

## A Rapid Need Assessment Survey of Anaesthesia and Surgical Services in District Public Hospitals in Cross River State, Nigeria

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### Abstract

**Background:** The district hospitals in Cross River State of Nigeria serve majority of the population residing in the rural areas and little is known about their capacity to provide anaesthetic and surgical care. The present study is an initial needs assessment of anaesthesia and surgical services in public hospitals in Cross River State as a stepping stone for strengthening anaesthesia and surgical services. **Methods:** A standardized Lifebox Hospital Initial Needs assessment questionnaire and another structured questionnaire were used to assess the anaesthesia and surgical services in 16 general hospitals (district hospitals). The survey did not involve face-to-face interviews. **Results:** There was no practicing physician-anaesthetist in the 16 district hospitals in Cross River State. There were only 13 trained nurse-anaesthetists distributed unevenly in the 16 surveyed district hospitals. One visiting consultant anaesthetist and five visiting consultant surgeons from the University Teaching Hospital worked at the general hospital in the capital city leaving all others in rural locations without any specialist provision. Apart from the nurse-anaesthetists in the general hospital in Calabar and at Dr Lawrence Henshaw Memorial Hospital, also in Calabar both in the capital city, the others working in the rural hospitals have had no refresher or In-service training in the past 2 years. Many of the district hospitals lack basic anaesthetic equipment. An average of 3-53 surgeries are performed at the district hospitals with intravenous Ketamine as the commonest technique of anaesthesia. **Conclusion:** The district hospitals' anaesthetic and surgical capacity is grossly inadequate in relation to the population being served. It is recommended that shorter training programs for physicians at the primary and secondary levels of care and regular revision courses for nurse anaesthetists in Nigeria will strengthen the district surgical and anaesthetic capacity and services with urban-rural shift in manpower especially with government incentive for rural health workforce.

### INTRODUCTION

Surgery and anaesthesia have traditionally been viewed as expensive, resource-intensive and requiring highly specialized training.<sup>1</sup> This misconception has led to surgery and anaesthesia taking a back seat to public health, maternal and child health, and infectious diseases in global health.<sup>2</sup> Surgery has also been termed the "neglected stepchild of global health."<sup>3</sup> These concepts have changed rapidly since it has been found that surgical diseases contribute about 11% to Disability Adjusted Life Years<sup>4</sup> and therefore would benefit from preventive and public health strategies necessary to achieve the Millennium Development Goals. The realization of the huge public health burden of surgical diseases in low and medium income countries (LMICs), and the fact that surgical services and treatment could be made cost effective, led World Health Organization (WHO) to launch the Global Initiative for Emergency and Essential Surgical Care (GIEESC) in 2005.<sup>5</sup>

The GIEESC is a global forum whose goal is to promote collaboration among diverse groups of stakeholders to strengthen the delivery of surgical services at the primary referral level in LMICs.<sup>5</sup> Improvements in surgical services at the primary referral level in LMICs will equally require the provision of safe and effective anaesthesia. The provision of safe and effective anaesthesia will need adequately trained human resources and essential health technologies. The surgical and anaesthesia service capacity have generally been very low in sub-Saharan Africa (SSA) as evidenced through surveys conducted in

Ethiopia,<sup>6</sup> Gambia,<sup>7,8</sup> Ghana,<sup>9,10</sup> Liberia,<sup>8,11</sup> Malawi,<sup>12</sup> Nigeria,<sup>13</sup> Sierra Leone,<sup>8,14</sup> Rwanda,<sup>15,16</sup> Tanzania,<sup>8,17</sup> and Uganda.<sup>18</sup> The survey from Nigeria was conducted among rural private hospitals and was administered to attending members in a conference of the Association of Rural Surgical Practitioners of Nigeria.<sup>13</sup> This was done using the Personnel, Procedures, Equipment and Supplies (PIPES) survey tool developed by the non-governmental organization Surgeons Overseas (SOS).<sup>13</sup> This is a tool developed to assess surgical capacity through the workforce, infrastructure, skill, equipment, and supplies of health facilities in LMICs.<sup>13</sup> The other indicated surveys done in SSA used a comprehensive survey tool designed by the Harvard Humanitarian Initiative. This tool was adapted from the WHO Tool for Situational Analysis to Assess Emergency and Essential Surgical Care as part of an international initiative to assess surgical and anaesthesia capacity in LMICs.

