

# **TUBERCULOSIS**

## **knowledge and case detection**



**Call to battle cancer in South Sudan**

**HIV/AIDS KAP in Nimule**

**Ileosigmoid knotting**

**Bladder exstrophy – epispadias complex in a newborn**

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**Front cover photo:** Photomicrograph of a sputum sample containing *Mycobacterium tuberculosis*.

Photo Credit: Tim Vickers at English Wikipedia - the Centers for Disease Control and Prevention's Public Health Image Library (PHIL)

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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.

## The call to battle cancer in South Sudan

As South Sudan grapples with conflict, political instability and continuing poor health infrastructures among myriads of other problems, a growing number of cancer cases is causing alarm in the medical community.

All the risk factors for cancer are rampant in South Sudan: tobacco smoking, alcohol consumption, physical inactivity, obesity and household solid fuel use. The leading cancers being diagnosed include cancer of the cervix, breast, prostate and oesophagus, leukaemia and lymphomas. With no cancer registry in the country, the exact incidence and prevalence of the different cancers will not be known for some time.

Because there are only two pathologists in the country and a lack of diagnostic facilities and equipment in the public hospitals, the burden falls on the private sector.

Cancer treatment is still nascent to non-existent in South Sudan. Basic surgical removal of cancer growths is the only option for many people. The country does not possess an oncology facility and consequently, with no access to chemotherapy and radiotherapy, treatment is a major challenge. Those who can afford it are referred for further management to countries such as the Sudan, Egypt, Uganda, India or South Africa.

For those who cannot afford treatment abroad, it is the end of the road. They say, "Thanks doctor for the diagnosis, I will go back home and wait till the hour comes". I am always in agony after hearing that.

### THE COUNTRY URGENTLY NEEDS A NATIONAL CANCER POLICY, AND A STRATEGIC PLAN FOR THE PREVENTION AND CONTROL OF CANCER.

South Sudan and the Ministry of Health should embark on a concerted effort to raise awareness of cancer. The country urgently needs a national cancer policy, and a strategic plan for the prevention and control of cancer. More pathologists should be trained and oncology services should be established. A commitment to allocate resources to fight the increasing scourge must be supported, and donors and partners must push for such initiatives. If the issues are not addressed, we may lose the war to cancer before a single battle is fought.

The battle must start NOW.



Recurrent left breast mucinous adenocarcinoma in a 36 years old woman in Juba, South Sudan.  
(Credit: Dr Oromo Francis Seriano)

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# Knowledge, Attitude and Practice, and service barriers in a tuberculosis programme in Lakes State, South Sudan: a qualitative study

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**Background:** The World Health Organisation (WHO) estimates the incidence of tuberculosis (TB) in South Sudan to be 79 per 100,000 for new sputum smear positive TB and 140 per 100,000 for all forms of TB cases. The case detection rate of 53% for all forms of TB in South Sudan is below the WHO target of 70%.

**Objective:** To explore knowledge, attitude, and practice barriers as well as service barriers to implementing TB programme in Lakes State, South Sudan.

**Method:** This was a qualitative study conducted in May 2015.

**Results:** Despite some understanding of the symptoms, causes, and consequences of TB, the stigma for TB and lack of disclosure of the disease, is very high among the local community. The limited network of TB facilities for case detection, lack of community distribution of TB drugs and lack of food at hospitals when patients were admitted for treatment, are key barriers to TB service delivery.

**Conclusion:** To overcome barriers it is recommended that the local community worldview should be incorporated into TB awareness, testing, and treatment, and attention should be paid to areas where traditional practices, such as elimination of maize, clash with modern treatments.

**Keywords:** Tuberculosis, KAP, Dinka, service barriers, stigma, South Sudan

## BACKGROUND

Globally, the World Health Organization (WHO) ranked tuberculosis as “the ninth leading cause of death worldwide”, affecting an estimated 10.4 million people in 2016<sup>[1]</sup>.

Tuberculosis (TB) is a common cause of death in South Sudan with a prevalence rate of 257 per 100,000 population<sup>[2]</sup>. The case detection rate of 53% for all forms of TB in South Sudan is below the WHO target of 70%<sup>[3]</sup>. If the disease is discovered, the treatment success rate for smear-positive tuberculosis is just 75%, which is also below the WHO target of 85%<sup>[3]</sup>. South Sudan adopted the WHO End TB Strategy in 2015 to expand TB diagnosis and treatment services in the hospitals and primary health care centres (PHCCs)<sup>[4]</sup>. As in South Sudan and other parts of Africa, systemic barriers and patients attitudes to TB treatment continue to be a hindrance in achieving TB control<sup>[5, 6, 7]</sup>. Innovative approaches maybe required to overcome some of these challenges<sup>[8]</sup>.

To work towards reducing morbidity and mortality from TB in South Sudan, BRAC, a non-governmental organization, implemented a WHO-funded “TB Reach” project in Rumbek East County and Rumbek Central County in Lakes State from July 2014 to November 2015. The population in the area is predominantly from the Dinka ethnic group, the largest ethnic group in the South Sudan, with a population of 4,500,000<sup>[9]</sup>.

This study followed a TB education programme run by BRAC from September 2014 to March 2015. BRAC’s “TB Reach” programme had significantly higher numbers of referrals and correct detection than other governmental agencies who are involved in TB work (see Table 1). However, BRAC wanted to understand if there were additional barriers that could be removed to improve education and treatment relating to TB.

## METHODS

This was a qualitative study conducted in May

**Table 1. TB Cases Referred by BRAC and other organizations at Rumbek State Hospital**

	Total number	Referred by BRAC n (%)	Referred by other organizations n (%)
<b>Number of TB sputum tested</b>	618	419 (68)	199 (32)
<b>Number of TB cases detected</b>	30	28 (93)	2 (7)

*Data from the Tuberculosis Department, Rumbek State Hospital, September 2014 to March 2015 (Unpublished data)*

2015. Fifty participants took part either in one-on-one interviews or focus group discussions (see Table 2). All the 50 participants were Dinka and were from the six stakeholder groups described in Table 2. The gender, age and education levels were diverse and not found to be significant in the analysis. Data analysis was performed on transcripts from interviews and focus group discussions. Data were categorized thematically according to content and specific categories to discover underlying factors and to perform an in-depth comparative analysis.

## FINDINGS

Many members of the Dinka ethnic community live in Lakes State. For the Dinka, healing is an interactive process, which means that illness is a community affair, and that when one is well, there is harmony and balance between people, God, ancestors, and nature. For these reasons, the Dinka do not like to be isolated for TB treatment and have significant stigmas surrounding the disease, as it affects families and one's social position (including employment and marriage practices).

There is significant stigma to TB with the Dinka. The Dinka and healthcare workers refer to it as *ayiel* (cholwech) or "malaria cough" in order to work around this stigma. However, this may be confusing and does not directly address the social stigma to the disease. Added to this social barrier are service barriers, making it even more difficult for TB to be detected and treated, as found in other parts of Africa [5].

This study found that respondents understood the symptoms, causes, and consequences of TB. Unfortunately, many of the community members continue to reject the disease as TB because of the negative stigma attached to it. As described further below, and in other studies [6], we found that there are knowledge, attitude and practice (KAP) barriers in the lack of understanding and accommodation of Dinka traditions, worldview, and traditional treatments and we found there are service barriers in the lack of food in hospitals, and the lack of surveillance and ability to keep and directly feed medicine to patients by community health workers.

## KAP Barriers

In Lakes State, a barrier to both detection and treatment of TB is the knowledge, attitudes, and practices (KAP) of the Dinka people. These barriers result in a lack of detection, treatment, and completion of treatment leading to low success rates [10]. Among respondents, there was some understanding of the symptoms, consequences, and treatment process of TB. However, others thought the disease was caused by worms, smoking, sour things, cow kicks, or spirits. However, in almost all cases, if respondents' family members had TB it was rejected as the disease in question. Instead, TB was referred to as *ayiel* (cholwech) or "malaria cough" by both patients and healthcare workers. From interview data, we believe this is because of the negative stigma attached to TB.

We learned that the Dinka people have a negative connotation with TB going back to 1972 when the German Leprosy and Tuberculosis Relief Association in Lakes State would remove TB patients for at least six months of treatment. Affected families were seen as "satan" in the words of participants, and socially excluded because of the vernacular belief that they were suffering from a curse from God. Because TB is a transmittable disease and several members of a family are often affected, the family as a whole suffered, as even those without the disease were seen as part of the "bad spirit on the specific family". In our study, participants stated that only elderly persons and patients admitted to the hospital were likely to disclose the disease to their family and community. Lack of disclosure was based on the fear of social exclusion by the community. Marriage considerations were found to be a significant factor in the non-disclosure of TB as well.

All of the 12 Dinka patients interviewed were receiving both modern and traditional treatments for the disease and included chicken and goat rituals, and the elimination of maize, sour milk, and other foods. Removal of maize from diets became a barrier to modern hospital treatment as maize was the only food offered at the hospital.

