

# **NOMA is a severe disease**

It is treatable if detected  
and managed early!

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REGIONAL OFFICE FOR

**World Health  
Organization**

**Africa**

Non communicable Diseases Cluster (NCD)  
**Regional Programme for Noma Control**

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Photo credit: WHO/Julie Pudlowski, NGO Hilfsaktion, Professor Sudeshni Naidoo, Dr Dimba Elizabeth, Dr Benoit Varenne, Professor Emmanuel Crezot, Dr Lassara Zala, Dr Will Rodgers and Dr Priscilla Benner, Dr Adeniyi Semiyu Adetunji. Layout and typesetting: Agence Panacee ([www.panacee.fr](http://www.panacee.fr))

# Why this document?

In countries contending with noma, and in spite of numerous initiatives, families, community health workers and primary health care professionals are still **LARGELY** under-informed about this disease. To help bridge the knowledge gap on noma and improve early case diagnosis, detection and treatment, WHO has taken the initiative to update the staging of the disease and to provide, for each stage identified, recommendations for enhanced management.

This brochure is designed as a training tool and is intended for all stakeholders at the primary health care level: health workers, community health care workers and opinion leaders who are in contact with the population groups at risk of contracting the disease.

# What is noma?

**Noma (from Greek: to “devour”) is a necrotizing disease that destroys the mouth and the face.**

- Noma starts as a lesion (a sore) of the gums, inside the mouth. The initial gum lesion then develops into an ulcerative, necrotizing gingivitis that progresses rapidly, destroying the soft tissues and bones of the mouth and further progressing to perforate the hard tissues and skin of the face.
- In the absence of any form of treatment, noma is fatal in 90% of cases. Where noma is detected early, its progression can be rapidly halted, either through basic hygiene rules or with antibiotics. Such early detection helps to prevent suffering, disability and death.
- It mostly affects young children between the ages of 2 and 6 years suffering from malnutrition, living in extreme poverty and with weakened immune systems. Noma is often described as “the face of poverty”.
- Owing to the rapid progression of the disease and the high mortality rate associated with its acute phase, numerous cases of noma remain undetected.

***“Noma is a disease that progresses very rapidly. Without rapid treatment, in a few days, the patient’s condition becomes life-threatening.”***



Disease known for over

**1000** years



**1994,**  
WHO declared noma  
a public health problem

Mostly affects  
children aged  
between

**2** and **6** years



**Now mostly prevalent in sub-Saharan Africa**

Rare cases reported in Latin America and Asia

As much as **90%**  
mortality rate

- Sepsis
- Dehydration
- Malnutrition

**140 000**  
estimated  
new cases/yearly

(Source WHO 1998)

## Without treatment, noma results in:

- **As much as 90% mortality rate. Affected persons die of sepsis or severe dehydration and malnutrition.**
- **Survivors suffer from severe facial disfigurement, have difficulty speaking and eating and face social stigma.**



# What is the **causative agent** of noma?

**The causative agent of noma remains unknown. It seems unlikely that a single infectious agent (virus or bacteria) is responsible for the disease. It would be more appropriate to speak of factors that contribute to the onset of the disease, or its determinants.**

- Noma is the result of complex interactions in immunosuppressed children living in extreme poverty. The validation of a hypothesis pointing to a causative sequence responsible for the disease is ongoing.
- In addition to known factors such as malnutrition, coinfections - measles and malaria - and poor oral hygiene, a number of social and environmental factors such as maternal malnutrition and closely-spaced pregnancies that result in offspring with increasingly weakened immune systems, could be strongly related to the onset of the disease (Source: GESNOMA Group. University of Geneva and Geneva University Hospitals).

## Who are the persons at risk and what social, health and economic factors are associated with the onset of the disease?

- Children aged between 2 and 6 years who are highly immunocompromised
- The period following the weaning of the child
- Extreme poverty
- Poor living conditions
- Living in resource-constrained countries
- Poor oral hygiene
- Malnutrition
- Malaria
- Kwashiorkor
- Measles
- HIV infection
- Immunocompromised adolescents or adults

# Noma can be avoided through simple actions that can be performed by everyone!

Early detection followed by prompt treatment is crucial in improving the health of the affected child and can save his/her life. Treatment can be provided at home in the early stages of the disease.

