



**NATIONAL PROGRAMME FOR  
PREVENTION AND CONTROL OF  
FLUOROSIS (NPPCF)**

**REVISED GUIDELINES (2014)**

**DIRECTORATE GENERAL OF HEALTH SERVICES**

**MINISTRY OF HEALTH & FAMILY WELFARE**

**GOVERNMENT OF INDIA**

## Foreword

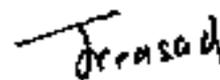
Fluorosis, a public health problem is caused by excess intake of fluoride through drinking water/food products/industrial pollutants over a long period. The duration for the clinical manifestation to appear varies depending on various factors like age, nutritional status, quantity of fluoride ingested, efficiency of kidney to excrete fluoride, etc. It results in major health disorders like dental fluorosis, skeletal fluorosis and non-skeletal fluorosis.

There is no treatment for severe cases of skeletal fluorosis, only efforts can be made towards reducing the disability which has occurred. However, the disease is easily preventable if diagnosed early and steps are taken to prevent intake of excess fluorosis through provision of safe drinking water, promote nutrition and avoid foods with high fluoride content.

At present more than 14 thousand habitations are affected with fluoride levels higher than the permissible limit with population at risk being 117.7 lakhs. With an aim to prevent and control Fluorosis cases in the country, Government of India initiated the **National Programme for Prevention and Control of Fluorosis (NPPCF)** as a new health initiative during 11<sup>th</sup> Five Year Plan in 2008-09 in a phased manner. 100 districts of 17 States were covered during 11<sup>th</sup> Plan and additional 95 new districts are being taken up in a phased manner during the 12<sup>th</sup> Plan.

Under the programme, assistance to States for strengthening manpower in endemic districts, purchase of equipment for lab including an Ion meter, training at various levels, health education and publicity, treatment including reconstructive surgery and rehabilitation and am hopeful that people in the affected districts will be benefitted considerably.

I am glad that Nutrition & IDD cell is updating the guidelines for the National Programme for Prevention and Control of Fluorosis which now includes details of qualifications, job responsibilities of contractual staff under NPPCF, specifications for ion meters, monitoring, dietary counselling etc among other things. I am sure these Guidelines will be extremely helpful in effective implementation of the NPPCF.



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## Preface

The National Programme for Prevention and Control of Fluorosis (NPPCF) addresses a long felt need to take early measures for preventing onset of fluorosis in areas with high fluoride content in ground water.

The Guidelines for National Programme for Prevention and Control of Fluorosis (NPPCF) were formulated in 2009, following a one day workshop held in Chennai. During the first meeting of the Technical Advisory Committee of NPPCF, held on 21<sup>st</sup> March 2014 under the Chairmanship of Dr. S.Y. Kothari, Special DG (PH), it was decided that guidelines be revised giving details of various components.

After several discussions and circulation, the Guidelines have since been updated with no change in the objectives and strategy of the programme. We received valuable suggestions from some of the members of the Technical Advisory Committee but I would take this opportunity to specially thank Dr. A.K. Susheela, Executive Director, Fluorosis Research & Rural Development Foundation, Delhi who has very diligently and sincerely worked on the several drafts of the Guidelines. I would also like to thank Ms. Kumkum Marwah, Research Officer (N) in Directorate General of Health Services for the effort and contribution to this document.



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# NATIONAL PROGRAMME FOR PREVENTION AND CONTROL OF FLUOROSIS

## Revised Guidelines (2014)

### 1. Introduction

Fluorosis, a public health problem is caused by excess intake of fluoride through drinking water/food products/industrial emission over a long period. It results in major health disorders like dental fluorosis, skeletal fluorosis and non-skeletal fluorosis. The late stages of skeletal and dental fluorosis effects being permanent and irreversible in nature are detrimental to the health of an individual and the community, which in turn has adverse effects on growth, development & economy of the country.

The desirable limit of fluoride as per Bureau of Indian Standards (BIS) is 1ppm ( 1 mg per litre). Fluoride may be kept as low as possible as high fluoride is injurious to health .

High levels of Fluoride were reported in 230 districts of 20 States (*after bifurcation of Andhra Pradesh in 2014*) . The population at risk as per population in habitations with high fluoride is 11.7 million as on 1.4.2014 ( data from MDWS). It affects men, women and children of all age groups.

