

Challenges to Pediatric Service in Southern Ethiopia

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San Antonio, USA
March 7, 2014

Disclosures

- I have no financial disclosures


Objectives

- To describe the basic health system of southern Ethiopia
- To highlight the differences between pediatric practice in the U.S.A. and Ethiopia
- To understand the challenges of pediatric care in southern Ethiopia


Ethiopia: The Horn of Africa

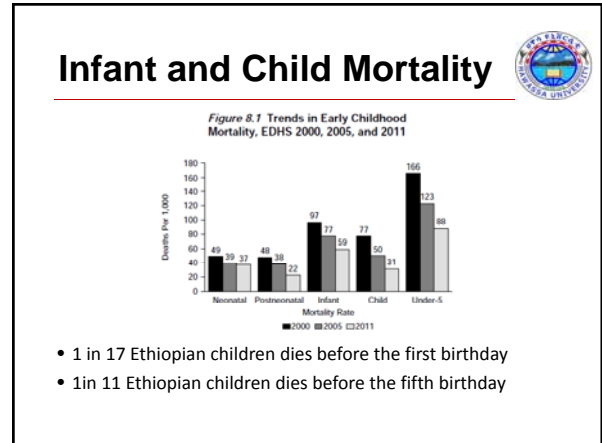
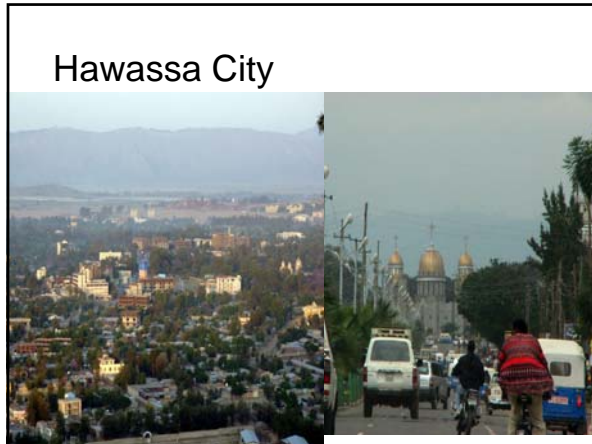


SNNPR: Southern Nations Nationalities and Peoples Region



Hawassa Lake





Infant and Child Mortality

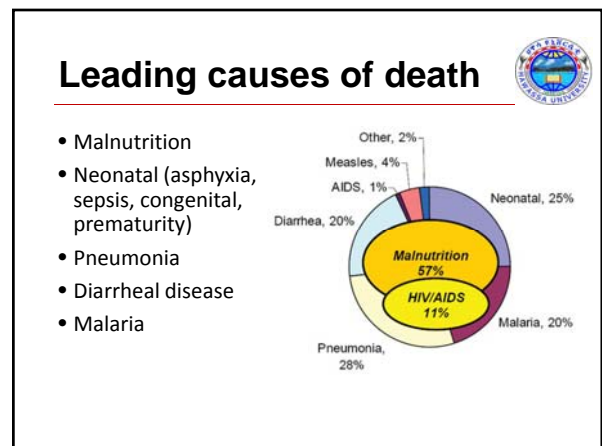
Table 8.2 Early childhood mortality rates by socioeconomic characteristics

Neonatal, postneonatal, infant, child, and under-five mortality rates for the 10-year period preceding the survey, by background characteristics, Ethiopia 2011

Background characteristic	Neonatal mortality rate ^a	Postneonatal mortality rate ^a	Infant mortality rate ^a	Child mortality rate ^a	Under-five mortality rate ^a
Residence					
Urban	41	19	60	25	85
Rural	62	28	90	42	134
Region					
Tigray	64	30	94	23	86
Afar	53	20	74	67	127
Amhara	54	21	75	34	109
Oromia	65	32	97	42	139
SNNPR	50	27	77	36	113
Benishangul-Gumuz	52	21	73	41	114
Harari	35	19	54	32	84
Addis Ababa	21	18	40	14	53
Diri Dawa	31	16	47	14	61
Mother's education					
No indication	46	26	72	43	121
Primary	25	13	38	32	88
Secondary	13	12	25	4	49
Maternal illiteracy	8	8	16	4	24
Male gender					
Lower	50	41	91	61	152
Unisex	48	26	74	41	121
Female	38	17	55	38	96
Female	37	23	60	36	100
Female	37	23	60	27	86

^a Compared as the difference between the infant and neonatal mortality rates.

