Medical Checks for Children

Medical Report

South Africa, Eastern Cape 2019

In collaboration with

Children of the Dawn & Kinderfonds MAMAS

September - October 2019

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1.Introduction

From september 28th untill october 5th 2018, a Medical Checks for Children (MCC) team visited three locations in Eastern Cape, a province in the south-east of South Africa. Free of cost, the MCC team checked and treated 1513 children, aged newborn until 12 years. The team consisted of Ines von Rosenstiel, paediatrician and medical mission leader; Dorien Jakobs, child nurse and organizational mission leader; Anneke Landstra, paediatric pulmonologist; Anton te Riet Scholten, family physician; Arna Jacobs, child nurse; Emma Dogterom, resident paediatrics; Jankina Ligtvoet, child nurse; Jasper Vos, architect; Karin Heij, neonatology nurse; Lotte Noorlag, resident Neurology; Mirjam Binnekamp, resident paediatrics; and Jorien te Riet Scholten, student econometry.

Our host patron during our stay was Magali Malherbe, director of the Children of the Dawn of 9 rural community projects, in partnership with the Dutch organization Kinderfonds MAMAS. This was the first explorative mission to this rural region in South Africa.
Technical equipment and some of the supplies were brought from the Netherlands by the MCC team members. Most of the medication was ordered through the local Matatiele pharmacy, with the help of Dr. Kethiwe in cooperation with Kitso Maragelo. Hundreds of knitted hats, sweaters and blankets were donated by compassionate volunteers in our home country.

Kinderfonds MAMAS (Children's Fund MAMAS) is a Dutch charity organisation that has been co-funding dozens of high-quality grassroots childcare organisations all across South Africa since 2000. Kinderfonds MAMAS believes in MAMA POWER!Children of the Dawn works under the umbrella of Kinderfonds MAMA as a local organisation.

Children of the Dawn is a South African Public Benefit Organisation caring and supporting rural orphaned and vulnerable children. Children of the Dawn has been working in Matatiele since 2009 and is currently supporting 119 children and their families. They provide basic support to children and their families registered in their programme. At their care centers, children are provided with love, attention, psycho-social support, after school support, meals, clothes and access to sports, education and leisure activities.

Children of the Dawn is partially funded by Kinderfonds Mamas, a Dutch NGO, that works with another 32 NGOs dealing with vulnerable children in South Africa. A few years ago, Kinderfonds Mamas introduced another Dutch NGO – Medical Checks of Children (MCC) – to its network of NGOs in South Africa. MCC's mission is to bring specialised medical services to gravely under resourced areas and screen children aged 0 to 12 for a wide range of ailments. When the first mission is successful, MCC comes back for a further 4 years. The services rendered by MCC are at no cost for the host community.

The cooperation with Children of the Dawn consisted mainly of the following (amongst others):

- Identifying and engaging the local stakeholders;
- Prior announcement and preparations of the medical camp in the locations;
- Selection of locations and selection of the children;
- Giving full support to the MCC team during the medical camp;
- Commitment to ensure relevant medical follow-up.

The MCC team was delighted by the cooperation with Magali Merherbe, Nandipha Magqashela, all the local (healthcare) workers and seven retired nurses who helped us during this intens first medical camp under the strong mentorship of our Letcee partner Kitso Maragelo.

2. Medical Checks for Children on location

During the medical checks, the children were checked following the MCC carrousel:

1. Registration of the child
2. Measuring height and weight
3. Blood test for haemoglobin
4. Physical examination
5. Giving medication and education about the correct use of it (pharmacy)
6. Education on hygiene and tooth brushing (a tooth brush was given to each child
7. Food station on some locations

Data collection

Anthropometric measurements were recorded, and a finger prick sample was taken for determination of the haemoglobin (Hb) concentration. Each child was examined by a Medical Doctor. History of illnesses was recorded. Specifically, caretakers were asked if the child had fever, diarrhea, an upper respiratory infection, vomiting, decreased appetite and/or weight loss. They were also asked if their child received treatment for any condition, and if so, from where. The data of the children are saved and analysed through the MCC database.

3. General information on the different locations

Matatiele is a mid-sized town serving the farming and trading communities of East Griqualand in the foothills of the western Drakensberg, Eastern Cape, South Africa, on the border with KwaZulu-Natal and 20 km from the southern frontier of Lesotho. Dairy farming is the principal activity. Good trout fishing is to be had in the numerous streams of the area.

As a town, Matatiele is the reference point for all of the northern Transkei. According to the 2011 Census, the Matatiele Local Municipality has a total population of 203 843, of whom 98,1% are black African, with the other population groups making up the remaining 1,9%. Of those aged 20 years and older, 8,2% have completed primary school, 38,4% have some secondary education, 12,8% have completed matric and 5,8% have some form of higher education.

The residents in and around Matatiele, as in most of the northern Transkei region, are generally bilingual in Hlubi, isiXhosa and Sesotho. Many speak English. Some also speak as a home language (or as a language of heritage) Phuthi, especially residents in Tsitsong and Tšepisong.

The average household has 4 members with half of them an income of less than 1 dollar per day per member. Unemployment in this region is high: 50-75%. Adult views on anacceptable standard of living for children are captured in the South African Social Attitudes Survey[1]. The top five socially perceived necessities for children identified by adults are:

- Three meals a day
- Toiletries to be able to wash every day
- A visit to the doctor when ill and access to the required medicines
- All fees, uniform and equipment required for school
- Sufficient clothing to keep warm and dry

Children experience poverty in a range of ways. They highlight threats to personal safety, both in the home and in the community. Whether or not children personally experience violence or abuse, anxiety

[1] Bradshaw, J. and Holmes, J. (2010) 'Child poverty and socialexclusion in South Africa', in B. Roberts, M. wa Kivilu and Y.D.Davids (eds.) South African Social Attitudes: The 2nd Report.Reflections on the Age of Hope. Pretoria: HSRC Press, pp.167-182.

about it is an important feature of childhood experience in the context of poverty. The result is that the circle of poverty, abuse, malnutrition and neglect becomes even wider.

Medical facilities: Physical inaccessibility can be related to distance, transport options and costs, or road infrastructure. Physical distance and poor roads also make it difficult for mobile clinics and emergency services to reach outlying areas. Within South Africa, patterns of health care utilisation are influenced by the distance to the health service provider: Those who live further from their nearest health facility are less likely to use the facility. This "distance decay" is found even in the uptake of services that are required for all children, including immunisation and maintaining the clinic card (Road-to-Health booklet).

Mthatha General Hospital is a large Provincial government funded hospital situated in central Mthatha in South Africa. It is a general hospital and forms part of the Mthatha Hospital Complex. The hospital departments include Emergency department, Paediatric ward, Maternity ward, Obstetrics/Gynecology, Out Patients Department, Surgical Services, Medical Services, Operating Theatre & CSSD Services, Pharmacy, Anti-Retroviral (ARV) treatment for HIV/AIDS, Post Trauma Counseling Services, Occupational Services, X-Ray Services, Physiotherapy, NHLS Laboratory, Oral Health Care Provides, Laundry Services, Kitchen Services and Mortuary.

The hospital forms part of the Mthatha hospital complex with Nelson Mandela Academic Hospital. Nelson Mandela Academic Hospital is a large Provincial government funded hospital situated in central Mthatha in South Africa. It is a tertiary teaching hospital and forms part of the Mthatha Hospital Complex.

The hospital departments include Emergency department, Paediatric ward, Maternity ward, Obstetrics/Gynecology, Out Patients Department, Surgical Services, Medical Services, Operating Theatre & CSSD Services, Pharmacy, Anti-Retroviral (ARV) treatment for HIV/AIDS, Post Trauma Counseling Services, Ophthalmology Out-patients Clinic, Occupational Services, X-Ray Services, Physiotherapy, NHLS Laboratory, Oral Health Care Provides, Laundry Services, Kitchen Services and Mortuary.

Collaboration: Apart from the collaboration of the NGO Children of the Dawn and MCC as two independent parties working within Child nurtuting framework, collaborative arrangements were set up with Dr Ross, PHS and others of the Department of health.

The Matatiele Local Municipality is made of 26 wards. Children of the Dawn works in a number of wards, some 20 to 40mn away from the town centre. After careful analysis of current stakeholder relationships and needs of the different wards, Children of the Dawn decided to bring the Medical Check for Children team to 3 wards:

- Ward 25 – Khauoe

Ward 25 comprises of the villages of St Paul, Jabulane, Ned, Malosong, Khauoe, Thabang, Magogogong, Nkosana 2, New stance, Jabavu. There are no health facilities within the ward. The absence of permanent health care facilities means clinics located in neighbouring wards provides for basic primary health services such as family planning, basic check-ups, and immunization for Ward 25. The Health Department mobile clinic visits the Khauoe location once a month.

- Ward 08 – Nchodu

Ward 08 comprises of the villages of Outspan, Nchodu, Magema and Zwelitha Villages. There are no health facilities located with the ward. Inhabitants rely on health care centres located in other wards or villages.

- Ward 03 – Masakala / Khohlong

Ward 03 comprises of the villages of Tsepisong, Masakala, Khohlong, Mdeni, Dikgutlwaneng, Hebron and Madimong. There is no health care facility located within the ward. The health care facility located in neighbouring ward which is ward 01 provides for basic primary health services.

Program:
Day 1: Khauoe
Day 2: Khauoe
Day 3: Nchodu
Day 4: Nchodu
Day 5: Masakala / Khohlong

At the different locations we checked children who were included in the Children of the Dawn program and great numbers of children from the three main wards.