In the endemic States, the geological crust is heavily loaded with fluoride bearing minerals and this fluoride leaches out into the drinking water. The drinking water fluoride so far detected in the country ranges from 0.2 to 48 mg/ litre. However, the information on fluoride content in agricultural crops and other ready to consume food items and industrial emissions from various industries with high fluoride content is a matter of concern. Several of the ready to serve foods, beverages, snacks, etc. have high content of black rock salt (CaF<sub>2</sub>) or 'kala namak' which has 157ppm fluoride. There is a need to avoid fluoride from these sources for improving the health and preventing fluorosis. This can be achieved only through awareness programmes.

As the damage/change in skeletal system and teeth due to prolonged exposure to high fluoride levels is irreversible, the focus of management of fluorosis is on prevention, health promotion, deformity correction and rehabilitation.

In order to address the problem of fluorosis in the country, Govt. of India started 100% centrally approved "**National Programme for Prevention and Control of Fluorosis (NPPCF)**" as a new health initiative during 11<sup>th</sup> Five Year Plan in a phased manner. During the 11<sup>th</sup> Plan 100 districts from 17 States were identified for programme implementation. During the 12<sup>th</sup> Five Year Plan period it is proposed to add another 95 districts for prevention and control of fluorosis. Further, in the 12<sup>th</sup> Plan the programme has been brought under the NCD Flexi-pool of National Health Mission (NHM). The ratio of sharing of funds between Centre and State accordingly would be 75:25 and in case of North Eastern States would be 90:10 .

## 2. Goal and Objectives

The NPPCF aims to prevent and control Fluorosis disease in the country.

- (1) The Objectives of the National Programme for Prevention & Control of Fluorosis are as follows: To collect, assess and use the baseline survey data of fluorosis of Ministry of Drinking Water Supply for starting the project;
- (2) Comprehensive management of fluorosis in the selected areas;
- (3) Capacity building for prevention, diagnosis and management of fluorosis cases.

## 3. Strategy

Following is the strategy under the NPPCF

**A. Capacity building (Human Resource )** at different level of health care delivery system for early detection, management and rehabilitation of fluorosis cases.

### A.1 Training:

Various types of training, advocacy and sensitization for various categories of health professionals /personnel at different levels of health care facilities such as Health workers, ASHA, Anganwadi Workers, Policy Makers, PRI's, VHSC & Teachers will be undertaken at district level.

There will be Trainers Training for State Nodal Officer, District Nodal Officers, District Consultants at Head Quarter of any endemic State/any recognized Reference Laboratory by National experts. Besides, Laboratory monitoring/techniques (estimation of fluoride in urine) Training for Laboratory Technicians at any recognized National Reference Laboratory will be undertaken .

### A.2 Manpower Support:

In order to implement the activities under the Programme manpower support at National level and district level, one National Consultant and one DEO at Central level and one District Consultant, one Lab Technician and three Field Investigators (for six months ) on contractual basis in the district are provided.

## B. Surveillance of fluorosis in the community including school children

Survey will be conducted by the district contractual staff in association with district health officials as per surveillance guidelines for assessment and diagnosis of fluorosis cases including dental fluorosis in children in the age group of 6-11 years, skeletal and non-skeletal fluorosis at community level.

After availability of baseline data Resurvey after three months of intervention activities

### **C. Establishment of diagnostic facilities in the district/ medical hospitals:**

It is proposed to strengthen the laboratory diagnostic facilities in district/ hospitals/ medical college for early detection and confirmation of fluorosis cases.

### **D. Management of fluorosis cases including treatment, surgery, rehabilitation:**

#### **D.1 Early Detection**

The identified cases shall be confirmed by (i) physical examination i.e dental changes, pain and stiffness of peripheral joints, skeletal deformities (ii) laboratory tests i.e. urine, and drinking water analysis for fluoride level and where possible (iii) radiological examination i.e. X-ray of forearm, X-ray of most affected part

#### **D.2 Prompt Intervention :**

The prompt intervention is planned in the following manner

**D.2.1 Health Education** is very important aspect of management. Creating awareness about fluorosis disease, drinking water (safe/unsafe), diet editing and diet counselling through interpersonal communication, group discussions, media, posters, wall paintings etc.