- Rural morbidity and mortality much higher than urban
- Mother's education strongly correlates to child mortality



Maternal and neonatal public health

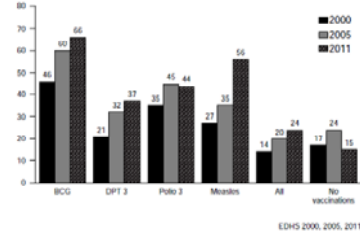
- 27% of mothers in southern region received pre-natal care (improving dramatically)
- 10% of children born in health facility 5% of children weighed at birth
- 48% of last pregnancies protected against tetanus

Table 11.1. Tetanus control indicators
Among mothers age 15-49 with a live birth in the five years preceding the survey, mothers were asked whether they received tetanus (T) during the pregnancy for their last birth and whether they were protected against tetanus during pregnancy (EDHS 2011)

Background characteristic	Percentage receiving last or new pregnancy tetanus last pregnancy	Percentage whose last birth was protected against tetanus
Mothers' age at birth		
15-19	29.7	43.0
20-24	36.4	49.8
25-29	29.4	45.7
Birth order		
1st	35.1	49.1
2nd	29.2	43.2
3rd	24.1	40.9
4th	20.9	41.4
Residence		
Urban	52.0	67.5
Rural	36.5	44.9
Region		
Amhara	31.8	58.0
Afar	22.1	29.7
Benishangul	32.5	43.2
Central	28.1	31.7
South	28.1	31.7
Southwest	37.7	50.8
East	46.2	64.4
North	42.1	52.3
West	35.7	48.8
Education		
No education	41.8	50.5
Primary	34.8	51.1
Secondary	61.7	82.6

Vaccinations

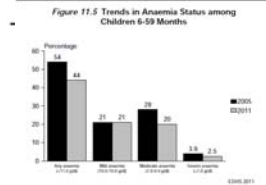
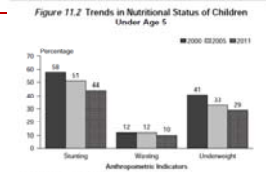
Figure 10.2 Trends in Vaccination Coverage During the First Year of Life Among Children 12-23 Months, Ethiopia 2000-2011



- 24% of children age 1-2 fully vaccinated nationally
- Wide range by region (9-79%)

Public health nutrition

- Improving overall
- Breast feeding: 98% (50% through 2 years)
- Anemia very common (~40%)
- Challenges of micronutrients:
 - Vitamin A deficiency
 - Zinc deficiency
 - Iodine deficiency



Public health characteristics

- 54% of households had access to improved drinking water (from 35% 10 years ago)
 - 13% of people have it available in home
- Only 8% of families use a non-shared, improved toilet
- Major disparities between rural and urban populations
 - Southern region outside of Hawassa is mostly rural

Housing characteristic	Residence		Total
	Urban	Rural	
Electricity			
Yes	85.2	4.8	23.0
No	14.8	95.2	77.0


Southern Ethiopia: SNNPR

- Population of the SNNPR is ~15 million; over 45% of the population are children under age 15 years (EDHS, 2011)
- There are around 56 ethnic groups with their own languages, culture and traditions.
- There are a total of 16 large health facilities
 - Most of them with limited admission facility/ OPD service only
 - Only one referral teaching hospital-Hawassa University Referral Hospital (HURH)
- In the region, there are only 10 pediatricians


Inpatient Pediatric Service in Southern Ethiopia

- Despite the large pediatric population, few health facilities have an established pediatric service.
- Five health facilities have pediatric inpatient service.
- Most other hospitals only have under-five clinics
 - The rest should get the service with adults


Hawassa University





- Is one of the large Universities in Ethiopia
- Five campuses
 - College of Medicine and Health Sciences is one of them.
- More than 38,000 alumni.