Table 1: Number of checked children per day and geographical location

Villages	30/09/19	01/10/19	02/10/19	03/10/19	04/10/19	Total
Ward 25 – Khauoe	185	394	0	0	0	579
Ward 08 – Nchodu	0	0	319	340	0	659
Ward 03 – Masakala / Khohlong	0	0	0	0	275	275
Total	**185**	**394**	**319**	**340**	**275**	**1513**

Table 2: Summary of checked children per geographical location, age and gender

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
Age	**N**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
<=1 year	151	10%	55	9%	35	13%	61	9%
>1 en <5 years	318	21%	112	19%	82	30%	124	19%
<5 years	469	31%	167	29%	117	43%	185	28%
>=5 en <=10 years	798	53%	306	53%	135	49%	357	54%
>10 years	246	16%	106	18%	23	8%	117	18%
Gender								
Boy	717	47%	276	48%	127	46%	314	48%
Girl	787	52%	302	52%	147	53%	338	51%

4. Specific diagnoses

1. Growth abnormality and malnutrition

Malnutrition has long been considered a consequence and cause of poor human health, development, and achievement throughout life. There are severe forms of malnutrition, characterized by classical clinical signs such as extreme thinness or edematous extremities and hair signs. More prevalent are the hidden forms of undernourishment that can stunt child growth and development and impair the immune system[2]. It is reported that over one-third of child deaths in South-Africa are due to undernutrition, mostly from increased severity of disease[3].

The following definitions categorize the different types of malnutrition:

- Underweight = weight for age at or under the third percentile of the reference population (WHO growth curves), only children up to 10 years old. This is an indicator of malnutrition or weight loss because of disease.
- Stunting = height for age at or under the third percentile of the reference population, (WHO growth curves), only children up to 19 years of age. This is an indicator of chronic malnutrition.
- Wasting = weight for height at or under the third percentile of the reference population (WHO growth curves), only children up to 120 cm in height. This is an indicator of acute malnutrition.

UNICEF distinguishes between the immediate, underlying and basic causes of malnutrition. Immediate causes of malnutrition include inadequate dietary intake and illness. This can lead to a potentially vicious cycle of illness and malnutrition, where malnutrition impairs children's immunity leading to recurrent bouts of illness, which further undermine children's nutritional status. Underlying causes include household food insecurity, inadequate maternal care, poor access to services and unhealthy living environments, which in turn are driven by the unequal distribution of resources in society.

In the area surrounding Matatiele which we have visited for our medical mission, 5% of the children was classified as underweight. Seven percent of the children suffered from stunting and 3% suffered from

[2] Merson, Global Health Disease Programs, Systems and Policies, page 243.
[3] UNICEF 2009 State of the World's Children report

wasting. If we look at children under five specifically (high risk group), we see that 6% of children is underweight, 13% is stunting and 5% is wasting.
All the children who could not be grouped in one of the WHO definitions because of the age limitations as noted above, were categorised as 'unknown' when analysing the data.

Undernutrition in South African children younger than ten years old has dropped significantly since 2005 as a result of school nutrition programmes nation wide to all Quintile 1-3 schools[4]. These schools service the most deprived communities in Southg Africa. This significant drop is shown in the introduction of an evaluation study of school nutrition programmes in Eastern Cape by Graham et al. in 2015 (figure 1). The underweight percentages dropped in 7 years from 10 to 6% nationally which is comparable to our findings. In the national data stunting levels remain higher, despite these investments, suggesting that interventions in early childhood are necessary (this age group does not benefit from school nutrition programmes yet).
In the Eastern Cape there are different school nutrition programmes. Depending on the Quintile of the school children receive a lunch from the South Africa's National Nutrition Plan (NSNP) (Quintile 1 – 3 schools). The recently introduced Tiger Brands Foundation (TBF) nutrition programme delivers breakfast in the form of fortified cooked porridge to approximately 50.000 childeren nationally, primarily in Quintile 1 and 2 schools, including schools in Eastern Cape.
The recent research of Graham et al. compared this two nutrition programmes – schools receiving only the NSNP and schools receiving both the NSNP and the TBF - with a control group of a quintile 4 school (see figure 2 and 3). Despite high levels of poverty in the region, children at all groups showed lower rates of underweight and wasting than the Eastern Cape averages for children. This is partly explained by the fact that the provincial averages are for children 0 – 15 years and the highest levels of undernutrition are for children 0 – 3 years. Once children reach school they are benefitting from the NSNP. With regard to height-for-age data, children in the schools receiving both nutritional interventions and those in the relatively better off control schools had low stunting rates (9% and 6.5% respectively) when compared to the national average for learners aged 4-14 years of 13%. Those at the schools receiving the NSNP only had somewhat higher stunting rates (14.5%) than children at the control schools and those received the TBF breakfast. This difference suggest that the addition of a nutritious breakfast can positively shift stunting levels.
The added value of a fortified breakfast at school is evident, but at this moment we are not yet aware of the arrangements made in the 3 schools we visited. There are notable differences between the underweight prevalence between the schools (Masakala has a higher prevalence of underweight of 8% then Khauoe (5%) and Nchodu (3%)). This might be a result of different school nutrition programmes but it might also be due to differences in poverty of the surrounding areas.
Altough the stunting percentages of the school-aged children in Matatiele are surprisingly low, we can still conclude that the children under five, especially the ones younger than 1 year old, are the most vulnerable to be underweight, stunted or wasting. And thus the 0-5 year olds should be the primary target group for feeding programs as they are not included in the school nutrition programmes.

[4] Graham, Lauren, et al. "Evaluation study of the National School Nutrition Programme and the Tiger Brands Foundation in-school breakfast feeding programme in the Lady Frere and Qumbu districts of the Eastern Cape." *Johannesburg: Centre for Social Development in Africa, University of Johannesburg* (2015).

The double burden of malnutrition: there is a worrying increase in obesity and obesity-related diseases in South Africa. The double burden of malnutrition is characterised by the coexistence of undernutrition along with overweight and obesity. Paediatric obesity and stunting are both risk factors for metabolic syndrome and diseases in adulthood and are therefore relevant additional data for missions conducted in the future[5].

Table 3: Prevalence of weight/age at or under P3 (underweight) per geographical location by age and gender

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
	N	%	n	%	n	%	n	%
Underweight	68	5%	27	6%	21	9%	20	4%
No underweight	1173	78%	435	75%	217	79%	521	79%
Unknown	271	18%	116	20%	37	13%	118	18%
Underweight children per age								
<=1 year	17	11%	4	7%	11	31%	2	3%
>1 en <5 years	12	4%	6	5%	2	2%	4	3%
<5 years	29	6%	10	6%	13	11%	6	3%
>=5 en <=10 years	39	5%	17	6%	8	7%	14	4%
>10 years	-	-	-	-	-	-	-	-
Underweight children per gender								
Boy	33	6%	13	6%	10	9%	10	4%
Girl	35	5%	14	6%	11	9%	10	4%

Table 4: Prevalence of length/age at or under P3 (stunting) per geographical location by age and gender

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
	N	%	n	%	n	%	n	%
Stunting	102	7%	42	7%	15	5%	45	7%
No stunting	1408	93%	535	92%	259	94%	614	93%
Unknown	3	0%	2	0%	1	0%	0	0%
Stunting children per age								
<=1 year	13	20%	12	22%	0	0%	1	9%
>1 en <5 years	13	9%	10	9%	0	0%	3	11%
<5 years	26	13%	22	13%	0	0%	4	11%
>=5 en <=10 years	18	4%	12	4%	0	0%	6	6%
>10 years	8	6%	6	6%	0	0%	2	6%
Stunting children per gender								
Boy	53	7%	20	7%	9	7%	24	8%
Girl	48	6%	22	7%	6	4%	20	6%

[5] Kimani-Murage, Elizabeth W., et al. "The prevalence of stunting, overweight and obesity, and metabolic disease risk in rural South African children." *BMC public health* 10.1 (2010): 158.

Table 5: Prevalence of weight/length at or under P3 (wasting) per geographical location by age and gender

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
	N	%	n	%	n	%	n	%
Wasting	38	3%	15	3%	14	5%	9	1%
No wasting	708	47%	253	44%	165	60%	290	44%
Unknown	767	51%	311	54%	96	35%	360	55%
Wasting children per age								
<=1 year	11	7%	3	5%	7	20%	1	2%
>1 en <5 years	11	3%	5	5%	2	3%	4	3%
<5 years	22	5%	8	5%	9	8%	5	3%
>=5 en <=10 years	16	6%	7	7%	5	8%	4	4%
>10 years	0	0%	0	0%	0	0%	0	0%
Wasting children per gender								
Boy	18	5%	9	7%	7	8%	2	1%
Girl	20	5%	6	4%	7	8%	7	4%

Figure 1: Progression of South African Children's nutritional status since 1994[4]

	1994 (≥6)*	1999 (1-9)	2005 (1-9)	2012 (0-9)
Stunting	25%	20%	20%	21%
Underweight	10%	10%	10%	6%
Overweight	No available data	20%	14%	14%**

*Columns one and four are limited by the different age ranges used
** Reported for children aged 2-9 years
Source: (Iverson et al., 2011; Shisana et al., 2014)

Figure 2: Percentages of learners within normal height-for-age range by school type[4]

Control			NSNP only			TBF + NSNP			TOTAL		
Stunted (%)	Not stunted (%)	n	Stunted (%)	Not stunted (%)	n	Stunted (%)	Not stunted (%)	n	Stunted (%)	Not stunted (%)	n
6.5 ɪ	93.5	276	14.5*ɪ	85.5	570	8.7*	91.3	541	10.6	89.4	1387

Figure 3: Percentage of learners within normal weight-for-age range by school type[4]

WAVE	Control			NSNP only			TBF + NSNP			TOTAL		
	Under-weight (%)	Not under-weight (%)	n	Under-weight (%)	Not under-weight (%)	N	Under-weight (%)	Not under-weight (%)	n	Under-weight (%)	Not under-weight (%)	n
Pre-test	1.7	98.3	120	3.7	96.3	190	2	98	253	2.5	97.5	563

Quite some children stated during their visit to our medical camp that they only drank 1 or 2 cups of water a day. Smuts et al. reported that about 50% of households in rural districts in the Eastern Cape and KwaZulu-Natal provinces used the local river as the main source of drinking water in 2008[6]. Unsafe water and inadequate sanitation and hygiene are significant contributors to the 1.8 million deaths caused by diarrhoea every year. For children under five years of age, this burden is greater than that covered by HIV and malaria combined. Lack of water and chronic thirst in schoolchildren have negative effects on their concentration in school and on further academic achievements, often causing headaches.

