

## Open Appendicectomy: How I do it

- Teenage pregnancy in Juba, South Sudan
- Childbirth: preferences, practice and perceptions
- Household air pollution and childhood pneumonia
- Vision 2020 links
- Postgraduate medical education



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“A drive to provide universal primary school education for all South Sudanese children, especially girls, would rescue millions from poverty and ultimately prevent or reduce the risk of war. Let us lobby the Minister for General Education in the Transitional Government of National Unity to achieve this goal in his three years in office.”

-- Dr. Eluzai Hakim

**Cover photo:** Performing an open appendicectomy (credit John Adwok)

**SSMJ** SOUTH SUDAN MEDICAL JOURNAL  
ISSN 2309 - 4605

Volume 9. No. 2. [www.southsudanmedicaljournal.com](http://www.southsudanmedicaljournal.com)

A Publication of the South Sudan Doctors' Association

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The *South Sudan Medical Journal* is a quarterly publication intended for Healthcare Professionals, both those working in the South Sudan and those in other parts of the world seeking information on health in South Sudan. The Journal is published in mid-February, May, August and November. Reviewers are listed on the website

# Diabetes - a global epidemic and its implications for South Sudan

On April 7 2016, World Health Day, the World Health Organization (WHO) released a report highlighting the increasingly serious epidemic of diabetes - 422 million, or 1 in 11, adults are living with diabetes, the great majority being type 2 diabetes [1]. There has been a four-fold increase over the past 35 years [2], the increase being most rapid in low- and middle-income countries – so diabetes is now most common in poorer countries, like South Sudan, where there is limited access to treatment and lack of awareness of its complications.

Diabetes is a chronic non-communicable disease (NCD) characterized by high levels of blood glucose. It occurs when the pancreas does not produce enough insulin (type 1 diabetes), or when the body cannot effectively use the insulin it produces (type 2 diabetes). Its complications can lead to heart attack, stroke, blindness, kidney failure, lower limb amputation, and premature death [1].

South Sudan is one of many countries where the management of diabetes is poor and resources are lacking, so prevention is of utmost importance. The WHO report recommends promoting healthy eating, weight control, and physical activity from an early age onwards. This implies the need for education of the general public, including schoolage children, as well as the availability of low-cost healthy foods.

**Diabetes can be delayed or prevented in people who are overweight and have impaired glucose tolerance.**

Diabetes can be delayed or prevented in people who are overweight and have impaired glucose tolerance. Diet and physical activity interventions and counselling are more effective than medication. For patients with diagnosed type 2 diabetes well-trained staff are essential to provide supportive counselling on practical food choices and weight control, and monitoring for complications. At present these staff are sadly lacking in South Sudan.

On April 1st the United Nations General Assembly proclaimed a Decade of Action on Nutrition [3] and this journal hopes that well before 10 years have passed the nutritional status of the South Sudanese people will be greatly improved. South Sudan has high rates undernutrition, especially among young children, and especially in areas of conflict and food insecurity – and the Government and many local and international NGOs are involved in its management. Now perhaps is the time for the healthcare community to also collect data on obesity, diabetes and other NCDs with the aim to improving services for these life-threatening conditions [4].

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South Sudan Medical Journal



# Factors contributing to, and effects of, teenage pregnancy in Juba

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**OBJECTIVE:** To explore the factors contributing to, and effecting, pregnancy among teenagers in Juba.

**METHODS:** This descriptive cross-sectional study was conducted in Juba Teaching Hospital among 50 randomly sampled pregnant teenagers in 2015.

**RESULTS:** The factors contributing to teenage pregnancy included: lack of school fees, lack of parental care, communication and supervision, poverty, peer pressure, non-use of contraceptives, desire for a child, forced marriage, low educational level and need for dowries. The effects of pregnancy on the teenagers included: school drop-out, health risk during and after childbirth, divorce, rejection by parents, stigmatism, and, sometimes if the baby is unwanted, abortion.

**CONCLUSIONS AND RECOMMENDATIONS:** The factors driving teenage pregnancy are complex and varied and therefore require multifaceted interventions. We recommend improvements related to education, family planning, school-based health centres, youth-friendly clinics and youth development programmes.

*Key words: forced marriage, poverty, school drop-out, teenage pregnancy*

## Introduction

Teenage pregnancy is a public health concern in both developed and developing countries. It is defined as any pregnancy that ends before the age of 20 years. About 16 million girls aged 15 to 19 years old give birth each year, which is about 11% of all births worldwide [1], and this does not include births among girls aged under 15 years. The highest teenage pregnancy rates, which are often associated with early marriage, are in sub-Saharan Africa, where one in every four girls has given birth by the age of 18 years [2]. In the Amhara region of Ethiopia, half of all girls are married before the age of 15 years. Many are engaged even younger and sent to live with their future husband's family [3]. If current levels of global child marriages hold, 14.2 million girls annually will marry too young, and many will be aged under 15 years [4].

South Sudan is among the top ten countries with the highest prevalence of teenage pregnancy, the others being Burkina Faso, Central African Republic, Chad, Guinea, Malawi, Mali, Mozambique, Niger and Bangladesh [4]. A third of South Sudanese girls start childbearing at ages 15-19 years, and 3 percent have had a live birth before the age of 15 years [5]. The South Sudan constitution, that defines a child as anybody below 18 years, prohibits forced marriage but does not specify a minimum age for marriage [6]. South Sudan's child marriage rites may be based on ancient traditions, but their practice today can be blamed on the country's contradictory laws and their

weak enforcement. In South Sudan, teenage girls are more likely to be married than in school [7]. Worldwide, factors contributing to teenage pregnancy include: dowry payment, poverty, low educational status, poor quality, and access to, reproductive health services, peer pressure, tradition and culture [8].

## Objective

The aim of our study was to explore the factors contributing to teenage pregnancy in Juba, and its effects on the young mothers, in order to gain an insight on how to reduce teenage pregnancy in South Sudan.

## Materials and Method

This descriptive cross-sectional study was conducted at Juba Teaching Hospital (JTH) between September 1 and October 30, 2015. Fifty pregnant teenagers were randomly selected from the antenatal clinic register book using systematic random sampling. Data were collected anonymously from consenting respondents using a structured questionnaire through direct interview, and analyzed using the Statistical Package for Social Sciences (SPSS) version 20 software. The recommendations were given to JTH, and the girls were counselled about the effects and risks of teenage pregnancy after their interviews.

The study was approved by the ethical review committee of the Juba College of Nursing and Midwifery and permission obtained from Juba Teaching Hospital.

**Table 1. Percentage distribution by selected socio-demographic characteristics**

Variable	Percent (n = 50)
Age -years	
14-16	20
17-19	80
Religion	
Catholic	54
Protestant	28
Muslim	6
Others	12
Level of education	
Never went to school	8
Not completed primary school	46
Completed primary school	12
Not completed secondary school	26
Completed secondary school	8
Occupation	
Unemployed	4
Student	2
House wife	86
Other	8

## Results

Table 1 shows the proportion of girls in each age, religion, education, and occupation group. The mean age was 17.5 years (SD +/- 1.1 years).

Table 2 shows the distribution of the girls by marital status, age when sex started (mean age  $15.9 \pm 1.5$  years) and at marriage (mean age  $16.9 \pm 1.2$  years), present age of partner (mean age  $25.8 \pm 7.2$  years). It also shows how many of the pregnancies were wanted and/or planned, and contraceptive use. Most of the girls were married before they became pregnant.

The girls were asked what they felt about teenage pregnancy and associated stigma, its prevalence in Juba and cultural norms on sex before marriage – see Table 3. Some of the girls reported that they themselves had experienced stigma and isolation.

Figure 1 shows the relative importance of the factors contributing to teenage pregnancy and early marriage as reported by each respondent. Of most importance were: love/desire for child; 'girls suppression' (i.e. activities, such as education, restricted by parents in preparation for marriage); lack of school fees, lack of parental care (i.e. lack of supervision and parent-child communication), poverty, peer pressure, non-use of contraceptives, forced marriage, and low educational level. Cultural beliefs included expectation of early marriage.