The present survey used a rapid assessment tool known as the Lifebox Hospital Initial Needs Assessment questionnaire with another structured questionnaire to assess anaesthesia services in public hospitals in the Cross River State (CRS) of Nigeria. Lifebox ([www.lifebox.org](http://www.lifebox.org)) is a non-profit organization saving lives by improving the safety and quality of surgical care in low-resource countries.<sup>19</sup> Since 2001, Lifebox has trained more than 2000 anaesthesia providers, and more than 4200 pulse oximeters have been supplied to more than 70 low-resource countries thereby closing the operating room pulse oximetry gap in about 15 countries.<sup>19</sup> This organization is supported by

the World Federation of Societies of Anaesthesiologists (WFSA), Association of Anaesthetists of Great Britain and Ireland, Harvard School of Public Health and the Brigham and Women's Hospital in Boston, United States of America.<sup>19</sup> This survey was primarily aimed at the secondary health care facilities which are owned and managed by the CRS Ministry of Health (MOH). This survey audit will identify the anaesthesia providers in CRS, their level of training and retraining as well as equipment available for providing safe anaesthesia and monitoring patients in the peri-operative period. The data will also identify baseline information and gaps in anaesthesia and surgical capacity as a first step for the CRS MOH initiative to improve surgical and anaesthesia services. This information is a stepping-stone for national and international assistance since CRS is a relatively poor state in the Nigerian Federation.

### Country and State overview

Nigeria is the most populous African country, located in the West African sub-region with a population of more than 160 million people.<sup>20</sup> It is a Federal Republic with 36 states and a Federal Capital Territory. It is politically sub-divided into six geo-political zones: North-Central, North-Eastern, North-Western, South-Eastern, South-South and South-Western. There are 774 Local Government Areas (LGAs) where more than 60% of the population reside. The health care system is divided into three levels: primary, secondary and tertiary. There are public and private health facilities operating at all levels. The primary healthcare facilities (health centres) are managed by the Local Government, the secondary healthcare facilities (general hospitals) are managed by the State Government, while the tertiary facilities (University Teaching Hospitals and Federal Medical Centres) are managed by the Federal Government. Health indicators for Nigeria are among the worst in the world despite the fact that Nigeria is the sixth largest exporter of crude oil. The United Nations Human Development Index ranked Nigeria 156 out of 187 countries.<sup>21</sup> In particular, Nigeria is one of the five countries contributing more than 50% to the global maternal mortality ratio<sup>22</sup> and one of the countries with the highest physician's and nurse's emigration to developed countries.<sup>23</sup> Physicians and nurses who remain in Nigeria predominantly practice in urban cities leaving the LGAs, most of them rural with severe shortages in health manpower.

CRS, with approximately 3.2 million population and 20156 square kilometres, is located in the South-South geo-political zone.<sup>24</sup> The state has boundaries with the Republic of Cameroon in the East, Benue State in the North, Ebonyi State in the North West and Akwa-Ibom State in the South.<sup>24</sup> It is divided into 18 LGAs with 18 general hospitals and 613 primary health centres. There is only one tertiary health facility, the University of Calabar Teaching Hospital (UCTH) located in Calabar, the capital city, which provides specialist care to the entire population. Being a tourism state, the importance of safe anaesthesia as a component of safe surgery cannot be overemphasized.

### Physician-anaesthetist, nurse-anaesthetist and surgery training programs in Nigeria

Physicians are trained to be specialist anaesthetists or surgeons in a four-year training program leading to the Fellowship in Anaesthesia (FMCA) or Surgery (FMCS) of the National Postgraduate Medical College of Nigeria (NPMCN) or the Fellowship in Anaesthesia or Surgery (FWACS) of the West African College of Surgeons (WACS). This is after a six-year medical education program in the university leading to the Bachelor of Medicine and Bachelor of Surgery degree, one-year rotatory internship, and one-year of compulsory National Youth Service. Most Fellows, after completion (average time of completion is 7-8 years), work in University Teaching Hospitals and Federal Medical Centres, all located in urban cities. Another training program for doctors designed for primary and secondary healthcare is the Diploma in Anaesthesia (D.A) of the Universities or WACS, which is a 12-month training program. There is no short training program in Surgery.