Suggestions:

- MCC advises to execute the strategy to ensure appropriate nutrition during the first 3 years of a child's life. (Nurturing Care Framework)
- MCC advises a fortified cooked porridge breakfast besides the NSNP to all Quintile 1 – 2 schools.
- MCC advises that children drink at least 4 cups of water each day. We advise Children of the Dawn to play a counseling role for parents and children herein.
- Strenghten awareness for the paradox of double burden of malnutrition in rural South Africa.

2. Anaemia

Iron is essential in the body for oxygen transportation and cellular respiration - functions that are especially critical in red cells, brain and muscle. Iron deficiency is considered the most common micronutrient deficiency in the world; anaemia, characterized by abnormally low blood hemoglobin concentration, is its major clinical manifestation. In addition to iron deficiency, other micronutrient deficiencies (such as folate, vitamin B12 and vitamin A), chronic inflammation and inherited disorders of haemoglobin structure can all cause anaemia (WHO/UNICEF/UNU 2001)[4].

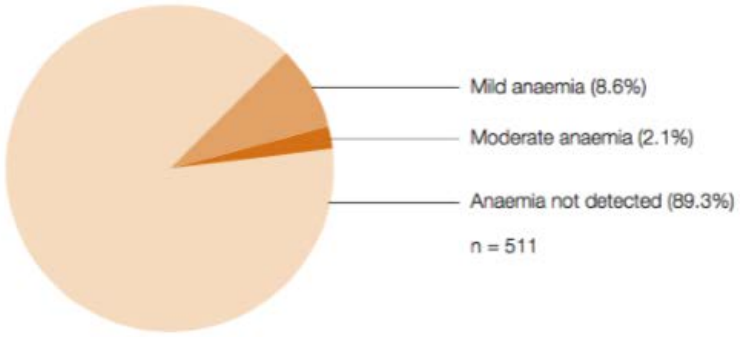
Iron deficiency, a common form of nutritional deficiency during childhood, results from sustained negative iron balance, which is caused by inadequate dietary intake, absorption and/or utilisation of iron, increased iron requirements during the growth period, or blood loss due to parasitic infections such as malaria, soil-transmitted helminth infestations and schistosomiasis. In later stages of iron depletion, the haemoglobin concentration decreases, resulting in anaemia.

The South African National Health and Nutrition Survey, 2012 (Sanhanes-1 study)[5], is a survey about the national health and nutritional status of the South African nation. This study states that it is estimated that 600 million preschool- and school-age children worldwide are anaemic and it is assumed that at least half of these cases are attributable to iron deficiency (WHO/ CDC 2008). In 2008 rates of anemia among preschool aged children in South-Africa were 24%[7]. In the South African National Health and Nutrition Survey, 2012 (Sanhanes-1 study) the prevalence of anaemia was 10.7% (children under five

[6] Smuts, Cornelius M., et al. "Socio-demographic factors and anthropometric status of 0-71-month-old children and their caregivers in rural districts of the Eastern Cape and KwaZulu-Natal provinces of South Africa." *South African Journal of Clinical Nutrition* 21.3 (2008): 117-124.
[7] WHO. 2008. Worldwide Prevalence of Anemia 1993-2005: WHO Global Database on Anemia
[5] The South African National Health and Nutrition Survey, 2012 (SANHANES-1 study)

years of age) (see figure 3.8.2.1 from the Sahanes-1 study). The huge decrease is correlated to the beneficial effect of the Food Fortification Program.

Figure 3.8.2.1: Anaemia status of children under five years of age, South Africa 2012



** There no cases of severe anaemia among children under five years of age*

[5]*Source: Sahanes-1 study*

In general, the prevalence of anaemia seems to drop, although the recent publication in the South-African Journal for Child Health, *Persistent and new-onset anaemia in children aged 6 - 8 years from KwaZulu-Natal Province,* a neighboring province of Eastern Cape, suggests the prevalence of anemia might be higher[8]. The baseline anaemia prevalence in this article was 56.9% and at follow-up the anaemia prevalence was 41.9%. The ages of children assessed, methods of determining Hb concentration and anaemia HB-level cut-offs varied between the different studies. Hence, outcomes on anaemia prevalence need to be compared with caution.

In South Africa no national policy has been implemented so far to provide iron supplements to pregnant women or young children. While iron deficiency is frequently the primary factor contributing to anaemia, it is important to recognise that the control of anaemia requires a multi-faceted approach. In addition to iron deficiency, infectious diseases such as worm infections, other chronic infections, particularly HIV-AIDS and tuberculosis, as well as other nutritional and vitamin deficiencies are risk factors for anemia, and this as well can be a side effect of ART medication in HIV positive children.

Anaemia is always multifactorial in cause. Household factors are important when considering malnutrition and anaemia. A study on the diversity of the diet of the population in Eastern Cape showed[9]:

- A high prevalence of poor dietary diversity (59.6%) compared to other provinces of South-Africa.
- The diet is rich in carbohydrates (high caloric food), such as putu.
- The diet is poor in vitamin A-rich fruit and vegetables.

[8] Gwetu, Thando Patience, et al. "Persistent and new-onset anaemia in children aged 6-8 years from KwaZulu-Natal Province, South Africa." *South African Journal of Child Health* 9.4 (2015): 127-129.

[9] Labadarios, Demetre, Nelia Patricia Steyn, and Johanna Nel. "How diverse is the diet of adult South Africans?." Nutrition journal 10.1 (2011): 33.

- The diet is poor in other vegetetables and nuts.
- The diet is poor in meat, poultry and fish.
- The diet is poor in dairy and eggs.
- The vegetables are mostly roots, tubers and cabbage, spinach being the exception.

The diagnosis anemia was made in 429 of the 1414 children (30%) eligible for testing their blood. Of the children under five, 29% was anemic. Cut-off values were determined based on age and height of the place where the children lived, using the World Health Organization cut-off values for anemia. If we take a closer look at the differences between the three visited wards, we see a remarkable difference. Khauoe has a prevalence of anemia of 21% whilst Nchodu has a prevalence of 39%. This might be a result of different school nutrition programmes but it might also be due to differences in poverty of the surrounding areas and differences in dietary diversity.

In two children (<1%) the Hb level was lower than 5.0 mmol/l after a second confirming measurement, marking a more severe form of anemia and suggesting possible underlying pathologies other than iron deficiency. Depending on the age and presence of growth abnormalities, children were given iron supplements or multivitamins for at least two months. Children with severe anemia (<5.0 mmol/l) were treated with supplementation as well as referred for further diagnostics.

In the table below percentages of anemia on the different locations are displayed.

Table 6: Prevalence of anaemia per geographical location by age and gender

	Total		**Khauoe**		**Masakala**		**Nchodu**	
	1513		**Total= 579**		**Total= 275**		**Total= 659**	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Anaemia	429	30%	107	21%	78	29%	244	39%
No anaemia	985	70%	405	79%	191	71%	389	61%
Unknown	98	6%	67	12%	6	2%	25	4%
Hb <5,0 mmol	2	0%	1	0%	1	0%	0	0%
Anaemia per age								
<=1 year	36	24%	9	16%	4	11%	23	38%
>1 en <5 years	100	31%	25	22%	22	27%	53	43%
<5 years	136	29%	34	20%	26	22%	76	41%
>=5 en <=10 years	232	29%	57	19%	43	32%	132	37%
>10 years	61	25%	16	15%	9	39%	36	31%
Anaemia per gender								
Boy	228	32%	61	22%	33	26%	134	43%
Girl	196	25%	46	15%	45	31%	105	31%

Suggestions:

- MCC advises a diet rich in fruits and vegetables, greater diversity, and less added sugars.
- MCC supports the general guidelines: mothers known to be HIV infected should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary

foods thereafter and continue breastfeeding for the first 12 months of life. Breastfeeding should continue until the age of 2 years and should be supported by ART adherence strategies.

3. Worm infections

Worm infections are one of the major health problems confronting millions of school-aged children. The presence of intestinal parasites in a population group is indicative of lack of proper sanitation, low economic standards and poor educational background. These parasites consume nutrients from the children they infect, thus aggravating malnutrition and retarding physical development. They also destroy the tissues and organs in which they live. They cause abdominal pain, diarrhoea, intestinal obstruction, anaemia, ulcers and various other health problems.
Heavy, prolonged infection adversely affects growth, development and educational achievement, and significantly increases childhood morbidity. Parasite infections produce different manifestations according to the site, intensity and length of infection. The host response also influences the clinical course of the infection. In general, children experience the heaviest worm burden, and persistent infection is common in low- and middle-income settings.

