in -born and outborn SCBU (NDUTH)

Fig.32c: Examining a newborn after a Caesarian Section at SCBU

Fig.32d: Reviewing a neonate with jaundice receiving phototherapy.

Fig. 32e: Ward round in SCBU.

Fig 32f: Drs. Adeyemi, Kunle-Olowu& Peterside welcoming the accreditation team **.WACS.(O&G)**

Some of the equipment in our neonatal unit are shown in Figs.33a-33c.

Fig.33a: A refrigerator for storage of drugs in SCBU.

Fig. 33b: Neonatal incubator with attached phototherapy machine.

Fig.33c: Auto-immuno analyser and ABG machines in the side laboratory (SCBU)

The unit also has a 10 -bed mothers' sleep- in ward where mothers stay all through the period of their children's admission, which increases the contact between them and their babies including their participation in decision making, milk room to promote exclusive breastfeeding, doctor's sleep- in room and a well-equipped side laboratory.

All babies are admitted into the Special Care Baby Unit (SCBU) and managed by the medical and nursing staff. However, very critical babies needing intensive care are referred to other tertiary facilities (e.g. UPTH,) where the appropriate care is given. High risk deliveries at the hospital are attended by the most senior resident in the unit to ensure adequate respiratory support and other forms of care that may be needed by the newborn and this is usually on request by the attending obstetrician through a written consult to the unit.

The categories of neonatal care in the unit, the specialized equipment, material and human resources needed to make it function optimally as highlighted above, capture the complexities of newborn care and the structures put in place to give appropriate care. These services rendered by the neonatal unit of NDUTH, have contributed significantly to the improvement of newborn survival as critically ill babies, preterms, very low birth weight babies (e.g.900grams) now have a fair chance of survival. Worthy of mention is the fact that for any neonatal unit to function optimally it must have its full complement of staff {e.g. nurse –to- patient ratio-SCBU 1:2 and NICU 1:1) appropriate and functional equipment and continuous professional development (training) of staff. The absence or/ inadequacy of these services including trained personnel contribute significantly to negative health outcomes for the newborns, thus increasing their chances of dying or becoming physically challenged in later childhood.

Mr. Ag. Vice-chancellor Sir, I had drawn your attention to the problems faced by newborns, recommendation of neonatal care aimed at guaranteeing best care as shown in the various level of care (Table 9)based on newborn's health needs and the available neonatal care here in the state.

Analysis of the inpatient records of the department of Paediatrics (NDUTH) from 2016-2017 revealed that neonatal admissions constituted 22.5% of all admissions into the Paediatric department. Over a period of 21 months from January, 2016 to September 2017, case notes of neonates admitted into the SCBU of NDUTH were retrieved and analyzed retrospectively. However, I must at this point mention that this period was marked with industrial strikes by various sectors of the healthcare professions which adversely affected the patronage of the

hospital, but suffice it to say that the picture presented here is a reflection of the trend in our facility. There were 185 admissions during the study period. Tables 11a &11b show the reasons for admission into the neonatal unit (inborn &outborn).

Table 11a. Distribution of inborn morbidity pattern .

Diagnosis	Total	%
Prematurity	34	37.36
Perinatal asphyxia	15	16.48
Sepsis	13	14.28
Jaundice	12	13.18
Transient tachypnea of the newborn	6	6.59
Hypoglycaemia	3	3.29
Haemorrhagic disease of the newborn	2	2.19
Infant of a diabetic mother	3	3.29
Abandonment	1	1.1
Macrosomia	1	1.1
Meconium aspiration syndrome	1	1.1
Total	**91**	**100**

Table 11b: Distribution of out-born morbidity pattern .

Diagnosis	Total	%
Sepsis	39	41.48
Perinatal asphyxia	16	17.02
Prematurity	18	19.14
Jaundice	10	10.63
Meconium aspiration syndrome	2	2.12
Infant of a diabetic mother	1	1.06
Cellulitis	1	1.06
Aspiration pneumonitis	1	1.06
Haemorrhagic disease of the newborn	3	3.19
Transient tachypnea of the newborn	1	1.06
Macrosomia	1	1.06
Gastrochisis	1	2.12
Total	**94**	**100**

With regard to admissions into the neonatal unit at NDUTH, Tables 11a&11b show the number of babies admitted and identified the common causes as indicated by the percentages. It was also observed that there were differences in the reason for admissions between the babies delivered in NDUTH (in-born) and those referred from other facilities including home deliveries (out-born) and the difference was statistically significant ($p<0.05$) for babies who were admitted on account of prematurity and sepsis(Table 12c & Fig.34).

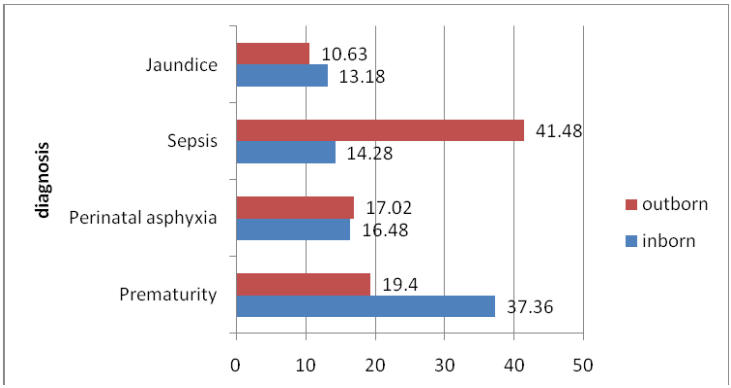


Fig.34: Histogram showing the distribution of the top four reasons of admission into the Neonatal Unit (NDUTH) by place of delivery.

Table 11c. Comparison of morbidity between inborn and outborn newborns admitted into SCBU.

Diagnosis	**Total**		x^2	p-value
	Inborn	outborn		
Prematurity	34	18	4.271	0.039*
Perinatal asphyxia	15	16	0.007	0.934
Sepsis	13	39	9.645	0.002*
Jaundice	12	10	0.226	0.635
Transient tachypnea of the newborn	6	1	na	
Hypoglycaemia	3	0	na	
Haemorrhagic disease of the newborn	2	3	na	
Infant of a diabetic mother	3	1	na	
Abandonment	1	0	na	
Macrosomia	1	1	na	
Meconium aspiration syndrome	1	2	na	
Gastroschisis	0	1	na	
Aspiration pneumonitis	0	1	na	
Cellulitis	0	1	na	
Total	**91**	**94**		

After babies are admitted, it is important for us to know the outcome, which may also give an overview of quality of care received by the newborn and the constraints faced by the healthcare providers. Tables 12a & 12b provide the information on the outcome of newborns following their admission into our unit.

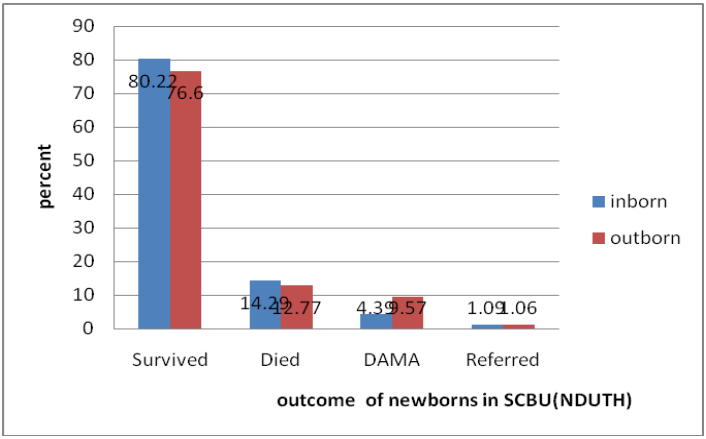
Table 12a: Pattern of outcome of inborn newborns admitted into SCBU

Outcome	**Total**	**%**
Survived	73	80.22
Died	13	14.29
Discharged against medical advice	4	4.39
Referred	1	1.09
Total	**91**	**100**

Table 12b: Pattern of outcome of outborn newborns admitted into SCBU.

Outcome	**Total**	**%**
Survived	72	76.60
Died	12	12.77
Discharged against medical advice	9	9.57
Referred	1	1.06
Total	**94**	**100**

Mr. Ag. Vice-chancellor Sir, a striking feature in respect of the babies admitted into the unit is that while cause of admissions showed statistically significant difference between inborn and outborn, the outcome (those that survived and those that died) did not show any statistically significant difference (p value>0.05) (Fig.35& Table12c).



The management outcome of babies admitted into SCBU (NDUTH)

Fig. 35: Histogram showing the outcome by place of delivery (in-born &out-born)

Table 12c. Comparison of survival and deaths between inborn and outborn newborns admitted into SCBU.

Outcome	**Total**		x^2	**p-value**
	inborn	outborn		
Survived	73	72	0.043	0.835
Died	13	12	0.070	0.792
Discharged against medical advice	4	9		
Referred	1	1		
Total	**91**	**94**		

I had mentioned in my earlier discussion the unacceptably high number of newborn deaths that occurred in Bayelsa State (FMOH,2015).
The figures presented here in our analysis are just a tip on the ice-berg, as most of our people utilize the Federal Medical Centre which is located in Yenagoa (physical access) and the fact that almost 80% of residents in Bayelsa State are in the rural areas including Okolobiri (NDUTH) and Amassoma where our institution (NDU) is located. However NDUTH being a tertiary and referral centre, do give a representation of disease patterns. It is equally important for us to know the various causes of death, since such knowledge will play a significant role in decision making on which interventions should be targeted most in order to give best care to the newborns.

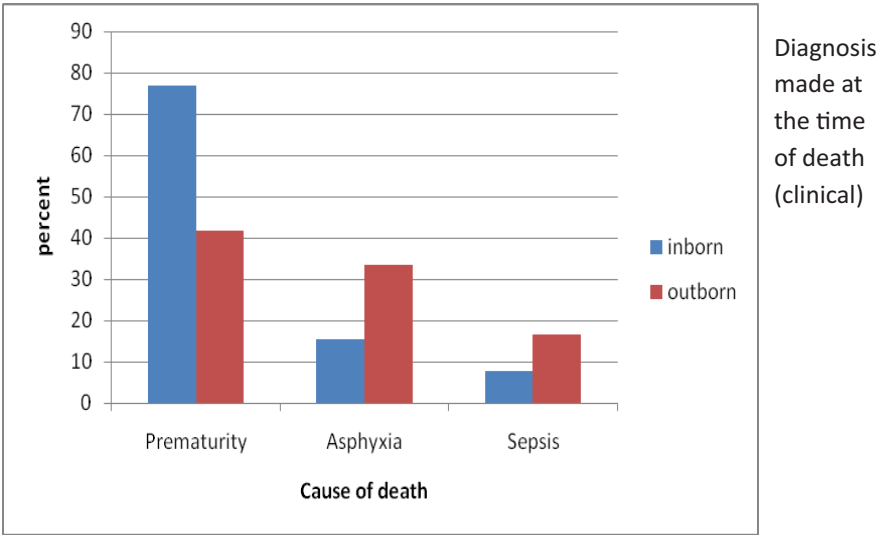
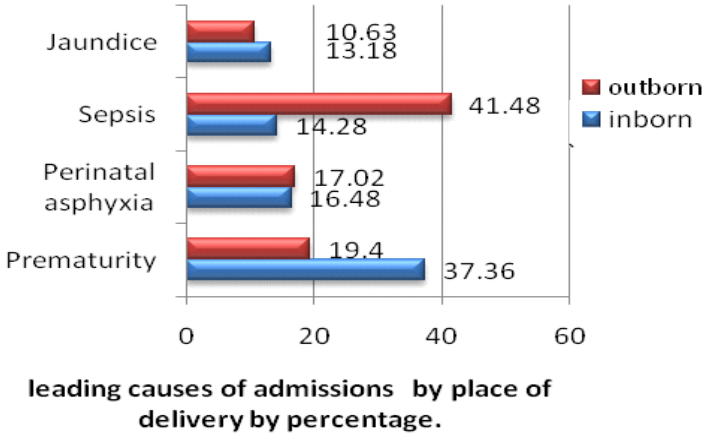


Fig 36: Leading causes of newborn deaths by place of delivery (2016-17,NDUTH).



Leading causes of admission by place delivery by percentage.

Fig 37a : Distribution of morbidity pattern by place of birth

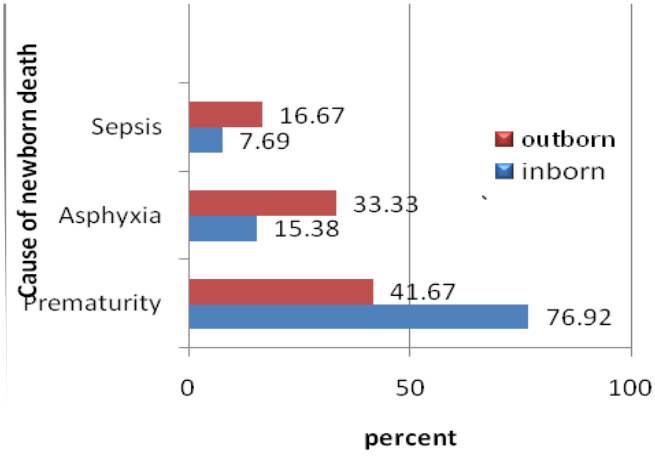


Fig 37b : Distribution of mortality pattern by place of birth

From 37a and 37b it was observed that while prematurity(in-born) and neonatal sepsis(out-born) were the top reasons for admission into our neonatal unit, it was prematurity that was the leading cause of death in both groups ie, irrespective of place of delivery .

2.3 FACTORS INFLUENCING NEWBORN SURVIVAL IN BAYELSA STATE:

1. Individual and family factors

Antenatal Care : All pregnant women are advised to attend a minimum of four antenatal visits at a health facility during which they are expected to receive evidence-based examinations and screening using the WHO focused antenatal care involving

a) early detection and treatment of problems and complications,
b) addressing complications and diseases such as HIV and malaria,
c) birth preparedness and complication readiness and
d) basic health promotion through sound nutrition and preventive measures. (Fig. 38)

In Bayelsa State 62.9% of pregnant women had more than four (4) antenatal visits (Fig.39a) as recommended. However some socio-economic factors viz: place of residence and household wealth contributed to the number of antenatal visits as only 38 percent of rural women and 18% of poorest household had at least 4 antenatal care (ANC) visits (Figs.39b &39c).