The respondents mentioned several effects that

**Table 2. Percentage distribution by reproductive characteristics of respondents**

Variable	Percent (n = 50)
Marital status	
Married	86
Single	10
Divorce	2
Widowed	2
Age at start of sex - years	
11-13	8
14-16	54
17-19	38
Age at first marriage - years	
14-16	38
17-19	62
Age of partner - years	
15-19	12
20-24	44
25-29	20
30-34	10
35-39	2
40-44	10
>44	2
Current pregnancy:	
Wanted and planned	40
Wanted and unplanned	16
Unwanted and unplanned	44
Were you using any method of family planning?	
Yes	4
No	98
If yes, which method(s)?	
Pill	50
Implants	50

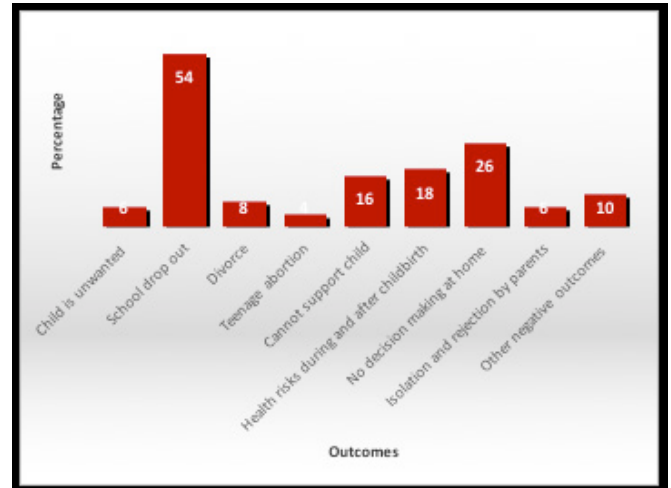
pregnancy can have on teenage girls – see Figure 2. The most important was dropping out of school. A quarter said the girl would have no decision making power at home, and almost a fifth were aware of the health risks to mother and baby.

## Discussion

Most of the respondents were aged 17 years or over, the majority were married, and just over half said the baby was wanted. Some admitted that getting pregnant was planned as it enabled them to avoid further sex - in South Sudan sexual abstinence is a common cultural practice during pregnancy and up to 2 years postpartum. Even so for 44% respondents the pregnancy was unwanted, and 20% were young teenagers (aged 14-16 years) for whom the risks of pregnancy are greatest.

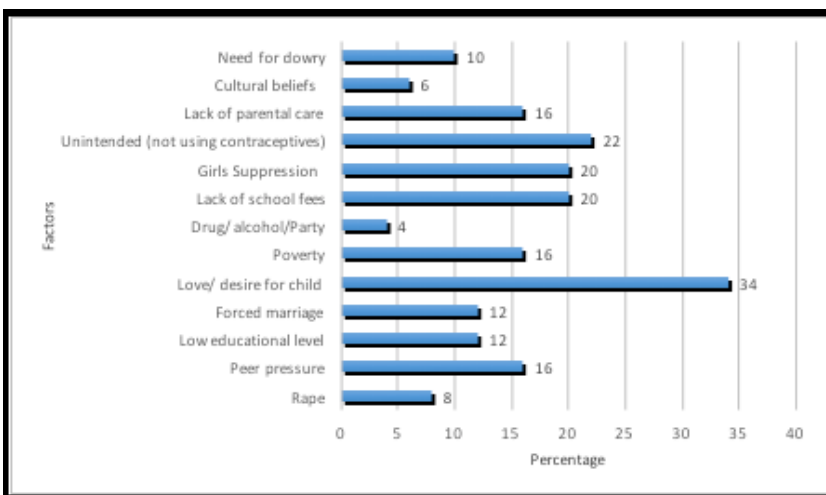
**Table 3. Respondents' answers to questions related to teenage pregnancy**

Variable	Percent (n = 50)
Do you think teenage pregnancy is risky?	
Yes	80
No opinion	6
No	14
Do teenage pregnancies commonly occur in your community?	
Yes	94
No opinion	2
No	4
Do pregnant teenagers suffer stigma and isolation	
Yes	60
No opinion	14
No	13
Is sex permitted before marriage in your culture?	
Yes	18
No	82

**Figure 2. Respondents' responses on effects of pregnancy on teenage girls in Juba**

4 respondents had used contraceptives probably reflects their low use in South Sudan [5].

Poverty can also contribute to early marriage as girls' families benefit from dowries (provided by the partner's family often as cattle). It is interesting that only 12% of respondents felt that forced marriage, and 4% felt rape were factors contributing to teenage pregnancy.

**Figure 1. Respondents' responses on factors contributing to teenage pregnancy in Juba**

There was insufficient data to do regression analysis but the results do suggest that poverty was an important factor contributing to pregnancy. Lack of money for school fees apparently led to many girls dropping out of school and sometimes opting instead for marriage. The Government of South Sudan has been criticized for not budgeting enough to education. Over half the respondents had not completed primary school, and this low level of education may also have made the girls vulnerable to early sex, and to family and peer pressures. The fact that only

'Teenage' is a time when boys and girls may undertake irresponsible activities and end up being unexpected mothers and fathers and most of the respondents realized that teenage pregnancy was 'risky' – and could lead to stigma and family rejection and abuse, and, most importantly, having to drop out of school. Several respondents were aware of the health risks of pregnancy to teenage mothers and their babies – maternal mortality and anaemia rates are higher, and teenagers often get poor prenatal care [5]. High rates of preterm delivery, small-for-gestational age babies and neonatal mortality are common among teenage pregnancies in South Sudan [9]. We were unable to follow up our respondents and so do not know the outcome of their pregnancies.

### Conclusions and Recommendations

The factors driving teenage pregnancy are complex and varied, as are the effects on the teenage girls - and therefore require multifaceted interventions. We recommend:

#### 1. To policy makers:

- Provide stable funding for comprehensive educational and support services to pregnant and parenting teenagers.

- Enforce laws that prohibit early marriage, rape and abduction.
- Develop programmes that empower teenagers to cope with the challenges that they face during adolescent relationships and pregnancy, and how to avoid unwanted sex.
- Implement culturally-appropriate school-based and out-of-school health and sex education starting before the age of 14 years.

## 2. To health care workers and teachers:

- Make existing public clinics 'youth-friendly'.
- Integrate into the curricula for students and out-of-school youths: life orientation, teenage pregnancy, HIV/AIDS, sexually transmitted infections and family planning. Teachers are in the best people to do this.

## 3. To communities, parents or guardians:

- Attend workshops on sex education, help to develop schools' policies on sex education, and to provide students with adequate resource material.
- Strengthen parent-teen communication.
- Mobilize communities to engage in sexual and reproductive health, and establish a mechanism for collective action for deterring gift dowries, forced marriage, and rape.

## Constraints

This study was limited by the sample size. As it does not involve regression analysis some confounders may obscure or mask the significant factors. However, the findings can provide insight into how teenage pregnancy can be prevented in similar area settings. We recommend a larger more in-depth study.

## Acknowledgement

To all the respondents who gave us their precious time, to the administrators and Staff of Juba Teaching Hospital, and to Juba College of Nursing and Midwifery for approving the study.

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# Childbirth in South Sudan: Preferences, practice and perceptions in the Kapoetas

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**BACKGROUND:** Focus group discussions (FGDs) were designed to better understand the community's views and preferences around maternity care to design a communications campaign to increase facility deliveries and skilled attendance at birth in the three county catchment areas of Kapoeta Civil Hospital.

**METHODS:** Twelve FGDs were conducted in Kapoeta South, Kapoeta East, and Kapoeta North counties. Four South Sudanese facilitators (two women, two men) were hired and trained to conduct sex-segregated FGDs. Each had 8-10 participants. Participants were adult women of reproductive age (18-49 years) and adult men (18+ years) married to women of reproductive age.

**RESULTS:** The majority of participants' most recent births took place at home, though most reportedly intended to give birth in a health facility and overwhelmingly desire a facility birth next time. Husbands and the couple's mothers are the primary decision-makers about where a woman delivers. More men than women preferred home births, and they tend to have more negative opinions than women about health facility deliveries. Though participants acknowledge that health facilities can theoretically provide better care than home births, fear of surgical interventions, lack of privacy, and perceived poor quality of care remain barriers to facility deliveries.

**RECOMMENDATIONS:** Interventions encouraging facility births should target the decision-makers—husbands and a couple's mothers. Improvements in quality of care are needed in health facilities. Developing social network interventions that circulate positive experiences about delivering in health facilities may be effective in changing public perception and decision-making about facility deliveries. Additional research and pilot testing is needed to more fully inform effective social and behavioural change strategies around maternal health in the Kapoetas in South Sudan.