Nurses are trained as nurse-anaesthetists after 18 months of training in a post-basic nursing program. The basic nursing training program is three-years of training in general nursing, after completing six years of secondary school education. There are now few university degree programs leading to the Bachelor's degree in Nursing Science (BSN) from the universities. All these nursing training programs lead to certification by the Nursing and Midwifery Council of Nigeria.

### Rural-urban practice

Physician-anaesthetists (Fellows and Diplomates), nurse-anaesthetists and consultant surgeons are all concentrated in urban hospitals leaving the rural areas and urban slums with a critical shortage of anaesthetic and surgical workforce. Therefore the majority of the surgical and anaesthetic procedures in rural areas in Nigeria are carried out by government-employed medical officers with almost all anaesthesia being provided by nurse-anaesthetists. In some very remote districts, Community Health Extension Workers (CHEWs) and Community Health Aids with little or no formal training in providing surgical care, are the only health workers available to provide some form of surgical care. The Association of Rural Surgical Practitioners of Nigeria (ARSPON) has been making some effort to address this workforce gap in rural areas by providing short on-the job training for medical officers to enable them to provide safe and affordable surgery to the rural population.<sup>13</sup> The concept of surgical task-shifting to "non-physician clinicians" to address this rural-urban surgical workforce disparity, as is being officially done in other LMICs of SSA<sup>25</sup> is not acceptable in Nigeria.

### METHODOLOGY

A standardized questionnaire, the Lifebox Hospital Initial Needs Assessment Survey (Appendix 1) and another structured questionnaire (Appendix 2) was distributed to all 18 general

hospitals (secondary health facilities) in CRS. All the general hospitals, which are the first referral hospitals in the districts, perform surgery. The site visit was conducted in April/May 2014. Permission to conduct the site visit was given by the CRS Honorable Commissioner for Health. The hospital surveys did not involve face-to-face interviews with the medical superintendents, hospital matrons or anaesthesia providers. The questionnaires were to be completed by the anaesthesia providers and medical superintendents in each of the hospitals visited. Each completed questionnaire was to be sent to the office of the Honorable Commissioner for Health at the MOH headquarters in Calabar, the capital city. The results are presented in frequency tables and charts.

## RESULTS

A total of 16 well-completed questionnaires were received from 18 general hospitals/secondary healthcare facilities visited (88.9 % response rate). Averages of 3 - 53 surgeries are performed monthly in each of the hospitals (Table 1). The common procedures performed include: herniorrhaphy, appendicectomy, caesarean section, myomectomy, prostatectomy and exploratory laparotomy (Table 1). There are no practicing physician anaesthesiologists or surgeons employed by the State MOH except for one visiting consultant anaesthesiologist and five visiting consultant surgeons from the University of Calabar Teaching Hospital (UCTH), at the General Hospital, Calabar, which is located in the capital city of the State (Table 1). There are 13 nurse-anaesthetists distributed unevenly in the 16 hospitals (Table 1). There are no clinical officers cadres in the Nigerian healthcare system. Apart from the nurse-anaesthetists at the General Hospital in Calabar and Dr Lawrence Henshaw Memorial Hospital, also in Calabar, the other nurse-anaesthetists have had no refresher course or in-service training in the past two years. In the 16 general hospitals, the commonest anaesthetic technique used is Total Intravenous Anaesthesia (TIVA) with Ketamine (Table 1).

Basic anaesthetic equipment such as anaesthetic machines, oxygen cylinders, suction machines, and pulse oximeters were lacking in most of the hospitals visited (Box 1).

The WHO Surgical Safety Checklist Information was administered to the hospitals management team at the Districts Hospital (Box 2). This shows that all the surgical teams had never used the WHO checklist, never received training, and the checklist was not available in the operating rooms, although all surgical personnel would like to receive training on the WHO checklist and pulse oximetry

## DISCUSSION

This survey aimed to provide a quick assessment of anaesthesia and surgical services in public hospitals in CRS of Nigeria. The data shows gross and significant shortages in anaesthesia and surgical providers in all 16 general hospitals. There were no consultant anaesthetists, diplomate anaesthetists or consultant

surgeons employed in the CRS MOH. There were only 13 nurse-anaesthetists working in the 16 general hospitals, and one visiting consultant anaesthetist and five visiting consultant surgeons at the General Hospital, Calabar, the capital city. In six of the hospitals, there were no nurse-anaesthetists providing care for the surgical procedures being conducted. As it has been reported from the many surveys in SSA,<sup>6, 18, 26</sup> most of the procedures in all the hospitals are being done by generalist medical doctors and general nurses, many without any postgraduate training in surgery and anaesthesia.