A study in 2009 in the eastern Cape determined the prevalence of intestinal parasites in primary school children of Mthatha, South Africa and its relation to their socio-economic status. Out of 162 learners analyzed, 64.8% (105/162) stool samples were positive for ova and cysts of which 57.4% (93/162) were known pathogenic parasites. The most common parasite was *Ascaris lumbricoides* 29.0% (47/162), followed *by Giardia lamblia* 9.9% (16/162) and *Entamoeba histolytica/dispar* 6.8% (11/162) (Other parasites observed but at lower rates of occurrence were *Iodamoeba butschlii, Trichuris trichiura, Hymenolepis nana, Taenia spp, Chilomastix mesnili, and Fasciola spp*.Significant associations between parasitic infections and parents' unemployment and lower education were observed. Prevalence of worm infestation was thus more than 50%; therefore, there was a need for mass de-worming of school children in these communities and also a need for other public health interventions like health education programs and improvement of sanitation[10].

The South-African Department of Health has launched a national deworming programme in 2016[11]. The department said the goal was to attain a minimum target of regular administration of deworming medication to at least 75% of school-aged children and up to 100% of those at risk of morbidity. South-Africa has a program in which children are offered preventive anti-worm medication. In our checked population, a high percentage of 72% of the children (1096/1513) had received anti-worm treatment in the last half year. All of the children who had not received anti-worm treatment were given one dose of albendazole 500 mg above the age of five and 250 mg for the age of 2-5 years. Children with severe acute worm infections were treated with albendazole during three consecutive days.

[10] Prevalence of Intestinal Parasites in Primary School Children of Mthatha, Eastern Cape Province, South Africa, dec 2013, DOI: 10.4103/2141-9248.122064
[11] http://allafrica.com/stories/201603010156.html

Table 7: Prevalence preventive anti-worm treatment in the last half-year per geographical location by age and gender

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
	N	%	n	%	n	%	n	%
Anti-worm	1096	72%	416	72%	177	64%	503	76%
No anti-worm	410	27%	161	28%	98	36%	151	23%
Anti-worm per age								
<=1 year	62	41%	19	35%	13	37%	30	49%
>1 en <5 years	155	49%	55	49%	39	48%	61	49%
<5 years	217	46%	74	44%	52	44%	91	49%
>=5 en <=10 years	654	82%	250	82%	105	78%	299	84%
>10 years	225	91%	92	87%	20	87%	113	97%

Suggestion

- MCC advices to continue the *community delivery strategy* of anti-worm medication: twice a year one tablet of mebendazol 500 mg.
- MCC advices to optimize the community delivery strategy of anti-worm medication in cooperation with the department of health by implementing trainings for teachers and other school personnel who will hand out the medication.

4. Respiratory problems

Acute respiratory infections comprise infections of various parts of the respiratory tract, ranging from mild viral and bacterial infections of the upper respiratory tract (e.g. common cold), to life-threatening infections of the lower respiratory tract. Lower respiratory tract infections are the cause of high morbidity and of mortality. Pneumonias in particular are typically one of the leading causes of death among infants and children younger than 5 years[12]. Risk factors for Acute Respiratory Infections (ARI) are poverty, crowding, lack of parental education, malnutrition, low birth weight and lack of breastfeeding.

In the three wards we saw that 12 out of 1513 (1%) suffered from a clinically evident pneumonia. Depending on their medical history and previous treatment, they were treated with amoxicilline or amoxicillin/clavulanic acid. A total of 44 children (3%) suffered from upper respiratory infections (otitis media, otitis externa or tonsillitis). Six children showed dyspnea because of asthma and were treated with salbutamol nebulizers. Although there were many children seen with common could (data not recorded), the amount of serious respiratory problems was surprisingly low during this season.

Tuberculosis (TB) is a significant contributor to the nationaland regional burden of disease. Children account for ~10% of tb cases, although in South Africa (SA) this figure is thought to be higher. CARE II South Africa was launched in October 2014 to support the South Africa National Department of Health (NDOH) with TB prevention and control efforts, working closely with national and provincial partners to close gaps in areas identified, and to further develop sustainable systems which can carry forward

[12] Graham, 1990 - Merson, Global Health Disease Programs, Systems and Policies, page 191.

long-term improvements in TB and drug-resistant (DR) TB diagnosis, care, and treatment services. We referred four children to the tb clinic in Matatiele for further diagnostics.

5. Cardiac problems

Congenital heart disease is the number 8 leading cause of under-five child mortality in South-Africa[13], with the ventricular septal defect as the most prevalent type. In South-Africa, rheumatic heart disease is the leading acquired heart disease among children. Acute Rheumatic Fever is caused by an untreated sore 'strep' throat, which may lead to repeated attacks affecting the joints (arthritis), skin (rash) and heart (carditis). After attacks of untreated ARF, chronic heart valve damage (RHD) may develop. In the instance of RHD, open-heart surgery is necessary to repair or replace heart valves[14].

The medical carrousel included a cardiac examination. There were four children that were suspected of having a pathological murmur. All five got an referral for further diagnostics, preferable in the Umtata hospital in central Mthatha.

6. ENT

We saw a high number of young children with the complaint of frequent nosebleed (epistaxis) (data not recorded). There are multiple causes of epistaxis which can be divided into local, systemic, environmental, and medication induced. Local causes mainly include digital manipulation, a deviated septum or trauma. Environmental factors can include allergies or dryness during winter months. In winter especially children prone to colds and sinus infections, and indoor allergens can be more common (dust mites thrive when we crank up the heat indoors), leaving the nose inflamed – enlarging the blood vessels, irritating the mucous lining and causing bleeding. Other causes are medications (ibuprofen) or supplement/alternative coagulopathies.[15]

Nosebleeds can also point to vitamin deficiency. Vitamin deficiency caused nosebleeds in children and adults are more difficult to stop. A lack of certain vitamins, especially K (coagulation) and C (development of collagen), can contribute to the mechanisms of nosebleeds, as wel as a lack of vit B9 and B12 (elevated levels of homocysteine). Vitamin A deficiency can lead to dryness and inflammation in the nasal cavity, leaving it more susceptible to injury and bleeding. Dry mucus membranes also increase the risk of infection, which can also cause bleeding from the nose. We treated the children with nosebleed with multivitamins together with the advice to eat orange and yellow vegetables and fruits.[16]

Suggestion

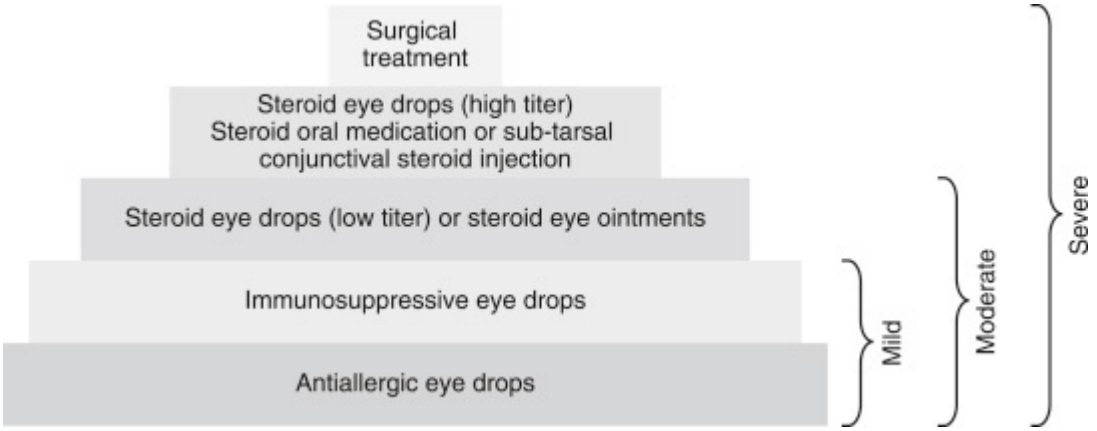
- MCC advices a diet rich in vitamins such as fruits, especially oranges, and yellow vegetables to help prevent frequent epistaxis

[13] http://www.unicef.org/southafrica/SAF_publications_mrc.pdf
[14] http://www.pcssa.org/faq/
[15] Yau, Stephanie. "An update on epistaxis." *Australian Journal of General Practice* 44.9 (2015): 653.
[16] https://www.livestrong.com/article/430809-nose-bleeds-vitamin-deficiencies/

7. Eye problems

A large amount of children had interchangeably complaints of red and itchy eyes (data not recorded) fitting with the clinical picture of a keratoconjunctivitis. 15 children were diagnosed with an acute keratoconjuncitivis at the time of the visit. The etiology of keratoconjunctivitis can be devided into infectious, allergic or traumatic causes. There are different degrees of keratoconjunctivitis.