## Service Barriers

The study also found that a barrier to TB case detection

**Table 2. Respondent Groups**

	Data gathering method	Number of participants
Patient	Focus groups	12
Community Leader	Interviews	4
Community People	Focus groups	13
Traditional Healer	Interviews	4
Formal Health Care Service Provider	Interviews	2
Community Health Worker	Focus groups	15

and care in South Sudan is the limited network of TB facilities. Nationwide, only 44% of the population are within five kilometres of a health facility<sup>[11]</sup>. The county-level TB co-ordination structures are not yet functional for all 79 counties, and among the functional hospitals and primary health care centres, only 22% have TB diagnostic services and only 13% have both TB diagnostic and treatment services.

In hospital, TB and HIV are treated under the same roof because according to hospital data, 12% of TB patients were HIV positive (it should be noted that patients with HIV are heavily screened for TB)<sup>[12]</sup>. Unfortunately, this conflates the ‘curable’ (TB) with the ‘incurable’ (HIV), adding to the stigma surrounding the disease, which is a significant barrier<sup>[7]</sup>.

We also found that there has been a lack of food provided to TB patients during their hospital stay. Before 2010, patients were fed in hospital three times a day by the World Food Programme. Their breakfast consisted of porridge, while lunch was posho (maize cooked to a dough or porridge-like consistency) with milk, vegetable and nuts, while dinner was simply bread and milk. Since 2010, however, patients receive only one kilogram of maize flour. Cooking facilities are not provided and patients must supply their own attendant to prepare meals. As aforementioned, elimination of maize is a common vernacular treatment for the symptoms of TB and many respondents reported that admitted patients often left the hospital early because of this. Introduction of new approaches have been shown to be effective<sup>[8]</sup>.

Another service barrier is the fact that medicine is provided only by hospitals for patients to take home.

Community health workers do not keep medicine and there is no community based distributor of TB medication. Therefore, if there is a lack of medicine at discharge, or misunderstandings about medication, access to information and medication is limited in the community.

## CONCLUSION

We found that the BRAC “TB Reach” programme was successful in disseminating information about TB in its project areas, but a lack of government support and the lack of understanding of how the Dinka see the disease may reduce the on-going effectiveness of treatment efforts.

An important barrier to treatment is the significant dropout rate among hospital patients because of a lack of prepared food and the hospital providing only maize flour, which is often contraindicated by traditional Dinka healing practices for “malaria cough”. Further, when patients drop out and return to their communities, community health workers do not have access to medicine to continue treatment.

To overcome barriers it is recommended that the following cultural and health system issues are addressed:

- Dinka people’s worldview should be incorporated into TB awareness, testing, and treatment and attention should be paid to areas where traditional practices clash with modern treatments.
- Hospitals should provide an alternative to maize flour for TB patients.

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## Epidemiology of tuberculosis in South Sudan

TB is a major problem of public health in South Sudan. According to the WHO estimates for the year 2014: i) the prevalence of TB was 319 cases per 100,000 population, ii) 17,000 people were newly affected with TB, indicating an incidence of 146 new TB cases per 100,000 population and iii) 3,400 persons died of TB which resulted in a mortality rate of 29 deaths from TB per 100,000 population. The information system of the National TB Programme (NTP) indicates that TB notification has increased from 2,955 cases in 2008 to 8,856 in 2014. The information system of NTP reported that among smear-positive pulmonary TB cases notified in 2014:

- 65% are males, which indicates a sex-ratio of 2 males for 1 female;
- One third of them belongs to the age group 25-34 years in both gender groups;
- 85% are aged less than 45 years in both gender groups.

Among the total number of smear-positive pulmonary TB patients notified, two thirds were identified in 4 of the 10 states, namely: Central Equator State (38%), Warrap State (12%), Northern Bahr El Ghazal State (11%) and Upper Nile State (5%). The incidence of notified smear-positive pulmonary TB cases was 37 per 100,000 population at national level in 2014. This notified incidence was significantly higher in males than in females in all the age groups except for those aged less than 15 years or more than 64 years (see graphs below). In the age group 25 to 44 years, males are approximately 2 times more likely to be notified for smear-positive pulmonary TB than females.

DOTS strategy was initiated at very low scale in 2002 with 12 health facilities which provided TB diagnosis and treatment services. The NTP adopted the WHO Stop TB Strategy in 2006 which focused on the extension of basic DOTS services and the implementation of TB/HIV collaborative activities. Until 2014, TB services have been implemented in 87 TB diagnosis and treatment centres; none of the 792 PHCUs that are available across the country is ensuring any TB services. In early 2015, the NTP adopted the WHO End TB Strategy to achieve the objectives identified in the 2015-2019 NSP.

*\* This is an extract from the Guideline for Tuberculosis & TB/HIV Prevention, Care and Control in South Sudan, Third Edition, 2016 (Ministry of Health). The Diagnosis of tuberculosis flow chart is shown on the back cover (see page 27)*

# Knowledge of tuberculosis and factors responsible for low case detection in the Amansie Central District, Ghana

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**Background:** Tuberculosis (TB) case detection rate has remained consistently low in the Amansie Central District despite the implementation of the National TB Programme (NTP).

**Objective:** To assess the factors influencing this low case detection of TB.

**Method:** Information was collected from 120 individuals and 40 health workers were randomly selected from four health facilities that provided TB treatment.

**Results:** All patients had a good knowledge of TB. There was no statistical association between patients knowledge and educational level ( $p>0.05$ ). However, knowledge on the causes of TB was strongly associated with occupation ( $p<0.05$ ). 53% of patients indicated health facilities as the first place of visit when sick and how they are received was dependent on education ( $p=0.005$ ) and marital status ( $p<0.05$ ); 60% of health workers were not trained on the NTP despite 93% being aware of the programme, and 62.5% reported not initiating contact tracing after disease confirmation. Only 34 of the 120 patients reported health workers visiting them regarding TB.

**Conclusion:** Development of interventions such as HCW training on TB treatment and care, and establishing referral networks that bring TB information and services closer to community members can contribute to improved TB case notification.

**Keywords:** tuberculosis case detection, knowledge of tuberculosis, health-seeking behaviour, Health worker attitude, Ghana.

## INTRODUCTION

There are huge gaps in the performance of national tuberculosis (TB) control programmes [1]. It is estimated that 3.7 million TB cases, including 1.6 million with sputum smear positive disease, were not reported by the Direct Observed Treatment Strategy (DOTS) programmes [2].

Attempts to curb and control this problem led to the 'WHO-CIDA INITIATIVE' which began in 2009 in Ghana, with the aim of addressing the country's low detection of TB cases. This initiative successfully detected 15% additional TB cases over the period 2009 to 2013 leading to an interim achievement [3]. The incidence of new cases worldwide is falling too slowly at around 1%/year and levels of case detection and successful treatment are far too low. Globally, only 12% of the estimated cases were detected in 2009 and less than 5% were properly treated [4].

According to the Tuberculosis Surveillance Unit,

in the Ashanti region of Ghana, only 2101 of the 9583 expected cases were detected in 2008, only 2106 out of 9910 in 2009, and only 1101 out of 10219 cases in 2010. Case detection rate has remained below 25% from 2010 to 2015 [4]. Also in the Amansie Central District in the Ashanti region of Ghana, 45 out of 107 expected cases were detected in 2014 and only 18.2% in 2015.

This has been the trend in most districts and regions in Ghana leading many to hypothesize that, either the projections are exaggerated, the cases in the communities are not reporting to the health facilities or the cases are not being detected at the health facilities [4] which led to this study.

We sought to gain a deeper understanding of the reasons and assess the factors influencing the persistently low TB case detection rates in the District. The contextual scope is to detail and examine behavioural changes and socio-demographic influences through quantitative and qualitative analysis of data. It focuses primarily on

knowledge of TB, health-seeking behaviour and attitudes of healthcare providers. Our purpose was to understand the main bottle necks in TB case detection, and provide evidence based recommendations for improving TB case detection and informing policy decisions in Ghana.

## METHODOLOGY

This was a randomized cross-sectional study conducted between March and May 2017 in the Amansie Central District, Ghana among four of the 12 health institutions that provide TB treatment. A total of randomly selected 120 patients present in these 4 health facilities agreed to participate in the study. Forty health workers (doctors, nurses, midwives) were also selected.

Information was collected through interviews by public health students using structured questionnaires.

The study was approved by the Committee on Human Research Publication and Ethics (CHRPE) of the School of Medical Sciences, KNUST and Komfo Anokye Teaching Hospital.

Data entry and analysis was done using SPSS version 20. Quantitative data were used to generate simple descriptive information. The chi-square test was used to determine association and dependence among variables.

## RESULTS AND DISCUSSION

### Socio-Demographic characteristics of study participants

Of the 120 patients and 40 health workers, 90 (56%) were females and 70 (44%) were males. The mean age (in years) of the health workers was  $37.43 \pm 5.97$  ( $p= 0.34$ ) and of the 120 patients was  $39 \pm 3.79$  ( $p=0.24$ ).

Among the 120 patients: 49.1% had basic or primary education and 29.2% reached senior high school; 47.5 % were married, 38.3% were single and 7.5% were divorced; 39.2% were farming, 26.7% were trading, 15.8% were civil servants, 2.5% were students and 15.8% were unemployed. Among the health workers, there was a mean working years' service of  $5 (\pm 1.34)$  years; 82.5% were nurses, 5% were doctors, 5% were physician assistants, and 7.5% were midwives.