**Keywords:** *Maternal health, childbirth, facility deliveries, behaviour change, qualitative*

## Introduction

In July 2014, the American Refugee Committee (ARC) was awarded a grant from the Health Pooled Fund to improve the capacity of Kapoeta Civil Hospital to provide comprehensive emergency obstetric and neonatal care (CEmONC) in order to reduce maternal and neonatal mortality. This project focused on improving the facility infrastructure and human resource capacity to provide all nine signal functions of CEmONC. Another component of this project was to increase community awareness and demand for emergency obstetric care.

In 2015, the average health facility delivery rates in Kapoeta Civil Hospital's catchment area were low: Kapoeta South (8.8%), Kapoeta East (2.3%), and Kapoeta North (2.2%) [1]. There is shortage of human resources for health in South Sudan. Kapoeta Civil Hospital is one of the few facilities in the three-county catchment area that has skilled birth attendants: midwives, nurses, and doctors who have undergone formal training. Traditional

birth attendants (TBAs) often assist home deliveries, but they do not have formal training and are unable to handle complicated deliveries.

These focus group discussions (FGDs) were designed to better understand the community's views and preferences around maternity care to design a communications campaign to increase facility deliveries and skilled attendance at birth.

## Methods

An exploratory, qualitative study was conducted using principles of grounded theory [2]. Twelve FGDs were conducted September 4-6, 2014 in Kapoeta South, Kapoeta East, and Kapoeta North counties in both urban and rural areas. Four South Sudanese facilitators (two women, two men) were hired and trained to conduct the FGDs. FGDs were sex-segregated and conducted in Toposa or Juba Arabic, with direct translation into English. Each had 10 participants and lasted 60-90 minutes.



Adult women of reproductive age (18-49 years) and adult men (18+ years) married to women of reproductive age were recruited to participate. Participants were selected based on maximum variation of age, socioeconomic status, and delivery experiences (location, type of birth assistant). Participants all chose to participate willingly and provided verbal consent. Soda and biscuits were offered to participants; no other gifts or incentives were provided.

Facilitators used a discussion guide; they were encouraged to probe and explore issues as they emerged. Participants were asked about their perceptions of available antenatal and delivery services, pregnancy care and delivery experiences both at home or in health facilities, birth preparedness and emergency preparedness practices, spheres of influence and decision-making for deliveries, and related topics.

Thematic analysis was conducted based on facilitators' notes and a debriefing session with facilitators. Analysis explored systematic variations in responses by sex and FGD location (urban/rural); differences where noted are reported. Results were verified and refined with community members and stakeholders. Responses are qualitatively categorized in the results to summarize their relative weight. "Most" or "majority" suggests approximately 75% or more participants responded similarly; "many" refers to greater than 50% but less than the majority; "few" refers to approximately 25% or less. Outliers were fully explored and reported where authors determined they highlighted unique and important perspectives.

## Results

A total of 120 people (60 male, 60 female) participated. Participant characteristics are summarized in Table 1.

### Delivery location

The majority of women and men both responded that their (wives') last birth took place at home. Nevertheless, all but one woman and several men said they would have preferred to give birth in a health facility, but labour caught them off guard or delivery happened "abruptly". Most women indicated they viewed the health centre as a place to go in case of emergency, not necessarily for routine deliveries.

Women that gave birth at a health centre generally had positive opinions of the facility. In contrast, most men had negative opinions of facility delivery services (both perceived and based on actual experience). They commented the facilities are not up to required standards and cited drunk health care workers; nurses demanding money (government health care services are supposed to be free); midwives holding a grudge against the husband and thus either mistreating his wife or killing their baby; doctors exchanging people's children; and the umbilical cord being thrown in a latrine, which causes newborn death or difficulties conceiving in the future (traditionally, umbilical cords are buried under a special tree).

If participants had a complaint about the care they or their wives received during labour, most said their course of action would be to change delivery locations next time. Few said they would provide direct feedback to the facility in-charge or to the midwife.

Both men and women expressed serious concerns about privacy, particularly at the health facility. Women reported fears of male nurses assisting them during labour; they wished to be alone with a female midwife. One man also said the prospect of health facility workers "looking directly at her private parts" made him uncomfortable.

Nevertheless, both female and male participants overwhelmingly reported wanting to give birth in a health facility for their (wives') next birth. They explained health facilities offer better services, skilled personnel, and drugs and vaccines. On the other hand, they have seen women suffer and die in home births due to the unclean environment and TBAs' lack of training.

### Influence on decisions about delivery location

In deciding where to give birth, women most often said their mothers/mothers-in-law made the decision; others mentioned husband, sister, and midwife. Equal proportions of men reported they themselves, as husbands, and their mothers/mothers-in-law make this decision. Notably, no participants mentioned the pregnant woman has any input or decision-making influence about where she gives birth.

Both men and women overwhelmingly reported the husband makes the decision about when to seek care if

**Table 1. Participant characteristics by location (numbers).**

	Male		Female		TOTAL
	Urban	Rural	Urban	Rural	
Kapoeta South	10	10	10	10	40
Kapoeta East	10	10	10	10	40
Kapoeta North	10	10	10	10	40
<b>Total</b>	<b>60</b>		<b>60</b>		<b>120</b>

his wife experiences complications. Men explained a belief that if a woman experiences obstructed labour it means her baby was conceived with another man. Before the husband allows his wife to be transported to the hospital, he must find the man that impregnated his wife and oblige him to offer an animal sacrifice. Such traditional practices may contribute to the delays in seeking skilled birth services.

### Birth attendant preferences

Both men and women reported wanting their birth attendants to give respectful, kind, patient-centred care,

including maintaining privacy in the delivery room, not hurrying them during labour, and respecting preferred delivery positions.

Most women and men said they preferred midwives to assist them in their (wives') delivery, because they are well-trained and knowledgeable, provide good care and treatment, have respectful manners, and give gifts following delivery (mosquito net, soap, towel). Men insisted that midwives and nurses pursue continuing medical education to ensure current knowledge, ethics, and professionalism. A few respondents preferred TBAs

**Table 2. Recommendations to address barriers to facility deliveries**

Barriers to Facility Deliveries	Intervention Recommendations
Women are caught off guard at the onset of labour and give birth before transportation can be arranged.	Build on existing birth planning habits. For example, couples already save money in case of an emergency—encourage them to go one step further by identifying emergency transport options and saving emergency numbers.
Men, and the couples' mothers are the primary decision-makers about where a woman delivers. More men than women prefer home births and have negative opinions about delivering at health facilities.	Interventions must target the decision-makers. They should also include the expectant mother to empower her to have a voice in the decision-making process.  Conduct additional research with couples' mothers. Their insights may be critical in understanding the decision-making process about delivery location and/or choice of birth attendant.
Women view health facilities as a place for emergencies, not necessarily for routine deliveries.  Fear of surgical interventions which are believed to limit future fertility.	Outreach and education via home health promoters.
Lack of privacy	Implement improvements in health facilities to meet the privacy expectations of women and their partners.
Traditional practices: - Inability to conduct traditional practices with the umbilical cord. - Beliefs about origins of complications and traditional practices to resolve them that delay transfer to facility.	- Facilitate brainstorming sessions between community members and clinicians to find innovative solutions that respect both traditional practices and medical infection prevention protocols. - Work with community leaders to change social norms to prioritize emergency transfers for women and resolve social issues later.
Perceived and experienced poor quality of care at the health facility. Lack of knowledge/empowerment to provide direct feedback to the health facility.	Implement quality improvements in health facilities. Develop community feedback mechanisms, e.g., through Boma Health Committees. Capitalize on trust in and perceived support from midwives to change public perception about quality of care at health facilities.
Fear of the unknown: As facility delivery rates in this area are so low, there are very few experiences—positive or negative—to be shared among community members. Social network research has shown how social networks can serve to effectively circulate and reinforce fears, misperceptions, and misinformation [3,4].	Demystify the facility birth experience. Develop social network interventions that circulate positive experiences delivering in health facilities.

due to their experience and good care assisting many deliveries in the village.

When asked who made them feel most confident or hopeful during delivery, women cited midwives and TBAs in equal proportions. For both, women mentioned feeling respected, well cared for, and supported. Nevertheless, when asked if a caregiver ever became frustrated with them during labour, the majority of women said yes. In all but one example, it was the TBA that got frustrated, made the woman feel cowardly, and left her to deliver alone. Only one woman reported that a health facility worker got frustrated with her. In this instance, a midwife slapped her during delivery because she refused to give birth from a bed, which made her lose energy to push and eventually required a Caesarean section.

### Complication readiness

Both men and women cited complications (haemorrhage, long labour, and umbilical cord complications) as the greatest fear in delivery. Participants were particularly concerned about surgical intervention (episiotomy, Caesarean section), as there is a belief it will impact future fertility. Women also expressed fears about neonatal death and, less often, maternal death during delivery.