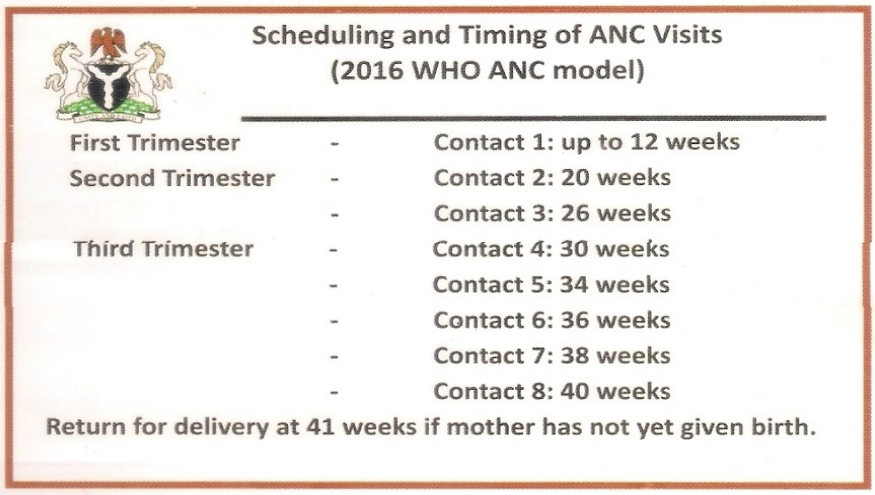


Fig.38. Scheduling and recommended antenatal visits.
Source: Facts for Life. UNICEF& FMOH, 2017

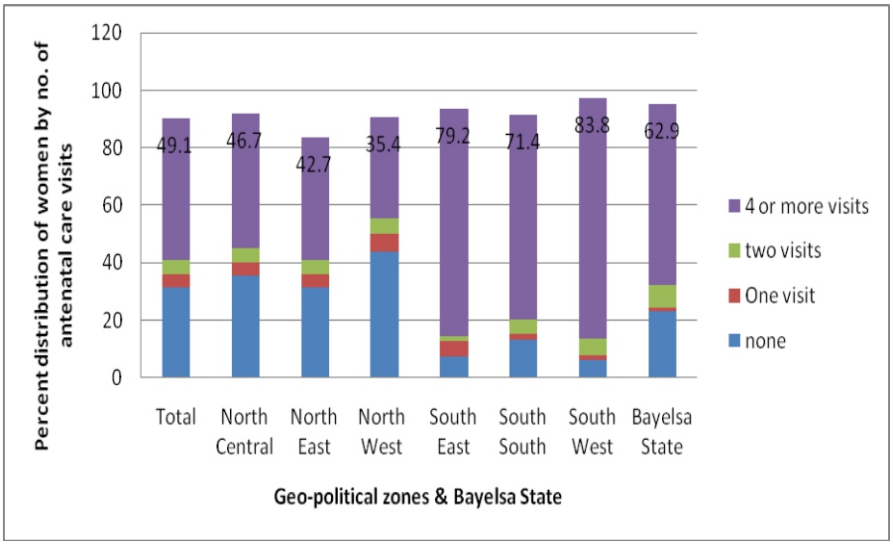


Fig 39a: Histogram showing the number of antenatal visits by geo-political zones and Bayelsa State(MCIS-2017)

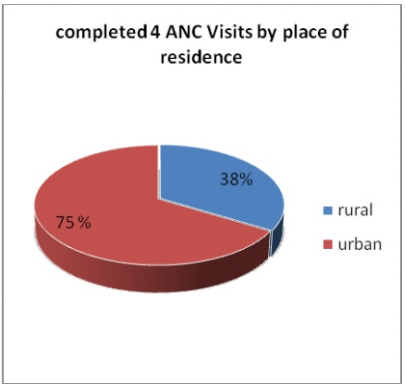


Fig.39b. Pie-chart showing percentage of women who completed four (4) ANC visits by place of residence.

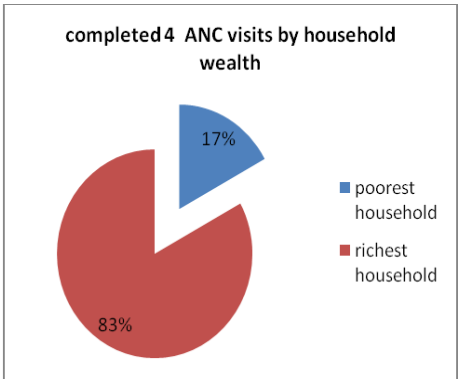


Fig.39c. Pie-chart showing percentage of women who completed four (4) ANC visits by household wealth.

Various cadre of health care workers viz: Medical doctors, Nurses/Midwives, Auxiliary midwives, Community health workers provide antenatal care for pregnant women. The traditional Birth Attendants also provide care in their homes to these women (Fig.40). In Bayelsa State providers of antenatal care include Medical doctor (31.9%), Nurses/Midwives (29.6%), Auxiliary midwives (0.7%) Traditional birth attendants (14%) and Community health workers (0.3%) (MCIS-2017) (Fig.40).

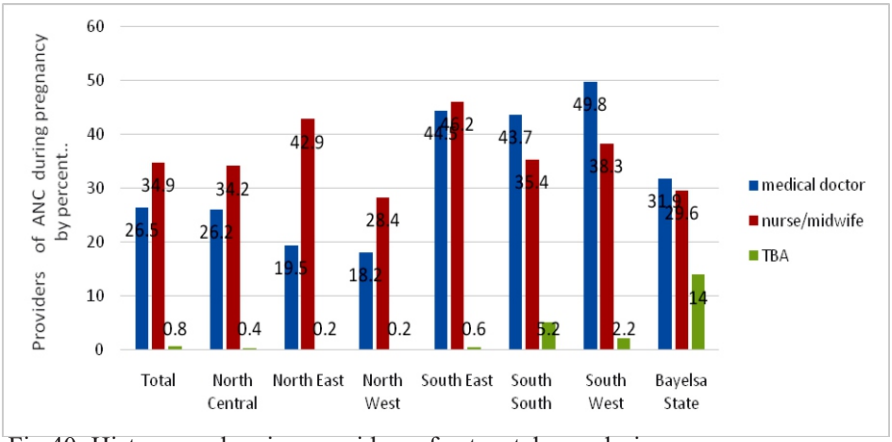


Fig.40: Histogram showing providers of antenatal care during pregnancy.

There is also the trend of increased proportion of home deliveries and associated poor care birth practices. This is well documented in the MICS 2017 report (Fig.41) where only 32.4 percent of deliveries took place in health facilities (public and private) despite the fact that 62.9 percent of pregnant women attended antenatal clinics in health facilities. In a study by Dickson (2014) in some local government areas of Bayelsa state- Sagbama, Yenagoa and Brass, it was found that 49.1% of the respondents received ANC from the TBA, 47.1% of respondents preferred the services of the TBAs and reasons given for the preference were: proximity-27%, better service-44.2% and less cost - 41.6%(Dickson ,2014)) .

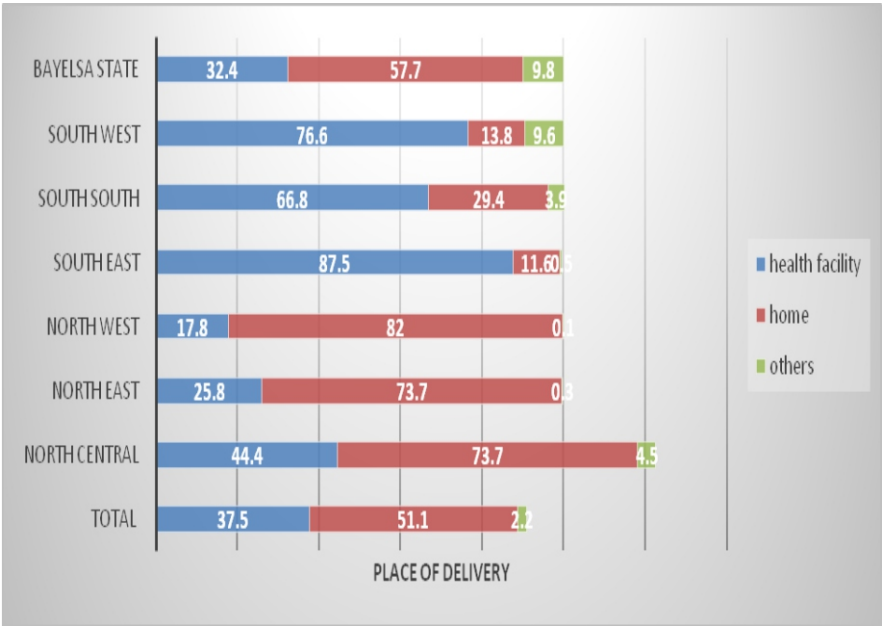


Fig 41:Histogram showing percent distribution of women aged 15-49 year with live birth , according to place of their last delivery

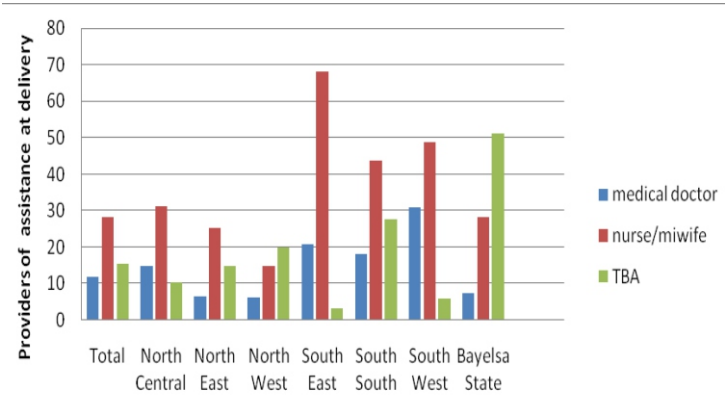


Fig.42: Histogram showing persons who provided assistance at their last delivery.(%)

Delivery outside the hospital is unfortunately associated with poor cord care, infections and other problems i.e. poor care birth practices such as application of substances to the cord some of which are harmful, not establishing skin-to-skin contact with the mother immediately after birth (FMOH,2015).

Most deliveries outside a health facility with no skilled attendant at birth is fraught with many dangers, especially in cases of emergencies such as the baby not breathing which will require active resuscitation to help the baby breath. This lack of knowledge and requisite skill may lead to poor neonatal health outcomes including deaths, many of which are preventable.

Case 1

Let us take a look at a scenario which is a common occurrence here in Bayelsa State. Miss T, 18 year- old single mother with primary school level of education, received no antenatal care, visited the only Primary Health Centre in the nearby community at 01.00hrs when labor started. The primary health Centre was under lock and key, the healthcare worker who was alone in that centre had travelled to Yenagoa to collect her monthly salary.

Miss. T. in company of her mother returned to their community and visited the Traditional Birth attendant (TBA). She had prolonged labor and when she finally delivered her daughter, she did not breathe spontaneously. The TBA was not trained in neonatal resuscitation and as such could not effectively help the baby breathe and unfortunately the baby died. This story is not uncommon and it should not be the case as such deaths are totally preventable.

Case 2.

Mrs. A. O, 24 year- old, had ANC in a secondary health facility. Labour started in the night and it was difficult to get to the hospital. She lives close to a midwife whose attention was called and the midwife delivered the baby who incidentally did not cry immediately after birth . However this midwife had been trained on neonatal resuscitation at her place of work and she was able to assist the baby breathe and the newborn was rescued from the clutches of death.

In case 2 although delivery took place at home, there was a skilled attendant at the delivery which untimetely contributed to the child's survival.

Both babies were asphyxiated at Birth and Birth asphyxia accounted for 31% of neonatal deaths in Bayelsa State (FMOH 2015)

2. SOCIETY AND CULTURE

Adverse Cultural Practices: Nigerians have very strong ties to traditional beliefs and practices and these dominate every sphere of our being including newborn care. Some of these beliefs and practices are hazardous to newborn health e.g. use of cow dung and some herbs e.g. *Bryophyllum Pinnatum* (Never Die) in the care of the umbilical cord. The use of masseurs by pregnant women and newborns also have deleterious effect as shown by a case report of an eighteen day old female who was rushed to the hospital(NDUTH) by her mother and grand- mother(Peterside 2012). Baby had severe wasting, recto-vaginal prolapsed and

infected umbilical cord (Fig.43a & 43b) which was attributed to repeated traditional homecare practices by the mother and grandmother.

Fig 43a: wasting (loss of subcutaneous fat) with swollen umbilicus

Fig.43b: prolapsed vagina and rectum

Cord care: Clean cord care is one of the key interventions recommended by United Nation Commission aimed at preventing early neonatal infections which contributes significantly to neonatal mortality. (neonatal infections contribution to neonatal mortality is 24% in Bayelsa State FMOH 2016). The policy on cord care outlined by the WHO is that nothing should be applied after it is cut, however in recognizing the traditional practices in low- , middle- income countries like ours, WHO recommended the use of antiseptics where the child is presumed to be at risk. In Nigeria, the use of antiseptic in cord care is very common and one of the essential commodities in the newborn package is the use of chlorhexidine digluconate (7.1% gel)(GSK) for cord care. Cord care is one of the practices where traditional beliefs hold sway and family members especially the grandmothers and in-laws seem to have the final say as seen commonly in the low and middle income class families. Some communities use local herbs mixed with white ash and salt, never die, including toothpaste which are believed to hasten the healing process and this is practiced on the premise that the cord must fall off before the 8th day of life or before the naming ceremony. Cord care using methylated spirit

and other substances including antibiotic ointments and herbs was reported in 62.4% of mothers in Yenagoa metropolis (Opara and Alex-hart 2012). A similar study by Lawrence et al(2015) in Yenagoa reported that only a few TBAs saw the need to wash their hands before and after cord care and in cases of emergency,rope from sac bag (garri bag) is used to tie the cord. Fig 44 shows a 7 day old female admitted in our SCBU. The mother had applied Macleans toothpaste to the cord to hasten healing.

Fig44: 7- day old neonate with infection of the umbilical cord.

Female Education and Gender Issues: Low Education level, gender discrimination and lack of empowerment of women prevent them from seeking appropriate healthcare and making the best choices for their own health and that of their children which may eventually lead to poor health outcomes with long-term sequelae (Opara, 2015). Educating the woman empowers her to make smarter maternal decisions about many health issues including hers and the baby. This may include among others, prenatal care (where and when), basic hygiene, nutrition and immunization which are all vital to reducing the leading causes of death among the newborns. Educated mothers are more likely to ask pertinent questions while receiving care from their

caregivers, enforce their right to medical information and most likely adhere strictly to professional advice as well as understand the risk associated with non-adherence to instructions , thereby leading to better understanding , compliance and better health outcomes.

Teenage pregnancy: This is said to occur when a girl aged between 13-17 years becomes pregnant. A study here in Amassoma (Maliki, 2012) revealed that the age at which teenagers engage in sexual intercourse is too early (12years)and permissiveness of parents, drop in moral values, socio-economic as well as cultural factors were implicated as causative factors. The association of poor pregnancy outcomes with teenage pregnancy is attributable to the fact that teenage mothers are more likely to be unmarried and isolated, they usually exhibit a sense of guilt, low self-esteem and other psychological issues which may include unwillingness to attend antenatal clinics and refusal to have facility based delivery because of shame and unsupportive environment in the facility. In a study by Isah and Gani (2012) they reported an incidence of 6.2% of teenage mothers with their ages ranging from 14 to 19 year. In this study, 26 out of the 88 teenage mothers (31.3%) had Caesarean sections, 22 (84.6%) being emergency caesarian sections. Deaths of the newborn while in the mother's womb (stillbirth) and early newborn deaths in this group of mothers was 11(perinatal mortality of 133/1000 births). This picture only reflects what occurred in the Teaching Hospital and we must understand that in our communities the story is not different and they may not have access to emergency obstetric care (EOC) both in terms of equipment and personnel. Most of such occurrences are undocumented thereby making the problem an invisible one.

Early initiation of breastfeeding: The healthy term newborn if placed on the mother's abdomen immediately after birth within

45 minutes negotiates his/her way to the mother's breast by wriggling up her abdomen. Early Initiation of breastfeeding within 30 minutes to one hour of birth is one of the 10 steps to promoting successful breastfeeding and promotes closeness between mother and child (WHO, 2017). The first yellowish milk (colostrum) is baby's first immunization as it contains all the antibodies needed to fight germs and protects the baby from serious illness. It also contains the food needed by the child and this will make the child to be very strong. National data reports that only 33% (Bayelsa State 27%) of babies were put to the breast within this time frame and this portends a dangerous signal to successful Exclusive breastfeeding, thereby compromising the newborn and infant's health(Debes et al.2013) .