### Knowledge of TB

Table 1 shows that the knowledge on causes and treatment of TB among patients was good; the majority (87.5%) knew TB was a disease and 58% knew that it was caused by germs. Knowledge of TB was independent of educational level ( $p= 0.794$ ) as has been proposed by many studies<sup>[5]</sup>. Community involvement is crucial for any successful TB control programme<sup>[6]</sup>.

The main sources of patients' knowledge of TB was the radio or health workers – see Table 1. A study conducted in India indicated health workers as the major

**Table 1. Knowledge of patients on TB (n=120)**

Variable	n (%)
<b>What is Tuberculosis?</b>	
Disease	105 (87.5)
Curse	11 (9.2)
Don't Know	4 (3.3)
<b>Sources of information on tuberculosis</b>	
Local Information Centre	3 (2.5)
Radio	43 (35.8)
Health worker	40 (33.3)
Relative	29 (24.2)
School	5 (4.2)
<b>Causes of tuberculosis</b>	
Witches	9 (7.5)
Curse	10 (8.3)
Germs	70 (58.3)
Bad Air (Odour)	16 (13.3)
Don't Know	15 (12.5)
<b>Transmission of tuberculosis</b>	
Cough	59 (49.2)
Cough/Sneezing	46 (38.3)
Sex/Sharing of sharp objects/cough	5 (4.2)
Sex/Cough	3 (2.5)
Sharing of sharp objects/cough	4 (3.3)
Contact with infected person/cough	3 (2.5)
<b>Symptoms of tuberculosis</b>	
Cough	30 (25.0)
Cough/weight loss	35 (29.2)
Cough/night sweat/weight loss	12 (10.0)
Cough/fever/night sweat	2 (1.7)
Cough/night sweat/weight loss/diarrhoea	19 (15.8)
Weight loss/fever	10 (8.3)
Weight loss	12 (10.0)
<b>Is tuberculosis curable?</b>	
Yes	92 (76.7)
No	3 (2.5)
Don't Know	25 (20.8)
<b>If yes, how can it be cured?</b>	
Herbs	10 (8.3)
Orthodox medicine	78 (65.0)
Prayer camp	4 (3.3)
Not applicable	28 (23.3)

**Table 2. Knowledge of health workers of TB (n=40)**

Variable	n (%)
<b>Awareness of National TB Programme</b>	
Yes	37 (92.5)
No	3 (7.5)
<b>Trained on NTP</b>	
No	24 (60.0)
Yes	16 (40.0)
<b>When is a TB case suspected?</b>	
When cough is persistent/ night sweat/ chest pains	27 (67.5)
When the person cough persistently	9 (22.5)
When cough is persistent/ night sweat	4 (10.0)
<b>Actions taken when a case is suspected</b>	
Take sample	35 (87.5)
Refer to the next level	5 (12.5)
<b>If sample, what is taken?</b>	
Sputum	35 (87.5)
Not applicable	5 (12.5)
<b>Storage of sample</b>	
No	31 (77.5)
Yes	4 (10.0)
Not applicable	5 (12.5)
<b>Persons reported to when a case is confirmed</b>	
TB co-coordinator	37 (92.5)
The in-charge	2 (5.0)
Refer	1 (2.5)
<b>Role played after a case is confirmed</b>	
Education	28 (70.0)
Treatment	9 (22.5)
None	3 (7.5)
<b>Frequency of counselling patients during treatment</b>	
Monthly	25 (62.5)
Weekly	10 (25.0)
Quarterly	1 (2.5)
Not applicable	4 (10.0)
<b>Delivering of TB health education to community</b>	
Yes	26 (65.0)
No	14 (35.0)
<b>Contact tracing of patients</b>	
No	25 (62.5)
Yes	15 (37.5)

**Table 3. Health seeking behaviour of patients (n=120)**

Variable	n (%)
<b>Best place for tuberculosis treatment</b>	
Health facility	105 (87.5)
Drug store	6 (5.0)
Traditional healer	5 (4.2)
Prayer camp	4 (3.3)
<b>Reasons for selecting such places</b>	
Easily accessible	49 (40.8)
Healing is fast	41 (34.2)
Less costly	24 (20.0)
Effective treatment	6 (5.0)
<b>Payment for tuberculosis service</b>	
No	112(93.3)
Yes	8 (6.7)
<b>If so, where was payment made?</b>	
Dispensary	6 (5.0)
Laboratory	2 (1.7)
Not applicable	112 (93.3)

source for disseminating information on tuberculosis [7]. On TB transmission, 49% of patients indicated cough, 38% stated cough and sneezing and 4% indicated sex, sharing objects and cough (Table 1). In comparison to another Indian study [8], our patients showed more correct responses.

Knowledge of TB among health workers was also good (Table 2). This high level of awareness is likely to be associated with increased case detection. However, no mechanism was available for tracking suspects. Very few of the nurses (37.5%) initiated contact tracing after the diagnosis of a sputum positive case. A study in South Africa showed contact tracing to be a powerful means of improving case detection [9] and failing to practice it, is a weakness and leads to low case detection. Despite the high knowledge and awareness of the health workers, 60% were not trained on the national TB programme. 65% of health workers were reported to be giving TB health related education in the community and even among these people it was not frequent. Direct and indirect methods of health education significantly enhance awareness, spread and prevention of TB and its relevance in these settings cannot be overlooked [10].

### Health seeking behaviour

TB control is faced with the problem of getting patients to seek care especially when the level of formal education is low. The Technical Policy and Guidelines for HIV/TB Collaboration on Ghana has identified late reporting of patients for medical care, late diagnosis

**Table 4. Relationship between some socio-demographic characteristics and how patients are received**

	Cordially (n)	Cold heartedly (n)	Others (n)	Total (n)	p-value
<b>Educational level</b>					
Basic Education	55	4	0	59	0.005
SSS/TECH	29	5	1	35	
Graduate	17	9	0	26	
Total	101	18	1	120	
<b>Marital status</b>					
Single	37	9	0	46	0.009
Married	50	7	0	57	
Divorced	8	1	0	9	
Widowed	6	1	1	8	
Total	101	18	1	120	

and HIV/TB co-infection as challenges confronting the DOTS implementation [11]. Seeking care from traditional healers is common and may account for the delay to seek medical care [12]. Among our patients 87.5% said the best place for TB treatment is the health facility (Table 3). Their reasons included accessibility (41%), fast healing (34%) and less cost (20%).

Accessibility of healthcare is a major problem to TB case detection especially in low resource settings [13]. The uncontrolled nature of settlements in these regions has necessitated many rural inhabitants to rely on traditional healers in close proximity or seek healthcare at urban areas due to the absence of a specialised clinic for such services.

#### Attitude and activities of health workers

Based on previous studies [1], we examined the association between marital status and education and how patients are received. Education ( $p=0.005$ ) and marital status ( $p=0.009$ ) affected how patients were received (Table 4). These data show that one is less likely to be treated well by health workers if one is less educated or not married. Married people are considered responsible and are well respected in the community. Inequalities in education greatly affect how patients are received. This is problematic for TB case detection because individuals are less likely to visit the health centre due to these factors. The general acceptance of health workers as caring and empathetic answers the question of the contribution of health workers in TB case detection.

TB is characterized by stigma and therefore the ability of health workers to show care allows for improvement in case detection despite the variations in how they are

**Table 5. Attitude and activities of health workers**

Variable	n (%)
<b>Home visit by health workers in connection with TB</b>	
No	86 (71.7)
Yes	34 (28.3)
<b>If yes, what information was given?</b>	
TB is curable	28 (23.3)
Avoid spitting	2 (1.7)
Health education	2 (1.7)
TB is curable	2 (1.6)
Not applicable	86 (71.7)
<b>Relationship with TB patients in the community</b>	
Good	59 (49.2)
Very good	37 (30.8)
Fair	19 (15.8)
Very poor	5 (4.1)

received in the hospital. This is important as it allows and provides the right motivation for persons to seek care. The majority (71.7%) of patients said that health workers do not make home visits in connection with TB (Table 5). This poses a threat to case detection. A study in rural India identified health information given by health workers through periodic home visits improves health-seeking behaviour [14].

### CONCLUSION AND RECOMMENDATION

Health workers and patients were knowledgeable with regards to TB. Overall, educational level had less association with their knowledge on TB than marital status and occupation. A little above half of patients indicated health facilities as the first place of visit when sick and how they were received was dependent on factors such as education and marital status. More than two-thirds of health workers were found to not have been trained on the NTP despite their awareness of the programme and 62.5% reported not initiating contact tracing after disease confirmation. Very few individuals reported that health workers visit them regarding TB. The study could not investigate the effectiveness of laboratory investigations in contributing to tuberculosis detection. We therefore recommend a further study into this field.

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### South Sudan Humanitarian Situation Report

#### Extracts from this UNICEF report of 30 November 2017

- About 4.8 million people or around 45 per cent of the total population are severely food insecure with 25,000 in humanitarian catastrophe. This is 1.4 million more than at the same time last year. The post-harvest gains expected during this time have provided little relief.
- A measles outbreak has been confirmed in Panyijiar county in Unity state. 78 per cent of the cases reported are under five. None of the affected children had been vaccinated for measles.