Hawassa University Referral Hospital





- Is the only referral and teaching hospital in the Southern region of Ethiopia
- Catchment population is over 20 million people (includes part of the Oromia Regional state)
- Has a total of 350 patient beds
- Each department has inpatient, outpatient and follow up services.


Department of Pediatrics & Child Health






- In the department:
 - 4 General Pediatricians
 - 6 General Practitioners (MD)
 - 25 Interns (last year of Medical School)
 - 2 Residents
 - 42 Nurses
- Largest pediatric admission service in the region


Department of Pediatrics & Child Health



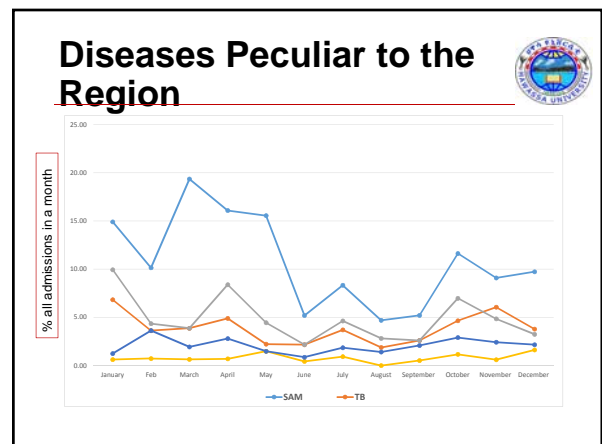
- Usually admit referred/critically ill cases
 - 60 inpatient pediatric beds + 10 SAM beds
 - 30 bed nursery
 - Pediatric Emergency unit
 - Outpatient and specialty clinics

Diseases Peculiar to the Region



- Based on electronic data recording in place since 2013
- Reviewed the admission/discharge diagnosis for each month
- Total monthly admissions to the inpatient ward ranged from 135-231



Severe Acute Malnutrition

- WHO Definition
- Underlying condition for over 60% of child deaths
- Cause:
 - Mostly primary/Poverty
 - May follow chronic morbidities

Month	SAM	TB	ABM
January	14.95	10.14	5.75
February	10.14	5.75	14.95
March	19.35	14.95	10.14
April	14.95	10.14	5.75
May	10.14	5.75	14.95
June	5.75	10.14	14.95
July	8.33	5.75	10.14
August	4.68	5.75	10.14
September	5.75	10.14	14.95
October	11.63	10.14	5.75
November	11.63	10.14	5.75
December	11.63	9.09	5.75

Severe Acute Malnutrition

- Diagnostic criteria:
 - Nutritional History
 - Anthropometrics
 - WFL<70%
 - Edema
 - Dermatosiis
 - Kwashiorkor
 - Marasmus
 - Physical Examination
 - Hair changes
 - Dermatosiis, Edema
 - Hepatomegaly
 - TSP, Albumin level

Severe Acute Malnutrition: Therapy and Complications

- Phased nutritional therapy
 - Phase I
 - Transition Phase
 - Phase II
- Morbidity/complications:
 - Infection
 - Diarrheal diseases
 - Hypothermia, shock
- Mortality rates:
 - Higher of edematous malnutrition cases
- Outpatient treatment

Severe Acute Malnutrition: Therapy and Complications

Comparison of the efficacy of a solid ready-to-use food and a liquid, milk-based diet for the rehabilitation of severely malnourished children: a randomized trial¹⁻³