Fluorosis is mainly caused due to excess intake of fluoride through drinking water/food products/industrial pollutants over a long period. Fluorosis is not diagnosed as fluorosis even by several of the medical professionals. This is because there is not much awareness of the problem from the health point of view. There is need to create awareness and skills among the medical as well as paramedical health workers to detect the disease in the community.

**D.2.2 Provision of safe drinking water, water harvesting (rain water), other measures in collaboration with Public Health Engineering Department.**

**D.2.3 Referral** effective linkages would be developed from village level to district with the help of functionaries and personnel from grass root level (AWW, ASHA, PRIs etc.) PHC/CHC level Medical Officers, Health personnel School teachers and District level Officers.

#### **D. 2.4 Medical Management**

Efforts are aimed to reduce the fluorosis induced disability and to improve quality of life of affected patients. Medical treatment is mainly supplementation of Vitamins C & D, Calcium, antioxidants and treatment of malnutrition. Treatment of deformity includes physiotherapy, corrective plasters, orthoses (appropriate appliances).

Some cases of skeletal fluorosis may need surgery to rehabilitate them.

- All patients identified for deformity treatment and surgery will be referred to district hospital.

- Those who need surgery will be given the appropriate treatment at the District hospital
- Complicated cases that cannot be adequately handled at the District hospital will be further referred to the Medical College for expert treatment.

#### 4. Expected Outcome

The expected outcome of the National Programme for Prevention & Control of Fluorosis in the districts will be:-

- a) Number of fluorosis cases managed and rehabilitated in the programme districts
- b) Capacity for laboratory testing for fluoride in water, urine to be developed.
- c) Trained health sector manpower in Government set up for measuring fluoride in urine and water
- d) Improve information base for the community and all concerned in the programme districts.

#### 5. Programme Framework & Phasing

**The programme commenced implementation** in 100 endemic districts in 17 States/UTs in a phased manner during the 11<sup>th</sup> Five Year Plan. **2008-09** 6 districts were selected from each of the 6 zones of the country based on information collected from Ministry of Drinking Water and Sanitation. The activities included baseline survey, diagnosis of Fluorosis afflicted areas, capacity building by setting up/strengthening laboratory for fluoride estimation, training of medical and laboratory manpower, early detection and rapid management and awareness generations through Informative Education Communications (IEC) .

The districts taken up during 2008-09 were : a) **Southern zone** - Nellore (Andhra Pradesh) and Dharampuri, (Tamil Nadu) ; b) **Western zone** – Jamnagar, (Gujarat); c) **Northern zone** – Nagaur, (Rajasthan) ; d) **Eastern zone** – Nayagarh, (Odisha) ; e) **Central zone** – Ujjain, (Madhya Pradesh).

**Year wise addition of districts has been as follows:**

Year	No. of districts
2008-2009	6
2009-2010	14
2010-2011	40
2011-2012	31
2012-2013	9
2013-2014	5
2014-2015	6

**The list of districts covered upto 2014- 2015 is at Annex 1.**

## 6. Activities

### Activities required to initiate the NPPCF

1. Procurement of Ion Meter and other items for Fluoride testing.
2. Training of Laboratory Technicians for 5 days in a reputed institution, where fluoride testing is a regular activity.
3. Training of Consultants on all aspects of Fluorosis – 2 days

### Programme activities

1. Community Diagnosis of Fluorosis village/block/cluster wise.
2. Facility mapping from prevention, health promotion, diagnostic facilities, reconstructive surgery and medical rehabilitation point of view – village/block/district wise.
3. Gap analysis in facilities and organization of physical and financial support for bridging the gaps, as per strategies listed above.
4. Behavioral changes through appropriate IEC strategy .
5. All members having Fluorosis should be introduced to interventions and monitored to improve health. 3 months later, health complaints and UFL to be re-assessed.
6. Referrals for severe cases and their follow up