Read the full report [here](#).

# HIV/AIDS: Knowledge, attitudes and practices among adolescents in Nimule, South Sudan

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**Background:** HIV is an infectious virus commonly transmitted through body fluids mostly semen and blood. It causes a serious and non-curable disease with grave consequences especially in sub-Saharan Africa. In South Sudan the prevalence rate of HIV was estimated at 2.7% in 2016. The treatment options are scarce and educational programs limited. This is of great concern since limited knowledge and awareness of HIV is a major risk factor particularly, among young people.

**Method:** A cross-sectional survey using self-administered questionnaires among adolescents was carried out in November 2016.

**Results:** Sixty-five students participated in the study. In general they had good knowledge about HIV/AIDS with the majority having heard of HIV. Majority stated that HIV spreads through sex (82%), blood transfusion (95%), and from mother to child during pregnancy and delivery (66%). Several misconceptions were present with 43% responding that HIV can be transmitted through mosquito bites and 18% stating that the virus can be spread through shaking hands, hugging and living in the same house.

**Conclusion:** Though the respondents showed fair knowledge about HIV/AIDS, there are still some areas in which they lack knowledge especially regarding spread of the disease and practice. More information about HIV/AIDS and sexual education should be made available.

**Keywords:** HIV/AIDS; knowledge, awareness, infections, South Sudan.

## INTRODUCTION

Acquired Immune Deficiency Syndrome (AIDS) is caused by the human immunodeficiency virus (HIV) that weakens the immune system, making the body susceptible to opportunistic diseases that often leads to death <sup>[1]</sup>.

Common risk factors of acquiring HIV infection include unprotected sex, sharing injecting equipment, use of contaminated blood, and the risk of HIV transfer from mother to child <sup>[2]</sup>.

HIV/AIDS is of global concern with Africa being the most affected continent with 25.7 million people living with HIV (PLHIV) in 2016 accounting for 64% of the global burden of HIV <sup>[3]</sup>. Young people are particularly vulnerable being responsible for more than half of all new infections worldwide. Every day, 6,000 young people become infected with HIV – more than five every minute. The majority of young people are infected sexually <sup>[1]</sup>.

In South Sudan the prevalence rate of HIV was estimated at 2.7% in 2016, with 16,000 new infections annually and about 200,000 people living with HIV/AIDS<sup>[3]</sup>. The number of PLHIV on treatment in South Sudan is very low, with a total of 7,986 people on antiretroviral

therapy. The level of stigma and discrimination of PLHIV in the country remains very high for example, some say that those with the disease should not be allowed to work with healthy persons and HIV can be transmitted through mosquito bites <sup>[4]</sup>.

The aim of the current study was to investigate the level of stigmatization due to HIV/AIDS, knowledge of spread and protection against HIV/AIDS, and identify gaps which needs to be addressed in order to decrease risk of HIV/AIDS.

## METHODOLOGY

The research was conducted at Hai Kanisa primary school in Nimule, South Sudan in November 2016. This was a cross-sectional study using a self-administered questionnaire. Students aged 13-20 years were eligible for the study. From primary 6 to primary 8, 65 pupils were randomly selected all of them agreeing to participate in the study. The questionnaires covered demographic information, knowledge, attitudes, and practices toward HIV/AIDS.

Chi-square tests were used to compare the responses based on gender. The analyses were done using Stata version 12 and Microsoft excel.

**Table 1. Knowledge on protection from HIV, by gender**

	Males n (%)	Females n (%)	p-value
<b>Do you know how to protect yourself from HIV?</b>			
Yes	32(76)	22(96)	0.64
No	10(24)	1(4)	
<b>How can you protect yourself from HIV?</b>			
a. Avoid unprotected sex			
True	28(67)	14(61)	
Not true	14(33)	9(39)	
b. Loyalty to one partner			
True	33(79)	19(83)	0.70
Not true	9(21)	4(17)	
c. Getting circumcised			
True	21(50)	7(30)	0.13
Not true	21(50)	16(70)	
d. Avoid places where HIV positive people stay			
True	26(62)	10(43)	0.15
Not true	16(38)	13(57)	
e. By using condoms			
True	40(95)	21(91)	0.53
Not true	2(5)	2(9)	
f. Abstinence from sex till marriage			
True	32(76)	23(100)	0.01
Not true	10(24)	0(0)	
g. By safe blood transfusion			
True	26(62)	15(65)	0.79
Not true	16(38)	8(35)	
h. Protecting yourself from insect bites e.g. mosquito			
True	19(45)	9(39)	0.63
Not true	23(55)	14(61)	
<b>AIDS is a God's punishment for immorality</b>			0.004
Yes	7(17)	12(52)	
No	32(76)	8(35)	
Not sure	3(7)	3(13)	

## RESULTS

A total of 65 students participated in the study, 65% boys and 35% girls. The mean age of participants was 16.7 years and all were Christians.

Most of the students had heard about HIV/AIDS (77%), most from school (46%), the media (25%), or parents (25%) The majority (91%) correctly identified that HIV/AIDS can kill, that it can spread from one person to another (91%), in particular through sexual intercourse with infected person (82%), and that a blood test will tell you if someone has the disease (80%). Most also knew that HIV/AIDS can spread from mother to child during pregnancy and childbirth (66%) and during breastfeeding (72%). Several misconceptions were present with

14% responding that HIV can be transmitted through eating and drinking from same plate and cup and 18% responded that the disease can be transmitted through shaking hands, hugging, and living with infected person in the same house. More than half of the pupils said HIV can be transmitted through kissing. Significantly more girls (70%) than boys (36%) responded that HIV can be transmitted through mosquito bites ( $p=0.02$ ). However, only 38% stated that there were treatment options for HIV.

More female students (96%) than male students (76%) stated that they knew how to protect themselves from getting HIV/AIDS ( $p=0.05$ ) (Table 1). The great majority of both boys (95%) and girls (91%) agreed that

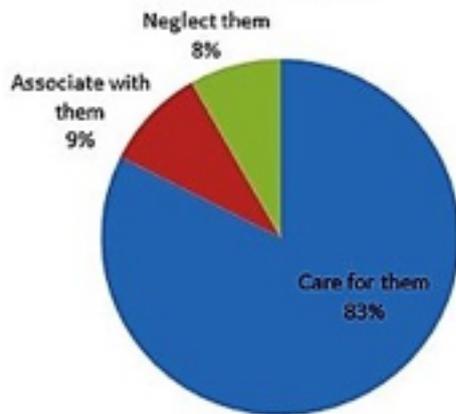


Figure 1. Ways PLHIV/AIDS are treated in the community (Credit: Michael Bol Jool Dit)

using condoms can protect one from getting HIV. Most respondents said safe blood transfusion can protect the person from getting the disease (62% of the boys and 65% of the girls) and more girls than boys responded that abstinence until marriage could protect one from getting HIV ( $p=0.01$ ). Almost half the pupils, said that avoiding insect bites can protect one from getting HIV. Also significantly more girls thought that HIV is a punishment from God ( $p=0.004$ ).

Most participants responded that the people living with HIV/AIDS in their communities are treated well (Figure 1). However a large number (60%) said that they would not associate with a close friend if he/she got HIV.

The majority of the boys (79%), but only 17% of the girls have had sexual intercourse (Table 2). 79% of the boys responded that they had their sexual debut before the age of 17 years, the few sexually active girls also had their debut at a young age. Most of respondents had sex with persons of the same age. Of the sexually active respondents 37% did not use any protection and 24% were drunk during sex relationships. Among the non-sexually active respondents, 61% said they would wait until marriage before engaging in sexual activity.

## DISCUSSION

In general, the students had a good knowledge about HIV/AIDS with the majority having heard of HIV. However, several misconceptions were present. Some of respondents said the disease can spread through eating and drinking from same plate and cup (14%), that the disease can be spread through shaking hands, hugging and living in the same house (18%), or can be transmitted through mosquito bites (43%). In comparison only 1% of students in an Ethiopian study thought that HIV can be transmitted through sharing of meals, clothes and latrines [5]. In a study from Northern Uganda 17% of the respondents thought that HIV can be transmitted by sharing food and 34% by mosquito bites [1].

Table 2. Sexual practice by gender

	Males n (%)	Females n (%)	p-value
Have you had your first sexual intercourse?			<0.001
Yes	33(79)	4(17)	
No	9(21)	19(83)	
If yes,			
a. How old were you?			0.09
5-8	2(6)	0(0)	
9-12	6(18)	3(75)	
13-16	18(55)	1(25)	
17-20	7(21)	0(0)	
b. How many people did you have sex with?			0.84
<3	16(49)	2(50)	
4-7	12(36)	1(25)	
8-11	5(15)	1(25)	
c. Were you drunk when you had sex?			0.23
Yes	9(27)	0(0)	
No	24(73)	4(100)	
d. Do you use condom during sex?			0.02
Always	11(33)	1(25)	
Some times	5(15)	3(75)	
Never	17(52)	0(0)	
e. From where do you get condoms?			0.15
Shop	4(12)	2(50)	
Hospital	28(85)	2(50)	
NGOS	0(0)	0(0)	
Others	1(3)	0(0)	

A favorable attitude towards PLHIV/AIDS is important to make them comfortable within society and helping them to seek treatment. The pupils of Hai Kanisa primary school have somewhat mixed responses regarding attitude towards people with HIV or AIDS. While on one hand most reported that PLHIV are well cared for in the community their own attitudes was less sympathetic as they responded that they will definitely not associate with such people. A negative attitude needs to be addressed especially among young people who are expected to promote positive attitudes toward PLHIV/AIDS in their communities.