The treatment of a keratoconjunctivitis depending on the severity:
1. Antihistaminic containing eyedrops / immunosuppressive eye drops
2. Predinsolone containing eyedrops
3. Predinsolone oral medication
4. Surgical treatment



A vitamin A deficiency can trigger a recurrent keratoconjunctivitis as well. Vitamin A deficiency is classically caused by food deprivation. Food sources which contain vitamin A are fish, meat, liver, eggyolk and butter. Besides, it is added as an additive in margarine and various baking products. Different types of fruit and vegetables contain beta-carotene, the precursor of vitamin A. These are different types of leafy vegetables such as spinach and different types of cabbage, carrots, mango's and mandarins (see appendix 3). Beta-carotene gives thes vegetables and fruits a typical orange and yellow colour. After consumption the precursor is converted into vitamin A. A conversion factor of 1:12 is being used. It is still unclear if consumption of beta-carotene can fully meet the vitamin A requirements.[17]

The most vulnerable individuals for developing a vitamin A deficiency are children and pregnant women.[18] Vitamine A deficiency remains a public health problem in developing countries. Worldwide over 190 million preschool-aged children have a vitamin A deficiency. In 2005 a national survey showed a prevalence of 63.6% of South African children aged 1 to 9 years had a vitamin A deficiency. Compared to a national survey in 1994 the vitamin A status of South African children appears to have

[17] https://www.vitamine-info.nl/alle-vitamines-en-mineralen-op-een-rij/vitamine-a/
[18] Faustino, Jacqueline Ferreira, et al. "Vitamin A and the eye: an old tale for modern times." *Arquivos brasileiros de oftalmologia* 79.1 (2016): 56-61.

deteriorated despite the supplementation programme which was introduced in 2002. [19]

Vitamin A deficiency not only causes a keratoconjunctivitis but can also cause night blindness, xerophtalmia, Bitot's spot, keratitis or keratomalacia. In addition to ocular problems, vitamin A deficiency predisposes children to retared growth, infertility, congenital malformations, infections, anaemia and early mortality as well. Besides, a deficiency can also cause a dry and flaky skin and dull hair.

Suggestion

- MCC advices a diet rich in vitamin A (liver, fish and butter contain vitamin A, spinach, cabbage, carrot, mango and mandarins contain beta-carotene (precursor of vitamin A)).
- MCC advices to optimize the vitamin A supplementation programme targeting all children aged 6 months – 5 years and postpartum women within 4 – 8 weeks of delivery.
- MCC advises a fortified cooked porridge breakfast (maize meal and wheat flour are fortified with several vitamins and minerals including vitamin A).
- During the next visit of MCC to Matatiele MCC will arrange the availability of antihistaminic and prednisolone containing eyedrops.

8. HIV

South Africa is currently the country with the largest number of people living with HIV in the world. Many children are HIV positive or have become ill and died due to AIDS. The majority of children are infected before and during the birth process and some later through breastfeeding. Children may also become infected through sexual intercourse, including sexual abuse. The prevention of mother-to-child transmission (PMTCT) has been very effective.
In a 2012 national HIV prevalence, incidence and behaviour survey, the prevalence of HIV measured in children aged 2 – 14 was 2.7% (95% CI:2.1 – 3.4%). HIV prevalence in children in the Eastern Cape is even lower: from the annual progress report the HIV prevalence among the youth was 1.3% in 2012 (95% CI: 0.7-2.3%) which was a decrease from 2.1% in 2008.[20]

We treated 14 children children who had serious secondary infections also indicating possible underlying immuneproblems like HIV. One child could be tested on the spot bij the Department of Health and was fortunately tested negative. Three other children got a referral for HIV and additional TB screening. As the disclosure of being on treatment was not always given by the caretakers the number of children with HIV may be well underscored in our findings.

9. Skin disease

A high burden of aspecific allergic skin disease was found in the children. Although sometimes mixed with eczema the main clinical complaint was diffuse itchy skin. Scientific literature from the Eastern Cape refer to twenty four plant species as possible causative agents of acute contact dermatitis

[19] World Health Organization. "Global prevalence of vitamin A deficiency in populations at risk 1995-2005: WHO global database on vitamin A deficiency." (2009).
[20] http://www.hsrc.ac.za/uploads/pageContent/4565/SABSSM%20IV%20LEO%20final.pdf

(ACD)[21]. The Asteraceae was probably the most important allergenic plant family, represented by commonly used medicinal plants such as Artemisia afra, vegetables such as Lactuca sativa and weeds such as Conyza bonariensis. Sub-acute eczematous lesions of the face and the exposed areas of the upper limbs were characteristic of Asteraceae allergies. Out of the 24 plants mentioned for causing ACD, 67% are principally used as food. Hydrocortioson and topical antihistamine creme was given as a treatment to many.

Scabies was treated with topical or oral therapies on the spot. Topical treatments included benzyl benzoate lotion and permetrin soap. Ivermectin was used as an oral therapy. Ivermectin is expensive and unavailable in Matatiele and was thus imported from the Netherlands to be used for scabies treatment in the older children.

Caretakers received important information on hygiene measures and were advised to put their clothes in a sealed of bag and leave it in the sun for at least 2 days. We also donated many additional clothing and hats to vulnerable affected families, since many of them don't have a second set of clothes.

In respect to other skin diseases we saw 201 children (13%) with variable presentations of dermatomycoses, mainly tinea capitis. Tinea capitis in African countries is highly prevalent and linked to social stigma. Besides overcrowding, ringworm often spreads through the use of infected objects like dirty razor blades when shaving the heads of the children. The presenting signs include scaling of the scalp and is often accompanied by secondary bacterial infection(s). Follicles may be seen discharging pus. Antifungal cream and selsun shampoo were given for severe dermatomycosis.

We encountered a moderate range of different kind of wounds and skin disorders, mainly impetigo. Impetigo is a contagious superficial bacterial infection manifesting on the face and extremities with lesions that progress from papules to vesicles, pustules, and crusts. The cases were treated by antibacterial creams and/or oral antibiotics in severe cases. Eight children (1%) had impetigo. Several underlying factors in the enviroment of the children such as lack of running water, overcrowding, poor personal hygiene, minor skin trauma or eczema are the main predisposing factors for these bacterial skin infections. A low percentage of the number of impetigo cases was secondary to the underlying scabies.

Handwashing is important for reducing spread among children, and other preventive measures employed in reducing the spread of staphylococci/streptococci may also be helpful. A practical way to reduce recurrence rates of staphylococcal furunculosis is treatment with Betadine solution in water. However, the iodine needs to be rinsed off completely not to affect the thyroid function. Children who are iron deficient have higher percentages of boils and vitamin C has also been advocated to improve deficient neutrophil function in prevention of boils.Many children therefore received a multivitamin supplementation for clinical vitamin deficiency and skin problems.

[21] https://www.sciencedirect.com/science/article/pii/S0254629914002300?via%3Dihub

10. Dental health

Despite the availability of epidemiological data on caries prevalence rates in children, there is little evidence to suggest that childhood caries is adequately addressed through policy and service provision efforts in South Africa. Dental caries is influenced by multiple factors such as diet, socio-economic status and the availability of oral health services. Of the 1513 children that were checked, this widespread condition affected 383 children (25%). On top of that 103 children were suffering from caries with pain. Only the children with inevitable dental pain and discomfort were advised to go to a dental clinic. As part of our medical carousel however, all screened children got education on dental hygiene and all were provided with a colourful tooth brush. School oral health programmes could provide additional support for oral health promotion efforts, because of their potential to reach all children, thereby addressing social inequities.

Apart from dental caries we saw several children with extensive periodontal (gum) disease. Periodontal disease is essentially infection caused by bacteria in the mouth. As your body tries to fight the infection, it triggers a chronic inflammatory response putting the immune system under pressure. Over time, the infection spreads lower and deeper until it settles in the roots and loosens the gums from the teeth. This in turn forms periodontal 'pockets' that fill with matter and bacteria that causes further deterioration and erosion of the bone in which the teeth are embedded. As a result, the support base for the teeth become so eroded that the teeth start to shift, loosen and eventually fall out. The first stage of periodontal disease is inflammation of the gums, known as gingivitis, and this is caused by poor dental hygiene. If gingivitis goes undetected or is left untreated, it eventually leads to periodontal disease. Dental hygiene is vital to oral health.

Suggestions:

- MCC encourages the dental mobile clinic by the public health department to regularly diagnose and treat children for dental healthcare.
- Upscaling health promotion concerning dental health in all schools and daycare centers.
- Awareness in the community between the link of severe caries with high sugary sweets, incorrect diet, source of water and fluoride content.
- Affordability of toothbrushes and fluoridated toothpaste
- In the near future fissure sealant programmes

11. Psycho-social, emotional and mental health- developmental disabilities.

Children are at risk of developmental disabilities, due, at least in part, to poverty, malnutrition and social deprivation. Fourty percent of the children in South-Africa is growing up in extreme poverty or neglect. Ever since their birth they are vulnerable. Attending school is often not possible due to poverty, illnesses or because there is no school in the surrounding. Sixty percent of the South-African children starts primary school with a considerable delay which they will never be able to catch up.
The fact that very few children attend kindergarten plays an important role in this. Yet it is precisely those first years of life that are extremely decisive for the development of a child.[22]

[22]Struyf, Annemie and Blancquart, Lieve. *Iemand: Gepakt Door Zuid-Afrika.* Tielt: Lannoo, 2009.

During this medical mission we encountered 37 children with developmental problems, who were doing poor in school with special educational needs due to severe learning difficulties. In 12 cases there was a correlation with the history of adverse childhood experiences (ACE) such as domestic violence, abuse or neglect, death, crime mental illness or parental substance abuse. The presence of ACEs does not mean that a child will experience poor outcomes. However, children's positive experiences or protective factors can prevent children from experiencing adversity and can protect against many of the negative health and life outcomes even after adversity has occurred. All children were referred to the family help and social workers of the Children of Dawn. Comprehensive clinical evaluation is the first step and frequently determines the direction of further investigations. Hearing and vision screening and thyroid function tests should be performed in most patients. Children with neurological findings such as epilepsy should undergo brain imaging.