To prepare for emergencies, women and men frequently said they set aside money for treatment or transport. Nevertheless, transportation issues were the most commonly cited barrier to reaching a health facility in the case of an emergency. Additionally, two men said they got the doctor's contact information in case of emergency.

### Discussion

The majority of participants' most recent births took place at home, though most reportedly had intended to give birth in a health facility and overwhelmingly desire a facility birth next time. Additionally, participants strongly prefer midwives as birth attendants; a skilled provider is only available in a health facility. What might explain the disparity between intention/preference and actual practice?

Though participants acknowledge that health facilities can theoretically provide better care than home births, a number of concerns seem to present barriers. Participants notably did *not* mention finances as a barrier. Suggestions

for addressing the barriers are summarized in Table 2.

These barriers and recommendations are not exhaustive. As this was an initial, exploratory study, additional qualitative research would be useful to deepen the understanding of the issues that emerged and more fully inform effective social and behavioural change strategies. A population-based quantitative study designed around these findings would be useful to quantify the themes and therefore assist in prioritizing interventions that are likely to have the greatest impact.

### Limitations

The quality and depth of the data collected may have been compromised by facilitators' relative inexperience. Though a seasoned ARC qualitative researcher trained the most qualified facilitators we could identify, these were the first FGDs the facilitators had ever conducted. Experienced South Sudanese researchers are scarce.

Social desirability bias may be a possible explanation for participants' paradoxical preferred versus actual delivery location. Participants could have stated a preference for facility delivery for their (wives') next birth so as to be seen by their peers or the facilitators as "knowledgeable" or "modern". However, care was taken to design questions that were not leading, and FGDs were conducted away from health facilities and not in the presence of health workers.

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Many thanks to everyone who helped to prepare this issue including John Black, Berkin Hack, Richard Lewis, Edward Kamau, Charles Otero and Fiona Sizmur

# Household air pollution and childhood pneumonia in South Sudan: will clean cooking stoves reduce the incidence and mortality?

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Pneumonia causes more childhood deaths compared to other infectious diseases. Studies have showed that young children exposed to household air pollution (smoke) caused by burning of unprocessed solid fuels such as wood, charcoal, crop waste, animal dung and coal had double the risk of pneumonia infections compared to children who are not exposed or those from families using cleaner fuels such as electricity or gas. In 2012, more than half a million children below the age of 5 years died as a result of exposure to household air pollution worldwide. Based on studies which have indicated that reduction of household air pollution also reduces its health risks such as pneumonia, the World Health Organization recommended the use of cleaner fuels and/or technologies that offer significant health benefits, including the use of clean cooking stoves. Around 99% or all households in South Sudan use solid fuels for cooking in both rural and urban areas. This puts children in South Sudan at risk of pneumonia related deaths attributed to household air pollution. Therefore, promoting the use of clean/improved cook stoves such as the Uga Cooking Stove (locally made in Uganda, using charcoal) is critical to reduce the risk of childhood pneumonia and pneumonia related death in South Sudan.

**Key words** Household air pollution, childhood pneumonia, South Sudan, clean cooking stoves

## Introduction and background

In 2012, exposure to household air pollution (HAP) caused by cooking and heating with unprocessed biomass (solid) fuels such as wood, charcoal, crop waste, animal dung, and coal claimed 4.3 million lives worldwide. This mostly occurred in low and middle income countries with almost 600,000 deaths in Africa, and out of all the global deaths attributable to HAP, 534,000 occurred among children under the age of five years [1]. Among all-childhood mortality, pneumonia is the leading global infectious cause accounting for 15% of all deaths among children less than 5 years of age. In 2013, it had killed approximately 935,000 children under the age of 5 years [2].

South Sudan is among countries with the highest infant and under five mortality rates in the world recorded at 67 and 104 deaths per 1000 live births respectively [3]. In 2012, the International Vaccine Access Centre Pneumonia Report rated South Sudan among the top 15 countries with the highest pneumonia related mortality globally [4]. Although this is based on aggregated data for both South Sudan and Sudan, the South Sudan Household Survey (SSHHS) also showed that pneumonia is the leading cause of death among children under the age of five years [5]. This is further supported by the "Count down to 2015" report which showed the overall DPT3

vaccine coverage in South Sudan to be as low as 59% and less than 50% of children with pneumonia getting the right treatment [6]. See Figure 1.

The use of solid fuels is rampant in South Sudan and the reasons are beyond the scope of this article. The SSHHS 2010 showed that nearly all (99%) of households in South Sudan use solid fuels for cooking, with no difference in types of solid fuel use between rural and urban homes or between "rich" and "states" [5]. However, the same study showed that the percentage use of firewood for cooking is highest in Warrap and Lakes states (93%) and lowest in Central Equatoria and Western Bahr el Ghazal states (62%).

## Aims

To discuss the health risks associated with household air pollution resulting from the use of solid fuels with particular emphasis on the related incidence and mortality of childhood pneumonia and, explore an affordable approach through the use of cleaner or improved cooking stoves.

## Methods

Information for this paper was obtained by searches of ScienceDirect, the Global Alliance for Clean Cookstoves Website, the World Health Organization websites, the Liverpool School of Tropical Medicine electronic

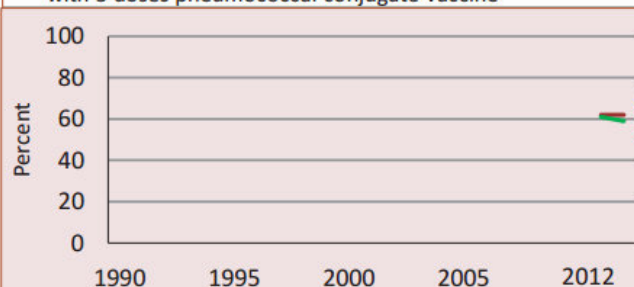


## CHILD HEALTH

### Immunization

Percent of children immunized:

- against measles
- with 3 doses Hib
- with 3 doses pneumococcal conjugate vaccine
- with 3 doses DTP
- with rotavirus vaccine



### Pneumonia treatment

Percent of children <5 years with symptoms of pneumonia:

- taken to appropriate health provider
- receiving antibiotics

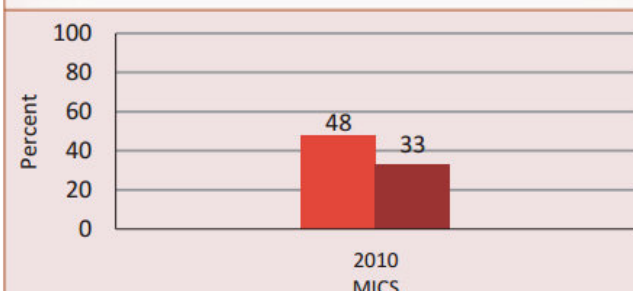


Figure 1. Child health. Reprinted with permission from World Health Organization Fulfilling the health agenda for women and children, the 2014 report – Countdown to 2015. Page 172. Child Health.

Copyright©WHO2014. [http://www.countdown2015mnch.org/documents/2014Report/SouthSudan\\_Country\\_Profile\\_2014.pdf](http://www.countdown2015mnch.org/documents/2014Report/SouthSudan_Country_Profile_2014.pdf)

library using the search terms “household air pollution”, “indoor air pollution”, “cookstoves”, “pneumonia”, “under five”, and “acute respiratory infections”, The University of Edinburgh online library using the search terms “Childhood pneumonia AND Poverty” and, The University of Liverpool online library searching the DISCOVER data base using the search terms “Childhood pneumonia AND/OR developing countries”. Ten articles were used for this review.

### Health effects of solid fuel use

The burning of solid fuels using open fires or inefficient cooking stoves produce hundreds of gases and aerosols (suspended solids and liquids) which include particulate matter (PM), carbon monoxide (CO), nitrogen oxides, sulphur oxides, poly-aromatic and different hydrocarbons, plus a variety of organic matter [7]. The PM and CO are the main pollutants responsible for many types of health risks attributed to the use of solid fuels. The major effect on respiratory health is more likely to be caused by PM<sub>2.5</sub> (fine particles with diameter up to 2.5 mm) because it is filtered to a limited amount by the naso-oropharynx and thus, can penetrate into the bronchi and alveoli [7]. In addition to bronchial irritation, these particles hinder aspects of the humoral and cellular immune systems thus giving infectious micro-organisms (viruses and bacteria) easy access into the respiratory system [7].