In the current study pupils exhibited poor sexual practices with infected people with most of them responding that they never use condoms during sex, engaging in early sexual debut and having multiple sexual partners. In other studies, a similar low use of condoms has also been reported; 38% of males and only about 15%

females according to a study in Northern Uganda use condoms during sex <sup>[1]</sup>. The majority (84%) of Sudanese and Bantu Somalian women in Sudan reported not having used condoms before with 61% refusing to use condoms though they sense the danger of getting HIV with their spouses <sup>[6]</sup>. In a South African study the use of condoms was much more common with 91% saying that they use condoms <sup>[7]</sup> and an Ethiopian study also reported a relative high use of condoms among responders (77%) <sup>[5]</sup>.

### CONCLUSION

The respondents in the current study showed a fair knowledge of HIV/AIDS, though there are some gaps especially regarding the spread of the disease and sexual practices.

Possible ways of addressing this include enhanced health education concerning HIV/AIDS and making condoms available by the government and NGOs which are the main sources.

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## Establishing the Africa Centres for Disease Control and Prevention: responding to Africa's health threats

In 2017, heads of states and governments of the African Union and the leadership of the African Union Commission will officially launch the Africa Centres for Disease Control and Prevention (Africa CDC) in Addis Ababa, Ethiopia. As detailed in the African Union's Africa Agenda 2063 —a roadmap for the development of the continent—some of the concerns that justified the establishment and initiation of an Africa-wide public health agency include rapid population growth; increasing and intensive population movement across Africa, with increased potential for new or re-emerging pathogens to turn into pandemics; existing endemic and emerging infectious diseases, including Ebola; antimicrobial resistance; increasing incidence of non-communicable diseases and injuries; high maternal mortality rates; and threats posed by environmental toxins.

The Africa CDC will work with member states, WHO, and partners to strengthen their capacity in four strategic priority areas:

- (1) health-related surveillance and innovative information systems, with a focus on improved capacity for event-based surveillance, disease prediction, and improved public health decision making and action;
- (2) functional and linked clinical and public health laboratory networks in the five geographic subregions of Africa;
- (3) support for member states' public health emergency preparedness and response plans; and
- (4) strengthened public health science for improved decision making and practice.

### Reference:

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# Bladder exstrophy – epispadias complex in a newborn: a case report and review of literature

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**Background:** Bladder exstrophy-epispadias complex (BEEC) is a rare congenital malformation of the genitourinary system usually associated with other malformations.

**Case summary:** We report the case of a new born delivered vaginally at 39 weeks and 2 days of gestation with BEEC. Three prenatal ultrasound scans missed the diagnosis. Medical management was provided and the patient was discharged against medical advice 48 hours later upon refusing surgical intervention.

**Conclusion:** The diagnosis and management of BEEC is a challenge in sub-Sahara Africa. Radiologists doing prenatal ultrasounds should check routinely to exclude foetal anomalies.

**Reporting:** Care 2016 guideline.

**Key words:** bladder exstrophy, epispadias, congenital malformation, prenatal ultrasound

## INTRODUCTION

Bladder exstrophy-epispadias complex (BEEC) is a congenital anomaly of the genitourinary system with a spectrum of congenital malformations ranging from isolated epispadias, to classical bladder exstrophy, to cloacal exstrophy as the most severe—and rarest—presentation.

The malformation may extend to involve the genitalia, the abdominal wall muscles, the pelvic floor musculature, and the bony pelvis <sup>[1,2]</sup>. The incidence as estimated by Nelson et al <sup>[3]</sup> is 2.15 per 100,000 live births with classical bladder exstrophy estimated at 1:10,000 to 1:50,000 live births and epispadias estimated at 1:117,000 live births <sup>[4]</sup>.

BEEC results from an insult during the development of the urogenital system during which there is a disorder leading to cloacal membrane overgrowth preventing medial migration of mesenchymal tissue <sup>[1]</sup>. The main stay in the management of BEEC is surgery. This varies depending on the type and severity of the defect. Currently, a staged approach is the most commonly used strategy. In the standard-staged repair, a primary closure of the bladder without osteotomy, and genital reconstruction, is attempted in the first 72 hours of life in males. Then

between 6 and 12 months of age, the epispadias is repaired. Bladder neck reconstruction follows around the age of 5 years, if a reasonable bladder capacity is reached <sup>[5]</sup>.

We present a case of a child delivered vaginally at 39 weeks and 2 days of gestation with BEEC. All three prenatal ultrasound scans missed the diagnosis. Medical management was given and the patient was discharged against medical advice 48 hours later upon refusing surgical intervention.

## CASE PRESENTATION

A new-born male was delivered vaginally at 39 weeks + 2 days of gestation to a 29 year old mother gravida 3 para 2. Her pregnancy was uneventful. Prenatal ultrasounds done at 12 weeks, 23 weeks and 31 weeks of pregnancy did not detect any foetal anomaly. Apart from routine sulfadoxine – pyrimethamine and iron and folic acid taken, the mother did not take any other drug during pregnancy.

Following delivery, the new-born presented with a genitourinary defect as shown in Figures 1 and 2. There was an abdominal wall defect with an exposed and everted bladder draining urine which was clearly visible

immediately below the umbilical stump (Figure 1); a complete dorsally opened urethral plate running from the bladder neck down to the open glans (Figure 2); left and right corpora cavernosa were clearly visible beneath and alongside the urethral plate (Figure 2); the scrotum was normally developed, with descended testes (Figure 1). There was no associated anorectal malformation (ARM), the anus was present, normally located and patent.

Other aspects of the physical examination were normal. This genitourinary anomaly was consistent with the bladder exstrophy–epispadias complex (BEEC). The defect was covered in delivery room with sterile silicon gauze and transparent waterproof dressing and the baby transferred to the neonatal unit. Trans-fontanel, cardiac, pelvis, and renal ultrasounds were then performed and found to be normal. Biological investigations including full blood count, serum electrolytes, urea and creatinine were performed and reported to be normal. The baby spent 48 hours in the neonatal unit and the parents signed for discharge against medical advice.

### DISCUSSION

#### Epidemiology

BEEC is a rare congenital malformation of the genitourinary system with an incidence estimated by Nelson et al [3] in 2.15 per 100,000 live births, with an even male-to-female ratio (OR = 0.989; 95% CI = 0.88–1.12), and a significantly increased incidence in Caucasians compared with other neonates (incidence, 2.63 vs. 1.54 per 100,000;  $p < 0.0001$ ). This incidence varies depending on the geographical location and socioeconomic status [3]. The clinical syndrome includes bladder exstrophy, epispadias and cloacal exstrophy. Classic bladder exstrophy occurs in 1:10,000 to 1:50,000 live births [4]; epispadias is estimated to occur in 1:117,000 live births [6], and cloacal exstrophy in 1:250,000 births [7]. The incidence is not known in our sub region.

#### Embryology

The embryology of the BEEC has been long studied, yet debate still exists over the specific origins of the anomaly [8]. It is thought to be derived from a derangement in the fusion of the mesoderm during the first week of life [1]. Normally, at the end of third week of life, intermediate mesoderm invaginate to form the genitourinary system, while the lateral plate mesoderm will contribute to forming the primitive gut tube [1,2]. A disruption in this interaction, linked to cloacal membrane overgrowth preventing medial migration of mesenchymal tissue, is reported to give rise to BEEC [9].

The severity of the resulting condition depends on the point at which disturbed mesodermal layers interaction begins. Given the embryological origin

of BEEC, it is often associated with other peculiar orthopaedic, musculocutaneous, and gynaecological conditions. Associated upper urinary tract anomalies are rare. Gastrointestinal and spinal/neurological anomalies can be associated in patients with BEEC. Some of the associated malformations include: vesicoureteric reflux, mega ureter, horseshoe kidney, ureterocele, abdominal wall defect, umbilical hernia, neural tube defects, spinal dysraphism, club feet, congenital hip dislocation, pubic symphysis diastasis, anterior displaced anus, imperforate anus and Mullerian anomalies [1,5,10]. In our indexed case, after a thorough clinical assessment and morphological investigations, the only associated anomaly was abdominal wall defect as the anus was patent, and renal, trans-fontanel and pelvic ultrasounds were normal.