The gross inadequacy of the anaesthetic workforce in this survey represents what is found in many of the 778 LGAs (Districts) in the Federal Republic of Nigeria. This is because many of the LGAs are rural and studies have indicated the general difficulties of most health workers seeking jobs in rural hospitals. The lack of specialist anaesthetists in peripheral hospitals in most of Nigerian Districts therefore requires a re-direction of the training programs for doctors in Nigeria with greater emphasis on the shorter training program design for primary and secondary healthcare levels. In addition, annual refresher courses should be made mandatory for nurse-anaesthetists especially for those practicing in rural areas.

A recent review of the met and unmet needs of surgical disease in rural SSA, where district and rural hospitals are the main providers of care, shows a very huge burden.<sup>27</sup> An important finding is the discrepancy between surgical care needs and provision.<sup>27</sup> Since the majority of the population in SSA reside in rural areas, there is the need to strengthen the surgical services at this level. This is the first of the four recommendations of the Bellagio Essential Surgery Group.<sup>28</sup> Many of the surveys using the WHO Situational Analysis Tool have described the lack of capacity in many district hospitals to meet the local surgical and anaesthesia needs.<sup>6-18</sup> One study, using pulse oximeter availability as a measure of operating room resources, showed that between 58.4% and 78.4% of operating rooms in West Africa, East Africa and Central SSA do not have pulse oximeters.<sup>29</sup> This finding was also clearly shown by our own rapid survey and assessment. Three important factors have been responsible for these findings. These are lack of resources, lack of manpower and the need for training.<sup>27</sup> The need for training to improve the quality of the surgical and anaesthesia providers at the district hospitals is the third recommendation of the Bellagio Essential Surgery Group.<sup>28</sup>

Training programs and improvement of the facilities at the District Hospital has been shown to increase the number of operations performed.<sup>27</sup> Also, the presence of a visiting consultant anaesthetist in the District Hospital has been shown to increase the scope of anaesthesia services during the visiting period.<sup>30</sup> The visit left more knowledgeable local staff in the care of their patients especially in peri-operative care.<sup>30</sup> The need for developing countries in SSA, particularly in Nigeria, to concentrate more on shorter training programs in surgery and

anaesthesia at their current level of development has been advocated.<sup>31,32</sup> This has been shown by Sani et al where a 12-month training program for General Practitioners in district hospitals in Niger significantly reduced the number of referrals to the regional and specialist hospital.<sup>33</sup> In many other SSA countries, where gross shortages of medical manpower exist, surgical task shifting has been championed and research has shown that these are cost effective interventions.<sup>25, 34</sup> This is, however, not acceptable in Nigeria which is Africa's most populous country with very poor health indicators.

There are some limitations to this study. Firstly, it was a snapshot of anaesthesia and surgical services which did not highlight in detail the eight key areas of surgical and anaesthesia care, as in other surveys. These key areas include: access and availability of hospital services, human resources, physical infrastructures (including availability of water and electricity), surgical and anaesthetic procedures, surgical and anaesthesia outcome, essential equipment availability, NGO and international organizations providing care, and access to essential pharmaceuticals. Secondly, this assessment did not include the only public tertiary hospital in the State and private hospitals. Lastly, this was an initial assessment in preparation for a more detailed survey based on the WHO guidelines when research funds are received.

## CONCLUSION AND RECOMMENDATIONS

There has been a paradigm shift in global public health and the concept of primary healthcare which has resulted in increased awareness of the importance and contributions of surgical disease to the overall burden of disease especially in LMICs. This rapid survey of anaesthesia services in CRS, one of the 36 states in Nigeria, will serve as a window to inform other Nigerian State governments of the need to increase surgical and anaesthesia capacity and funding in their development agenda. It is therefore recommended that visiting consultant's services to all the general hospitals in an organized and planned fashion should be highly encouraged. All the anaesthesia caregivers should attend refresher courses at least once every two years. These courses can be arranged locally, or sponsorship provided for attendance of relevant courses by Anaesthesia Trainers within and outside the State. Basic anaesthesia equipment and guidelines as recommended by the Nigerian Society of Anaesthetists (Box 3) must be available and followed to enhance patient safety. It is also recommended that the government should give incentives to medical and nursing staff working in rural areas so that there will be a reversal of the rural-urban shift. The Lifebox global oximetry project is interested in making high quality, low-cost pulse oximeters available in every operating room. Therefore, every secondary care facility in the country should take advantage of this laudable program.