Global developmental delay and intellectual disability are common disorders in every population, with a prevalence of 1 - 3% [23]. Although a specific cause is not always immediately identifiable, for many affected people the aetiology is genetic or the result of secondary insult to the developing brain. Investigating children with intellectual developmental disorders (IDD) may be a significant challenge, especially in resource-limited settings. Low- and middle-income countries are experiencing a significant reduction in mortality of children under 5 years of age. Children are more frequently

[23] Moeschler, John B., and Michael Shevell. "Comprehensive evaluation of the child with intellectual disability or global developmental delays." *Pediatrics* 134.3 (2014): e903-e918.

surviving for example HIV/AIDS and malaria with potential neurodevelopmental delays as longterm outcomes as a consequence. For low- and middle-income countries this is an emerging new population of children. It is important to reduce the negative consequences of morbidity events in childhood through secondary preventive interventions such as early recognition and support. Currently, however, most teaching programs still focus on the treatment of acute childhood illnesses and improving survival. Often they have limited sensitization, interest and training in child development or recognition of early neurodevelopmental delays. Parents also have strong cultural values and traditions about child development and healthcare. They might be unaware of the significance of serious developmental delays or the presence of significant neurodevelopmental disorders. Usually no medical attention is sought because of developmental or behavioural concerns. In high-income countries there is a trend to rely on the use of screening instruments by practiotioners. These screening tools ar now emerging for resource-limited settings too. Althoug the importance of good practice in routine primary care should not be substituted by screening tools only. It is important to develop a regular surveillance of development during clinical contacts. An awareness that medical care involves going beyond reducing morbidity and mortality needs to be promoted with involvement of the department of health. [24]

Besides the general developmental delays, two children with speech problems and possible autism were detected during this mission. South Africa literature shows that many did not identify children with autism as a group with specific needs. Very often autism is not recognized as a stand-alone condition. Rather, autistic children are viewed as part of a broad and mixed group with “barriers to learning”.[25]
South Africa is marked by stark health disparities. Young children with autism or related developmental conditions and their families get almost no services or support. The vast majority of South Africans rely on the national public-health system for their basic healthcare needs.
Families who have a child with health or developmental problems typically bring them to a community clinic. If a clinic nurse or doctor flags a child for further evaluation, families typically face wait times of 18 months. There is increasing evidence that early intervention has positive outcomes for parents of children with neurodevelopmental disabilities. The National Integrated Early Childhood Development Policy was identified as the most relevant to early detection and intervention. Professionals in low- and middle-income countries urgently need training to recognise red flags of autism in very young children. Autism Navigator® for Primary Care is a web-based course designed to increase awareness of red flags of ASD in the second year of life and thus promote earlier detection and referral for intervention. So-called ‘naturalistic developmental behavioral interventions’ comprise a class of proven autism therapies that caregivers can deliver at home5. The aim is to enhance communication and social interaction by capitalizing on a child’s motivations and interests.

[24] Scherzer, Alfred L., et al. "Global perspective on early diagnosis and intervention for children with developmental delays and disabilities." *Developmental Medicine & Child Neurology* 54.12 (2012): 1079-1084.
[25] Schreibman, Laura, et al. "Naturalistic developmental behavioral interventions: Empirically validated treatments for autism spectrum disorder." *Journal of autism and developmental disorders* 45.8 (2015): 2411-2428.

5. Nurturing Care Framework

'A FRAMEWORK FOR HELPING CHILDREN SURVIVE AND THRIVE TO TRANSFORM HEALTH AND HUMAN POTENTIAL (WHO)'

The Nurturing care framework is adopted as one of the first countries by South Africa in 2018. The new Nurturing Care Framework draws on state-of-the-art evidence on how early childhood development unfolds, to set out the most effective policies and services that will help parents and caregivers provide nurturing care for children. It is designed to serve as a roadmap for action, helping mobilise a coalition of parents and caregivers, national governments, civil society groups, academics, the United Nations, the private sector, educational institutions and service providers to ensure that every baby gets the best start in life. It outlines:

- Why efforts to improve health, well-being and human capital must begin in the earliest years, from pregnancy to age 3.
- The major threats to early childhood development.
- How nurturing care protects young children from the worst effects of adversity and promotes physical, emotional and cognitive development.
- What caregivers need in order to provide nurturing care for young children[26].

[26] http://www.who.int/maternal_child_adolescent/child/nurturing-care-framework/en/

Responsive care giving

It is important that the children have secure emotional relationships with caregivers and that care-seeking for childhood illness happens timely. Therefore MCC stresses the presence of caregivers accompanying the child to the medical check up. Only one (<1%) of the children did not have a caretaker present at the day of the medical check (table 8). We were very pleased with this high attendance of caretakers. When there was no caretaker around, some medication was distribuated by the regional fieldworker to the specific families. A high number of grandparents or extended family memebers were more commonly involved in the care of young children bringing them to the medical checks. In South Africa work migration, abscent fatherhood and high HIV prevalence among younger-to-middle aged adults has led to a heavy burden on grandparents, especially grandmothers, to care for their grandchildren.

Table 8: Child with care taker at the day of the check

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
	N	%	n	%	n	%	n	%
No	1	0%	1	0%	0	0%	0	0%
Yes	1512	100%	578	100%	275	100%	659	100%
Teacher	0	0%	0	0%	0	0%	0	0%

Security and safety of children

Children should not experience neglect, violence, displacement or conflict. South Africa's ongoing violence against children however paints a bleak picture and emphasizes the findings by the first national prevalence study conducted in 2016 and highlighted by the Children's Institute Out of Harm's Way report, which estimates that up to 34% of the country's children are victims of sexual violence and physical abuse before they reach the age of 18. [27]

The study further states that in the Western Cape and Mpumalanga alone, over half of the children reported a lifetime prevalence of physical abuse by caregivers, teachers or relatives.

Violence is interlinked and cumulative in nature; children who experience or witness violence are at increased risk of revictimisation or perpetration later in life and when they become parents themselves they often lack the ability to bond with their own children and are more inclined to use violence.

Furthermore, violence against children has a severe impact on SA's economy. A report by Save the Children: Violence Unwrapped — The Social and Economic Burden of Violence Against Children in South Africa, says that the estimated economic value of disability-adjusted life years lost due to violence against children (including fatal and non-fatal) totalled R202 billion in 2015. This accounted for 3,3% of SA's GDP in 2015. [28]

[27] Jamieson, Lucy, Winnie Sambu, and Shanaaz Mathews. "Out of Harm's Way? Tracking child abuse cases through the child protection system at five selected sites in South Africa-Research Report." (2017).

[28] Fang, Xiangming, et al. "The economic burden of violence against children in South Africa." *International journal of environmental research and public health* 14.11 (2017): 1431.

Children with physical and intellectual disabilities

The overall confirmed prevalence rate for children with disabilities under 10 years in South Africa is 6%. During this visit we encountered 34 special need children. The most prevalent disabilities were mild perceptual or learning disabilities, followed by autism, cerebral palsy, seizure disorders, one child with a giant spina bifida and one older boy with albinism.

Albinism is a condition where a child is unable to produce normal colouring of the skin, hair and eyes due to lack of pigments. Albinism is an inherited, genetic disorder.
The boy was wearing a large brimmed hat and had low vision and pre-cancerous sores on sun – exposed areas. He felt well protected in his family and had many friends at school. A pair of sunglasses were handed to him. Strategies and advice for sun protection were given.

The almost 2 year old boy with spina bifida showed the physical signs of leg weakness and paralysis orthopedic abnormalities, bladder and bowel control problems, including incontinence, unknown urinary tract infections, and unknown kidney function, and some pressure sores and skin irritations.There is a need for further dignostics as to assess a possible hydrocephalus and other abnormalities, together with surgical repair and rehabilitation.
Spina bifida is believed to be caused by a combination of genetic and environmental factors such as alcohol misuse or medication such as antiseizure medications, and poorly managed diabetes. The mother is a refugee herself and she and her child are without documents at this period in time. The Children of the Dawn will try to help the family to get the necessary documents to being able to set the first steps to medical help for the brave boy.
Children with spina bifida should be followed by a specialized team of doctors throughout their lives and families should be educated on the different complications to watch for.
Children with spina bifida have a higher risk of latex allergy, an allergic reaction to natural rubber or latex products. Latex allergy may cause rash, sneezing, itching, watery eyes and a runny nose. It can also cause anaphylaxis, a potentially life-threatening condition in which swelling of the face and airways can make breathing difficult. So it's best to use latex-free gloves and equipment (catheters) when caring for a child with spina bifida.

Foetal Alcohol Syndrome (FAS) is thaught to be the third highest cause of congenital mental retardation. This syndrome is associated with cranio-facial malformations, growth retardation, abnormalities in the nervous system and organ malformation. Foetal Alcohol effects are preventable simply by women refraiming from alcohol during pregnancy. FAS is permanent and irreversible and impairs a child's lifetime ability to function mentally, physically and socially[29].
During this years visit we diagnosed two children with behavioural problems and clinical FAS, which were referred to the social workers of Children of the Dawn.

During our visit we did see one girl with the syndrome of Down with clinical signs of congenital heart disease. We referred her for visual Diagnosis and family help for special needs care.

[29] http://www.fasfacts.org.za/

MCC complements the effort of the Children of Dawn towards support and treatment of maltreated and (sexually) abused children by continous awareness and suitable actions.

Adequate nutrition

During this MCC mission a percentage of 16% of the children showed clinical signs of a vitamin deficiency. As mentioned above, anemia and recurrent eye problems could also be caused by vitamin deficiencies, aspecially vitamin A. The actual amount of vitamin deficiencies might even be higher. Fourty-eight percent of the children were actually treated with multivitamins. Vitamin deficiencies are common in developing countries, mainly because of poor diet diversity. In general, the South African population consumes a cereal-based diet that is low in animal foods, vegetables, and fruit. The 1999 National Food Consumption Survey (NFCS) showed that a large proportion of children ages 1 to 9 years did not consume adequate amounts of various micronutrients, including vitamin A[30]. If we take a closer look to the diet diversity in the Easern Cape region the same conclusions can be drawn[31].