A cross sectional study by kunle-Olowu et.al(2013) of mothers of infants aged 7 to 24 months who were interviewed on their knowledge and practice of exclusive breastfeeding using a structured self-administered questionnaire during a medical outreach under the auspices of the Nigerian Medical Association, Bayelsa State Branch.

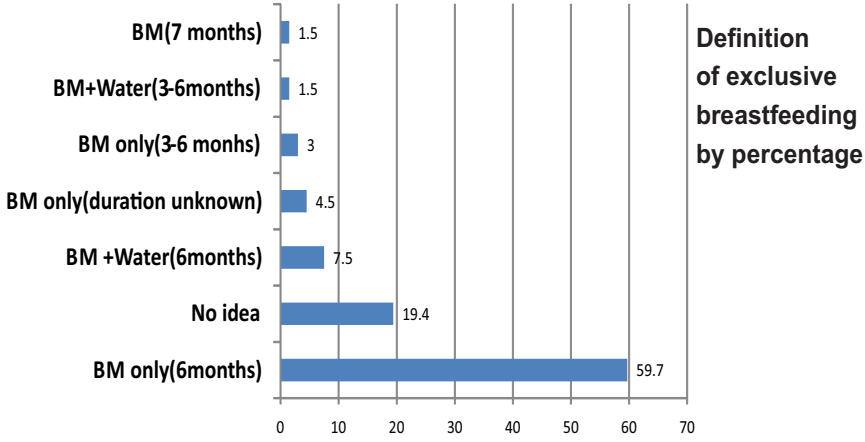


Fig45: showing distribution of women (%) by knowledge of definition of Exclusive Breastfeeding

The major sources of knowledge on exclusive breastfeeding were the health workers (80.6%), followed by the media (10.4%). While all babies received breast milk in the first 6 months of life, only 26.9% of mothers practiced exclusive breastfeeding. Increased breastfeeding rates were seen among women with higher educational status and increased maternal age. We concluded that there is a wide gap between knowledge and practice of exclusive breastfeeding among women in Gbarantoru community in Bayelsa state.

3. CHALLENGES IN THE HEALTH CARE FACILITIES WHERE DELIVERIES TAKE PLACE IN BAYELSA STATE

Quality of Care.

While it has been documented that most deliveries occur outside health facilities (MCIS, 2017), it is pertinent to note that even births taking place in the health facilities do face some challenges.

3.1. Training

There are two (2) training institutions of Nursing in Bayelsa State- Faculty of Nursing, NDU and the School of Nursing, Tombia. As we speak the state is yet to commence the training of midwives (School of Midwifery) 20years after its creation. At present only 275 midwives are in the state employment. Due to poor funding, attendance at conferences and workshops is abysmally poor and lack of continuous medical education for health workers affects the quality of care rendered .A mandatory refresher course policy which is currently in place is not enforced as such workers knowledge, skills and attitude to newborn health matters in particular is very poor. We have seen babies with severe intrapartum-related complications (birth asphyxia) referred to us at NDUTH from other health facilities in the State. This, we believe, may be attributed to low quality of care as well as inadequate training of the staff in some of these facilities.

Another challenge here in Bayelsa State is the practice by the State Ministry of Health, where desk officers who are in charge of programs are sponsored to attend workshops and conferences on a continuous basis (information overload) but fail to do a step down training for the health workers in the health facilities (foot soldiers) thereby depriving them of current knowledge and skills.

Fig.46. Illustration of Desk officers in the State Ministry of Health (information overload).

3.2. Presence of Skilled attendant at delivery

The life saving measures a skilled attendant provides within the first minute of birth determines the outcome of the newborn, as such It is advocated that a person skilled in basic neonatal resuscitation be present at all deliveries. However, the acute shortage of well trained personnel in the State employment makes this impossible, and the resultant effect is that some deliveries in our health facilities do not have skilled attendant (Fig. 47). Statistics from the State MOH showed that among the 8,292 deliveries that took place in the state health

facilities including PHCs in 2015, only 5,457(66%) had skilled attendant at delivery (SMOH 2015).

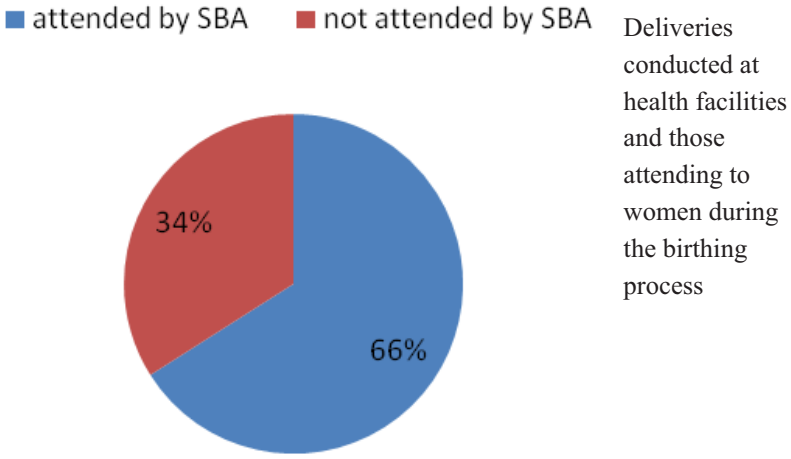


Fig. 47: Pie-Chart showing the distribution of deliveries in health facilities in Bayelsa State by person providing care at delivery.

The above pie chart(Fig.47) shows that delivery in a health facility may not be synonymous to being attended to by skilled attendant as personnel although a health worker may not have been trained to an appropriate level of midwifery proficiency.
It is recommended that all deliveries at health facilities should have a skilled attendant at delivery since a strong negative correlation has been shown to exist between their presence and first day deaths as shown in Fig.48 (Save the Children, 2013)

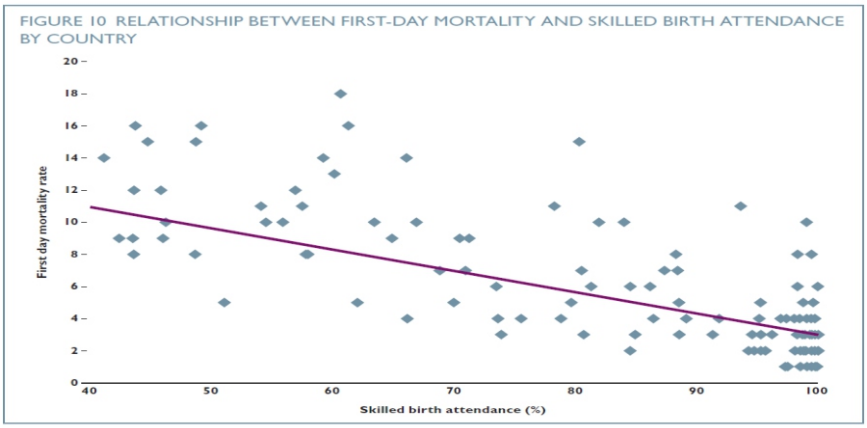


Fig 48: First day deaths and skilled Birth Attendance by country (2005-2012).

Acute shortages of health workers and Ill- Distribution of Manpower:

It is said that "a well performing health workforce" is one which is available, competent, responsive and productive. Health workforce being an integral part of health system plays a critical role in achieving effective health service delivery and their availability has been shown to have a positive correlation with positive health outcomes. The numbers, their skill mix and distribution determine to a large extent the services rendered in terms of quality and quantity. In a state like Bayelsa where over 80% of its citizens reside in rural settings , the point of care for most people especially in the rural areas is the Primary Health Centre(PHC) located in the communities serving mostly the socially disadvantaged and vulnerable populations. The health workers are poorly distributed in favour of urban areas (32% of doctors and 52% of total no. of nurses in Yenagoa)

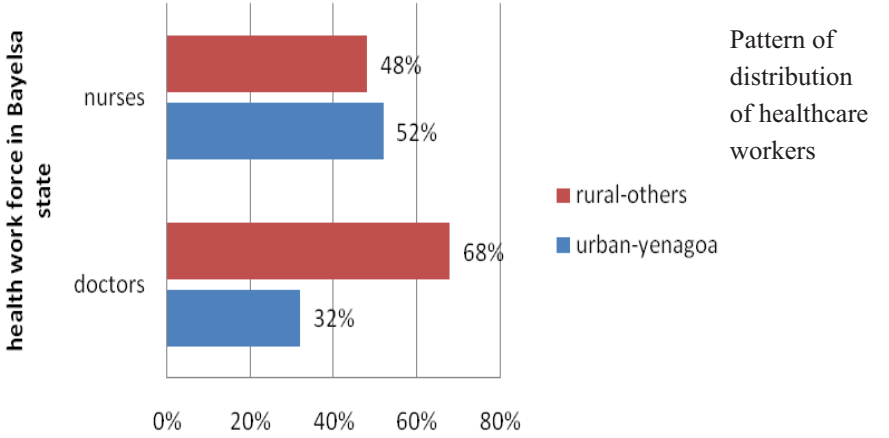


Fig.49 : Histogram showing a skewed distribution of health workforce by place of residence.

This pattern of ill distribution of manpower as shown above (Fig.49) is a contributory factor to the high newborn deaths especially in the rural areas as those who need their services lack access to them by virtue of their place of residence(Babatunde 1993).

Use of Partograph to monitor labour (when a piece of paper can save a life)

The partograph is a graphic record of progress of labour i.e. a monitoring tool and relevant details of mother and unborn baby (Fig50a). It was introduced as an early warning system to detect labour that was not progressing as anticipated. This is expected to allow for timely transfer to a referral centre, for augmentation or caesarian section. It indicates when augmentation is needed and can point to possible cephalo-pelvic disproportion before labour becomes obstructed. Its use has been shown to increase the quality and regularity of observation made by the attending staff

on both the mother and unborn baby. This has been shown to be effective in preventing prolonged labour, and improved neonatal outcome (WHO 2008). It also prevents infection which may be caused by multiple vaginal examinations.

Opiah et al (2012) in a study on the knowledge and utilization of partograph at FMC and NDUTH showed that it was routinely used (FMC 50.6% and NDUTH 98.8%) by health workers in these facilities. However it was reported that documentation of events during labour was scanty, only 32.6% were properly filled. The reasons given were (a) takes too much time 8.6% (b) shortage of personnel 19.6%, non-availability 30% and little or no-knowledge 22.2%. This may imply that quality of care during labour and birth maybe suboptimal even in facilities where the partograph is used. Analysis from available data from the health facilities in the state (2015) showed that out of the 8292 deliveries, only 991(12%) utilized the partograph during labour (Fig 50b). More worrisome was the fact that its use was mainly in the tertiary institutions and a few secondary health facilities, none of the Primary Health Centers (230) reported using the partograph to monitor labour.

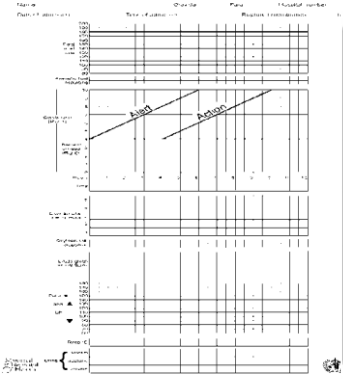
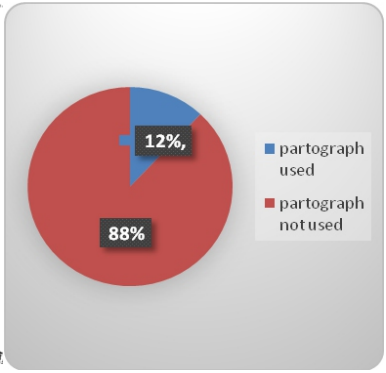


Fig. 50a. The WHO recommended partograph.



Utilization of partograph in health facilities

Fig50b : proportion of utilization of partograph in labour by health facilities in Bayelsa State. Source: State Ministry of Health, 2015.

Poor Infrastructural Development:
Unfortunately most of the PHCs are usually poorly staffed and ill-equipped (no electricity and potable water, lack of drugs, no functional suction machines etc), to deal with newborn health issues.
Furthermore majority of the highly-skilled health workers are not likely to be found in these areas where they are most needed for reasons such as insecurity, lack of good schools for their children, inadequate accommodation for the hospital staff, poor means of communication and transportation among others.

A study by Babatunde A (1993) investigating the linking mechanism between key socioeconomic factors and child survival identified local area infrastructural development as the main socio economic factor in neonatal mortality .This study highlighted the fact that in places where the health facility close to the people is adequately equipped both in infrastructure and personnel, utilization will be optimum even by the poor. It also reported that the easier physical access to modern health facilities in the urban areas may account for the observed advantage of place of residence (urban versus rural) as a critical determinant of newborn survival.

Poor emergency obstetric and neonatal care and referral system.
About 15% of pregnant women will develop obstetric complications such as obstructed or prolonged labour, bleeding. This group of women will need Basic Emergency obstetric care which involves (a) Administration of antibiotics, uterotonic drugs (oxytocin) and anticonvulsants (magnesium sulphate). (b) Manual Removal of placenta(c) Removal of retained products following miscarriage or abortion (d) Assisted vaginal delivery, preferably with vacuum (e) Basic neonate resuscitation care. The Emergency obstetric care is expected to be provided by skilled staff even in primary health centres and its absence poses a major

challenge to the health system, and a threat to the mother and child. While 18 health facilities in the state can offer Basic Emergency Obstetric care, (BEOC) they are ill-distributed. Most of the PHCs in the rural areas do not render clinical services during the weekends and at nights (no 24 hours coverage, seven days a week). All mothers who will need care can not access it and most be referred to other places. The referral system is weak due to inadequate number of dedicated ambulance boats and vehicles in addition to the difficult terrain with minimal road networks.

2.4 PROSPECTS IN NEWBORN CARE

Mr.Ag. Vice- Chancellor Sir, based on the evidence as presented in this lecture, the available resources both in terms of manpower and infrastructure, we cannot say our newborns are receiving the best care here in the state. However with a concerted coordinated effort among policy makers, healthcare providers, opinion leaders, communities and the families we can provide best care for our newborns. This is possible because we already know the problems they face, why and when they are dying. The implementation of some low cost interventions known to have high impact such as targeting the time around the birthing process , quality care for the small and sick newborn, care in the early post partum period will prevent about 80% of the newborn deaths and long-time complications (Table 13& Figs 54a-c). Some of our strengths in the State include,

(a) The presence of two tertiary health facilities (FMC &NDUTH) providing neonatal care as well as trained personnel

(b) The State Primary Health Care Development Agency which was inaugurated some months ago.

(C)The Paediatrics Association of Nigeria (PAN) in collaboration with Nigerian Society of Neonatal Medicine (NISONM) who the frontiers of ensuring Best Care for newborns with the commitment of ending preventable newborn deaths. In my earlier discussion, the significant role of skilled attendant at delivery

was emphasized to give live-saving measures within the first(golden)minute in order to prevent birth asphyxia and other related emergencies. I also mentioned the acute health care workers shortage, however project **c.u.r.e**., a U.S based non-profit organization, conducts training tagged- Helping Babies Breath (HBB), resuscitation techniques including Train-the –trainers (TOT) program with a curriculum that addresses three main issues viz: neonatal resuscitation, essential care for every newborn (ECEB) and preemie babies. Their success story in Ghana (NMR 26.9/ 1000 live births) where following 2 HBB trainings with proper neonatal resuscitation equipment resulted in 0.17% NMR reduction can be replicated here in Bayelsa State. I have made reference to all of these, to enable us see the window of opportunities available to us, and why it is possible for us as a State to give the best care to our newborns.