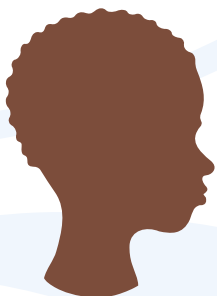
## First action: open and examine your child's mouth!

Regular oral examination of children at home or during medical visits is an indispensable action that helps identify gum lesions that may develop into noma in at-risk subjects.



## Combating misconceptions

- **Noma is not transmitted from one person to another; noma is not a contagious disease!**
- **Noma is not caused by witchcraft or a curse on the child's parents**



# Know the stages of the disease

## 1 Acute necrotizing gingivitis stage

## 2 Oedema stage

### WARNING SIGNAL Simple gingivitis



Bleeding when touched or during brushing; red or purplish red gum, swelling gum.



Spontaneous bleeding gum, onset of painful ulceration of the gums; ulceration involving one or more interdental papillae, fetid breath or halitosis, excessive salivation.



Indefinite duration



Rapid extension of the gingival ulceration and the mucosal tissue, fetid breath or halitosis, facial swelling or oedema, painful cheek, high fever, excessive salivation, mouth soreness, difficulty eating, anorexia, lymphadenopathy.



Progression timeline: 1 to 2 weeks



**THIS IS A MAJOR EMERGENCY: TAKE THE PATIENT TO HOSPITAL FOR EMERGENCY TREATMENT**

**THE PATIENT'S LIFE IS IN DANGER  
EMERGENCY TREATMENT**



D-Day



D-Day +3



D-Day +9

**REVERSIBLE STAGES  
OF THE DISEASE**





# ase in order to act quickly!

## 3 Gangrenous stage



Extensive destruction of intraoral soft and hard tissue; lesion with a well-demarcated perimeter surrounding a blackened necrotic centre, separation of the slough, leaving a hole in the face, often around the cheeks or lips; difficulty eating; rapid perforation of the cheek; exposition of the teeth and denuded bones, progressive drying of the facial gangrene; anorexia; apathy.



Progression timeline:  
1 to 2 weeks

## 4 Scarring stage



Trismus may occur, depending on the location of the lesions, sequestration of teeth and exposure of bones and beginning of scarring.



Progression timeline:  
1 to 2 weeks

## 5 Sequelae stage



The child is disfigured. Trismus may occur, depending on the location of the lesions; there is teeth loss, feeding difficulties, speech problems, salivary leak, teeth displacement, dental anarchy, fusion of maxilla and mandible bones, nasal regurgitation.

ENT IMMEDIATELY TO THE NEAREST DISPENSARY OR APPROPRIATE TREATMENT

ER = ACUTE PHASE OF NOMA  
MENT REQUIRED



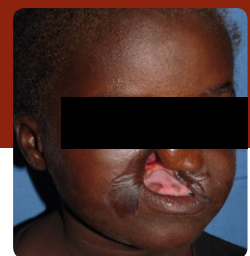
D-Day +15



D-Day +30



D-Day +45



D-Day +5 months

IRREVERSIBLE STAGES  
OF THE DISEASE

# WARNING SIGNAL

## Simple gingivitis



This is a sign of poor oral hygiene.

It is a major predisposing factor that must be diagnosed and treated.

It occurs mostly in malnourished children with weakened immune systems.