Meta-analysis of studies showed that young children exposed to smoke from burning of household solid fuels had twice incidence of acute lower respiratory infection (ALRI), especially pneumonia compared to children who are not exposed or those from families using cleaner fuels [8]. Other health effects attributed to the use of solid

fuels [8] although not specifically discussed in this article include:

Chronic obstructive pulmonary disease in adults.

- Low birth weight.
- Stillbirth.
- Perinatal mortality.
- Risk of childhood injuries from burns (falling into open fires).
- Risk of snake-bites encountered in the process of gathering firewood.
- Financial burden incurred by falling sick or taking care of a sick child as a result of household air pollution.

### Clean cooking stoves and their health benefits

Fuel use is often interpreted as an ‘energy ladder’ based on increasing cleanliness, efficiency, cost, convenience, and improving socio-economic status and decreasing health impacts [9]. See Figure 2. One can therefore deduct that socio-economic status and choice-making stand at the centre of the ladder. It could be argued that developing countries such as South Sudan, being newest in the world could not afford to provide the cleanest types of fuel to all (or most) of its citizens. However, could choosing improved and less environmentally degrading method(s) of energy production be feasible? The authors of this review article think the answer is a “BIG YES!” There are a variety of improved Uga-cooking stoves with a range of designs and performances. However, a good example for our setting is the improved charcoal cooking

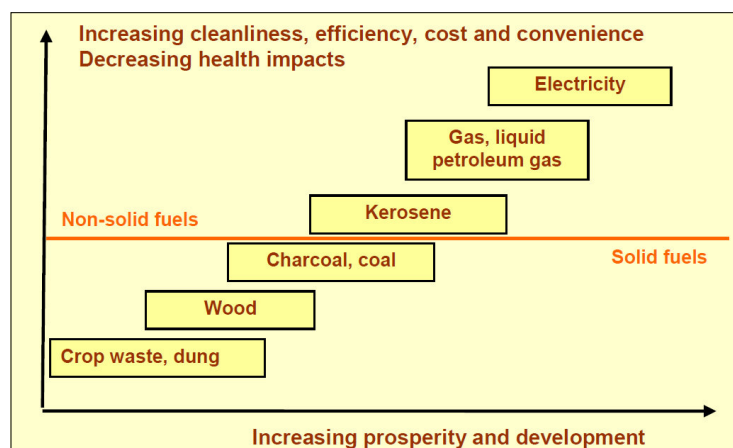


Figure 2: The energy ladder. Reprinted with permission from World Health Organization Indoor air pollution health and the burden of disease. Page 1. Energy ladder. Copyright©WHO2005.

<http://www.who.int/indoorair/info/briefing2.pdf>



Figure 3. The Uga Cookstove: uses charcoal, locally made in Uganda (credit Gasim Omer Elkhaila Abd-Elfarag)

stove (Figure 3), designed in such a way that it reduces CO emissions compared to the traditional stoves. A Guatemala randomized intervention trial had confirmed that reduction of indoor air pollution by the use of the plancha stoves (almost similar to the improved stoves described above) is associated with lower incidence of ALRI among infants up to 18 months of age [8].

### Introducing the clean cooking stoves in South Sudan

In order to introduce and ensure sustained use of the clean cookstoves in South Sudan, there is need to conduct a quality improvement project on a small scale as a pilot study in a suburban residence in South Sudan prior to a roll-out at a large scale. Funding to conduct such a pilot study can be ensured from non-profit non-governmental organizations such as the Global Alliance for Clean Cookstoves. The Global Alliance for Clean Cookstoves is a new public private-initiative committed to provide clean and efficient cooking solutions with a goal targeting 100 million homes to adopt clean and efficient cookstoves by 2020. The alliance includes over twenty partners which include organizations, companies, and UN and government agencies; some are currently working in South Sudan (such as the World Health Organization, Deutsche Gesellschaft für Technische Zusammenarbeit 'GTZ', World Food Program, and U.S. Agency for International Development). International governmental missions (embassies) in South Sudan, and other non-governmental organizations currently supporting health activities in South Sudan can also be a source of funding for such a study.

Sustained used of the clean cookstoves can be ensured through community engagement from the planning stages of the pilot study until the end. They should be informed of the study, its processes, benefits and expected

outcomes. Awareness activities to promote acceptance and sustained use of the stoves is critically needed. This can be done through the use of IEC (information, education, communication) materials, radio talks, television, automated mobile text messages by mobile phone operators, and local artists (singing about household air pollution, its risks, and solutions). Like many other quality improvement projects, there will be need to evaluate the continued use of the stove from time to time.

### Conclusion and recommendations

Other types of interventions such as improved household ventilation or behavior change may reduce levels of HAP or exposure or both. Nevertheless, reducing emission rates from HAP is considered as the most effective intervention, because contaminants produced in the home enter the ambient environment, contributing to outside air pollution exposure, and re-enter homes, thus aggravating HAP [10]. The World Health Organization Guidelines for Indoor Air Quality [10] recommended that "Governments and their implementing partners should develop strategies to accelerate efforts to meet these air quality guidelines. Where intermediate steps are necessary, transition fuels and technologies that offer substantial health benefits should be prioritized". With this in mind, we can conclude that promoting the use of improved/clean cooking stoves is a viable means for South Sudan to reduce the incidence of childhood ARTI, especially pneumonia and its related morbidity and mortality. This is achievable without changing of the energy source (charcoal) already in use by many in South Sudan. Further research is needed on the practical challenges of making fuel-efficient stoves more widely used in South Sudan.

### Conflicting interests

The authors of this review are not linked to any companies/organizations producing the cooking stoves mentioned in the article. No financial assistance was received for writing this article.

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# Open appendicectomy . . . How I do it

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## Introduction

This article is meant for medical officers and surgeons in training who might be called upon to perform this procedure in the absence of a trained general surgeon. The techniques described here are the ones used by the author for this procedure and might differ from those used by other surgeons. However, the principles of the operation are universal. This procedure is predominantly performed laparoscopically in the author's practice as is the case in most modern hospitals with the necessary equipment and expertise. The open procedure is the standard in many hospitals in developing countries and when there is a need to convert to open during difficult laparoscopic procedures.

## Indications

- Confirmed or suspected acute appendicitis.
- Interval Appendicectomy, 2-4 months after treating an appendicular mass or abscess conservatively.
- Appendicectomy during an unrelated abdominal operation.

## Operative Technique

- Supine position and general anaesthesia with intubation. Spinal or epidural anaesthesia can be given by the medical officer cum surgeon in the absence of an anaesthetist or anaesthetic assistant. You will need an assistant who could be a nurse or a technician besides the scrub nurse for better exposure. An abdominal general set of instruments and good lighting are mandatory.
- Skin incision

I prefer the Lanz incision to the McBurney's incision as it leaves a better cosmetic result. Ideally a size 10 surgical blade is used but can vary with age and size and what is available in your hospital. A new razor blade can do the trick in the absence of a surgical blade. Both incisions are centered at the McBurney's point at the junction of the middle and lateral thirds of a line from the umbilicus to the anterior superior iliac spine. For a standard open appendicectomy, a 3-8 cm skin incision is adequate depending on the age and body habitus of the patient (see Figure 1).

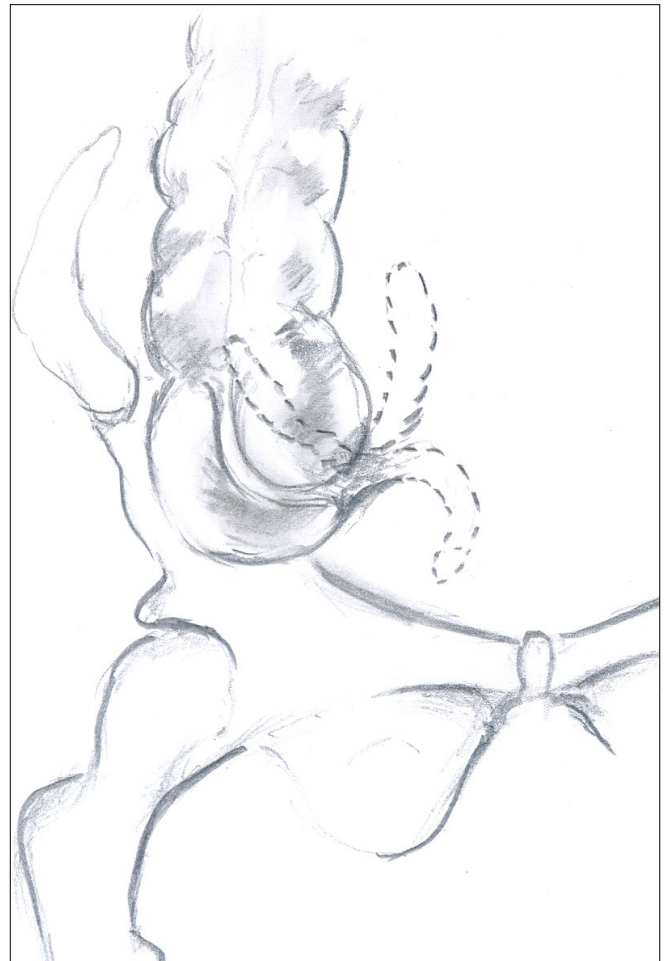


Figure 1. Common anatomical positions of the appendix.