#### Prenatal diagnosis

The diagnosis of BEEC can be made before delivery by prenatal ultrasounds. It is based on the non-visualization of the bladder during the first trimester ultrasound but in most cases, it is confirmed by an ultrasound in the second trimester. This second trimester morphological ultrasound also helps in the diagnosis of other associated malformations [11]. In one study, the sensitivity of prenatal ultrasound for diagnosis of congenital malformations was estimated at 7/36 (19%) at 17-18th week of gestation, and 13/36 (36%) overall [12]. In another study, 43 prenatal ultrasounds from 25 pregnancies with bladder exstrophy, where the ultrasound was done between 14-36 weeks of pregnancy, the diagnosis of bladder exstrophy was made before delivery in only three cases.

Five factors associated with bladder exstrophy were identified:

1. Non-visualization of the bladder on ultrasound in 12 of 17 cases (71%);
2. Lower abdominal bulge representing the exstrophic bladder in eight of 17 cases (47%);
3. A small penis with anteriorly displaced scrotum in eight of 14 males (57%);
4. Low set umbilical insertion in five of 17 cases (29%); and
5. Abnormal widening of the iliac crests was seen in three of 17 cases (18%) [13].

In our patient three prenatal ultrasounds were done between 12 and 31 weeks and none was diagnostic of bladder exstrophy. The radiologists did not mention any of the above features. Factors contributing to missed prenatal diagnosis may include: low incidence of the pathology, lack of clinical suspicion, few radiologists and high workload, poor local training and lack of continuous medical education.

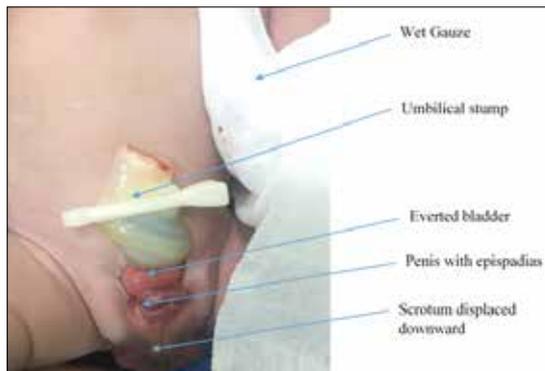


Figure 1. Showing bladder everted and scrotum displaced downward (credit: Paul N. Tolefac)

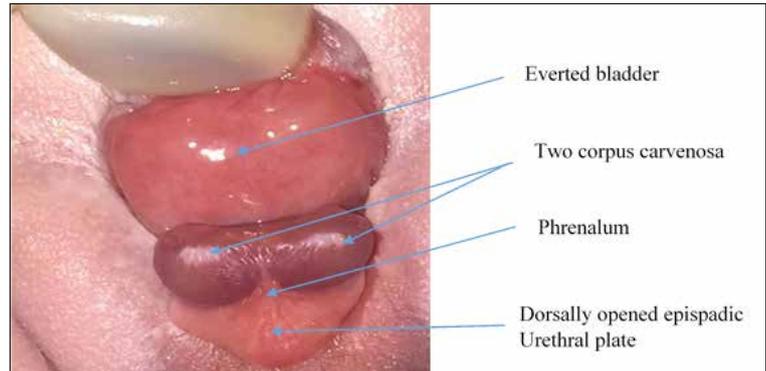


Figure 2. Showing bladder everted, corpus carvenosa and a dorsally opened epispidic urethral plate (credit: Paul N. Tolefac)

### Management

BEEC is a paediatric urological emergency. Immediate medical management usually consist of covering the extruding viscera with sterile silicon gauze surrounded by an occlusive dressing to prevent air contact and dehydration, fluid and electrolyte balance and antibiotic prophylaxis if indicated [2]. Surgical correction varies depending on the type and severity of the defect. Currently, a staged approach is the strategy most commonly used. In the standard-staged repair, a primary closure of the bladder without osteotomy, and without genital reconstruction in males, is attempted in the first 72 hours of life; between 6 and 12 months of age, the epispadias repair is performed in males.

Bladder neck reconstruction follows around the age of 5 years, if a reasonable bladder capacity is reached [5]. Alternatively, the neonatal primary complete repair and the deferred primary complete repair have been proposed [14]. Our patient benefited from the immediate medical management consisting of hospitalisation in the neonatal unit, covering the extruded viscera with wet gauze and fluid resuscitation. We did not give antibiotics. While the surgical team had been mobilised, for closure of the defect, the mother opted to go home against medical advice. This discharge against medical advice can be explained by the low socioeconomic status of the mother, financial constraints, refusal of the surgical intervention, and lack of confidence in the health care system which may all have contributed to her leaving the hospital to seek alternative treatment (traditional medicine).

### CONCLUSION

BEEC is a rare congenital malformation. Even in the era of highly advanced information technology, the prenatal diagnosis of congenital malformations remains a challenge. Radiologists doing prenatal ultrasounds should check routinely to exclude foetal anomalies. The management of BEEC is multidisciplinary.

### Declarations

**Ethics approval and consent to participate:** Ethical approval was obtained from the ethical committee of Douala general hospital. A copy is available for review upon request by the Editor-in-Chief of this journal

**Consent for publication:** Obtained from the patient's mother

**Availability of data and material:** The datasets (details of all results) are available from the corresponding author on reasonable request by the editor – in – chief. The file of the patient is in Douala general hospital.

**Competing interests:** “The authors declare that they have no competing interests” in this section.

**Funding:** None

**Author's contributions:** GEH followed up the patient during pregnancy, PNT and GEH managed the patient during labour and postpartum, PNT wrote the initial draft of the manuscript, EY, CN, GEH and AMC corrected the initial manuscript, all authors approved the final manuscript and are responsible for it.

**Acknowledgement:** We express our sincere gratitude to all staff and medical students who took care of the patient.

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# Type IIB Ileosigmoid knotting: a case report

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Ileosigmoid knotting is a rare cause of acute intestinal obstruction. It is more common in Africans and Asians than in white populations and it is more prevalent in males than in females with a ratio of 14:1. It is classified into four types (I, II, III and IV) with further extra two subtypes of A and B where type A is the most common presentation.

Preoperative diagnosis is a challenge to the frontline doctors in the accidents and emergency departments; especially with limited diagnostic tools. Ultrasonography may be misleading in most of the cases due to the similarity of the disease with other causes of acute abdomen, especially acute appendicitis.

Clinical presentation of an unprecedented intestinal obstruction with constant upper to mid-abdominal quadrant pain associated with mild to moderate abdominal distension contrary to the severe abdominal distension in sigmoid volvulus are the hallmarks that can help the surgical team to reach an accurate and early diagnosis preoperatively to avoid the devastating ischemia and gangrene in case of delay.

Emergency laparotomy with possible resection and primary anastomosis in type I or resection and exteriorization with ileostomy or colostomy in the other types is recommended.

**Keywords:** ileosigmoid knotting, intestinal obstruction, South Sudan

## INTRODUCTION

Type II ileosigmoid knotting is a variant of the rare ileosigmoid knotting that causes an acute intestinal obstruction. It was first described in the early literature as double volvulus with type I being rare especially in the western world. The first reported cases were documented in Uganda by Burkitt in 1953; then Shepherd reported a further 92 cases of type I ileosigmoid volvulus over a period of 17 years, 6 cases of which were patients seen by him personally<sup>[1]</sup>.

Ekehorn<sup>[2]</sup> and Faltin<sup>[3]</sup> tried separately to classify the knot according to the bowel involved and the arrangement of the loops but Alver<sup>[4]</sup> later developed the current classification of types I, II, III and IV. Type I, and II were further subdivided into A and B according to the direction of the knot whether it is clockwise or anticlockwise<sup>[4]</sup>.

The typical or type I ileosigmoid knotting is when loops of ileum wrap around the base of a redundant sigmoid colon to form a “knot” but in type II the redundant sigmoid is the active part that wraps around loops of ileum<sup>[4,6]</sup>.

The condition may progress rapidly within hours to form ischemia and gangrene which may lead to generalized peritonitis<sup>[4,6,7]</sup>; hence early diagnosis and operative management are important to avoid these complications.

Sound clinical diagnosis supported by plain erect abdominal X-ray and an ultrasonography scan are the main diagnostic tools in resource limited settings, but a CT scan is the gold standard diagnostic tool in the developed world<sup>[1,3,4,5,6,7,8]</sup>.

In this case that we are reporting we focus on the clinical and radiological presentation of type II ileosigmoid volvulus.

## CASE REPORT

S.K. was a 33-year old man who presented on June 3rd 2016 to the Accidents and Emergency Department of Juba Teaching Hospital. He had a 2-day history of constipation, abdominal distension and progressive abdominal pain mainly in the right upper abdominal quadrant and the epigastric region. The pain was associated with nausea and raised body temperature for one day but there was no vomiting reported.

The patient had no other concurrent diseases and had insignificant past medical or surgical history. He denied having similar bouts of abdominal distension or pain.

On examination, the patient was fully conscious and in fair general condition, he was not pale, jaundiced or cyanosed. He was dehydrated; there was no lymphadenopathy or lower limbs oedema.



Figure 1. Intraoperative photographs of the ileal loops and the sigmoid knotting around the gangrenous part. (Credit Tiberio Okori)

Abdominal examinations showed moderate abdominal distension with severe tenderness in the periumbilical and right lumbar region. There were no palpable masses and there were decreased bowel sounds and the rectum was empty.