All cases of simple gingivitis do not develop into noma, but they constitute a sign that must be treated quickly



### The main signs and symptoms that should alert you are:

- Red or purplish red gums
- Bleeding gums when touched or during brushing of teeth
- Swelling gums
- ➔ There is no external sign at this stage of the disease.
- ➔ **FIRST ACTION: OPEN AND EXAMINE THE CHILD'S MOUTH**



Healthy gums vs gingivitis



### Management by health workers

- Conduct an intraoral examination of the child
- Provide advice on daily oral hygiene
- Use warm salted water (which must have been boiled before) to disinfect the mouth
- Where available, use disinfectant mouthwash
- Advise and/or apply a high-protein daily diet





## Medication

- Mouthwash with chlorhexidine 0,2%, 10 ml /3 times daily
- Mouthwash with betadine /2 times daily can be used for children aged 0 to 6 years: clean the inflamed area with a compress
- Vitamin A supplements



## Management by family and friends

### • **ADVICE ON HYGIENE AND DIET**

- Help the child to maintain proper oral hygiene on a daily basis: use fluoride toothpaste where possible to brush or clean their teeth each day after meals, rinse their mouth with warm salted water (which must have been boiled before) or with a commercial disinfectant mouthwash
- Use safe drinking water
- Provide a high-protein diet (beans, peas, milk, eggs, meat, fish)

### • **DOING THE RIGHT THINGS**

- Go to the nearest health centre if there is no improvement in the event of spontaneous bleeding gums and if the child has trouble eating
- Use your fingers or a short stick to open and examine the child's mouth everyday

## Notes

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# STAGE 1 Acute necrotizing gingivitis



Acute necrotizing gingivitis is an aggravation of simple gingivitis. It is considered the first stage of noma disease.

At this stage, noma can still be halted



## The main signs and symptoms that should alert you are:

- Fetid breath or halitosis
  - Painful ulceration of the gums
  - Spontaneous bleeding of the gums
  - Ulceration involving one or more interdental papillae
  - Excessive salivation
- **Watch out when a child's mouth is closed and he/she hypersalivates and emits fetid breath with a putrid smell, regardless of whether they have fever or not**
- **Be even more vigilant when the child is malnourished with a case history of spotted fever (chickenpox, measles) in the preceding months or even weeks**



## Management by health workers

- Nutrient supplementation
- High-protein daily diet
- Antibiotics

**Notes** .....

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## Medication

- Amoxicillin PO 100 mg/ kg every 12 hours for 14 days + metronidazole PO 15 mg/ kg every 12 hours for 14 days
- Mouthwash with Chlorhexidine 0,2%, 10 ml /3 times daily
- Aspirin or paracetamol
- Use compresses soaked in hydrogen peroxide 20 volumes to clean the gum lesions
- Vitamin A supplements
- Nutritional rehabilitation: high-energy, ready to use paste, 3 sachets/daily



## Management by family and friends

### • TREATMENT TO BE PROVIDED

- Help the child to maintain proper oral hygiene on a daily basis: use fluoride toothpaste where possible to brush or clean their teeth each day after meals, rinse their mouth with warm salted water (which must have been boiled before) or with a commercial disinfectant mouthwash
- Give the child appropriate soft, high-calorie foods prepared with clean water
- Strictly follow the antibiotics prescriptions, dosage and timelines
- Give the child food supplements: Vitamins

### • DOING THE RIGHT THINGS

- Take the child as soon as possible to the nearest health centre
- Examine the inside of the child's mouth every day
- Consult a health professional if the lesions persist, or if the child has fever, has difficulty breathing, has a swelling on his/her cheek or feels pain
- Request follow up by a health professional once a week until the lesion completely disappears
- Go to a dental clinic for an examination to be undertaken by an oral health care professional

# STAGE 2

## Oedema



At the oedema stage, the patient enters into the acute phase of the disease. It is absolutely essentially to act quickly to avoid any aggravation that may prove irreversible.

At this stage, noma can still be halted



### The main signs and symptoms that should alert you are:

- Facial swelling or oedema
  - Difficulty eating
  - Fetid breath or halitosis
  - Rapid extension of the gingival ulceration and the mucosal tissue
  - Soreness of lips or cheeks
  - High fever
  - Excessive salivation
  - Mouth soreness
  - Anorexia
  - Soft lips or cheeks
- ➔ **Facial swelling**
- ➔ **Pains that prevent the child from eating**
- ➔ **Fetid breath**
- ➔ **High fever**



### Management by health professionals

The priority is to stabilize the patient and to quickly improve their general health situation through rehydration, nutritional rehabilitation, administration of vitamins (especially Vitamin A) and treatment with antibiotics.