**Table 1 :** Summary of audit of anaesthesia services in the 16 district hospitals in Cross River State, April/May2014

Hospital	Number of anaesthetists		Type of anaesthesia administered	Scope of surgery	Average number of surgeries	Refresher course within last two years
	Nurse-anaesthetist	Physician-anaesthetist				
General Hospital, Obubra	0	0	Ketamine	Herniorrhaphy, Laparotomy, C/S, Appendectomy,	10	No
General Hospital, Ogoja	4	0	GA(ETT), Spinal, Local, Ketamine	Herniorrhaphy, Laparotomy, C/S, Appendectomy, Myomectomy & Others	15	No
General Hospital, Sankwala	1	0	Local	Others	11	No
General Hospital, Okpoma	0	0	Local, Ketamine	Herniorrhaphy, Appendectomy & Others	3	No
General Hospital, Calabar	1	1 (Visiting)	GA (ETT), Face Mask, Spinal, Epidural, CSE, Local, GA(Ketamine)	Herniorrhaphy, Laparotomy, C/S, Appendectomy, Myomectomy & Others	53	Yes
General Hospital, Ugep	1	0		Herniorrhaphy, Laparotomy, C/S, Appendectomy, Myomectomy & Others	18	No
Cottage Hospital, Oban	0	0	Ketamine	Herniorrhaphy, C/S, Appendectomy, Myomectomy	4	No
Cottage Hospital, Akpet	0	0	Local, Ketamine	Herniorrhaphy, Laparotomy, C/S, Appendectomy.	10	No
Lutheran Hospital, Yahe	1	0	Local, Ketamine	Herniorrhaphy, Laparotomy, C/S, Appendectomy, Myomectomy & Others	5	

Eja Memorial Joint Hospital, Itigidi	1	0	Local, Ketamine	Herniorrhaphy, Laparotomy, C/S, Appendicectomy, Myomectomy	15	No
St. Joseph Hospital, Akpabuyo	1	0	Local, Spinal, Ketamine	Herniorrhaphy, C/S, Appendicectomy, Myomectomy	5	No
Dr. Lawrence Henshaw Memorial Hospital, Calabar South	1	0	GA (ETT), Face Mask, Local, Ketamine	Herniorrhaphy, Laparotomy, Appendicectomy, Myomectomy & Others	10	Yes
General Hospital, Ukem, Odukpani	0	0	Ketamine	Herniorrhaphy, Appendicectomy	3	No
Ranch Medical Center, Obudu	1	0	Ketamine	Herniorrhaphy, Laparotomy, C/S, Appendicectomy, Myomectomy	5	No
General Hospital, Akamkpa	1	0	Local, Ketamine	Herniorrhaphy, Laparotomy, C/S, Appendicectomy, Myomectomy	20	No
Government House Clinic, Calabar	0	0	Local, Ketamine	Herniorrhaphy, Laparotomy, Appendicectomy	3	No
TOTAL	13	1 (Visiting)			190	

GA: General Anaesthesia. ETT: Endotracheal Intubation. C/S: Caesarean Section. CSE: Combined Spinal and Epidural anaesthesia.

**Box 1. Summary of Equipment in the 16 General Hospitals, Cross River State, Nigeria: April-May 2014**

- 10% of the hospitals had pulse oximeter
- 20% of the hospitals had oxygen cylinders
- 20% of the hospitals had suction machines
- 30% of the hospitals had anaesthetic machines
- 80% of the hospitals had recovery beds
- 100% of the hospitals perform surgery

**Box 2. World Health Organization (WHO) Surgical Safety Checklist Information**

- How often do the surgical teams at your hospital use the WHO Surgical Safety Checklist? NEVER
- Has your hospital received training in the WHO Surgical Safety Checklist? NO
- Is the WHO Surgical Safety Checklist available in your operating rooms? NO
- Would you like to receive training in pulse oximetry and the WHO checklist? YES

**Box 3. Nigerian Society of Anaesthetists Standard Guidelines for the Practice of Anaesthesia**

**Anaesthetic Personnel**

- Certified physician anaesthetist
- Trained nurse-anaesthetist under supervision by physician-anaesthetists
- Maximum number of nurses to physicians should be 4:1
- Where there is no physician-anaesthetist, nurses should adhere strictly to the guidelines and conditions of their certification
- The surgeon should provide coverage especially in the area of patient resuscitation and fitness for surgery and take full responsibility for any decisions made against the guidelines.