### The Activities Proposed at 5 levels are tabulated below:-

S. No.	Level	Activities
1.	Community (Village)	<ol style="list-style-type: none"> <li>1. The consultant along with field personnel will assess the entire endemic village and identify the persons suffering from any form of fluorosis, so as to reach to provisional field based diagnosis.</li> <li>2. Awareness-cum-Training Programme for Medical Officers of PHC/CHC and District Hospitals about general symptoms of fluorosis and preventive management. Also for paramedical workers, ICDS workers, PRI functionaries, teachers in the community</li> <li>3. Line listing of water sources, identify and colour code safe</li> </ol>

		<p>sources to be introduced through the PHED. Intervention activities to be introduced for fluorosis prevention. Rehabilitative intervention, reconstructive surgery and Referral system for what is not possible locally</p> <ol style="list-style-type: none"> <li>4. Behavioural changes to be introduced through appropriate IEC approach.</li> <li>5. Inter-sectoral cooperation for interventions for Prevention and Control of Fluorosis with special emphasis on identification and colour code of safe sources.</li> <li>6. Selected interventions for prevention and health promotion to be introduced, behavioural changes, supply of safe drinking water. Monitoring and impact assessment are required.</li> <li>7. Prevalence of fluorosis in a District to be recorded. Management of Non-skeletal Fluorosis would be achieved in a short span of time by introducing interventions.</li> </ol>
2.	Community Health Centres (CHCs)/ FRU	<ol style="list-style-type: none"> <li>1. Similar activities to be introduced for CHC level staff and block level functionaries.</li> <li>2. Training Programme for Clinical examination and management of fluorosis cases – Medical officers, Health personnel of CHCs.</li> <li>3. Training-cum-Awareness Programme for BDC, ICDS staff and Block level functionaries about different components of the Programme for proper supervision and implementation.</li> <li>4. Diagnostic tests of urine fluoride level and skeletal fluorosis level assessment if facilities are available.</li> <li>5. Monitoring the of village/PHC level activities</li> <li>6. Referrals .</li> </ol>
3.	District	<ol style="list-style-type: none"> <li>1. Similar activities as the CHC level to be introduced at District level.</li> <li>2. Develop Fluorosis mapping of the district using water fluoride estimation data and dental fluorosis survey in school children</li> <li>3. Detailed training Programme for Medical Officers &amp; Health Personnel for comprehensive management of fluorosis cases to be drawn up and implemented.</li> <li>4. Training-cum-Awareness Programme for DDC, ICDS and education personnel on various components of the programme .</li> </ol>

		<ol style="list-style-type: none"> <li>5. Diagnostic support for dental, skeletal and non-skeletal fluorosis to be established in a District.</li> <li>6. Basic medical, surgical and rehabilitative activities for cases diagnosed by district level specialists.</li> <li>7. Monitoring.</li> <li>8. Referral of difficult cases to near by Medical College Hospital.</li> <li>9. The CMO of the district will be the Nodal Officer for NPPCF.</li> </ol>
4.	State	<ol style="list-style-type: none"> <li>1. Programme Planning, execution of programme activities, monitoring, mid-term evaluation and reporting to the Centre (GOI) through the State Nodal officer.</li> <li>2. Receipt and disbursement of allocation.</li> <li>3. Utilization certificate processing and physical progress to be submitted to the Centre (GOI) as per proforma.</li> <li>4. Assisting Central Team in follow-up activities.</li> <li>5. The SNO to regularly monitor the progress in the districts</li> </ol>
5.	Centre	<ol style="list-style-type: none"> <li>1. Programme Development, Programme Planning &amp; implementation through States/UTs.</li> <li>2. Fund management and release to the States/UTs</li> <li>3. Supervision, Monitoring and impact assessment.</li> <li>4. Performance reviews</li> </ol>

## Time Schedule of the Activities

S. No.	Activity for New Districts	Duration for recruitment/procurement
1.	Appointment of District Level Consultant, Lab Technician and Field Investigators (3 for 6 months)	2 months
2.	Procurement of laboratory equipment – Ion Meter etc I	4 months
3.	Training of Medical Officers / Doctors at district level, CHCs and PHCs	4 months
4.	Community level assessment and diagnosis of fluorosis cases	6 months after appointment
5.	Comprehensive management of fluorosis cases identified among the community	After six months of launching of the programme

## 7. Infrastructure

Under the programme there are **no regular posts** that have been sanctioned either at the Central level or the district level. Coordination of the programme at the Central level is to be done by Adviser Nutrition/ Incharge of Nutrition and IDD in the Directorate General of Health Services, at the State level by the State Nodal officer and at the District level by the District Nodal officer.