- The incision may be extended up to the edge of the rectus muscle medially in difficult cases when the appendix is in the retrocaecal or sub hepatic position (see Figure 2). In case extending the incision does not provide the required exposure, a new vertical incision suitable to the pathology should be made and the McBurney incision closed. A midline incision is best suited for difficult cases when the need arises. Struggling to perform a difficult operation through a small incision could lead to gut lacerations with catastrophic consequences.



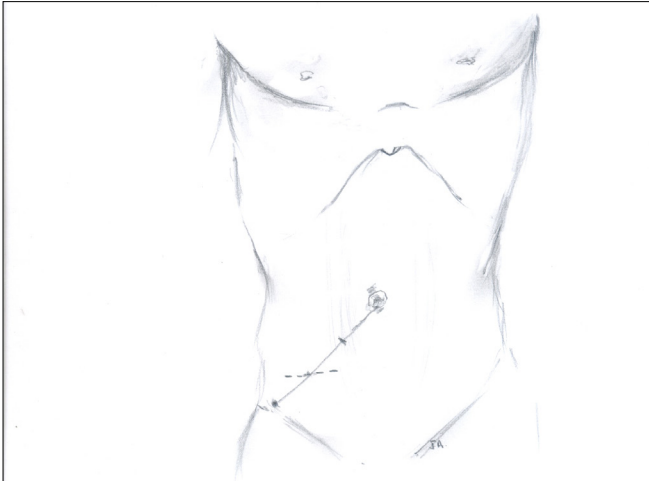


Figure 2. Skin incision (s).

- The subcutaneous tissues can be spread out bluntly with the fingers and a gauze swab up to the external oblique fascia. Branches of the superficial inferior epigastric blood vessels are tied with 3/0 absorbable sutures as they appear in the wound and small vessels cauterized with electrocautery, if available at your facility.
- The external oblique aponeurosis is split in the line of its fibres running obliquely downwards from lateral to medial using a combination of blunt and sharp dissection (see Figure 3).

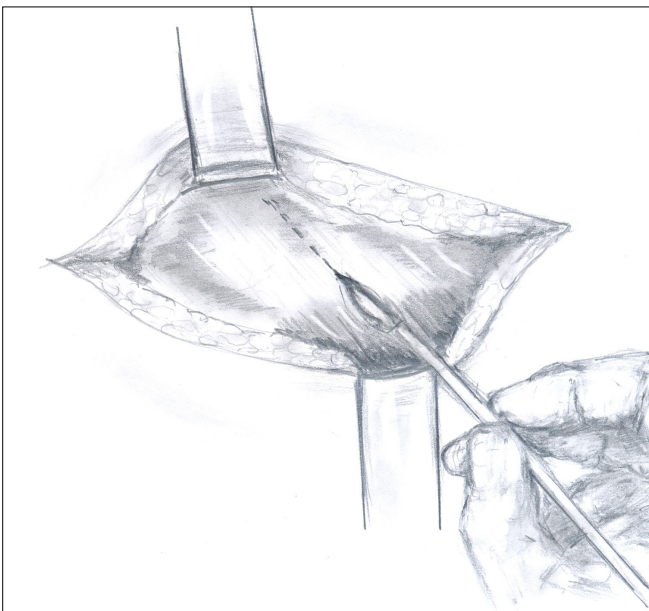


Figure 3. Division of the external oblique aponeurosis

The fibres are then retracted horizontally using a pair of flat retractors like the Kenny-Riles or Roux to expose the shiny upper surface of the internal oblique muscle fibres running obliquely laterally to medially in an upward direction.

- A long curved artery forceps like a Kelly Haemostatic forceps or the fingers are inserted through both the internal oblique and transversus abdominis muscles separating them up to the transversalis fascia and peritoneal layer using gentle spreading motions. It is important here not to use any sharp dissection which is unnecessary and could lead to excessive bleeding. This will also maintain the grid iron configuration of the muscle anatomy that will spring into place on closure with no or little need for sutures (see Figure 4).

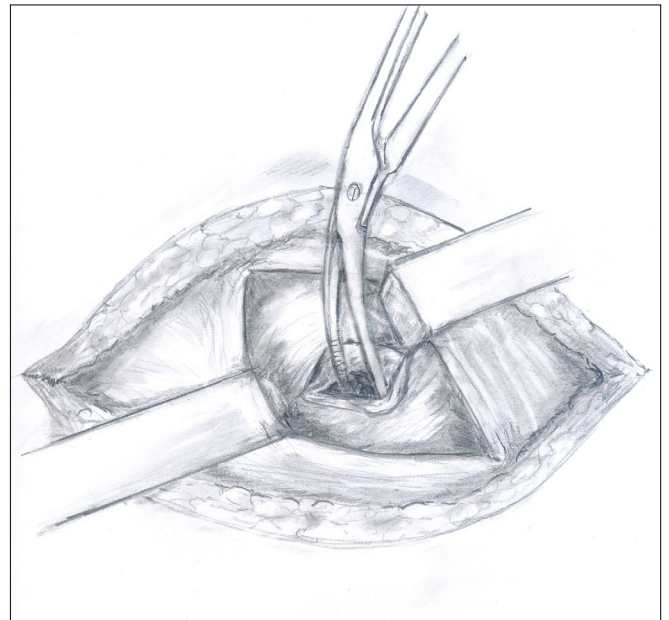


Figure 4. Splitting the internal oblique and transversus abdominis muscles

- The assistant changes to a pair of langenbeck retractors or similar with long narrow blades and retracts the muscle fibres in a horizontal manner to open up the space over the peritoneum. The peritoneum is then carefully lifted up and opened between two artery forceps with a Mayo or Metzenbaum scissors to avoid injury to underlying gut which maybe adherent to it because of the inflammatory reaction (See Figure 5).
- The retractors are then repositioned to include all the abdominal wall layers and firm horizontal retraction is applied by the assistant to open up the operative space and expose the contents of the right iliac fossa. Any fluid encountered at this stage is collected and sent immediately to the laboratory for gram stain and culture/sensitivity test. The caecum, if it is not

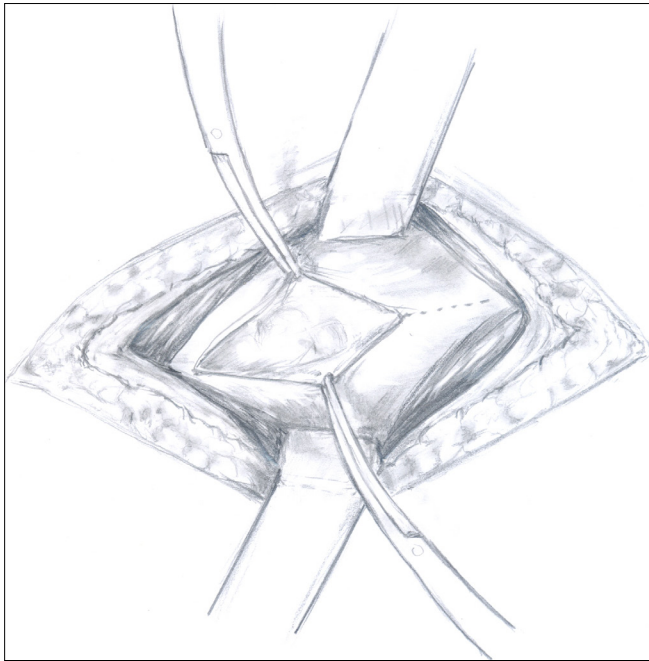


Figure 5. Opening the transversalis fascia and the peritoneum.

immediately visible, is located and delivered into the wound by sliding the fingers along the lateral abdominal wall. The base of the appendix is then identified by simply following one of the taeniae coli downwards on the surface of the caecum. The caecum and the appendix are then delivered into the wound if possible. Care is taken to minimise the extrusion of dilated loops of bowel or even a dilated floating caecum out of the peritoneal cavity as it can be extremely difficult to return it through the small incision (see Figure 6).