Suggestions:

- Strengthening efforts in collaboration with local NGO's and national initiatives adressing physical, emotional and sexual abuse.
- Improve data-gathering and screening that would help children with disabilities to go to neighbourhood schools and receive support in inclusive settings from an early age.
- Strengthen partnerships between government and NGO's for better chances for children with diabilities and special needs.
- https://www.unicef.org/southafrica/SAF_resources_sitandisability.pdf as a practical guide and www.nurturing-care.org as a valuable guide.

6. Referrals

During MCC's visit to the rural areas around Matatiele a list was made for children needing referral for further diagnosis and/or treatment for suspected pathologies. There was a total of 73 children who were referred by MCC for follow-up. Six children were referred to a cardiologist, 2 to a neurologist, 4 tot ENT specialist, 6 to an eyedocter, 8 for tb screening, 9 for bloodtest after 3 months and 36 children for family support.

Caregiver compliance with referrals for child health services is essential to child health outcomes but there is a lack of data of referral compliance in the regions Eastern Cape. In one 2014 South African study in the neighboring province KwaZulu Natal the overall compliance rate for children with suspected non-acute conditions was 45 percent. Referral compliance was especially low for suspected disorders of vision, hearing and development. Referral compliance was significantly lower

[30] Labadarios D, Steyn N, Maunder E, MacIntyre U, Swart R, Gericke G, et al. The national food consumption survey (NFCS): children aged 1–9 years, South Africa, 1999. Pretoria: Department of Health, Directorate of Nutrition; 2000.
[31] Labadarios, Demetre, Nelia Patricia Steyn, and Johanna Nel. "How diverse is the diet of adult South Africans?." Nutrition journal 10.1 (2011): 33.

for children with younger caregivers, those living in households with low educational attainment and for those with unstable caregiving[32].

Additional studies are in progress to identify other possible contributory factors including: caregiver knowledge and attitudes about referrals, environmental factors (e.g. financial and geographical accessibility) and health system factors (e.g. service availability, health worker availability and health system responsiveness).

Suggestions:

- Active collaboration with the Department of Health and Children of the Dawn is essential in developing interventions to strengthen referral processes as a means to improve the quality of life for disadvantaged and vulnerable children.

Table 9: Follow-up of all children per geographical location

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
	N	%	n	%	n	%	n	%
Dentist	15	1%	14	2%	0	0%	1	0%
Specialist in hospital	24	2%	15	3%	3	1%	6	1%
Revisit	2	0%	2	0%	0	0%	0	0%
Bloodtest after 3 months	9	1%	0	0%	3	1%	6	1%
International organisation	1	0%	1	0%	0	0%	0	0%
Other...	59	4%	27	5%	10	4%	22	3%

7.Treatment

Table 10: Treatment among all children per geographical location

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
	N	%	n	%	n	%	n	%
Ferro	14	1%	0	0%	0	0%	14	2%
mother iron	20	1%	6	1%	4	1%	10	2%
multivitamins	725	48%	254	44%	137	50%	334	51%
anti-worm	169	11%	77	13%	32	12%	60	9%
acute worm	165	11%	61	11%	41	15%	63	10%
anti-lice	1	0%	1	0%	0	0%	0	0%
anti-scabies	62	4%	21	4%	17	6%	24	4%
niclosamide	5	0%	1	0%	0	0%	4	1%
amoxicillin	28	2%	10	2%	12	4%	6	1%
augmentin	12	1%	3	1%	5	2%	4	1%

[32] Compliance with referrals for non-acute child health conditions: evidence from the longitudinal ASENZE study in KwaZulu Natal, South Africa and BMC Health Serv Res. 2014; 14: 242

paracetamol	19	1%	5	1%	6	2%	8	1%
ORS	2	0%	0	0%	2	1%	0	0%
eardrops	7	0%	2	0%	2	1%	3	0%
mupirocine=Bactroban	10	1%	4	1%	4	1%	2	0%
hydrocortisone cream	70	5%	32	6%	10	4%	28	4%
dactarin cream	184	12%	80	14%	24	9%	80	12%
fusidin cream	31	2%	6	1%	8	3%	17	3%
sudo cream	2	0%	2	0%	0	0%	0	0%
neutral cream	5	0%	2	0%	0	0%	3	0%
griseofulvin	1	0%	0	0%	0	0%	1	0%
eyedrops	18	1%	4	1%	5	2%	9	1%

8. Committing to action

Concrete commitments and collective action are needed to implement the strategic actions in supporting nurturing care and realize the Nurturing Care Framework's vision in and around Mataiele .

Here are *five recommended ways* for social workers and regional field workers within Matatiele to help support nurturing care.

- Check identity citizenship for every child
- Empower families and children in disadvantaged circumstances
- Ensure there is a continuum of care
- Protect children from maltreatment and family dissolution
- Integrate children who have additional needs and reach out to the most vulnerable

Our medical findings and the mentioned suggestions/recommendations above, should be underpinning the five components in the nurturing care framework. Necessary interventions can be focused on caregiver capabilities, empowerment of communities, supporting services and/or enabling policies.
The table below lists the outcomes of the different components of nurturing care. Although it will be a long raod to travel to get them all accomplished in the bigger picture, we can make continuous small steps in the right direction with joined forces.

Outcomes (Components of nurturing care)				
Good health	**Adequate nutrition**	**Responsive caregiving**	**Opportunities for early learning**	**Security and safety**
• Caregivers are mentally and physically healthy • Antenatal, childbirth and postnatal care are of good quality • Mothers and children are immunized • Care-seeking for childhood illness is timely • Childhood illness is appropriately managed	• Caregivers' nutritional status is adequate • Breastfeeding is exclusive and initiated early • Complementary feeding and child nutrition are appropriate • Micronutrient supplementation is given as needed • Childhood malnutrition is managed	• The child has secure emotional relations with caregivers • Caregivers are sensitive and responsive to the child's cues • Caregiver-child interactions are enjoyable and stimulating • Communication is bi-directional	• Communication is language-rich • There are opportunities for age-appropriate play and early learning at home and in the community	• Families and children live in clean and safe environments • Families and children practise good hygiene • Children experience supportive discipline • Children do not experience neglect, violence, displacement or conflict

Good Health

- MCC advices to monitor the *community delivery strategy* of anti-worm medication delivered by the Department of Health.
- Active co-operation of the Department of Health and Children of the Dawn is essential in developing interventions to strengthen referral processes as a means to improve the quality of life for disadvantaged and vulnerable children.
- MCC encourages the dental mobile clinic to be on the spot at the same days we do our medical checks for an efficiant referral system and pain treatment.
- Upscaling health promotion concerning dental health in all schools and daycare centers.
- Awareness in the community between the link of severe caries with high sugary sweets, incorrect diet, source of water and fluoride content.

Adequate Nutrition

- MCC advises adequate nutrition during the first 5 years of a child's life (Nurturing Care framwork).
- MCC advises a diet rich in fruits and vegetables, greater diversity, and less added sugars in the daily diet and three meals a day with a minimum of 3 cups of water a day.
- MCC supports the general guidelines: mothers known to be HIV infected should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter and continue breastfeeding for the first 12 months of life. Breastfeeding should continue until the age of 2 years and should be supported by ART adherence strategies.
- Strenghten awareness for the paradox of double burden of malnutrition in Eastern Cape.
- MCC advices to set an example for children at school in the form of school gardens.
- MCC advices a diet rich in vitamin A (liver, fish and butter contain vitamin A, spinach, cabbage, carrot, mango and mandarins contain beta-carotene (precursor of vitamin A)). See appendix 3.
- MCC advices to optimize the vitamin A supplementation programme targeting all children aged 6 months – 5 years and postpartum women within 4 – 8 weeks of delivery.
- MCC advises a fortified cooked porridge breakfast (maize meal and wheat flour are fortified with several vitamins and minerals including vitamin A).

Responsive care giving

- No child shall be medically checked without a dedicated caregiver.
- A minimum of 75 percent of all the referrals should have had adequate follow-up by 3 upto a maximum of 6 months after the MCC visit.

Opportunity for early learning

- Continuation of Children of the Dawn's professional early learning programs and up-scaling to more communities.
- Improve data-gathering and screening that would help children with disabilities to go to special needs schools and receive support in inclusive settings from an early age.
- Strengthen partnerships between government and NGO's for better chances for children with diabilities and special needs.

Security and Safety

- Health promotion on good hygiene.
- Health promotion of a safe and clean environment.
- Ongoing strengthening efforts in collaboration with local NGO's and national initiatives adressing physical, emotional and sexual abuse and maltreatment.

9.Concluding comments and last words

We feel grateful for the amazing support from all the professionals, outreach volunteers, the highly qualified retired nurses and staff from Matatiele in the triangle with the the Department of Health. The MCC team felt more than welcome at our first medical camp in Eastern Cape in South Africa. Mutual targets were hit, and personal connections were strengthened in a harmonious partnership climate. All three parties (Kinderfonds MAMAS, Children of the Dawn and MCC) have agreed to continue joined forces in the 2020 medical mission to further improve local child's health in Eastern Cape. We are excited to continue our close collaboration with all the stakeholders and will monitor the referrals in the coming months.

We are grateful to all caretakers and the communities for bringing the children to location and helping to conduct the program. We are happy we got the opportunity to work with and to learn from all volunteers, translators and others who have helped directly or indirectly, despite their own obligations. And last but not least sharing our success in mutual joy and a news paper article.