The contractual staff under the programme is as follows:

<u>National Level</u>	National Consultant (1)
	DEO (1)
<u>District Level</u>	District Consultant (1)
	Lab Technician (1)
	Field Investigator (3 for six months)

The **qualifications and the duties required** for the Consultants ( National and District level), Laboratory Technicians and Field Investigators are at **Annex 2.**

The **remuneration for the contractual staff** may be seen at **Annex 3.**

## 8. Survey of Fluorosis in a Community

The magnitude of fluorosis problem in an endemic area needs to be assessed based on appropriate surveillance tools including case definitions, adequate and proper sampling, and survey methodology for taking preventive measures, health promotion activities, deformity correction and rehabilitation of cases.

Under the National Programme for Prevention and Control of Fluorosis, the district laboratory is established/ strengthened for confirmation of fluorosis cases, the district cell under district Nodal Officer is created, staffed with Consultant, Lab Technician and Field Assistants and funds are provided for mobility, support for undertaking community based activities. The survey would also generate the database for impact assessment of the programme. The case definition, sampling procedure and survey methodology are as under:

### A. Case Definition

#### 1. Suspect Case:-

##### ➤ Dental Fluorosis ( in children ):

Any case with a history of residing in an endemic area along with one or both of the followings:

- Chalky white teeth / white spots on the white enamel surface
- Transverse yellow, brown / black bands or spots on the enamel surface (Discoloration away from the gums and bilaterally symmetrical)

##### ➤ Skeletal Fluorosis

Any case with a history of residing in an area with Fluoride above 1.0 mg/l along with one or more of the followings health complaints.

- Severe pain and stiffness in neck, back bone (lumbar region), shoulder, knee and hip region. Pain may commence either in 1 or 2 or more joints. Patient has restricted mobility of cervical and /or lumbar spine and has to turn the whole body towards that side to see
- Knock knee/ Bow leg (In children, adolescents )
- Inability to squat ( advanced stage of Skeletal Fluorosis )
- Ugly gait and posture ( advanced stage of Skeletal Fluorosis )

##### ➤ Non-Skeletal Fluorosis

Any case with a history of residing in an endemic area along with one or more of the following health complaints.

- **Gastro-intestinal problems:** Consistent abdominal pain, intermittent diarrhea/Constipation, bloated feeling, nausea, loss of appetite.

- **Neurological manifestations:** Nervousness & depression, tingling sensation in fingers and toes, excessive thirst and tendency to urinate frequently (Polydipsia and polyuria)
- **Muscular manifestations:** Muscle weakness & stiffness, pain in the muscle and loss of muscle power, unable to walk or work.

*[ Fluorosis endemic area refers to a habitation/village/ town having fluoride level more than 1.5 ppm in drinking water . It is also possible that the drinking water fluoride may be safe with Fluoride <1.5 mg/l; but have all health complaints of Fluorosis. Fluoride entry to the body may be due to food / beverages / snacks / street food with Black Rock Salt consumption which has 157ppm F<sup>-</sup> ].*

- *It is important to identify Non-Skeletal Fluorosis as it is the earliest signs of Fluoride toxicity.*

## 2. Confirmation of a Case:

Any suspected case can be confirmed after retrieval of a clinical history, by the following tests:

- Any suspected case with high level of fluoride in urine (>1mg/L).
- Any suspected case with interosseous membrane calcification in the forearm confirmed by X-ray Radiograph.
- Any suspected case, if kidney ailment is prevailing, serum fluoride need to be tested, besides urine fluoride.

## B. Sampling procedure

The information on fluorosis endemic areas along with fluoride level in the drinking water sources is to be obtained from Public Health Engineering Department (PHED) of the respective endemic states.