Table 13: shows some of the various interventions and their effectiveness (percent) by cause of neonatal mortality.

s/no	Causes of neonatal mortality	% of contribution to neonatal mortality ((Bayelsa sate)	% of contribution to neonatal mortality ((Nigeria)	% of contribution to neonatal mortality (Globally)	Suggested interventions and % effectiveness	% of effectiv eness of interven tions
1	Neonatal sepsis	31	16.2	15	Clean postnatal practices (24%) Case management of severe neonatal sepsis. (24%) Early initiation of breastfeeding (11%) Use of chlorhexidine gel for cord care (14%).	90
2	Birth asphyxia and birth trauma	32	30.9	24	Labour and delivery management-use of partograph and SAD (70%) Neonatal resuscitation (22%)	92
3	Preterm births and complication	26	31.1	35	Hospital care of preterm babies including kangaroo mother care (50%) Antenatal steroids for preterm labour (31%)	81

Source : Lancet Neonatal Survival series (2005)

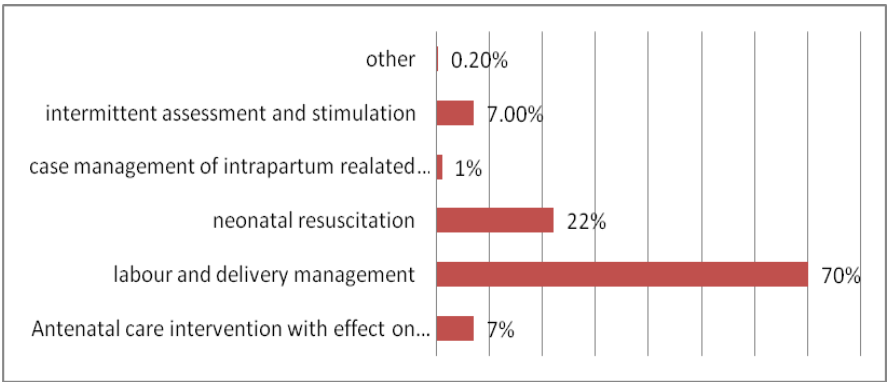


Fig.51a: Estimated effect on interventions on intrapartum-related related neonatal deaths

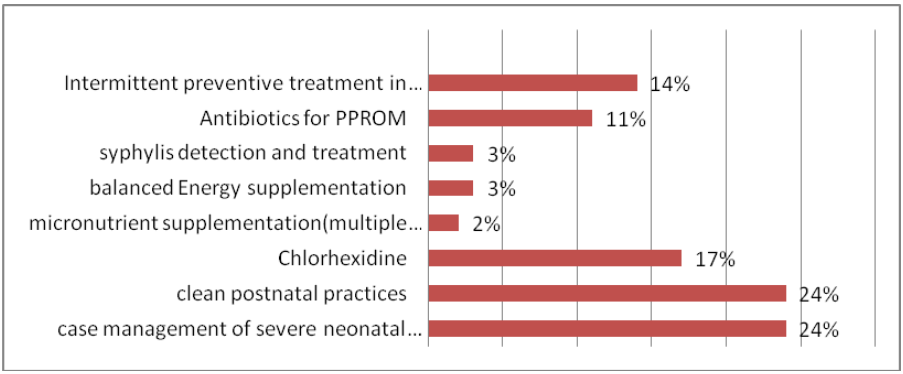


Fig. 51b: Estimated effect on infection-related neonatal deaths (sepsis,meningitis,pneumonia)

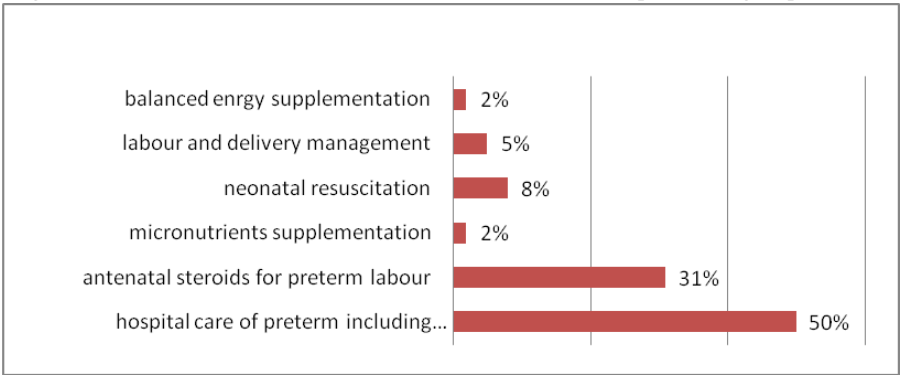


Fig51c: Estimated effect of interventions on preterm-related complications (<32 weeks gestation)

Table 14: The summary of High impact, low cost interventions to save newborns

Intervention	Lives saved	Cost
Case management of neonatal sepsis*	~500,000	$0.13- $2.03
Chlorhexidine umbilical cord cleaning*	*Cannot estimate in LiST*	$0.23
Neonatal resuscitation*	~230,000	~$0.50 - $10.00
Antenatal corticosteroids for preterm labour*	~430,000	~$0.60
Kangaroo Mother Care	~450,000	

Source: Extracted from Prioritized by the UN Commission on Life Saving Commodities for Women and Children: (Lawn et al. 2013).

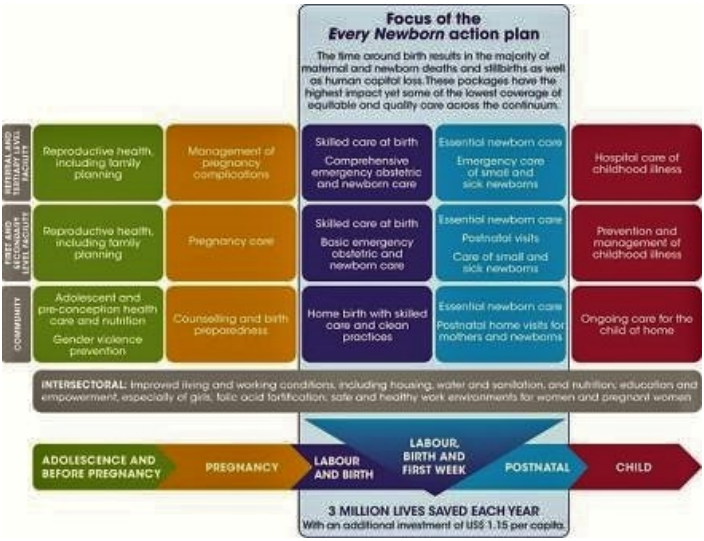


Fig.52: Showing various interventions for healthy mother and newborn and the need to focus around the birth period.Source : The Lancet Every Newborn Series, Mason E et al. Lancet, 2014.

The opportunity the continuum of care offers as shown Fig.52 lies on the fact that most of the problems contributing to deaths in the newborn occur especially around the time of birth and it is only proper to pay close attention to those interventions and as a matter of urgency adopt those practices/intervention at this critical period. This singular action by all stakeholders renews the prospects of newborn care and their survival here in Bayelsa State.

3.0 MY CONTRIBUTIONS TO CHILD HEALTH WITH FOCUS ON THE NIGER DELTA REGION.

Mr. Ag. Vice- Chancellor Sir, I have carried out various research projects in Newborn Health, Haematology, Child Health and Preventive Paediatrics, and I will be discussing some of the research works.

3.1. NEWBORN HEALTH

i. Original Article: Clinical Causes Of Death In The Niger Delta Region In Nigeria: A study On Childhood Mortality(kunle-Olowu O.E, Immananagha K.K et.al 2010)

A retrospective study carried out to provide information on the clinical causes of death among critically –ill children admitted to the Paediatrics and Emergency Wards, Special Care Baby Unit (SCBU) of the Federal Medical Centre using the clinical diagnosis made at presentation and subsequent reviews preceding their death over a six year –period (2002-2008). Data was collected from the hospital records.

We identified Neonatal sepsis, Severe Birth Asphyxia, Neonatal Tetanus, Complications of prematurity and Neonatal Jaundice as top five (88%) causes of death in the neonatal period, (Fig.53) others including congenital malformation, diarrhea and pneumonia contributed 12%. The overall contribution of neonatal deaths to childhood deaths in the study was 35%. The problem of late presentation was highlighted as a major factor that

determined the outcome of these illnesses as 66% of the children died in the first 48 hours of admission. Before presenting at the facility parents had sought care from drug shops, traditional medicine practitioners and private clinics.

Most of the parents (63.6%) experienced financial difficulties in the course of management of their child's ill-health. A lot of parents 152(54.3%) could not pay for the investigations requested nor provide the prescribed drugs throughout the period of hospitalization due to financial constraints. while we commended Government's effort in establishing the health facility we recommended that effort be made by government to reduce the out-of pocket expenditure on health to reduce the mortality rates and the need to enlighten the populace especially in terms of health seeking behavior of parents

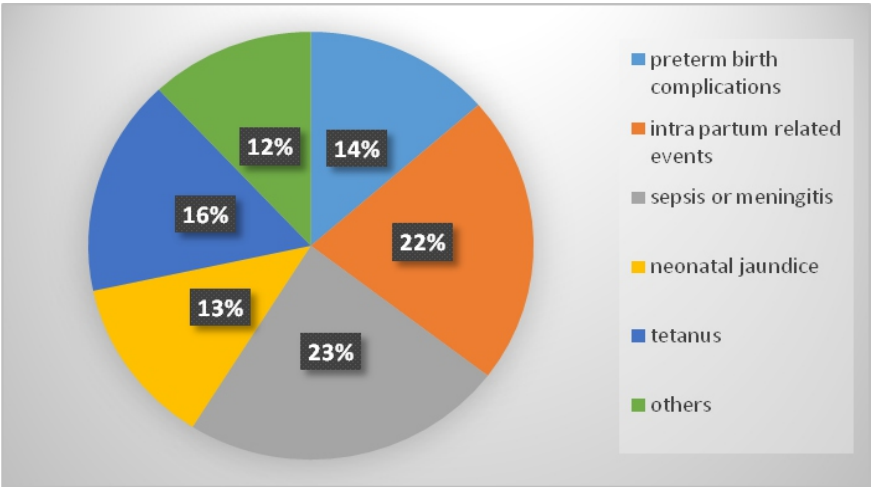


Fig.53: showing the diitribution of newborn deaths by causes at the Federal Medical Centre, Yenagoa

ii. Original Article:Prevalence and outcome of Preterm admissions at the neonatal unit of Niger Delta University Teaching Hospital, Bayelsa State:

A two- year retrospective study kunle-Olowu and Peterside (2010-2012) found that 24.0% of all the admissions into the unit were Preterm Births (born too soon, born too small) and the survival rate was highest (65.7%) among the mild preterms(34)with no complications such as infection or breathing problems. The study also showed that most of the deaths occurred in the extreme preterm babies<28 weeks of gestational age (GA) with these complications, highlighting the fact that infections and respiratory problems, when they coexist with prematurity in a neonate increases the risk of death. Among the preterms 55.1% were discharged home, 34.1% died and 10.9% were discharged against medical advice. (Figs 15a-15c).

Table 15a – medical problems of preterm neonates admitted into SCBU(NDUTH)

Table 4. Morbidity and mortality pattern.

Problem	Number	Percentage n = 138	Number who died	Case fatality rate
Respiratory problems	95	68.8	60	63.2
Jaundice	94	68.1	31	33.0
Sepsis	54	39.1	19	35.2
Asphyxia	40	29.0	15	37.5
Anaemia	28	20.3	11	39.3
Bleeding disorder	15	10.9	9	60.0
Necrotizing enterocolitis	12	8.7	8	66.7
Acyanotic congenital heart disease	8	5.8	3	37.5
Birth defect	8	5.8	2	25.0
Birth trauma	7	5.1	2	28.6
Hypoglycemia	7	5.1	4	57.1
Seizures	3	2.2	2	66.7

Table 15b- clinical outcomes and mean duration of stay according to gestational age

Table 5. Clinical outcome and mean duration of stay according to gestational age.

Gestational age at birth (weeks)	Total number (%)	Mean duration of stay (days)	Clinical outcome			Survival rate (%)
			Discharged	Died	DAMA	
24	1	5	0	1	0	0.0
25	0	0	0	0	0	0.0
26	4	18.25 ± 27.94	1	3	0	25.0
27	4	6.25 ± 6.70	0	4	0	0.0
28	18	17.83 ± 18.46	5	12	1	33.3
29	1	28	0	1	0	0.0
30	12	15.75 ± 14.52	5	5	2	58.3
31	15	15.00 ± 11.54	7	6	2	60.0
32	23	13.04 ± 10.12	14	8	1	65.2
33	15	11.60 ± 8.01	9	0	6	100.0
34	14	11.36 ± 6.93	10	3	1	78.6
35	11	14.75 ± 11.56	10	1	0	90.9
36	11	10.18 ± 6.90	9	0	2	100.0
Unknown	9	11.43 ± 11.89	6	3	0	66.7
Total	**138**	**13.33 ± 12.05**	**76**	**47**	**15**	**65.9%**

DAMA: discharged against medical advice.

Table15c ---Survival rate according to category of prematurity

Table 6. Survival rate according to category of prematurity.

Category	Total number	Percentage of total n = 138	Number who survived	Survival rate %	χ^2 (p value)
<28 weeks	9	6.5	1	11.1	29.24 (0.000)
28 to 31 weeks	46	33.3	22	47.8	
32 to 36 weeks	74	56.5	62	83.8	

iii. Case Report: Congenital tuberculosis: a case report and review of the literature.

Congenital tuberculosis is a rare infection transmitted from a mother to her unborn child, either through the infected placenta or amniotic fluid. Affected infants usually present with non-specific signs, hence a very high index of suspicion is required to make a diagnosis. We reported a 12 week old male child who was referred to NDUTH from FMC on account of difficulty with breathing and poor weight gain from birth, cough and swelling of the left side of neck of 9 weeks duration respectively i.e. swelling

was noticed when the child was just 3 weeks old, fever for 3 weeks and diarrhoea for 2 days before coming to the hospital. He was initially managed for severe neonatal sepsis with antibiotics. However the management was changed after 2 weeks (poor response to antibiotics, chest Xray findings(Fig.54) and was commenced on anti –tuberculosis on day 14 of admission. The index patient made remarkable recovery and was discharged

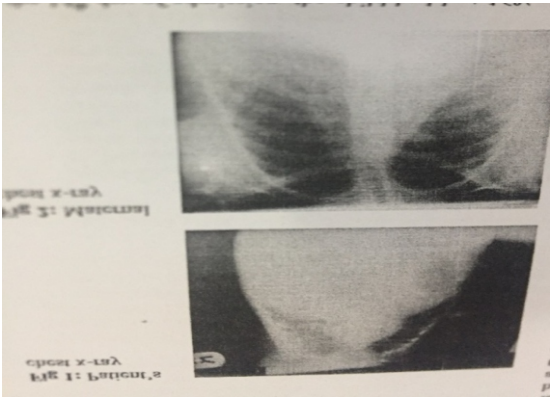


Fig.54: Chest X ray of mother and child showing features of tuberculosis

iv. A case report Epidermolysisbullosa simplex.

A baby born with long nails and redness of the nail beds which soon progressed to ulcers (wounds) which subsequently fell off. He also had blisters on the surface, abdomen and the perineum showing evidence of very fragile skin. At presentation the affected nails of both hands and feet were completely destroyed (Fig.55). He also had ulcers on the gums with multiple scalds on the abdomen, umbilicus, trunk and perineum. Initial diagnosis was scalded skin syndrome and he was treated with antibiotics. However on review by the dermatologist made the diagnosis of Epidermolysis bullosa simplex which is a rare hereditary cutaneous disorder mainly in an autosomal dominant fashion. Treatment is mainly supportive and parents were counselled on risk of reoccurrence in subsequent children and avoidance of trauma and infection.