El Hadji Issakha Diop, Nicole Idohou Doucoure, Marie Madeleine Nioua, André Briand, and Salmata Wade

ABSTRACT
Background: The World Health Organization recommends a liquid, milk-based diet (F100) during the rehabilitation phase of the treatment of severe malnutrition. A dry, solid, ready-to-use food (RTUF) that can be eaten without adding water has been proposed to eliminate the risk of bacterial contamination from added water. The efficacies of RTUF and F100 have not been compared.
Objective: The objective was to compare the efficacy of RTUF and F100 in promoting weight gain in malnourished children.
Design: In an open-label, randomized trial, 70 severely malnourished Senegalese children aged 6–36 mo were randomly allocated to receive 3 meals containing either F100 (n = 35) or RTUF (n = 35) in addition to the local diet. The data from 30 children in each group were analyzed.
Results: The mean (±SD) daily energy intake in the RTUF group was 808 ± 280 (95% CI, 703.8, 912.9) kJ/kg body wt⁻¹·d⁻¹, and that in the F100 group was 577 ± 201 (95% CI, 416.5, 737.5) kJ/kg body wt⁻¹·d⁻¹. The mean (±SD) daily energy intake in the RTUF group was 808 ± 280 (95% CI, 703.8, 912.9) kJ/kg body wt⁻¹·d⁻¹, and that in the F100 group was 577 ± 201 (95% CI, 416.5, 737.5) kJ/kg body wt⁻¹·d⁻¹.
Conclusion: The mean (±SD) daily energy intake in the RTUF group was 808 ± 280 (95% CI, 703.8, 912.9) kJ/kg body wt⁻¹·d⁻¹, and that in the F100 group was 577 ± 201 (95% CI, 416.5, 737.5) kJ/kg body wt⁻¹·d⁻¹.
Conclusion: This study indicated that RTUF can be used efficiently for the rehabilitation of severely malnourished children. *Am J Clin Nutr* 2003;78:302–7.

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The African Meningitis Belt

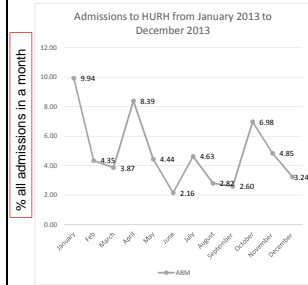
[Trotter et al: *Lancet Infect Dis*. 2007 ;7(12):797-803.]

- Globally- 1.2 million people, 170,000 deaths/year (who: *Wkly. Epidemiol. Rec.* 2009;80:313-320)
- Ethiopia forms part of the meningitis belt
- Extends from Senegal to West Ethiopia
- Group A meningococcus accounts for 80–85% of all cases (WHO Fact sheet No 141, 2009)
- Epidemics occurring at intervals of 7–14 years.

Acute Bacterial Meningitis



- Hailu and Muhe (2001): 6-8% of hospital admissions in Ethiopia
- A similar pattern from the 1-year admission in my hospital
- A year round problem
- Challenges:
 - Late presentation
 - No etiologic diagnosis
 - No antibiogram



Diagnosis of meningitis:



- Clinical signs and symptoms:
- Lumbar puncture and culture:
- Imaging availability:

Meningitis: empiric therapy

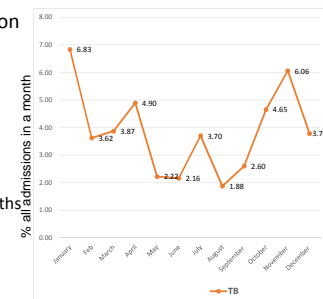


- Initial therapy with...
- f/u lumbar puncture...
- If non-responsive to therapy
- Morbidity/mortality

Tuberculosis



- Diagnosis made based on clinical clues
 - Contact history
 - Symptoms and signs
 - CXR abnormality
- Unavailability of PPD
- Treatment
 - Initially: 4 drugs/2 months
 - Then 4 months continuation/RH
 - DOTS