- Grasp the appendix with a Babcock or similar tissue forceps at the distal end on the mesoappendix. Skeletise the appendix by dividing the mesoappendix between serially applied artery forceps and ligate each with 2/0 or 3/0 absorbable sutures until its junction with the caecum. Be careful when clamping the appendicular artery when the mesoappendix is oedematous as it can slip and cause troublesome bleeding from the appendicular vessels (Fig. 7). Another pitfall and danger at this stage of the operation is an inadvertent laceration of the caecum during dissection and manipulation.
- Crush the base of the appendix with an artery forceps close to the caecum and insert two other forceps distal to it close to one another and divide between them with a knife. Ligate the stump of the appendix with a 2/0 absorbable tie. Anchoring the suture to the appendicular serosa minimizes the chances of a slipped tie that could lead to abscess formation and peritonitis in the post-operative period (Fig. 8). Touch the stump with a disinfectant swab (e.g. betadine). The author



Figure 6. Localisation and delivery of the appendix

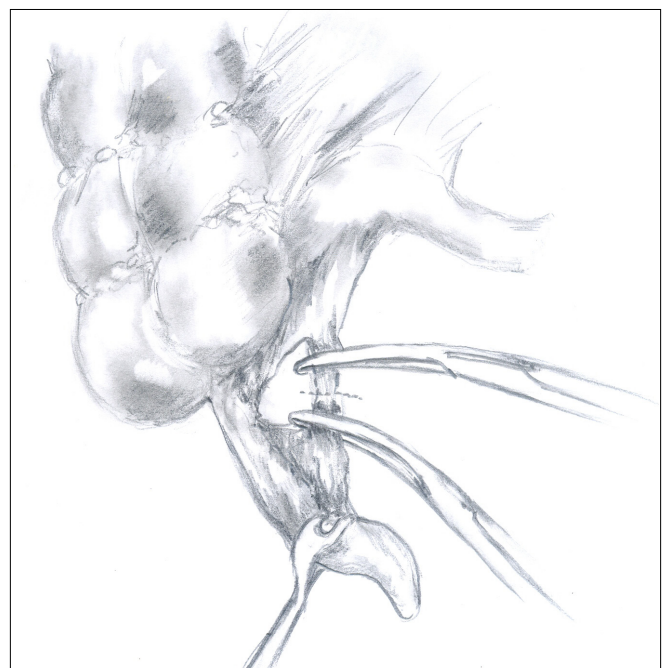


Figure 7. Division of the mesoappendix.



Figure 8. Ligation of the stump of the appendix.

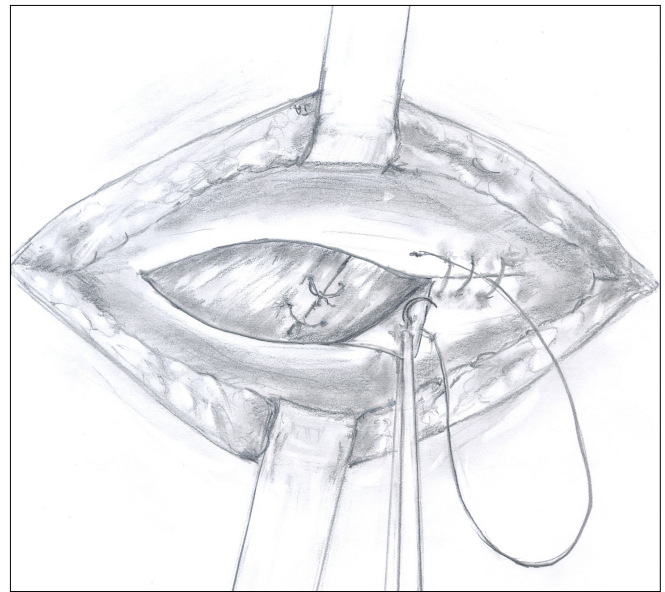


Figure 9: Closure of the incision

does not routinely bury the stump with a purse string stitch.

- Wash out the operation site with warm normal saline especially if an abscess or localized peritonitis had developed. A corrugated rubber drain inserted through a separate stab incision or a vacuum drain (can be improvised in the absence of the costly portovac by using a 20 cc syringe) is recommended in patients with abscess formation and localized peritonitis.
- Close the abdomen in layers. I use 2/0 or 3/0 synthetic absorbable running suture material to close the peritoneum after carefully elevating the edges off the intestines with 4 artery forceps. The muscle layers are allowed to fall into place as they were only separated on entry into the peritoneal cavity. Occasionally two or three loosely placed 3/0 absorbable sutures could be inserted on the internal oblique to ensure no gaps persist between the muscles. The external oblique muscle is then closed with a running 2/0 absorbable suture (see Figure 9). The subcutaneous tissues are approximated with a few absorbable sutures in obese patients.
- Skin closure depends on the degree of contamination observed at surgery. After elective or interval appendicectomies, a 3/0 subcuticular absorbable synthetic stitch gives the best cosmetic results. In case

of severe contamination it is often best to leave the skin open for 2-3 days with daily irrigations followed by a secondary suture of the skin. When the contamination is mild and well contained at surgery, skin clips or interrupted non-absorbable simple or mattress stitches can be inserted immediately after surgery. When in doubt, leave the skin open, sometimes with the sutures in place but not tied. Secondary suture is usually done easily under local anaesthesia in adults after 2-3 days of daily wound irrigation and packing.

- Postoperative:
  - o Normal diet after 24 hours or when patient passes flatus.
  - o Continue antibiotics if there was perforation and localised peritonitis.
  - o Remove any drain after 2 days
  - o Most patients are discharged after 48 hours on observed clinical improvement and stable vital signs. Inflammatory markers like WBC and CRP could be checked before discharge if available at your institution.
  - o Stitches are removed 7-10 days after surgery in the outpatient clinic.

*All illustrations prepared by John Adwok.*



## The Vision 2020 Links



Figure 1. Ben Parkin and Dr Wani Mena in the Juba Ophthalmology Unit. (Credit Ben Parkin)



Figure 2. The LINKS teams together at Wad Medani. (Credit Nick Astbury)

The VISION 2020 LINKS Programme originated as part of the 'VISION 2020 - The Right to Sight' initiative established in 1999 by the World Health Organization and the International Agency for Prevention of Blindness to eliminate avoidable blindness worldwide. The Programme was first implemented by the International Centre for Eye Health (ICEH) at the London School of Hygiene and Tropical Medicine in 2004.

To date there are 28 VISION 2020 links between institutions in the UK and in low-income countries, mostly in Africa (also in Indonesia, Fiji and Jamaica)). In addition, a number of organisational and clinical linkages have been established including a link between the College of Ophthalmology of Eastern, Central and Southern Africa (COECSA) and the Royal College of Ophthalmologists.

The initiative aims to give teaching eye institutions in low-income countries the skills and resources to develop high quality programmes and training for all eye care professionals. Their main needs and priorities are identified by a formal needs assessment process which helps to establish a foundation for sustainable partnerships between teaching institutions in developing countries and partner eye hospitals in the UK.

The International Centre for Eye Health (ICEH) promotes the development of links by acting as a re-source and networking centre for existing Links and facilitates the development of new ophthalmic links between partner institutions in Africa and the UK.

### Sudan link

Nick Astbury and colleagues in Norwich ran a successful link with the University of Gezira in Sudan from 2005-2011 before the Republic of South Sudan gained independence in July 2011.

From 2005 and 2011, 21 exchange visits took place, 12 out to Sudan and 9 back to UK, involving 23 members of staff from Norwich and 32 from Wad Medani. This was an institutional link that involved several departments at the Norfolk and Norwich as well as the University of East Anglia. The initial 3-year activity plan covered nursing, community epidemiology and research, physiotherapy, neurology and ophthalmology (VISION 2020 LINKS Programme). After six years an exit strategy was agreed and plans were made to start a link in South Sudan.

Achievements of the Gezira (Wad Medani) link included:

- Development of a new nursing curriculum.
- Development and implementation of a paediatric nurse led diabetes service.
- Setting up an infection control structure covering all 7 hospitals in Gezira.
- Introduction of a major maternal and child health programme.
- Development of a community research programme and successful bid for funds to the Wellcome Trust.
- New specialist glaucoma service introduced.