Fig. 55: ulcers on various aspects of the body but more pronounced on the finger nails.

v. Original Article: Immunization coverage of antenatal and immunization clinic attendees in the Niger Delta University Teaching Hospital.

Neonatal tetanus is a major cause of morbidity and mortality in the newborn period. A totally preventable disease by means of two complementary strategies: the administration of two doses of tetanus Toxoid to the pregnant woman and ensuring hygienic practices during and after delivery especially in the area of cord care.

In this study, we reported the maternal immunization coverage rate of TT among antenatal attendees using the immunization register. Out of the 601 pregnant women, 151(25.2%) and 82 (13.6%) had TT1 and TT2 respectively while 368(61.2%) had both TT1 and TT2 in that pregnancy (Fig.56).

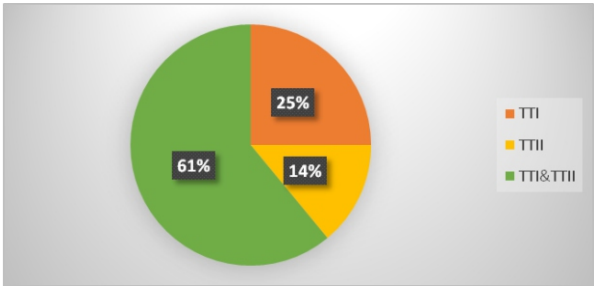


Fig.56: Maternal tetanus toxoid immunization pattern in index pregnancy.

This study highlighted the gaps in our immunization coverage and the risk of occurrence of neonatal tetanus in our state since the incidence of neonatal tetanus in any community is significantly related to the immunization coverage of the Tetanus Toxoid (TT) of pregnant women. We recommended more aggressive public enlightenment campaigns involving mothers, community leaders and local government staff on immunization including tetanus Toxoid for the reduction of risk of acquiring neonatal tetanus which is a significant contributor to newborn deaths.

3.2 Child Health

i. Original article: Knowledge and Practice of Exclusive Breastfeeding among Mothers in Gbarantoru Community, Bayelsa State

Mothers of infants aged 7 to 24 months were interviewed on their knowledge and practice of exclusive breastfeeding using a structured self-administered questionnaire during a medical outreach under the auspices of the Nigerian Medical Association, Bayelsa State Branch.

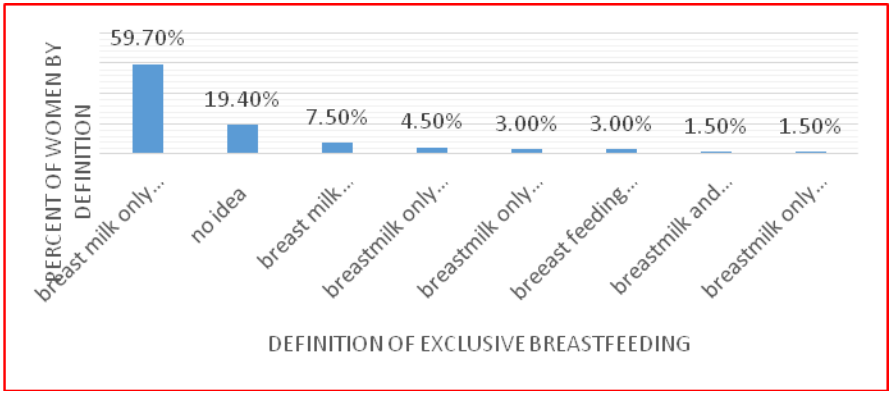


Fig.57: showing distribution of women (%) by knowledge of definition of Exclusive Breastfeeding

The major sources of knowledge on exclusive breastfeeding were the health workers (80.6%), followed by the media (10.4%). While all babies received breast milk in the first 6 months of life, only 26.9% of mothers practiced exclusive breastfeeding. (Fig.57) Increased breastfeeding rates were seen among women with higher educational status and increased maternal age. We concluded that there is a wide gap between knowledge and practice of Exclusive breastfeeding among women in Gbarantoru community in Bayelsa state.

ii. Original article: Patterns of acute febrile illness in children in a tertiary institution in the Niger Delta Region of Nigeria.

Fever is one of the common reasons children visit the hospitals , sometimes on an emergency basis and in most cases they are treated for malaria using the current guideline in line with the Integrated Management Of Childhood Illnesses(IMCI). In some instances where the fevers persist it is assumed that there is treatment failure and another antimalarial is usually prescribed. This prospective study (Pondei, Kunle-Olowu O.E & Peterside) was carried out (2011-2012) to describe the possible causes of febrile illness in malaria –endemic region where presumptive treatment of all fevers as malaria is practiced. Blood, ear swab, throat swab and urine samples were obtained from 190 children aged 6 months-11 years with febrile illness. Giemsa stain for malaria parasite, microscopy, culture and sensitivity for urine, ear and throat swabs were carried out (Fig58). We found that only 48% of febrile children had parasitological evidence of malaria and 6% had both malaria and bacterial infection.

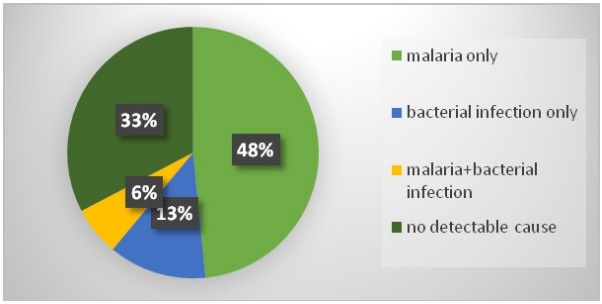


Fig 58:Proportion of detectable causes of febrile illness in children.

The findings in this study highlighted the contribution of bacterial infections in childhood fevers in a malaria –endemic settings. We recommended that other causes of fever must not be missed out in the clinical assessment of the febrile child especially the very young child aged less than 2 years and resources should be made available for facilities to incorporate bacterial culture since there is an overlap. Also attending Physicians should always remember the other possible causes of fever when attending to children with febrile illness.

iii.Original Article: **The etiology of non-malarial febrile illness in children in the malaria endemic Niger Delta Region of Nigeria**.

An earlier study by Pondei, Kunle-Olowu O.E & Peterside. (2013) showed that only 48% of febrile children had parasitological evidence of malaria and 6% had both malaria and bacteria infections. This Study was carried out to determine the aetiology of non-malarial febrile illness using urine samples, ear and throat swabs (Fig. 59a).

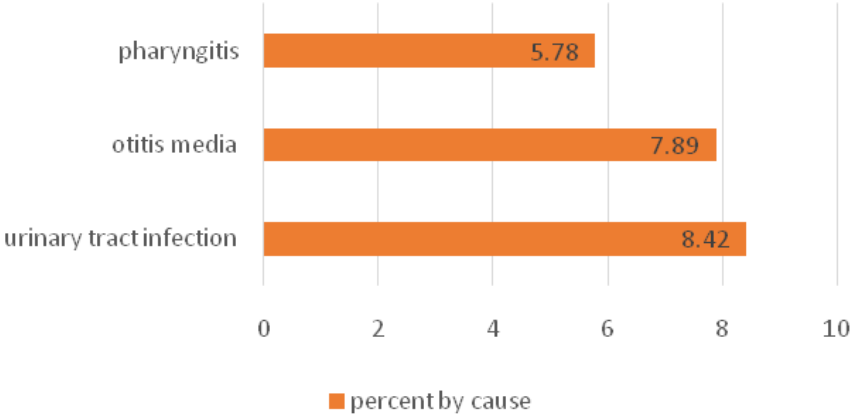


Fig 59a:showing the causes of non –malarial febrile illness among children presenting at NDUTH.

While the urine samples showed a predominance of Gram-negative bacilli-E.coli accounting for 75% of isolated bacteria (fig 48a), gram-positive cocci was S.aureus accounted for 60% of all pathogens for ear swab culture (Fig.59b&59c)

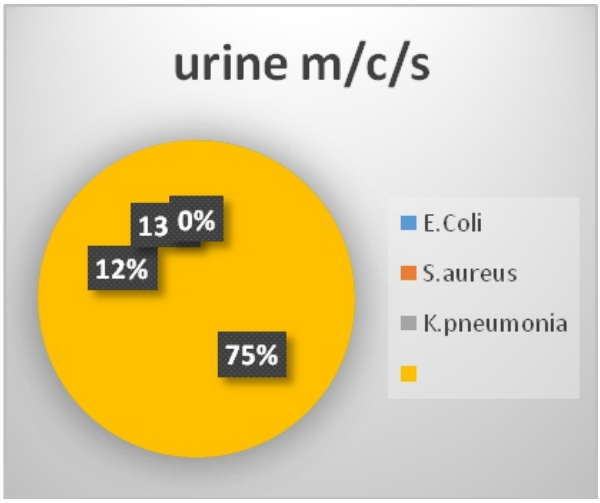


Fig59ba: Frequency of isolated pathogens

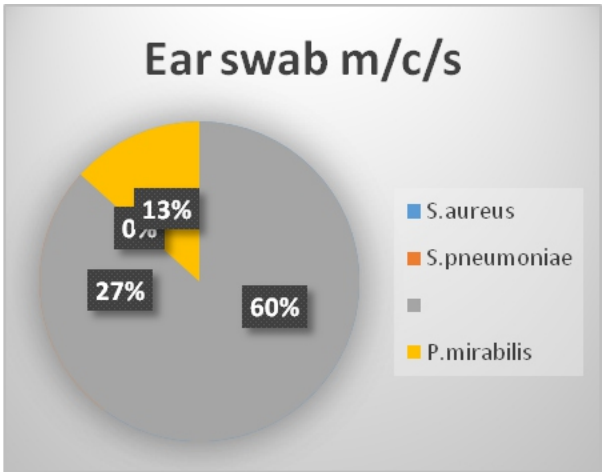


Fig 59cb: Frequency of isolated pathogens

and S. pneumoniae was responsible for all the positive throat cultures.The sensitivity pattern of the isolates to the various antibiotics was also tested and E.coli in urine sample was sensitive to floroquinolones and cephalosporin but resistant to cloxacillin. The S.pneumoniae from the throat swab was sensitive to ceftriaxone but resistant most of the antibiotics. The S.aureus isolated from the ear swab was sensitive to cloxacillin-clavulanic acid and gentamicin.

iv. Original article: .Severe malaria in children: presenting complaints of the Niger Delta children

A retrospective study of the common presenting complaints of children admitted in the Children Emergency ward at the Federal Medical Center,Yenagoa was carried out by Immananagha and Awotua-Efebo(2009). The aim was to identify the common complaints among the children in the Niger Delta which is a lowland rain forest belt area where malaria transmission is intense throughout the year as well as assess the disease burden in this area. The study showed the following as the common presenting complaints, fever (100%), anaemia(85.8%)vomiting(54.2%),convulsions(43.2%)impaired level of consciousness, including unarousable coma(42.6%),cough (36.1%), respiratory distress (28.1%) prostration(19.4%) (Fig 60).

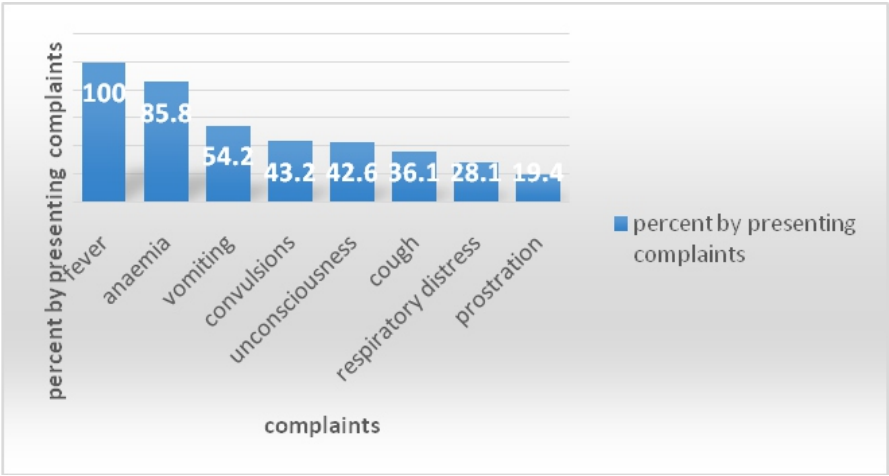


Fig. 60: Distribution of common presenting clinical complaints

v. Original article: Severe malaria in children: a proposal for clinical grading.

Severe malaria from plasmodium Falciparum has been documented to cause 1.5 to 2.7 million deaths in under five aged children with 90% of these deaths occurring in sub-Saharan Africa.

The WHO classification did not include the grading of severe malaria as seen in neonatal tetanus which correlates closely with prognosis and management thereby treating all patients with severe malaria as a homogenous group. Immananagha and Awotua-Efebo (2009) conducted a retrospective study of children aged 3 months to 12 years (155 children) who fulfilled the WHO SM criteria and their presenting clinical features and case fatality rates were investigated. The aim of the study was to identify those presenting clinical features with the highest case fatality.

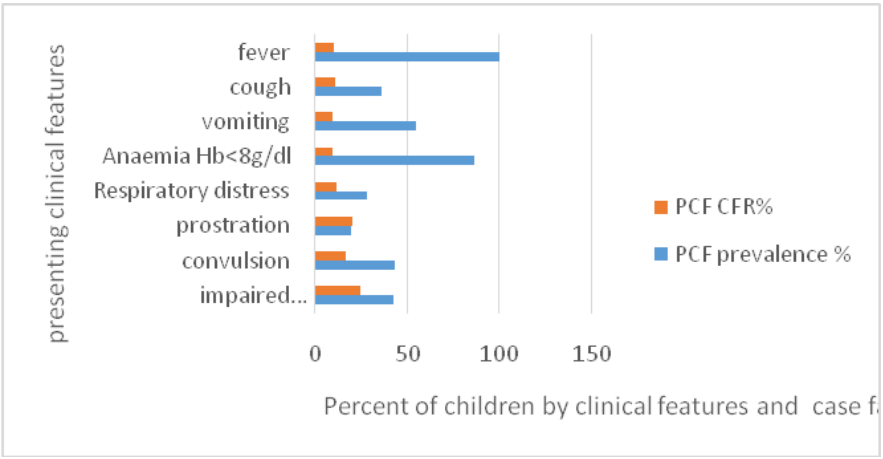


Fig. 61:presenting clinical feature by case fatality.

Four major clinical features were identified- impaired consciousness, convulsion, prostration and respiratory distress and cough, fever, vomiting and anaemia as minor clinical features (Fi. 61a). Three clinical grading system was proposed based using the presenting clinical features as the criteria.

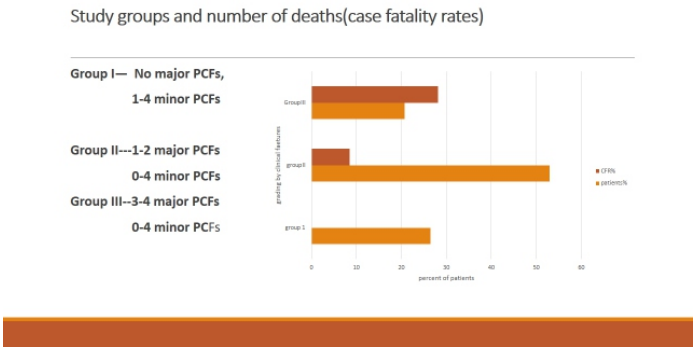


Fig. 61b: proposed grading using PCF

It was recommended that the proposed clinical grading be validated by means of larger studies since it has the potential of identifying less severely ill patients and encourage the development of appropriate guidelines that will take into account disease severity especially in our resource poor settings.

vi. Original Research Article: Nutritional Assessment of Children Aged Twelve to Fifty Nine Months with Diarrhoea, using Mid-Upper -Arm Circumference (MUAC).
Protein energy malnutrition is a significant isue of merbilidity an merdality in children and diairhoea has been shown to have a bit directional relationship with malnutrition.