- Correction of dehydration and electrolyte imbalance
- Nutritional rehabilitation
- Treatment of conditions that foster the development of measles, diarrhoea, malaria, tuberculosis, HIV...
- Use of strong doses of antibiotics: penicillin and metronidazole
- Use of disinfectant mouthwashes
- Correction of anaemia with folic acid, iron, ascorbic acid and Vitamin B

### Notes

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## Medication

- Antibiotic treatment
  - Option 1: Amoxicillin & clavulanic acid, 50 mg/ kg intravenously every 6 hours for 14 days + slow intravenous administration of gentamycin, 5 mg/ kg every 24 hours for 5 to 7 days + slow intravenous administration of metronidazole, 15 mg/ kg every 12 hours for 14 days
  - Option 2: Ampicillin intravenously, 100 mg/ kg every 6 hours for 14 days + slow intravenous administration of gentamycin, 5 mg/ kg every 24 hours for 5 to 7 days + slow intravenous administration of metronidazole, 15 mg/ kg every 12 hours for 14 days
- Mouthwash with Chlorhexidine 0,2%, 10 ml 3 times daily

**THIS IS A MAJOR EMERGENCY:  
THE PATIENT'S LIFE IS IN DANGER**

**DO NOT DELAY! REFER THE PATIENT IMMEDIATELY  
TO THE NEAREST HOSPITAL OR HEALTH CENTRE**



## Management by family and friends

- Take the child as soon as possible to the hospital or health centre for proper treatment
- Do not hide the child at home
- Fully and strictly follow the instructions given by health professionals

# STAGE 3 Gangrenous

The gangrene stage is a major emergency; the child's life is in danger. Sequelae will inevitably set in.

There is still time  
to save  
the child's life



## The main signs and symptoms

- Extensive destruction of intraoral soft and hard tissue
- Presence of a lesion with a well-demarcated perimeter surrounding a blackened necrotic centre
- Bluish-black discoloration at the corresponding external facial surface of the cheek or lips
- Separation of the slough, leaving a hole in the face
- Difficulty eating
- Rapid perforation of the cheek, exposition of the teeth and denuded bones
- More extensive destruction of the cone-shaped tissues below the intraoral cone than those at the top of the cone located on the surface of the face
- Progressive drying of the facial gangrene
- Anorexia



## Management by health professionals

The priority is to stabilize the patient and quickly improve their general health situation through rehydration, nutritional rehabilitation, administration of vitamins (especially Vitamin A) and treatment with antibiotics.

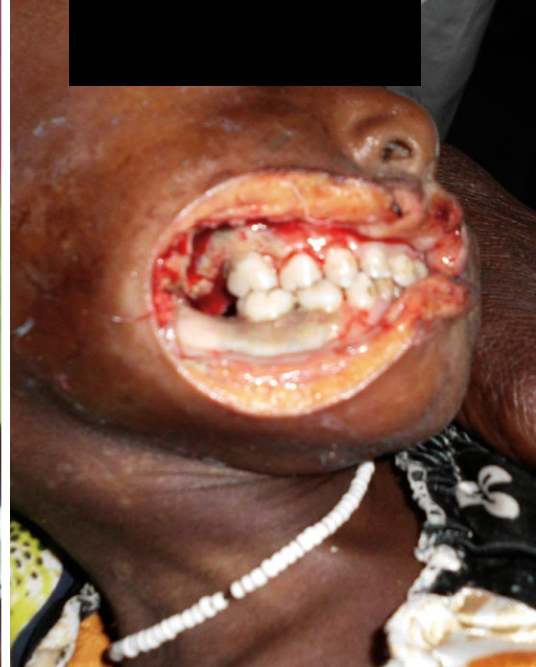
- If the patient's condition permits, rinse out his/her mouth daily with chlorhexidine digluconate solution
- Correction of anaemia with folic acid, iron, ascorbic acid and vitamin B
- Treatment of conditions that foster the development of measles, diarrhoea, malaria, tuberculosis and HIV
- Nutritional rehabilitation, preferably orally or by parenteral administration, or by nasogastric intubation if the patient is severely weakened
- Treatment of lesions: regularly bathe the lesions with an antiseptic, cover the cavities with gauze compresses soaked in antiseptic, keep the compresses moistened by further dousing their external layers with solution
- Correction of dehydration and electrolyte imbalance
- Administration of high doses of antibiotics: penicillin and metronidazole
- Deworming
- Management of secondary haemorrhage