Laboratory investigations showed a normal complete blood count apart from a slight leucocytosis (total white blood cell count: 12,400/cu mm). Abdominal ultrasonography concentrated on the appendix and images suggestive of an acute appendicitis were reported.

Based on the history and the clinical presentation and the physical examinations, a diagnosis of sigmoid volvulus with possible gangrene of the involved sigmoid colon was made. The possibility of a generalized peritonitis secondary to a gangrenous and perforated appendix was considered.

The patient was resuscitated with 2 litres of normal saline while investigations were being done. He was given tramadol injection of a 100 mg stat to control pain and 500 mg/100ml of metronidazole was infused and the patient was operated on 2 hours later from review time.

Laparotomy showed a gangrenous ileal loops with the sigmoid colon twisted twice anticlockwise around the ileal loops (see Figure 1), and approximately 500 ml of haemorrhagic fluid in the peritoneal cavity and pelvis was suctioned out.

The sigmoid was normal in appearance and was loaded with faecal material. It was released and left in situ. The gangrenous ileal loops were resected (120 cm) up to about 35 cm from ileo-caecal junction. An ileostomy was made in the right upper abdominal quadrant.

Initially the ileostomy functioned for one day, but on the second postoperative day, it became oedematous and changed colour from bright red to dark red. With digital examination of the stoma it became active.

On the fourth postoperative day, the patient reported some pain at the stoma site and an urge to defaecate. Rectal examination showed a full rectum and an enema was given and the rectum evacuated. The ileal stoma became gangrenous and the patient was taken to theatre ten days postoperative to refashion the ileostomy.

The patient was discharged after another 5 days with an active ileal stoma. Subsequent follow-up was uneventful and an elective sigmoidectomy for the redundant sigmoid with closure of the ileostomy was done on the eighth week later and the patient was discharged.

### DISCUSSION

Ileosigmoid knotting is a rare cause of an acute intestinal obstruction. It is more common in Africa, Asia and the Middle East than in the West, affecting men more commonly than females <sup>[1,3,4,5,6,7]</sup>. Alver classified it into four types based on the mechanism of formation of the knot. In type I which is the commonest, the ileum is the active component, wrapping itself around the sigmoid colon which is the passive component to form the knot.

Type II is the reverse of type I with the sigmoid being the active component and the ileum being the passive part. Type III is when both the ileum and the caecum (the ileo-caecal segment) acts as the active component and wrap around the redundant sigmoid <sup>[4,6,8]</sup>. Type IV or the undetermined type is when differentiating the two components from each other is impossible. Types I and II are further classified into subtypes A and B depending on whether the twisting is clockwise or counterclockwise respectively <sup>[4,6,9,12]</sup>.

The mechanism by which an ileosigmoid knot develops is still unclear. The anatomical predisposing factors, including a hypermobile small intestine with an elongated mesentery and a redundant sigmoid colon with a long pendulous mesocolon and a short attachment at the base of the mesentery <sup>[1,4,5]</sup>. Meckel's diverticulum has been reported to be present in 14–53% of cases. The knotting leads to closed-loop obstruction and causes gangrene of both the ileal loops and the sigmoid colon within a few hours in most patients <sup>[7,9,10,11]</sup>.

Heavy faecal loading of the sigmoid colon, arising from a high starch and cellulose diet, has also been blamed for the high incidence of sigmoid volvulus. This point should be remembered when taking a history. Our patient did not give much detail of his diet - probably because we did not stress on that point. However from my own observations, the condition of chronic constipation and a sigmoid colon heavily loaded with faecal material is a common finding in patients living in Juba, especially

patients with haemorrhoids and anal fissures.

Preoperative diagnosis of ileosigmoid knot is a challenge even for the most experienced surgeons. Plain abdominal radiographs may show the characteristic double closed-loop obstruction, with the sigmoid colon in the right upper quadrant and the small bowel loops in the left, but this is unusual and it is completely different from the typical features of small bowel obstruction where abdominal X-ray shows gaseous distension and air fluid levels. It is also different from large intestinal obstruction where the sigmoid volvulus presents with a typical inverted U appearance and large gaseous distensions<sup>[4,9]</sup>.

The classical clinical presentations of ileosigmoid volvulus is of unprecedented abdominal pain in 100% of cases pointing to a vascular impairment and suggesting strangulation and impending gangrene, abdominal distension in 94 -100% of cases, nausea and vomiting in 87 – 100% of cases and rebound tenderness in about 69%. These features indicate a combination of both upper and lower intestinal obstruction, and their presence should be met with prompt laparotomy to avoid gangrene formation<sup>[9,10,11]</sup>.

Sigmoidectomy for the redundant sigmoid is mandatory in type II ileosigmoid knotting because the redundant sigmoid is the active component. If not resected, because of its healthy appearance in some cases, then the chances of recurrence of the condition are high. Hence a decision has to be made preoperatively depending on the condition of the patient. If the ileum is gangrenous, as with our patient, resection and anastomosis of the ileum and exteriorization through ileostomy is advisable and an elective sigmoidectomy is done later.

If the ileum is healthy; sigmoidectomy with immediate anastomosis is advisable and the ileum is released untouched. If the ileum and sigmoid colon are both gangrenous, then resection and exteriorization of both ileum and the colon are advisable<sup>[9,10,11]</sup>.

### CONCLUSION

Type II ileosigmoid knotting is a rare but life-threatening cause of closed-loop intestinal obstruction. Clinical presentation of constant abdominal pain with mild to moderate abdominal distension with acute unprecedented intestinal obstruction should prompt suspicion of this diagnosis.

Resection of the redundant sigmoid should be put in mind as mandatory because it is the active component and if left un-managed, then chances of recurrence are high. Sigmoidectomy could be done at the same laparotomy or planned as an elective procedure depending on the viability of the intestine.

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*Photographs were taken by Mr Tiberio Okori, a theatre nurse at Juba Teaching Hospital.*

## Interview:

# Volunteering in South Sudan: creating partnerships, making a difference

Nyakomi Adwok

South Sudan, the world's newest country, faces diverse and complex challenges following decades of civil war. The current conflict has worsened the situation even further. This is particularly profound in the health sector, where scarcity of resources and personnel has left millions of people without basic medical care.

Since independence in 2011, individuals, teams and organisations from around the world have partnered with the South Sudanese to make healthcare more accessible. Their efforts bring much needed relief to communities while providing local medics with opportunities to learn and network. For volunteers, working in unfamiliar, resource-poor settings carries inherent difficulties. Despite this, many have discovered that the challenge of doing more with less can be educational, exciting and incredibly rewarding.

I spoke with **Martin Michel**, a general surgical registrar in Huddersfield Royal Infirmary, UK. In November 2017, he was part of a volunteer trip to Juba with St. Paul Medical Missions. I asked him about their experiences and what advice he would give to those considering volunteering in South Sudan. These excerpts have been edited for length and clarity.

### Tell us about your team

In total we were a group of 17 volunteers of varying specialties ranging from general practice, paediatrics, anaesthetics, general surgery, trauma and orthopaedics, and dermatology to emergency medicine and gynaecology. In addition, we had our very important support team comprising of a theatre manager, operating department practitioners and admin/computer support. The trip would have been impossible without their hard work. Our group had an international feel with volunteers originating from Canada, Austria, UK, Bulgaria, South Africa and Egypt - see Figure 1.



Figure 1. Members of St Paul Medical Missions standing outside a hotel (credit: St. Paul Medical Missions)

### How did you plan for this trip?

The St. Paul Medical group has organised multiple missions, visiting countries such as Togo, Uganda, Ethiopia and Burundi. This was the second time we had the opportunity to visit South Sudan and this helped to identify the needs of the population and prepare us for the cases we were likely to deal with. The whole program is self-funded or through kind donations, more information can be found on our website <http://www.stpaulmedicalmissions.org>.

### What kind of services did you provide?

Altogether we were present for seven days at Juba Teaching hospital offering emergency and elective services. We

would work from 9am to 7pm when we had to leave due to the curfew.

At Juba Teaching Hospital we had general surgeons and gynaecologists carrying out a variety of procedures and one emergency medicine doctor and two general practitioners ran an outpatient service (see Figure 2). We also had two orthopaedic surgeons working in the military hospital providing care for trauma patients (see Figure 3). Our paediatrician was based in El- Sabeh hospital and was joined by two general practitioners and our dermatologist for one day visiting the local orphanage. In total, we assessed approximately 500 patients and carried



Figure 2. Distributing medication in an outpatient clinic (credit: St. Paul Medical Missions)

out around 50 surgical procedures. On our last day we gave a series of lectures ranging from Advanced Trauma Life Support (ATLS) guidelines to the World Health Organisation (WHO) surgical checklist to local medical and nursing students.

**Scarcity of resources and essential equipment are major challenges facing many hospitals in developing countries. How did this affect the services you were able to offer?**

We anticipated a shortfall of resources and as this wasn't our first time to Juba, we were able to plan accordingly. We brought with us generous donations of medications and medical and theatre equipment. We wanted to make sure that we didn't use any of the resources already present to avoid diminishing local supplies. From a surgical point of view, our biggest hindrance was a lack of oxygen tanks, which we weren't prepared for. This meant that for the first couple of days we were only able to carry out procedures like groin hernias and perianal procedures under spinal anaesthetic. We were able to purchase oxygen from nearby hospitals after the second day, which meant we could do more complex work.