A prospective study of nutritional assessment in children presenting with diarhoea aged 12-59 months (144 children) over a six month period the Paediatric unit of the Niger Delta University Teaching Hospital. The aim of the study was to measure the effect of diarhoea and some socioeconomic factors on the nutritional status of the study group. Among the children presenting with diairhoea, 89% had acute diairhoea, 6%-percsistent diairhoea and 7% had chronic diairhoea (Fig 62a).

Nutritional assessment was carried out using the mid-upper-arm circumference which was measured to the nearest 0.1cm using the shakir strip (Fig. 62b). Children with MUAC<12.5cm were classified as having malnutrition while those with MUAC between 12.5cm and 13.4cm were classified as being at risk of malnutrition. Children with MUAC > 13.5cm were classified as having normal nutrition.

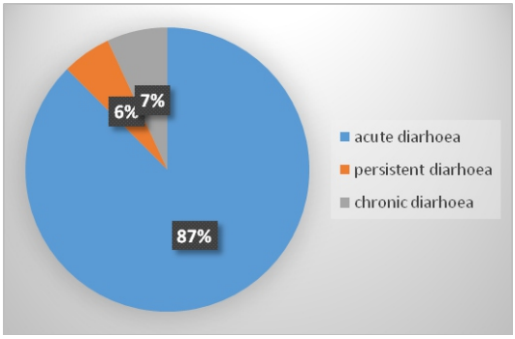


Fig.62a: showing type of diarrhoea by duration

Fig.62b: sharkir strip

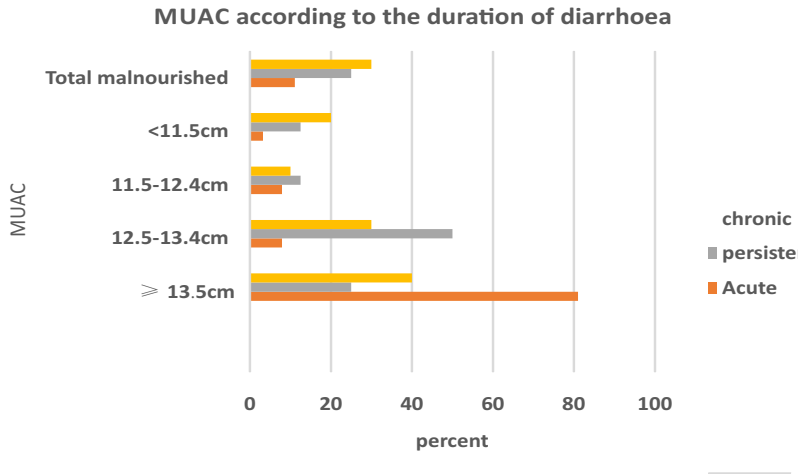


Fig. 62c:showing the mid –upper –arm circumference in relation to the duration of the diarrhoea.

In this study it was found that 13.2% of the children were malnourished, with 4.9% having severe acute malnutrition (SAM) and 8.3%-moderate acute malnutrition (MAM). 11.8% of the children studied were at risk of malnutrition. Children with chronic diarrhoea and ages ranging from 12-23 months had significantly lower MUACs(malnourished). From the findings it was concluded that under nutrition is an important problem in

children aged 12 to 59 months with diarrhoea. The need to pay attention to their feeding especially during the diarrhoeal episodes was emphasized.

3.3 HAEMATOLOGY

i. Original article: *Malaria Parasite Density and Splenic Status By Ultasonography In Stable Sickle-Cell Anemia (HbSS) Children*.

A prospective study was carried out Awotua- Efebo et al (2004) to determine the relationship if any, between malaria parasitaemia, parasite density and presence/absence of spleen (autosplenectomy- using abdominal ultrasound) in stable sickle –cell anaemia(SCA) children aged 6-15 years , with HbAA Children as controls.. While both groups had malaria parasites (30% in SCA and 34% in HbAA) the degree of malaria parasitaemia as well as the parasite density were lower in healthy SCA children than the controls. Also parasite densities were relatively higher among SCA children with splenomegaly and normal spleen sizes compared to SCA children with autosplenectomy.We concluded that autosplenectomy may be a positive adaptation in SCA children with effective innate immunity.

ii. Original article: *Haematological indices and the spleen in stable sickle cell anaemia children and HbAA controls.*

A prospective study carried out by Awotua-Efebo, Nwakwo and Alikor(2003) to determine the relationship between certain haematological indices and spleen sizes in stable SCA children aged 6-15 years using abdominal ultrasound to measure the spleen.

We reported lower haemoglobin and significant higher white blood cells and platelets among the SCA children when compared to the controls (HbAA). SCA with autosplenectomy had

significantly higher white blood cells and platelet counts when compared with those (SCA) that have normal sized spleen. However ,SCA children with splenomegaly were found to have lower haemoglobin and platelet counts with a slightly higher white blood cell count (Table16). We concluded that splenomegaly may be associated with poorer haematological indices even in healthy Nigerian children with SCA, the reverse was noted among those with auto splenectomy. We recommended more frequent visits of "stable" SCA children and parental counseling for those with splenomegaly.

Table16: showing the splenic status and haematological indices in the study groups (HbSS&HbAA)

	Splenic status				**Haematological indices**		
Group	normal	autosplenectomy	splenomegaly	Total	Hb	WBC	Platelets
HbSS	53	20	27	100	6.23 + _0.95	13.71 + - 4.05	225.7+_ 83.96
HbAA	96	0	4	100	12.40+-1.00	5.56+-1.33	206.74 +_22.81

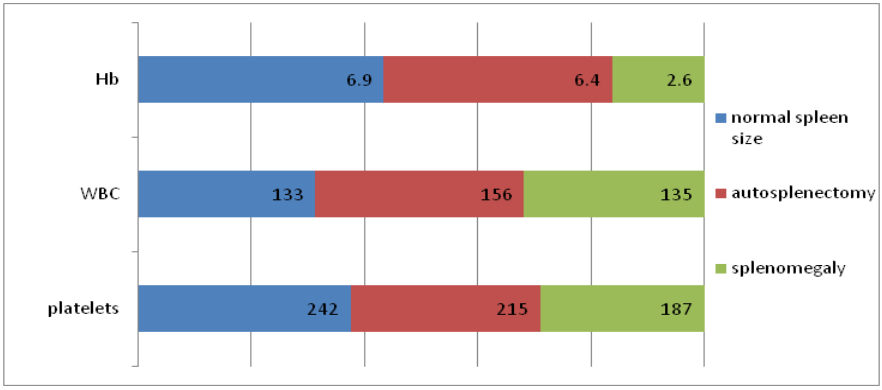


Fig.63:Haematological indices by splenic size in stable SCA children

iii **Original article**: *Ultrasonographic assessment of Splenic Size in Stable Sickle –Cell Anaemia*

The spleen due to its tortousintrasplenic microcirculation, low oxygen tensions and stasis all of which enhances the sickling phenomenon makes it quite susceptible to organ damage.in SCA children this subsequently leads to destruction, fibrosis and diminution of its size(autosplenectomy). A linear relationship between age and incidence of autosplenectomy has been documented which is commonly accepted to occur by 8-10 years ofage. Awotua-Efebo,Alikor and Nwankwo (2004) in a prospective study on the splenic size of stable SCA children , reported a higher incidence of normal sized spleen as well as persistence of the spleen(27%) and 48.1% of those with persistent/enlarged spleen were adolescents (Fig. 64). We concluded that the hyper-endemic nature of malaria infection, (recurrent malaria infection which causes Splenic enlargement), may account for this finding.

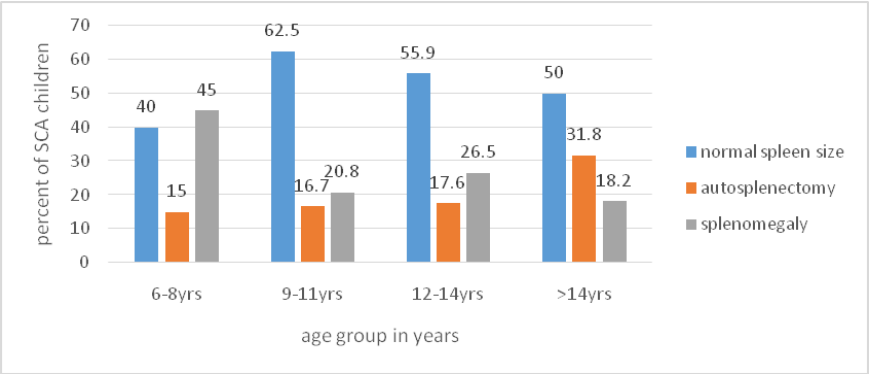


Fig.64: showing the splenic status of SCA children by age.

iv. Original article: ultrasonographic splenic status and morbidity pattern in stable Sickle cell anaemia patients.

A prospective study carried out by Awotua-Efebo et al (2005) to determine if there is any association between the size of the spleen and morbidity in the previous 24 months in stable SCA subjects, and influence of age and sex.Anaemic episodes were seen more commonly in SCA patients with splenomegaly and normal sized spleens than those with autosplenectomy. A weak positive correlation was observed between blood transfusion requirements and spleen size. Frequency of painful crisis did not show any significant variation with splenic status but occurred more in those with splenomegaly. Morbidity was higher among males than females and the younger aged groups 6-9 years. We concluded that persistence of splenomegaly increases morbidity in SCA patients.

3.4 OTHER CLINICAL RESEARCH STUDIES

i. **Original article**: Anti-microbial susceptibility pattern of micro-organisms associated with urinary tract infections in a tertiary health institution in the Niger Delta Region of Nigeria.

A prospective study to assess the prevalence and sensitivity pattern of urinary pathogens by Pondei, Ladapo and Kunle-Olowu (2012) where 634 midstream urine samples were examined microscopically and cultured using various medium(blood agar, MacConkey and Cled agar). This study found that 237 samples(37.4%) had significant growth suggestive of urinary tract infection and among the children aged 1-10 years, there was a male preponderance. While the predominant organism E,coli was sensitive to nitrofurantoin it was resistant to amoxicillin-clavulanate and cloxacillin.

A periodic assessment of sensitivity pattern of urinary pathogens, rational drug use and the use of nitrofurantoin as drug of choice in the treatment of uncomplicated UTI was recommended.

ii.**Original article**: Knowledge, attitude and practices of needle stick injuries among health workers.

Needle stick injuries (NSI) are important occupational hazards confronting the health care worker(HCW), with the potential of transmitting blood-borne infections.

Kunle-Olowu O.E, Pondei and Allagoa carried out a cross-sectional study (2013) to investigate the occurrence and causative factors of NSI and assess the knowledge and response of subjects when these incidents occur in a health facility (Table 17). Although the awareness of universal precaution guidelines was high(94.54%), the frequency of 43.63% showed a wide gap between knowledge and practice as well as highlighting the fact that NSI commonly occur in the hospital setting during work-related activities thereby confirming NSI as an occupational hazard.

Table 17: showing occurrence of NSI by category of staff

Time frame	No. of NSI	Category of staff/no involved
Within the past 3 months	15	House officers(6) Consultants(3) Registrar (I) Medical officer(1)
Within the past 6 months	24	House officers(2) Consultants(5) Registrar (2) Laboratory scientists(2)
Within the past 1 year	12	Consultants(1) Registrar (2) Nurses(3)
Within the past 2 years	6	Consultants(1) Medical officers (2) Laboratory scientists(1) Nurses(2)

Table 43: showing procedures associated with the occurrence of NSI.

procedure	doctors	nurses	Laboratory scientists
IV injection	24	1	-
IM injection	-	8	
SC injection	1	1	
Suturing of wounds	5		
Recapping of inj		5	
phlebotomy			5

We recommended the need for regular injection safety assessment and ensure that the risk management program of the hospital is up to their task.

iii Hepatitis B Vaccination Rate Among Medical Students At Niger Delta University Teaching Hospital, Bayelsa State,Nigeria.

Hepatitis B which is caused by hepatitis B virus (HBV) and transmitted in a setting of a percutaneous injury that involves a instrument coated or containing the virus is known to be an important cause of morbidity and mortality worldwide. Health personnel and medical students are at risk of acquiring HBV infection from occupational exposure. Hepatistis B vaccination is known to offer protection after receiving 3 doses of the vaccine. In this study while overall 54.6% of the students have received at least a dose of the vaccine, 47.4% have not received any vaccination.

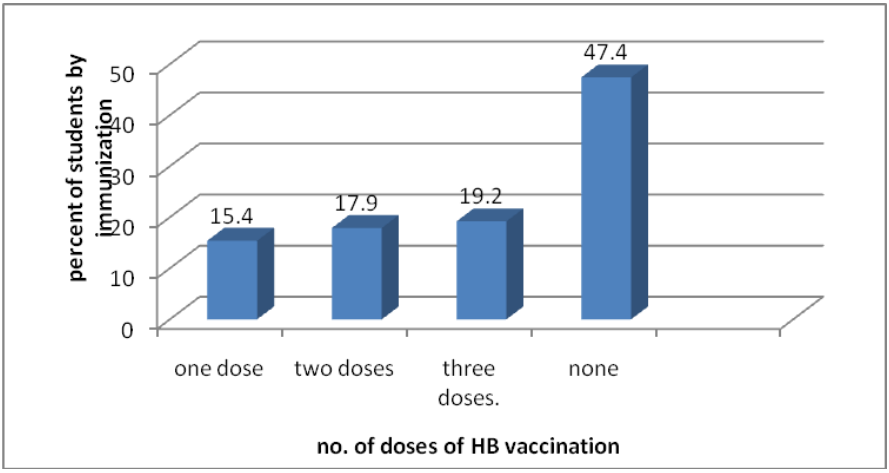


Fig. 65: showing Hepatitis B vaccination rate among medical students

4.0 THE WAY FORWARD

I believe strongly that it is the desire of everyone here in this hall that no newborn should die and that the transition from the mother's womb to our world both in the immediate post partum period and beyond is a success. Some factors such as skills gap, poor referral network, inadequate training, poor policy implementation and inadequate supply of commodities have been identified as bottlenecks in the attainment of our desired successful transition.

Here in Bayelsa state, I have highlighted some of the challenges these newborns face however in the words of Dr. Ngozi Okonjo-Iweala "I believe when you find problems you also should find solutions" as such I do recommend the following actions as a way forward in providing best care for the newborns in Bayelsa State . The family, communities, local governments, civil rights groups, media, government etc all have major roles to play.

Addressing the knowledge and skills gap

This in practical terms involves ensuring that a combination of the tools, skills, staff and support systems required for chosen functions are available and operational. In our discussion the chosen function is improving Newborn *Care*. This can only be achieved by the collaborative effort of training institutions, State Ministry of Health, health care personnel, Civil Society organizations, the State government and all of us here present.

We must also recognize the fact that tools and skills are not enough, attention must be given to the required support systems such as transportation(ambulances) staff with appropriate skill-mix (trained midwives or S-CHEWS) remunerations (Salary paid when due) and safety issues.