## Notes

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## Medication

- Antibiotic treatment
  - Option 1: Amoxicillin & clavulanic acid intravenously, 50 mg/ kg every 6 hours for 14 days + gentamycin by slow intravenous administration, 5 mg /kg every 24 hours for 5 to 7 days + metronidazole by slow intravenous administration, 15 mg/ kg every 12 hours for 14 days
  - Option 2: Ampicillin intravenously, 100 mg/ kg every 6 hours for 14 days + gentamycin by slow intravenous administration, 5 mg/ kg every 24 hours for 5 to 7 days + metronidazole by slow intravenous administration, 15 mg /kg every 12 hours for 14 days
- Mouthwash with Chlorhexidine 0,2%, 10 ml 3 times daily
- Use honey for local dressing and for anti-bacterial action and regeneration
- Use intramuscular ketamine for treatment of lesions and for dressing

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## Management by family and friends

- Take the child as soon as possible to the hospital or health centre for proper treatment
- Do not hide the child at home
- Fully and strictly follow the instructions given by health professionals

# STAGE 4 Scarring

At this stage, the acute phase is over. However, it is still important to treat the child to limit the sequelae as much as possible and to ensure the child's well-being.

Treat the child to limit the sequelae and ensure his well-being



## Main signs and symptoms

- Trismus may occur, depending on the location of the lesions
- Sequestration of teeth and exposed bones
- Beginning of scar formation



## Management by health workers

The scarring process at this stage is highly retractile and the formation of extremely fibrous scar tissue may induce trismus and a permanent shrinkage of the mouth.

- Physiotherapy may preserve the mouth opening
- Removal of all the scabs and exeresis of necrotic tissue
- Extraction of all loose teeth

## Notes

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## Medication

- Antibiotic treatment
  - Option 1: Amoxicillin & clavulanic acid intravenously, 50 mg/ kg every 6 hours for 14 days + gentamycin by slow intravenous administration, 5 mg /kg every 24 hours for 5 to 7 days + metronidazole by slow intravenous administration, 15 mg/ kg every 12 hours for 14 days
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## Management by family and friends

- Take the child as soon as possible to the hospital or health centre for proper treatment
- Do not hide the child at home
- Fully and strictly follow the instructions given by health professionals

# STAGE 5 Sequelae

At this stage, the irreversible sequelae are present. Management here consists in improving the child's quality of life and ensuring that they live in an environment that is conducive to their well-being.

This is the time  
for reconstruction:  
physical,  
psychological  
and social



## Main signs and symptoms

- Disfigurement
- Trismus may occur, depending on the location of the lesions
- Teeth loss
- Feeding difficulties
- Speech problems
- Salivary leak
- Teeth displacement
- Dental anarchy



## Management by health workers

At the sequelae stage, reconstructive surgery in view of functional and aesthetic rehabilitation is strongly recommended

- Undertake postoperative physiotherapy to prevent the recurrence of trismus
- Provide psychosocial assistance to promote social reintegration
- Undertake major reconstructive surgery only when the acute phase of noma is completely over and the progression of the disease has been definitively halted
- First ensure that the patient recovers his/her functional capacities and is free of trismus before embarking on aesthetic rehabilitation



## Medication

- No antibiotics if the acute phase is over





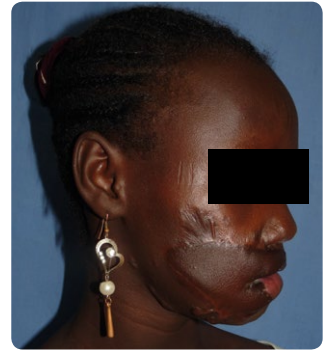
**BEFORE**



**AFTER**



**BEFORE**



**AFTER**

**Proper follow-up and keeping of appointments in the course of multiple surgeries and functional and aesthetic rehabilitation sessions are crucial factors for the success of surgical treatment.**