Tuberculosis: outcomes, common complications

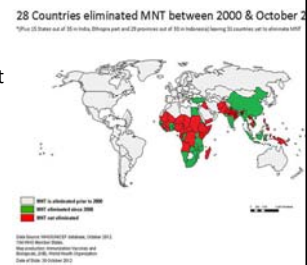


- Outcomes
- complications

Tetanus




- Vaccine preventable disease
- Not seen in the developed world
- 1-2 cases/month for the past year
- Diagnosis:
 - Mainly clinical
 - History of partial or fully unimmunized
 - History of trauma
 - Fully conscious patient
 - Typical spasms: lock jaw, board-like abdomen, spasms...



Tetanus – treatment options

- Treatment: antibiotics
- Sedation: Diazepam and Chlorpromazine
- No intubation and ventilation/ ICU care



Chronic Rheumatic Valvular Heart Disease

- Common problem
- Magnitude not really known
 - Ongoing: BOHRD study
- Diagnosis based on:
 - Older age at presentation
 - History of pharyngitis
 - History of acute rheumatic fever
 - Physical examination
 - Murmur of MR, AR, MS
 - CXR, EXG
 - Echocardiography

Chronic Rheumatic Valvular Heart Disease

Tadelle et al. BMC Cardiovascular Disorders 2013, 13:95
<http://www.biomedcentral.com/1471-2261/13/95>

BMC Cardiovascular Disorders

RESEARCH ARTICLE Open Access

Rheumatic mitral stenosis in Children: more accelerated course in sub-Saharan Patients

Henok Tadelle¹, Wubegzier Mekonnen² and Endale Tefera³

Abstract
Background: Mitral stenosis, one of the grave consequences of rheumatic heart disease, was generally considered to take decades to evolve. However, several studies from the developing countries have shown that mitral stenosis follows a different course from that seen in the developed countries. This study reports the prevalence, severity and common complications of mitral stenosis in the first and early second decades of life among children referred to a tertiary center for intervention.
Methods: Medical records of 365 patients aged less than 16 and diagnosed with rheumatic heart disease were reviewed. Mitral stenosis was graded as severe (mitral valve area < 1.0 cm²), moderate (mitral valve area 1.0-1.5 cm²) and mild (mitral valve area > 1.5 cm²).
Results: Mean age at diagnosis was 10.1 ± 2.5 (range: 3-15) years. Of the 365 patients, 126 (34.5%) were found to

Chronic Rheumatic Valvular Heart Disease

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Mean age: 10.1 +/- 2.5 years (range:3-15 years)
Mean MVA: 1.1 +/- 0.5cm²

Chronic Rheumatic Valvular Heart Disease

- Challenges:
 - Diagnostics- no echocardiographer in the region
 - Treatment:
 - Limited cardiac surgery in the country
- Treatment
 - Treating congestive state: diuretics
 - Monthly Benzanthine Penicillin

Summary:

- Southern Ethiopia has challenges and successes
 - Rural, low-resource setting
 - Good educational infrastructure
 - Few pediatricians for large pediatric population
 - Quality improvement in hospital is possible
 - Trajectory is good with improving vaccinations and public health
 - Still experience diseases that are uncommon in United States (tetanus, tuberculosis)

Acknowledgements



- Dr. Foster "Alex" Byron – support & sponsorship
- Dr. Thomas Mayes – support & sponsorship
- Dr. Minnette Son – support & sponsorship
- Dr. Elaine Maldonado - echocardiography
- Dr. Michelle Arandes – quality improvement
- Dr. John Erikson- echocardiography
- Dr. Alice Gong – neonatology
- Dr. Tony Infante – faculty development
- Dr. Dennis Conrad – grand rounds
- Dr. Ricardo Quinonez – health systems
- Monica Pinon of the office of international services

Questions?