(a)Training

Institutions where health care personnel are trained such as College of Health Sciences (NDU) College of Health Technology , Otuogidi and School of Nursing –Tombia ,should ensure that Basic Newborn Care Package and Neonatal Resuscitation form an integral part of their maternal and child services curriculum with practical sessions in accredited institutions like NDUTH, FMC and the clinical skills laboratory (CSL) at the College of Health Sciences. The curriculum should include among others, newborn resuscitation, competency in management of all phases of labour and delivery including the immediate post-partum period, clean birth practices, infection prevention and early initiation of breastfeeding. There should be collaboration between these institutions and they should set benchmarks and conduct regular review on curriculum and liaise with the state Ministry of Health.

The state Ministry of Health has the responsibility to enhance staff competency and Capacity. This can be achieved by ensuring that all health workers in facilities where deliveries are conducted undergo facility-based training on essential newborn care on a regular basis. Majority of healthcare personnel in Yenagoa

metropolis, with the exception of those at Diete-Koki , FSP Clinic and Government house clinic are yet to receive formal training on neonatal resuscitation. This will equip the staff with the appropriate knowledge and skills to provide the needed care for the newborn and consequently offer best newborn care especially in our PHCs where most of the facility deliveries take place due to proximity to place of residence.

Presently the Paediatric Association of Nigeria (PAN) in collaboration with "Helping Babies Breathe" (a non-for-profit NGO) is involved in carrying out comprehensive training on neonatal resuscitation.

Fig.57: Resuscitating a preterm (SCBU)

Fig.57b: training of staff on neonatal resuscitation (SCBU) by Dr. Agarry

There are certified trainers at NDUTH and FMC, the state Ministry of Health should collaborate with them and NISONM to ensure that these trainings are conducted for all staff, involved in maternal and child services in the health facilities in the State.

MINISTRY OF HEALTH (MOH)

Decentralization and Scaling up of neonatal care, and Improvement of the referral system

An important question we must ask ourselves at this point in time is what happens to the very preterm low birth weight babies delivered at koloama and Lobia 2? Any hope for the asphyxiated babies at Sangana in Akassa? What about the babies with neonatal infection at Angiama? The list is endless.

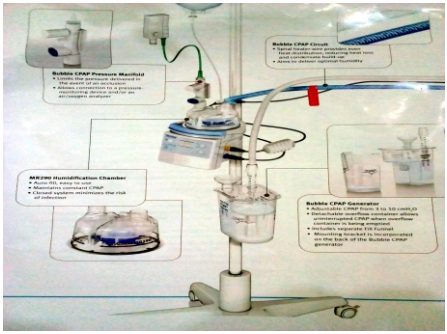
Most of these deliveries occur outside the state capital where no designated facility is in place in terms of infrastructure and personnel to cater for the very preterm low birth weight babies, those asphyxiated at birth or very ill neonates. While there are forty (40) secondary and two tertiary health facilities (NDUTH, FMC) in the state, only the tertiary health facilities provide round the clock neonatal care with dedicated unit and the full complement of staff.

a) The establishment of smaller units (SCBU) in each of the General hospitals at the local government headquarters will ultimately bring appropriate neonatal care closer to the people. These centers should be affiliated to the teaching hospital and staffed at all times by certified medical personnel. It will be the responsibility of the state Ministry of Health to ensure that standards are maintained by providing "job aids" in addition to appropriate guidelines to ensure that neonatal outcomes are similar to those being managed at the teaching hospital (Same protocols) and this will allow for integration within the healthcare system.

b) Improving Preterm Survival.

The importance of respiratory support for the preterm and ill newborns cannot be overemphasized using the bubble CPAP, at least one in each local government area in the neonatal units. Most often these births are preceded by premature rupture of membranes i.e. the water breaking too early, which further

exposes the baby to infections since the membranes which acts as protective covering for the baby has been broken. Another major problem is breathing difficulty due to the immaturity of their lungs. So in essence the preterm babies are likely to suffer from complications of respiratory distress due to their immature lungs and infections from loss of protective membranes and immature immune system. Respiratory support as seen in the use of the bubble CPAP (Fig. 67a) will improve survival as already practiced in some centers in Nigeria, making the treatment of sick preterms less tasking. The use of antenatal corticosteroids in preterm labour should be made mandatory for all health care facilities.



Figs. 67a Bubble CPAP

Training of all doctors, nurses and other healthcare professionals including the S-CHEWS on the guidelines for Kangaroo Mother Care (KMC) and establishment of KMC wards should be implemented by the state Ministry of Health. While the hospital care of the preterm babies has been shown to be the most effective intervention in improving their survival, here in the state most health facilities do not have the resources both in terms of personnel and equipment such as incubators, phototherapy machines, and radiant heater for this level of care. In Resource poor settings like ours, the Kangaroo Mother Care, a technique that was first developed to cope with situations where incubators were not available to keep the preterm baby warm has been shown to be a good alternative (Figs 67b&67c)

Fig.67b.The natural way

Fig. 67c Mother practicing KMC at the NDUTH

It is safe, cheap and affordable for most mothers, Effective in keeping baby warm and enables early breastfeeding and protection from infections. It has also been shown to stimulate love and early bonding of mother and child. The establishment of KMC wards in our health facilities will go a long way to improve the survival rate of the preterm neonates. Where there are no complications the days of hospitalization and the cost during this period using KMC has shown marked reduction. These interventions with very high impact i.e. administration of antibiotics and corticosteroid , practice of KMC should be put in place in the management of all preterm births regardless of the level of care of the health facility.

c) Launching and implementation of the Community based newborn care (CBNC).

With the inauguration of the State Primary Health Care Development Agency there is the urgent need for the formal launching and implementation of the Community-based newborn care which has already being incorporated within the Integrated Community Case Management (iCCM). This will ensure that the four Cs across the

continuum of care viz: prenatal and postnatal **Contact, Case-identification, Care** and **Completion** (full seven day course of antibiotics) are Practiced. In our setting which is mainly rural, with the high number of home deliveries this strategy is sine qua non for BEST CARE FOR NEWBORNS IN BAYELSA STATE

d) Improvement of the referral system and adequate supply of commodities.

With our peculiar terrain, there is an urgent need to improve the referral network, where help can be accessed within the shortest possible time. I must commend the State Ministry of Health on the TELE-HEALTH initiative, which to my mind is a major step in reaching the difficult to reach communities.

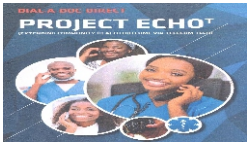


fig. 68a: TELE-HEALTH INITIATIVE

However going forward efforts should be made to ensure that the referral hospitals built in the 8 local government areas are well equipped with the needed resources including manpower and uninterrupted supply of commodities. It will also require the availability of functional ambulances both riverine and land for prompt referrals.

It is also important that there is adequate supplies of commodities partographs and other essential commodities for newborn care and the use of partographs in all health facilities be made mandatory with adequate supervision and monitoring by relevant regulatory bodies.

HEALTH CARE FACILITIES

a) Communication

All mothers should be adequately informed of the need to return to the facility within the next 48 hours after delivery and where this is not possible, home visits should be arranged, also the importance of watching out for" danger signs" should be communicated properly to the mother before she leaves the facility (Fig 68b).

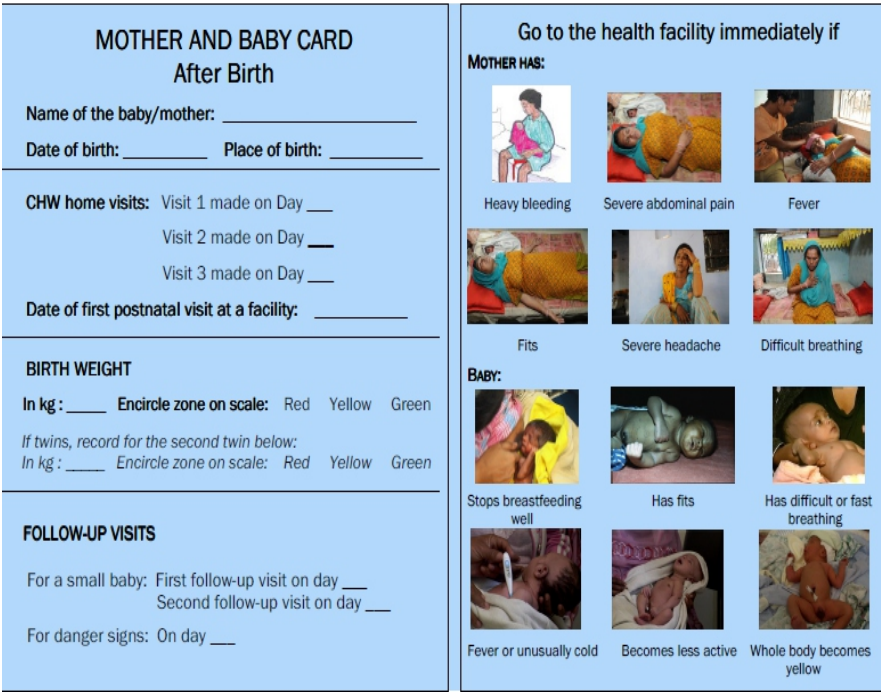


Fig. 68b. information for all mothers before discharge from health facility on relevant information including dangers signs and what to do.

b) Commit to universal coverage of high-quality care during birth.

Quality improvement must be incorporated in all services rendered by staff, with key performance indicators clearly outlined and reward for performance put in place. This can only be achieved when health workers are trained and the people utilizing the service demand for quality care as their right and hold health care professionals accountable for their actions or inactions The issue of losing a baby due to prolonged labour in a health facility should not be condoned. It is the responsibility of government to protect everyone including the unborn baby. All health workers should acquire competent skills in the administration of antibiotics to newborns presumed to be have

neonatal infection as this could be life-saving

(c) Post natal care scale up.
The scaling up of postnatal care in facilities where deliveries take place using known and proven interventions can make a significant difference in improving newborn survival. Scaling up does not necessary mean increase spending, however what is important is how to utilize the available resources in more productive ways. Most of our health facilities have health workers that if they are given access to critical materials (commodities e.g simple bag&mask, bubble syringe) and information resources (conference and workshop attendance-continuing medical education, on the job training, "job aids") with better supervision will improve service delivery and create efficiency.

(d) Accountability
The health workforce must be held accountable for their performance. It has been noted that service delivery is not just a matter of having a hospital with trained clinicians; the question of how staff perform their clinical duties as well as behaviour towards patients are also very important. The staff must respond appropriately to the expectations and needs of the clients. Regular clinical audit should be implemented, to make room for accountability and quality improvement .

THE ROLE OF CHEWS
The state MOH in collaboration with the LGAs should adopt the community based newborn survival strategies effectively which will involve the training of senior Community Health Extension workers (S-CHEWS) in these strategies since they spend most of their time in the various communities. In some instances they are members of the community where they work, which in most instances bring to bear a sense of ownership and accountability to

the people in the community. All the PHCs in the LGAs have substantial number of this cadre of health care workers. In the present scheme of affairs they represent a significant untapped human resource, and now is the time to harness all the potentials this category of health workers possess by adequate and appropriate training on life-threatening complications of pregnancy and childbirth, notably neonatal care including post partum care. The adage "if you don't train them, don't blame them" becomes quite relevant in our healthcare settings in the state. Since they are closer to the people, they can do home visits during the pregnancy and are in a position to encourage facility delivery. The Ministry of Health should ensure that the S-CHEWs are linked to higher levels of health services such as the Teaching hospital which will support their training and help maintain quality performance through regular follow-up, periodic skills assessment and re-training. The MOH and local government should make deliberate effort to ensure continuous supply of essential commodities to the facilities. Most of our mothers are discharged within 24 hrs after delivery except those who had either instrumental or C-Section. Home visits for newborn will improve coverage of key newborn practices such as early initiation of breastfeeding, skin-to-skin contact, attention to hygiene(hand washing with soap and water) clean umbilical care in the immediate postnatal period-days 1, 3&7 since newborn deaths are highest on the first day and first week of life. During their visit, (i.e S-CHEWS) they will refer babies with danger signs and where referral is not possible due to some logistics treat the child in accordance with the approved protocol. This community –based approach with the involvement of S-CHEWS will enable health workers to reach large numbers of pregnant women and newborns and form linkages between the family, community and the health facilities.

Fig.69 A community health worker with a family.

CIVIL SOCIETY ORGANIZATIONS (CSO)

Transparency and Accountability are the bedrock for change and its sustenance. It is the responsibility of CSO including women groups such as National Council of Women's Society (NCWS) to Campaign for and monitor government's commitment to end preventable newborn deaths and ensure universal health coverage of the interventions described above. They must be committed to mobilizing families and communities to address cultural and social barriers that drive neonatal mortality as reported by studies here in the state. Key issues should include addressing girls' empowerment, the demand for good-quality healthcare, and exclusive breastfeeding which should be initiated within 30-60

minutes immediately after birth and encourage health facility delivery They can through the media raise awareness on healthy home practices and empower families with basic accurate information on how to recognize problems and access care promptly thereby saving many lives.
it is very important that the unreached and hard to reach populations are targeted , where majority of newborn deaths from known causes are" invisible" as they are not reported or commonly seen as *acts of gods or witchcraft.*

COMMUNITY
The need for behavioral change as well as creating awareness on the need for pregnant women and children to be safe must be addressed through the various groups (women forum, religious leaders, CDC, male volunteers, chiefs council etc) in the various communities. Some of such persons can volunteer to be part of the health team and be trained in some relevant skills.
The community leaders should also come up with innovative ideas in areas of transportation of pregnant women especially in emergencies.

MEDIA.
Messages that will create awareness on the dangers faced by the newborns, various approaches to ensure better best care for our newborn through enlightenment campaign various news spotlights, billboards and news highlights.

GOVERNMENTS (State, Local)
I have intentionally left the role of government in improving newborn survival to be addressed lastly. While I have listed some interventions that will improve newborn survival, the driving force for the full implementation of these strategies rest mainly on the commitment of the Political leaders who should provide a

conducive environment and framework. The political class must of necessity see the burden of newborn deaths as a huge loss which must not be accepted and give it all the necessary attention. The survival of the child must be captured as a Human right issue and all bottlenecks to the successful implementation of newborn programs be removed. This should include among others:

1 *Removal of user fees for all maternal, newborn and child health services which ultimately eliminates financial barriers and ensures financial risk protection*. Finance is a major barrier to access care which ultimately affects decisions made by the family in terms of care obtained. Cost for spontaneous vaginal delivery in a hospital for uncomplicated cases is ₦10, 000 for unbooked cases and ₦7500 for booked cases which does not include inpatient care of the mother before discharge while that of the TBA is less than ₦2000.

The removal of these fees will enable everyone including the poor to come to the health facility thereby improving facility deliveries, providing access to appropriate care even in cases of obstetrics complications and newborn care. The inclusion of Maternal, Newborn and child health services in the present Bayelsa Health Insurance Scheme at all levels following the commencement of Community-based Health Insurance will protect mother and child and by extension the family and community.

3. Address the issue of health worker crisis

By employing more health personnel and ensure appropriate distribution of staff with requisite skills including midwives to save newborns as well as mothers.

4. Increase funding for maternal, newborn and child by either sourcing for additional funds or re-allocating the existing funds to fully address the issues raise both on short and long-term basis.

5. Policies and programmes related to newborn and child health should have major input from the Paediatricians and they should

be key players both in implementation, monitoring and evaluation of such policies.
6. Monitoring and evaluation of existing essential newborn care packages and where possible expand coverage.
7. Adequate funding to ensure constant supplies of commodities for essential newborn care in all health facilities.