**Anaesthetic equipment for each theatre**

Standard Continuous Flow (Boyles) Anaesthetic Machine with:

- Closed breathing system
- Adult semi-closed breathing system
- Paediatric breathing system

Suction Machine

- Electric
- Manual

Suction Catheters – disposable, various sizes

Laryngoscope set with batteries and:-

- 2 standard and 1 long curved blades

- 2 standard and 1 long straight blades  
 - Neonatal laryngoscope with 2 straight blades.  
 Intubating Forceps (Magill)  
 - Adult  
 - Paediatric  
 - Neonatal  
 Self-inflating Resuscitation Bag  
 - Adult  
 - Paediatric  
 - Infant  
 Anaesthetic Face Masks : Size 0, 1, 2, 3, 4  
 Paediatric (Rendell-Baker) – Size 00,0,1  
 Naso-gastric tubes  
 Head – Harness  
 Oropharyngeal Airways 00 – 5  
 Endotracheal tubes (cuffed, non-cuffed 2.5 – 9.0. mm)  
 - Red rubber, latex reinforced, portex  
 Plastic laryngeal Mask Airway (Sizes 1–5)  
 Endobronchial tubes  
 Bougies  
 Fluid Warmer  
 Warming Mattress (for paediatrics)  
 Pressure Infusor  
 Syringe Infusion Pump with lines

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#### Competing Interests

None declared

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Appendix 1



## Hospital Initial Needs Assessment Survey

**INSTRUCTIONS:** Please fill out the form as completely as possible. Required fields are highlighted in red when using Adobe Reader. If there are required fields which you are unable to complete, type any response but make a note in the Additional Comments section. Once the form has been completed, save the form using the Save As button and e-mail the form to [info@lifebox.org](mailto:info@lifebox.org).

Today's Date:

**Your Contact Information**

First Name:  Last Name:   
 Job Title:   
 Email Address:  Mobile Number:

**Hospital Information**

Hospital Name:

Mailing Address

Street Address:

City:  Dept/State/Region:

Country:  Mailing Code:

Type of Hospital:  Government  Private  Other

**Hospital Human Resources**

**SURGERY:** Please indicate the number of people performing surgery in your hospital.

Trained Surgeon  General Physician  Clinical Officer  Other

**ANESTHESIA:** Please indicate the number of people providing anesthesia in your hospital.

Trained Anesthesiologist  Clinical Officer  Nurse Anesthetist  Other



**Appendix 2**

**Questionnaire for the survey of public hospitals in Cross River State, Nigeria.**

**AUDIT OF ANAESTHETIC SERVICES IN CROSS RIVER STATE**

Please tick appropriate Box(s) or insert number

- (1) NAME OF HOSPITAL: .....
- (2) NUMBER OF ANAESTHETISTS: .....
- (3) Please state the designation of Anaesthesia Provider(s): Dr(Fellow)  Diploma in Anaesthesia   
 Nurse Anaesthetist  Others please specify:   
 GENERAL PRACTITIONER
- (4) Please indicate the number of Permanent/Visiting Staff in boxes provided:  
 Permanent Staff  Visiting
- (5) Please any Refresher Course Attended in last 2 years?: YES  NO
- (6) Type of Anaesthesia administered: GA(ETT)  Face Mask  Spinal  Epidural  CSE   
 Local   
 GA(TIVA e.g. Ketamine)
- (7) No. of Surgeons: General  O&G  Orthopaedic  Others
- (8) Average number of surgeries done monthly:
- (9) Total number of surgeries done in past 6/12:
- (10) Scope of surgeries done: (a) C/S  (b) Herniorrhaphy   
 (c) Appendicectomy  (d) Laparotomy  (e) Myomectomy   
 (f) Others
- (11) Do you manage patients with these conditions? Hypertension  Asthma  Sickle Cell   
 Disease  Diabetes Mellitus  Elderly  Paediatrics  Neonates



Summary of available anaesthesia equipment	Equipment needs