Figure 3. Fiona Grady teaching orthoptics (credit Nick Astbury)



Figure 4. Carol Edwards discussing nursing issues with her colleagues (credit Nick Astbury)

- Introduction of ophthalmic nursing protocols and guidelines.

In 2011 Nick Astbury and Carol Edwards led a team from Norwich to undertake a formal needs assessment chiefly related to nursing and ophthalmology training in Juba. Dr Wani Mena highlighted the priorities which particularly centred around human resource development and sub-specialty training. There is an on-going fundamental shortage of teachers and trainers which is impacting efforts to increase both the number and skills of Eye Care professionals of all cadres.

Ben Parkin visited South Sudan in 2012 and 2013 with the Africa-Poole Link which is supporting all specialist services in Wau Teaching Hospital – see Figure 1. He spent time teaching and working in the Eye Units of both Wau and Juba Teaching Hospitals as well as giving lectures in two Nursing Colleges in Wau. He subsequently joined the Juba VISION 2020 LINK and registered the link with ICEH in 2015. The new Memorandum of Understanding has been agreed by parties in Juba and the UK. Figure 2.

Already the link has raised funds to purchase an operating microscope with teaching and other supplies for Juba Teaching Hospital Eye Unit with the aim of improving surgical teaching and clinical care. An Institute of Ophthalmology has been established by the Ministry of Health to continue middle cadre training including ophthalmic nurses, cataract surgeons and refractionists.

The next activity of the link will be a visit by two consultant ophthalmologists from Juba to the UK. The programme includes observation of ophthalmic practice in four different hospitals, with opportunities

for clinical teaching in all sub-specialty areas. Continuing Professional Development needs will be addressed at two annual meetings, the Royal College of Ophthalmologists Annual Congress and the British Oculoplastic Surgery Society Scientific Meeting. A large number of specialist courses and meetings are available at these events. Finally the South Sudanese ophthalmologists have been registered on the East Anglian Sinus, Skull Base and Ophthalmic Surgery Course, a 3-day practical specialist surgical course using cadaver heads.

Another planned activity is to partner with the University of Nairobi in running a sub-specialist course, firstly in oculoplastics in 2017. A faculty of experts will give talks, show surgical videos and demonstrate techniques on patients to a limited number of local trainees as well as invited consultants from Juba and elsewhere.

### Summary

Links provide innovative, sustainable and cost effective benefits to health care delivery in Africa by encouraging local health workers to develop their skills and thus enhance service delivery, staff confidence and morale. They allow for in-service training in which skills shared can be clinical, technical, community-based, organisational or managerial and are based specifically on identified local needs and priorities.

*Prepared by Ben Parkin with help from Wani Mena and Nick Astbury.*

*For more information contact Ben at*

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## Gordon Memorial College Trust Fund News

At its last Executive Committee and Trustees meeting on 31st March 2016, scholarships were awarded to the below applicants from South Sudan.

The funds of the Gordon Memorial College Trust Fund (GMCTF) are held in Trust and administered by a group of Trustees and an Executive Committee. **The purpose of the Fund is to promote educational development in South Sudan and Sudan.** Grants are available for educational projects and activities in South Sudan and Sudan and for South Sudanese and Sudanese nationals studying for a postgraduate course in the UK, or in counties neighbouring Sudan and South Sudan, who intend to return to South Sudan or Sudan at the end of their studies. The Trust may also give financial assistance to South Sudanese and Sudanese nationals towards the costs of shorter training programmes, projects and courses in the UK. Please note that at present due to current difficulties in transferring funds to South Sudan and Sudan it is not possible for the Trust to support individual students studying in South Sudan or Sudan.

The scholarships are awarded on merit judged on objective criteria. This year 170 applications were received (of which 55 were from South Sudan), 32 were short listed and 7 applicants from South Sudan were awarded grants for the 2016-2017 academic year. Funds are increasingly getting less and the selection criteria are very rigorous.

### How to increase your chance of securing a scholarship

1. Apply early online between 1st December of one year and middle of February of the following year. The GMCTF committee meets in late March/early April each year to consider short listed candidates for award of scholarships.

2. Ensure that letters from two referees are submitted to the Secretary before the closing date as this may delay consideration of applications or lead to rejection of the applications concerned.
3. Append letter of admission to a recognised Institution where studies are to be undertaken and ensure that the fees charges by the Institution/ University are clearly set out by the Institution on their headed paper and signed by a recognised officer of that Institution. Do not guess the amount of fees or living expenses as excessive estimates of finances may lead to rejection of the application
4. For a course more than one year long, applicants must apply every year of study for a fresh scholarship, supporting their applications with letters from their course supervisor and Head of Department confirming the applicant's satisfactory progress.
5. Declare any other sources of funding which may be contributing to the course fees or living expenses as this ensure that more South Sudanese will get the opportunity of benefitting from a grant.

### Eluzai Abe Hakim

Consultant Physician,

International Adviser to the Royal College of Physicians London on South Sudan, Associate Editor South Sudan Medical Journal, Member Executive Committee GMCTF and Deputy Chairman The Juba Link

Name	Course	Institution of study	End Date
1. Dr. J. Koat	Ophthalmology	Makerere University	Jan '17
2. Dr. A. Koma	General Surgery	Uganda Martyrs University	Dec '18
3. Dr. J. Yosepa	Otolaryngology	Makerere University	Aug '16
4. Dr. R. Loro	General Surgery	Makerere University	Aug '17
5. Dr. M. Taban	Obstetrics & Gynaecology	Makerere University	Aug '17
6. Dr. G. Gel	Paediatric & Child Health	Makerere University	Aug '17
7. Dr. V. Aputu	Radiology	Makerere University	Aug '17

# Making progress in postgraduate medical education



Figure 1. Paediatricians from the UK training at the PGME Centre (credit Rich Bregazzi)

As the new College of Physicians and Surgeons of South Sudan (CPSSS) continues to develop, links between the UK and the College have been further strengthened.

Following an application to the Gordon Memorial College Trust Fund, which promotes educational development in South Sudan, trustees of the fund have agreed to finance two six week visits to the UK by CPSSS staff. The visits will take place later this year, and will help staff gain insight into postgraduate medical education, while enhancing their clinical practice. Most of their time will be spent in a UK hospital, but they will also be able to attend regional courses in medical education, courtesy of Wessex Deanery. The visit will be organised in the UK by the St Mary's Hospital-Juba Link, a charity that is well known in Juba Teaching Hospital (JTH) for its many years of support.

On their return to the College of Physicians and Surgeons, staff will continue to develop postgraduate medical education programmes, and be able to liaise with contacts in the UK in order to develop and implement e-learning.

The College, based at the Postgraduate Medical Education Centre in JTH, has made significant progress over the last six months. Thirty six graduate doctors from Juba University have registered with the College, and been deployed into hospitals to begin their postgraduate medical training. Undergraduates, based at JTH for their clinical training, already use the Centre facilities for teaching, and to access its reference library. Since November, we have hosted two teams of visiting clinical trainers from the UK (see Figure 1), and we are expecting



Figure 2. Surgeons from Juba Teaching Hospital training at the PGME Centre (credit Rich Bregazzi)

more before the end of the year. Meanwhile, we have agreed to host a UNFPA funded project to train Associate Clinicians in a range of medical procedures, focused upon improving infant and maternal mortality.

The development of postgraduate medical education, and the establishment of the College of Physicians and Surgeons, has been led by the Ministry of Health, and fully supported by colleagues in Juba Teaching Hospital, Juba University (see Figure 2), and by a network of colleagues in the UK. Our next steps are clear: to firmly establish our Basic Medical Training programme; to develop our internet capacity and implement e-learning, reaching out regionally and to our UK network for educational support; and to begin to develop specialty training programmes.

No one at the College underestimates the challenge of achieving our aims in such uncertain times. However, the goal of postgraduate medical education is compelling. We intend to continue, step by step, until we achieve this goal, and in so doing, contribute to increasing the capacity of South Sudan to deliver healthcare to its people.

If you would like more information, or wish to offer help and support to the College of Physicians and Surgeons of South Sudan, please contact Rich Bregazzi.

## Rich Bregazzi

Dean of the College of Physicians and Surgeons of South Sudan, and of Postgraduate Medical Education at [richbregazzi@gmail.com](mailto:richbregazzi@gmail.com).



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The mission of SSMJ is to publish research and clinical guidance that will positively influence the development of healthcare services in South Sudan.

Other websites associated with this journal: [www.southsudanmedicaljournal.com](http://www.southsudanmedicaljournal.com)

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