5.0 CONCLUSION

TAKE HOME MESSAGE

- Among all children, newborns have the highest risk of death
- Nigeria contribute 9% of global first day neonatal deaths.
- Most deaths occur in rural settings with no skilled attendant during delivery.
- Most deaths occur at home and among the poor households.
- Socioeconomic inequities contribute significantly to these deaths.
- Three preventable and treatable conditions are taking the lives of millions of newborn each year.
- There is substantial evidence that up to $^{2}/_{3}$ of newborn deaths can be prevented if mothers and newborns receive low cost-effective interventions with high impact as outlined in the lecture.

I do hope that our precious jewels will no longer make the tortuous journey to our world only for us by our actions and inactions say goodbye to them. Their survival and thriving is possible and the responsibility lies on us to be committed and make newborn care in Bayelsa BEST CARE FOR THE NEWBORNS.

Fig 70: Team work towards better neonatal health outcomes (everyone on the same page)

Fig 71: We can make it Happen

ACKNOWLEDGEMENT

No words are enough to express my gratitude to the family of Paediatricians in Nigeria and abroad, Profs. Oruamabo, Johnson, Yakubu, Nkanginieme, Nte, Akani, Alikor, Akinbami, Abiodun, Drs. Peterside, Ibhanesebor, Adeyemi, Biu, Oremodu, Duru and many others including the younger colleagues and staff of the Department of Paediatrics NDUTH and UPTH for your various roles in my life.

My mentor Prof. (Mrs.) Alice Nte who contributed positively to my career development deserves special thanks.

I also thank Profs. Imananagha, Fente-Koko, Ayibaemi Spiff, Awotua-Efebo, Kunle-Olowu, Dimie Ogoina (CMD), Brisibe, N Etebu, for teaching me the act of writing papers ,creating the enabling environment, and enticing me to be part of the academic world without telling me of the rigorous and many sleepless nights accompanying the role of a teacher, clinician and researcher.

My special thanks goes to my HERO Chief Godwill Numoipre Edgar-Zechariah (my father) whose mantra was "Education is the best legacy I can give to you" and did not allow any sex preference to interfere in his dealings with his children and his supportive wife Mrs. Irene Nimibofa Sam-Edgar (my mother).

I am indebted to my Late grandmother, Madam Deborah Joseph "and the Sisi", the name we always called you when we need special favour from you and the Matriarch of the family Late Madam Janet Ateki Joseph, You will forever live in my memory.

To my children, Nengimote, Enenimiete, Temona, Womotimi and Okazila, I am grateful for your unconditional love and understanding, just thinking of you put a big smile on my face. I am really blessed to have you, you are indeed my sunshine.

To friends who have made my sojourn a delightful one Engr.& Mrs. Wills, Drs. Florence Baralatei, Grace Otamiri, Lolade Olowu, Eno Ikpeme, Barbara Otaigbe, Adewoye Olufunke, Olatoregun, Pondei, Jeremiah, Johnbull Jumbo, Mr&Mrs. Allen Isaac, Hon Mrs. Gloria Izonfuo (mni), Mrs. Bosede Apiri, Irene Oshinbolu, Mrs. E Allagoa, Mrs.Aboye Oki. Mr. Sam-siso Okrinya, Mrs Ibaba Jack, Sen. Ehigie Uzamere, Dr. D. Alagoa, Dr. J Omietimi, Dr.& Mrs C Baralatei, Dr A. Owei among others.

The African saying "it takes a whole village to raise a child " is very true in my case and I express my thanks to late Dr Patrick Tekena , Dr. Uriel Dambo ,HRH Alagba T. Begold (Okoro VIII,Ologo-ama), HRH R. Samuel Sambo X, HRH Serena Dokubo (Ada X) HRH Beinmoyo R. Spiff(Cameron IX) HRH Otonyo Efebo (Shidi VII), HRM, Dr. Josephine Diete-Spiff.

The entire Edgar family of Ekperikiri (Brass), the Ateki and Chief Zechariah family of Twon –Brass and Chief Isele family of Okpoama are immensely appreciated.

My gratitude goes to my fathers and mothers in the Lord, who have always held my arms up in my trying moments Pastor & Mrs. Chris Oriri , Rev & Mrs. M. Obakhena, Rev. & Mrs. Ogemudia, Rev. Franklyn Eke , Evangelist M. Pere, Rev Grace Samuel among several others.

To my family, you have been wonderful, Hon Mrs. Mr. Ebikake, Ms. Betty Joseph, Dr. Bio Joseph, Rev. &Mrs O. J Oworibo, Chief Victor Ateki , Rev. Philip Ikurusi, Chief Aguba, Chief Daumunabo, Chief Animi, Mr. Blessing Edgar, Mrs. Diekuma Edgar Mrs. Suoyo Okuzunwa, Miss Zinaike Tuawari, Mr. Wanaemi Ikurusi, Mr Numo Gilbert. To my special nieces and nephews I really appreciate your love

I specially thank Mrs. Mabel Ekiyor(my Aunt) Dame Dr. Victoria Tekena , Dame Ellah Douglas , Dame Dr.Okara, Ms. Flora D. Davidwest, Dame Selea Kombo, Dr. Claudia Arumala,

Prof. A. Ighoroje, Prof. Seleya Fubara, Prof. Edomoyi, Mrs.Joy Banigo, His Excellency Ambassador Aworrhabi, for your unique roles at various stages of my life.

I am grateful to Dr. Godbless Eruani, for your confidence in me as an administrator when many were opposed to your idea.

Special thanks to all board members and staff of Bayelsa Health Insurance Scheme (BHIS) for opening up another world-an opportunity for service to humanity, especially the Executive Secretary Dr. Z Agadah and head of human resources Mr. A Glasgow and Tuwatimi Ebi Smart.

To the unique Uniport Medical School class of 79, you are a wonderful family.

To my sisters from Elemsco Uk. (ACMGS)You are just wonderful and exciting.

My special thanks to the Acting Vice Chancellor, Prof. S.G. Edoumiekumo and past Vice Chancellors and Registrars of the University, the past and current Provosts of the College of Health Sciences, Deans and Heads of Departments, Management of the Teaching hospital for contributing immensely to a story, a part of which am sharing today.

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GLOSSARY
NOTES AND DATA SOURCE

Indicator	Definition and Data Source
Births and Deaths	
Population	The annual number of births at the national level is from United Nations Population Division estimates for 2012. State level population and annual births are from the national census of 2006 updated to 2012 levels.
Annual births	
Neonatal Mortality Rate	Deaths that occur during the first 28 days of life, expressed per 1,000 live births. Data are zonal from the Nigeria Demographic and Health Survey (NDHS) 2013. Mortality rates are plotted in the year of the survey but they refer to the ten year period preceding the survey.
Under-five Mortality Rate	Deaths that occur from birth to 59 months of age, expressed per 1,000 live births. Data are zonal from the NDHS 2013. Mortality rates are plotted in the year of the survey but they refer to the ten yea r period preceding the survey.
Maternal Mortality Ratio (National)	Annual number of deaths of women from pregnancy-related causes per 100,000 live births. The national maternity mortality ratio from the NDHS 2013 is used on each state.
Annual Number of Deaths	For the state profiles, the national maternity mortality ratio from NDHS 2013 and the zonal neonatal and under -five mortality rates from NDHS 2013 are applied to the state level birth cohort to generate an approximate annual number of deaths by state.
Newborn and Child Survival Trends	
	Neonatal and under-five mortality are zonal rates from NDHS between 1999 and 2013. Mortality rates are plotted in the year of the survey but zonal rates refer to the ten year period preceding the survey and national rates refer to the five year period preceding the survey.
Antenatal care	
% pregnant women receiving 1 or more antenatal visits	Among women age 15-49 with a live birth in the x years preceding the survey, percentage of women attended at least once duri ng pregnancy by skilled health personnel (i.e. a doctor, nurse or midwife, or auxiliary nurse or midwife); from NDHS 2008, MICS 2011 and NDHS 2013.

% pregnant women receiving 4 or more antenatal visits	**Among women age 15 –49 with a live birth in the x yea rs preceding the survey, percentage of women attended at least four times during pregnancy from any provider; MICS 2017**
Care during Childbirth	
% live births attended by skilled health personnel	Among women age 15-49 with a live birth in the x years preceding the survey, percentage of women attended at least once during pregnancy by skilled health personnel (i.e. a doctor, nurse or midwife, or auxiliary nurse or midwife); from MKS
% live births delivered by c-section	Among women age 15-49 with a live birth in the x years preceding the survey, percentage of live births delivered by caesarean section; from NDHS 2008, MICS 2011 and NDHS 2013.
Missed opportunities in key maternal, newborn and child health packages: This graph shows the current coverage, the coverage gap between current coverage and full coverage, and missed opportunities to deliver high impact interventions within packages across pregnancy, nutrition and child health outreach services.	
ANC (Antenatal care) 1+	Among women age 15-49 with a live birth in the x years preceding the survey, percentage of women attended at least once during pregnancy by skilled health personnel (i.e. a doctor, nurse or midwife, or auxiliary nurse or midwife); from MUS 2017
ANC (Antenatal care) 4+	Among women age 15-49 with a live birth in the x years preceding the survey, percentage of women attended at least four times during pregnancy from any provider; from MUS 2017
Informed of Danger Signs	Among women age 15-49 with a live birth in the x years preceding the survey, percentage of women who were informed of signs of pregnancy complications during antenatal care; from NDHS 2013.
Immediate Breastfed	Among last-born children who were born in the t wo years preceding the survey who were put to the breast within one hour of birth; from NDHS 2013.
Skilled Attendant at Birth	Among women age 15-49 with a live birth in the x years preceding the survey, percentage of live births attended by skilled health personnel (i.e. a doctor, nurse or midwife, or auxiliary nurse or midwife); from MUS 2017

Care for Home Births	
Proportion of deliveries that take place at home	Percentage of live births in the five years preceding the survey by place of delivery and percentage delivered at the respondent's home or another home; from MUS 2017
Clean delivery kit used	Percentage of non -institutional last five births in two years preceding the survey whose mothers reported using a clean delivery kit; from NDHS 2013.
Baby wrapped immediately at birth	Percentage of non -institutional last five births in two years preceding the survey whose mothers reported using a clean delivery kit; from NDHS 2013.
Baby placed skin-to-skin at birth	Percentage of non -institutional last fi ve births in two years preceding the survey whose mothers reported placed the baby on the mother's belly or breast before the placenta was delivered; from NDHS 2013.
Bath delayed > 1 hour	Percentage of non -institutional last five births in two years prec eding the survey whose mothers reported delaying the baby's first bath by more than one hour; from NDHS 2013.
No substance placed on cord	Percentage of non -institutional last five births in two years preceding the survey who reported placing nothing on t he umbilical cord stump before it fell off; from NDHS 2013.
Early breastfeeding initiated	Percentage of non -institutional last five births in two years preceding the survey who were put to the breast within one hour of birth; data are zonal from NDHS 2013.
PNC within 2 days (mother)	Among women age 15-49 with a non-institutional last live birth in two years, who received a postnatal check in the first two days after giving birth; data are zonal from NDHS 2013.
PNC within 2 days (baby)	Percentage of non -institutional last five births in two years preceding the survey who received a postnatal check in the first two days of life; data are zonal from NDHS 2013.

ACRONYMS

C-IMCI	Community Integrated Management of Childhood Illness
IMCI	Integrated Management of Childhood Illness
IMNCH	Integrated Maternal, Newborn and Child Health
LGA	Local Government Area
MDG	Millennium Development Goal
UNICEF	United Nation Children's Fund
WHO	World Health Organization
PHC	Primary Health Care
TBA	Traditional Birth Attendant
IDP	Internally displaced Persons
MCEE	Maternal and Child Epidemiology Estimation
UNIGME	United Nations Inter-Agency for Child Mortality

Source: Nigeria States Data Profiles (Federal Ministry of Health 2015) UNICEF, Demographic and Health Survey(DHS 1999,2003,2008,2013)

CITATION ON

PROFESSOR ONYAYE EUPHEMIA
EDGAR KUNLE-OLOWU MB.BS (PH), FWACP

Professor Onyaye Euphemia Edgar Kunle-Olowu was born to the family of Chief and Mrs.Godwill Numoipre Edgar-Zechariah of Twon-Brass, Brass Local Government Area, (Old Rivers State) now Bayelsa State, in Okpoama on the 5th of May, 1961 . She started her Primary school education at St. Barnabas Primary School Twon-Brass and St. Cyprian's Primary School, Port Harcourt which she completed in 1973 with a distinction. She had her secondary school education at Government Girls Secondary School, Bassambiri, Nembe and Archdeacon Crowther Memorial Girls Secondary, Elelenwo (ACMGS) and obtained the West African School Certificate (WASC) in 1978. She gained admission to the University of Port-Harcourt as a pioneer medical student in 1979 where she obtained the Bachelor of Medicine,Bachelor of Surgery degree (MB.BS) in 1987. On completion of her university education and after a few years of working as a medical officer at the then Braithwaite Memorial Hospital,(now Braithwaite Memorial Specialist Hospital) Port-Harcourt, her passion for excellence and desire to make significant contribution in medical education as well as rendering quality clinical services informed her commencement of postgraduate training in her area of interest - Paediatrics at the University of Port Harcourt Teaching Hospital(UPTH) in 1995 and obtained the fellowship (FWACP) in 2001 .

She returned to the newly created Bayelsa State in 2001 and was deployed to the Hospitals Management Board where she worked as a Deputy Director, in addition to rendering Clinical services at

the then General Hospital, Okolobiri as a Consultant Paediatrician. She later proceeded on a short course at Wishaw General Hospital, Scotland and successfully participated in Neonatal Medicine Training in 2005. In 2007, she was nominated to be among the three (3) Nigerians who attended the Health Systems Management Diploma course at Galilee College, Israel and on return, was appointed the Medical Director of General Hospital Okolobiri and later become the Pioneer Chief Medical Director (CMD) of the Niger Delta University Teaching Hospital (NDUTH), Okolobiri in October 2007. As an administrator she ensured professionalism in all administrative matters which recorded some remarkable successes in areas of training and infrastructural development. In line with the statutory requirement she transferred her service to the Niger Delta University in 2008 and was appointed a Senior Lecturer and an Honorary Consultant of the Teaching Hospital. In 2014, she was promoted to the position of Professor of Paediatrics, the first in the University and the first in Bayelsa State. As a University Teacher, Clinician and Researcher, she has contributed immensely to the training of medical undergraduate students and resident doctors over the years. Professsor Onyaye Edgar Kunle-Olowu has several publications both in local and international journals which can be accessed online. She is a visiting Professor at the Federal Medical Center, Yenagoa and an examiner in the West African College of Physicians (faculty of Paediatrics).

Prof. Onyaye Edgar Kunle-Olowu has worked hard as a medical

practitioner and supported several professional associations. In recognition of her commitment to the profession she was inducted into the Roll of Honour by the Nigerian Medical Association, Bayelsa State (2017). She is a recipient of several awards from various bodies including the National Council of Women's Societies (NCWS) - Roll of Honour and the National Women's Association of Female Journalists (NAWOJ) - Excellence in Leadership.

She is a member of the Nigerian Medical Association (NMA), Paediatrics Association of Nigeria (PAN), Medical Women's Association of Nigeria (MWAN) and the National Council of Women's Societies (NCWS). She is married to Prof. A.O Kunle-Olowu. She is blessed with two loving daughters Mrs. Nengimote Diriyai (LL.M law and Technology) Dr. (Mrs.) Enenimiete Woha (MB.BS) and a grandson Master Womotimi Christopher Diriyai. Prof. Onyaye Edgar Kunle-Olowu is a Christian and has served the church in various capacities including the chairman of the church board, Living Faith Church, Azikoro Branch. Her life epitomizes the expression of GOD's grace on a daily basis.

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