## **Management by family and friends**

- Go to the health centre and seek referral to a centre specialized in reconstructive surgery of noma sequelae
- Several surgeries may be necessary; it is therefore important to strictly follow the treatment plan
- Keep the follow-up appointments for reconstructive surgery and physiotherapy sessions
- After returning home, continue with the physiotherapy exercises learned at the health centre
- Ensure proper nutrition and practice sound oral hygiene
- Provide an environment that is conducive to the child's well-being, where he/she feels loved, is able to make friends and can receive a proper education



**BEFORE**



**AFTER**



**BEFORE**



**AFTER**

**Notes** .....

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In addition to this information brochure, the following poster was designed to be posted in health centres

# NOMA is a severe disease

## It can be treated if detected early!





**First action:**  
Open and examine children's mouths

**Noma...**  
...is not a contagious disease, is not transmitted from one person to another  
...is not caused by witchcraft or a curse on parents

**Persons at-risk: mostly children aged 2 to 6 years**  
living in conditions of malnutrition and extreme poverty

**Signs and symptoms at the very beginning of the disease**

- Reddened, swollen gums that bleed spontaneously or when touched
- Fetid breath
- Excessive salivation
- Sore, lesion inside the mouth

**What are the warning signs for early detection?**

- Watch out when a child's mouth is closed and he/she hypersalivates and emits fetid breath with a putrid smell, regardless of whether he/she has fever or not

**The 5 stages of the disease**



**1** Acute necrotizing gingivitis stage



**2** Oedema stage



**3** Gangrenous stage



**4** Scarring stage



**5** Sequelae stage



The electronic version of the poster is available at the following URL: <http://apps.who.int/iris/handle/10665/254580>



Non communicable Diseases Cluster (NCD)  
Regional Programme for Noma Control

With the support of  


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## INFORMATION BROCHURE FOR EARLY DETECTION AND MANAGEMENT OF NOMA

Noma is a necrotizing disease that destroys the mouth and face, affecting mostly children between the ages of 2 and 6 years who suffer from malnutrition and live in extreme poverty. The acute phase of noma is devastating and is often fatal if the disease is not treated. Without prompt treatment, as much as 90% of patients die of sepsis or severe dehydration and malnutrition within two weeks of the onset of noma. Survivors of the acute phase present severe facial disfigurement, have difficulty eating and speaking and face social stigma and isolation.

Owing to the rapid progression of the disease and the high mortality rate associated with its acute phase, numerous cases of noma remain undetected. The great majority of affected communities in Africa are situated in peri-urban and rural areas where access to care is difficult and traditional beliefs and stigma still prevalent.

In spite of all the initiatives undertaken by countries with the support of partners, families, community health workers as well as primary health care workers remain largely under-informed about noma. Often, they fail to recognize the early signs and symptoms of the disease in at-risk children.

To help bridge the knowledge gap on noma and to improve early diagnosis, detection and management of cases at primary health care level in countries contending with the disease, WHO has taken the initiative to update the staging of noma disease (from the initial stages to the sequelae stage) based on a consultation of international experts on the subject, and to provide for each stage identified, recommendations to enhance case management at primary health care level. The information presented in this brochure will make it possible to recognize the various stages of noma, beginning with the earliest. The information provided also covers basic actions and treatments for the benefit of families and health workers in view of prompt management, which is crucial in improving the situation of the affected children and may save their lives. Regular examination of the child's oral cavity and prompt administration of the appropriate treatment in the early stages of the disease can significantly reduce the incidence of new cases as well as noma-related morbidity and mortality.

### EMERGENCY CONTACTS

#### THE NEAREST DISPENSARY .....

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#### THE NEAREST HOSPITAL .....

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.....

#### ADDRESSES OF PARTNERS (Foundation, NGO, Local association,...) .....

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Additional information on WHO and oral health is available at the following link:  
<http://www.afro.who.int/en/oral-health/publications.html>