We will be back in September 2020!

On behalf of the MCC Matatiele team 2019

10. Appendices

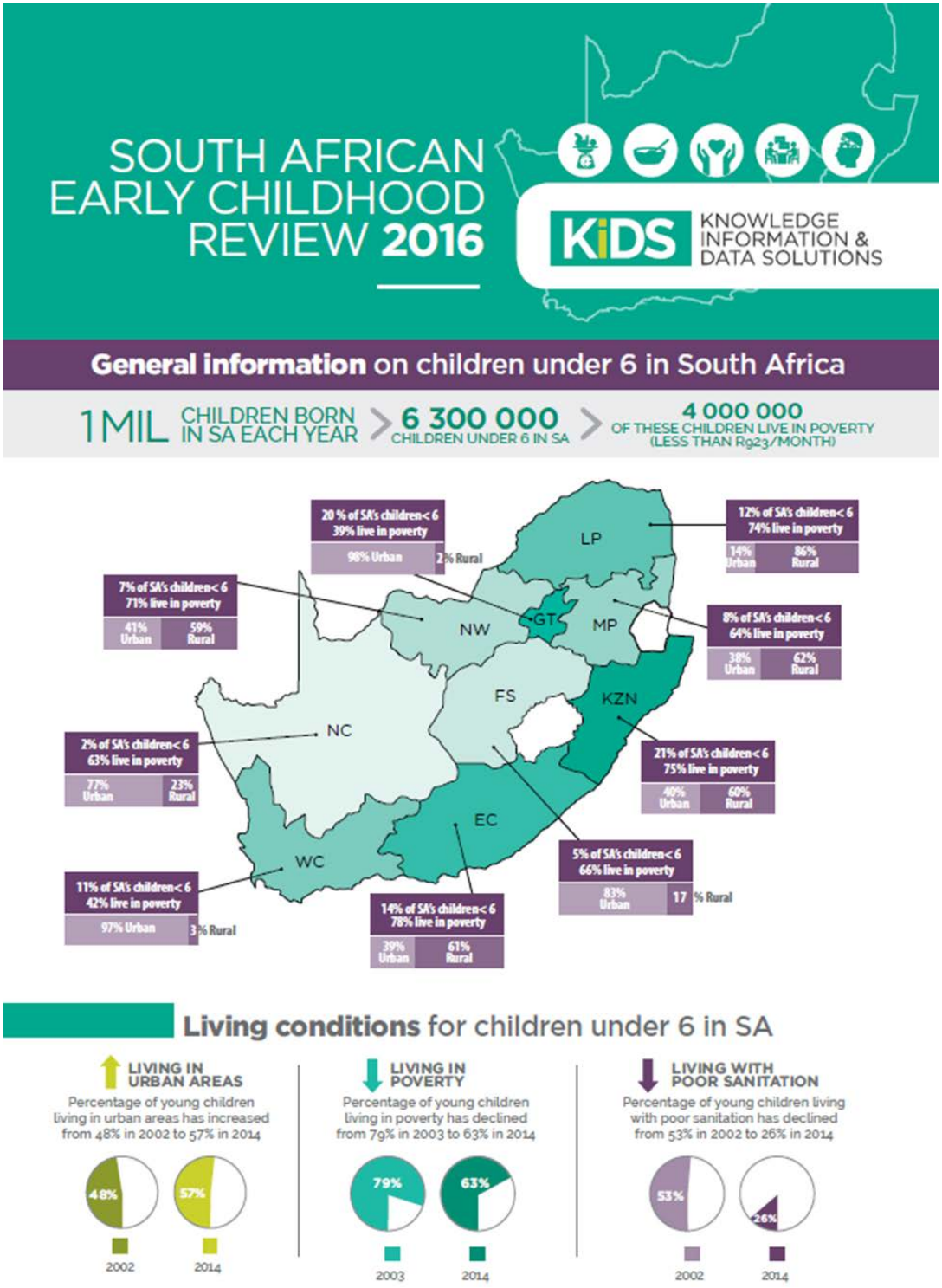
Appendix 1:

Table 11: Disease prevalence among all children per geographical location

	Total		Khauoe		Masakala		Nchodu	
	1513		Total= 579		Total= 275		Total= 659	
	N	%	n	%	n	%	n	%
Underweight	68	4%	27	5%	21	8%	20	3%
Stunting	102	7%	42	7%	15	5%	45	7%
Wasting	38	3%	15	3%	14	5%	9	1%
Anaemia	429	28%	107	18%	78	28%	244	37%
HIV pos.	12	1%	4	1%	5	2%	3	0%
AIDS	2	0%	0	0%	0	0%	2	0%
Malaria (suspected)	1	0%	1	0%	0	0%	0	0%
vitamin deficit (clinical signs)	247	16%	98	17%	43	16%	106	16%
syndrome n.o.s.	4	0%	2	0%	0	0%	2	0%
pneumonia (clinical)	12	1%	2	0%	6	2%	4	1%
tuberculosis (clinical)	4	0%	2	0%	0	0%	2	0%
bronchitis	2	0%	0	0%	1	0%	1	0%
BHR/asthma	6	0%	1	0%	1	0%	4	1%
dehydration : acute diarrhoea	1	0%	0	0%	1	0%	0	0%
dehydration : chronic diarrhoea	1	0%	1	0%	0	0%	0	0%
diarrhoea without dehydration	5	0%	2	0%	3	1%	0	0%
constipation	10	1%	3	1%	0	0%	7	1%
active worm infection	167	11%	61	11%	41	15%	65	10%
active lintworm	6	0%	1	0%	1	0%	4	1%
otitis media acuta	16	1%	6	1%	8	3%	2	0%
otitis media with effusion	19	1%	6	1%	5	2%	8	1%
otitis externa	6	0%	3	1%	0	0%	3	0%
tympanic perforation	1	0%	1	0%	0	0%	0	0%
(adeno)tonsillitis	3	0%	1	0%	1	0%	1	0%
hearing impairment	2	0%	0	0%	1	0%	1	0%
ENT other	15	1%	1	0%	2	1%	12	2%
cariës n.o.s.	278	18%	118	20%	41	15%	119	18%
pain n.o.s	2	0%	1	0%	0	0%	1	0%
caries with pain	103	7%	49	8%	19	7%	35	5%
wounds n.o.s.	16	1%	5	1%	4	1%	7	1%
eczema n.o.s.	27	2%	17	3%	1	0%	9	1%
dermatomycosis	201	13%	82	14%	30	11%	89	14%
Impetigo/furunculosis	8	1%	2	0%	2	1%	4	1%
lice	1	0%	0	0%	1	0%	0	0%
scabies	75	5%	33	6%	17	6%	25	4%
wounds infected,	14	1%	1	0%	5	2%	8	1%
insect bite	3	0%	3	1%	0	0%	0	0%
other (psoriasis etc)	44	3%	12	2%	9	3%	23	3%

psychomotoric retardation	9	1%	8	1%	0	0%	1	0%
hypertonia	1	0%	0	0%	0	0%	1	0%
epilepsy	5	0%	2	0%	1	0%	2	0%
spina bifida	1	0%	0	0%	0	0%	1	0%
migraine/headache	6	0%	1	0%	1	0%	4	1%
physiological murmer	2	0%	1	0%	1	0%	0	0%
pathological murmur (suspected)	4	0%	3	1%	1	0%	0	0%
refractory problem	3	0%	0	0%	2	1%	1	0%
strabismus	5	0%	3	1%	1	0%	1	0%
keratoconjunctivitis	15	1%	5	1%	2	1%	8	1%
inguinal hernia	1	0%	0	0%	0	0%	1	0%
old fracture	1	0%	0	0%	1	0%	0	0%
hernia(umbilical etc)	15	1%	8	1%	1	0%	6	1%

Appendix 2


SOUTH AFRICAN EARLY CHILDHOOD REVIEW 2016
KiDS KNOWLEDGE INFORMATION & DATA SOLUTIONS
General information on children under 6 in South Africa
1 MIL CHILDREN BORN IN SA EACH YEAR
6 300 000 CHILDREN UNDER 6 IN SA
4 000 000 OF THESE CHILDREN LIVE IN POVERTY (LESS THAN R923/MONTH)
20 % of SA's children< 6
39% live in poverty
98% Urban
2% Rural
12% of SA's children< 6
74% live in poverty
14% Urban
86% Rural
7% of SA's children< 6
71% live in poverty
41% Urban
59% Rural
8% of SA's children< 6
64% live in poverty
38% Urban
62% Rural
2% of SA's children< 6
63% live in poverty
77% Urban
23% Rural
21% of SA's children< 6
75% live in poverty
40% Urban
60% Rural
5% of SA's children< 6
66% live in poverty
83% Urban
17% Rural
11% of SA's children< 6
42% live in poverty
97% Urban
3% Rural
14% of SA's children< 6
78% live in poverty
39% Urban
61% Rural
LP
NW
GT
MP
FS
KZN
NC
EC
WC
Living conditions for children under 6 in SA
LIVING IN URBAN AREAS
Percentage of young children living in urban areas has increased from 48% in 2002 to 57% in 2014
48%
57%
2002
2014
LIVING IN POVERTY
Percentage of young children living in poverty has declined from 79% in 2003 to 63% in 2014
79%
63%
2003
2014
LIVING WITH POOR SANITATION
Percentage of young children living with poor sanitation has declined from 53% in 2002 to 26% in 2014
53%
26%
2002
2014

Appendix 3

Figure 4: Sources of vitamin A and signs of vitamin A deficiency

Figure 5: Sources of vitamin A