**Are there any experiences you had while volunteering that stood out for you?**

We all felt extremely privileged and fortunate to have visited Juba, there were so many beautiful memories I could not pick one. Overall, the kind nature and gratitude of all the people we treated will stay with me forever. Healthcare is so varied across the globe, however the human body varies little, everyone should have the right to adequate healthcare irrespective of resources.

**Any plans to return to South Sudan for similar trips in the future?**

Yes! Even as we were about to depart from Juba, a team of ophthalmologists from Cairo had just arrived to start their mission. We aim to go back to Juba in November. St. Paul Medical Missions also offer different services including charity clinics, building charity hospitals and arranging training courses.

**What advice would you give to other medics or organisations interested in volunteering in South Sudan?**

Go! You won't regret it. Meticulous planning and organisation is required to have a successful mission, start as early as possible, it takes time to assimilate and coordinate a group of health professionals as traditionally they are already very busy people. We were very fortunate in that we had Dr Nasser Malik, a Cardiologist, as our coordinator in South Sudan who has managed many successful missions and was the bedrock of the team. Another person I would personally thank is a member of the local surgical team, Dr Yaj Garang Yaj, he provided us with daily operating lists and helped coordinate the throughput of surgical patients. We would advise making good contacts in the hospital long before your visit to gain as much information as possible in regards of resources required and likely cases you may encounter.



Figure 3. Orthopaedic surgeons operating in the military hospital (credit: St. Paul Medical Missions)

## Dr Albino Mayom Kuel – the gift God sent to Italy

Contributed by Mr Raphael Abiem. Email: rtabiem@gmail.com

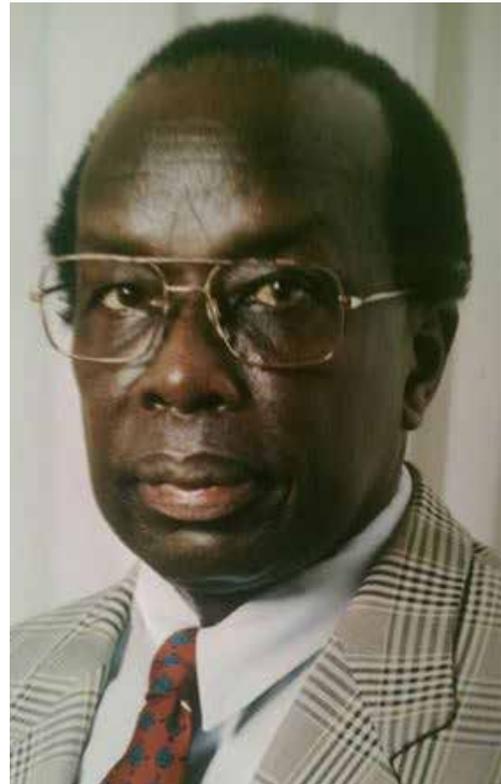
On Sunday 21 January 2018, Dr Albino Mayom Kuel, passed away after nearly 60 years of continuous living in Abio in the northern region of Torino, Italy.

The life story of Dr Kuel is a source of pride to all South Sudanese, and indeed the entire African continent. Dr Kuel escaped the repressive regime of the former President of the Sudan, General Ibrahim Abboud, in the early 1960s and chose to settle in Italy where the Comboni Fathers hosted and educated him until he became a medical doctor, graduating from the University of Padova. His penchant for education was insatiable; he thus went on to specialize in cardiology and became one of Italy's most celebrated heart surgeons. Dr Kuel's giant achievements in Italy were not widely known outside the towns and villages on the slopes of the Alps where he served.

Back in the 1960s, the sight of a black person in a town was a rarity. Dr Kuel thankfully put all phobias to rest, not with African magic, but by sheer indiscriminate kindness. The love Italians have for other races became clear in a church service held in his remembrance. About ten South Sudanese attended the service, but the number of Italians present spoke of something more than medical care alone could explain. A sense of deep love for a lost loved one permeated the audience. The priest giving the sermon said to the gathering that Dr Kuel was nothing short of a God-sent gift to the surrounding towns and villages. With his five clinics and a heart that had only grown bigger with the challenges thrown at it, Dr Kuel was not only in the community, but of the community.

Nothing tells the story more vividly than seeing the older people fighting to have the honour of comforting Dr Kuel's daughter, Miriam, and his son, Augustino. Their maternal aunt was in the church to support her sister's children, but not even she could compete with the Italian families trying to pay back the many gems of love Dr Kuel had bestowed on them in his life among them.

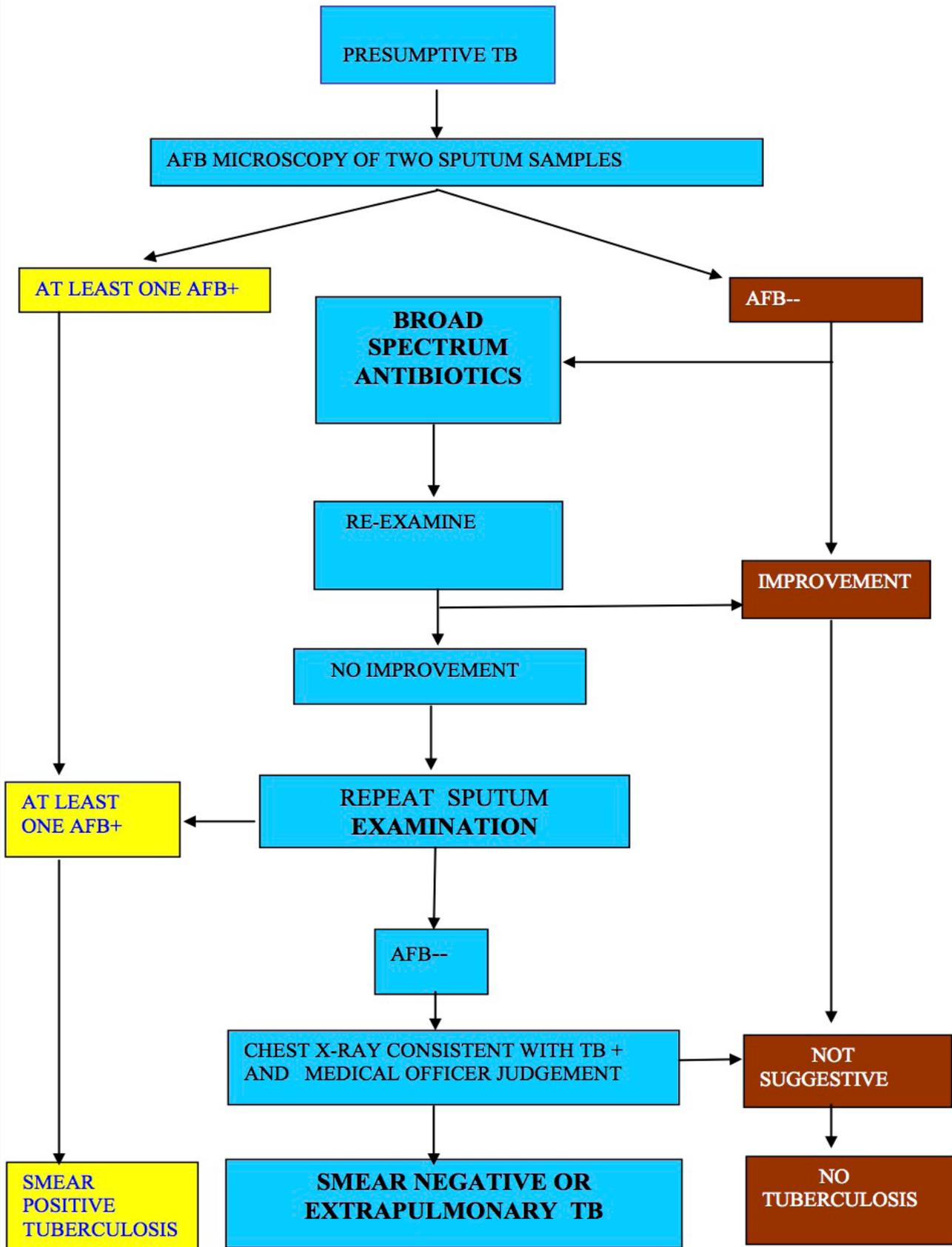
He has joined in God's eternal Glory, and is with his wife, Akur Mithiang Miyan – one of the pioneering South Sudanese women in the field of education – who died in 2008. Rest in peace Dr Albino Mayom Kuel.



Dr Albino Mayom Kuel

We thank everyone who contributed to this issue especially Rachel Ayrton, Richard Baraza, James Hakim, Ayat Jervase, Fred Kambuni, Constantine Loum, Zivai Mupambireyi, Gasim Omer, Lilian Mechek and Geoffrey Malual.

# DIAGNOSIS OF PULMONARY TUBERCULOSIS



Every effort has been made to ensure that the information and the drug names and doses quoted in this Journal are correct. However readers are advised to check information and doses before making prescriptions. Unless otherwise stated the doses quoted are for adults.