The survey for fluorosis would be conducted by the officials of district programme cell in the fluorosis endemic areas through stratified sampling procedure

Urine analysis for fluoride is to be undertaken for suspected cases, both in the schools and the community

1. Based on the level of fluoride content, the villages can be identified in the following 3 categories:

Strata	Fluoride Level
I	upto 1.0 – 3.0 ppm
II	3.1 – 5.0 ppm
III	> 5.0 ppm

2. For prevalence of fluorosis cases, 10% villages of each strata will be selected randomly. If number of villages is up to 20, then all the villages will be surveyed. If number of villages is more than 20, then 10% of villages from each strata (at least 20 villages in total) will be surveyed.

3. All the children in the age group of 6 to 11 years from the primary school (3<sup>rd</sup> to 5<sup>th</sup> standard) in villages of a block will be surveyed for prevalence of dental fluorosis.
4. Survey for skeletal and non-skeletal fluorosis cases would also be carried out in at least 20 households of each of the randomly selected villages of the district where dental fluorosis is prevalent in school children.

### C. Survey Methodology

Two types of surveys are expected to be carried out – the school and the community survey. The tools for assessing Dental Fluorosis is provided at **Annex 4a** and tool for assessing the Joint pain, i.e., the physical tests, is provided at **Annex4b**.

The **school survey** is for Dental Fluorosis (DF) in School children. The base line data for DF and visible Bone Deformities (BD) in School children is assessed class by class. Precoded proforma for baseline data collection for DF and BD survey is provided in **Annex 5a**

Thereafter, a class summary is developed as per the format in **Annex5b**; All class summaries in a School would lead to a School summary - **Annex 5c**. Similarly, there would be a Block and District summaries – **Annex 5d and 5e** respectively.

In the community survey, the base line data of all the members of the selected households is collected as per **Annex 6a**. Thereafter a village summary has to be developed. Details in **Annex 6b**. Similarly, when all household surveys in a Block and a District are completed, Block and District level summaries are brought out as per **Annex 6c and 6d** respectively.

#### **Analysis of urine sample**

Urinary analysis is carried out using an Ion meter. The specifications for the Ion meter are at **Annex 7**

#### **Sample Collection (Urine and Water) :**

1. 30ml of spot urine sample of the suspected cases will be collected in a plastic screw capped bottles (not glass bottles).
2. Put 1 - 2 drops of toluene (AR grade) on urine samples to make a complete layer.
3. Each sample should be properly labeled with number and relevant details.
4. Similarly 30 ml water sample will also be collected from the source and not from any container in the kitchen.

**Transportation of samples:**

- Urine samples should be sent to district laboratory as early as possible; store in a refrigerator.
- Water Samples can be kept at room temperature at district laboratory if not being analyzed immediately; urine should be stored in refrigerator.
- Analysis to be done using ION METER only. Date of testing and method used for testing to be specified in the report.
- Report should be sent to State Nodal officer on the pre-designed Proforma. When one village is completed, the data sheet to be shared with Additional DDG, DGHS, New Delhi.

**9. Capacity Building**

Capacity building is taken up at the Central as well as the district levels. The training of doctors including State, District programme officers and the Consultants as Training of Trainers (TOT) as well as training of Laboratory technicians is organized centrally. The health workers, community based health link workers (ASHA & AWW), sensitization of policy makers, PRIs, VHSC and school teachers in the programme is a key step for its successful implementation is taken up at the district level.

## Training Schedules

	Duration	Venue	Trainers	Trainees	Method of training	Training contents
Medical officers including State and District programme officers, Consultants	2 days	District HQs / State HQs/ National Institution	National level experts	20-25	Presentation, discussion & demonstration	<p>Clinical identification of cases of dental, non-skeletal and skeletal fluorosis, fluoride toxicity, diagnostic tests, radiological findings, fluorosis surveillance strategy, training, comprehensive management of fluorosis cases, IEC to change the behaviour of the community</p> <p>Issues which may confront doctors ( non responding to orally administered drugs)</p>
Lab. Technician	5 days	Recognised laboratory	Faculty of the Lab/Org.	20	Lecture-cum-demonstration: Internal and External Quality Control Procedures; accuracy of testing and reproducible results.	Handling of Ion meter and Ion selective electrode, standardization of technique, collection, storage, preservation and transportation of urine samples. Use of variable pipettes. Estimation of fluoride in Urine blood and water and interpretation of results.
Paramedics	One day	District HQ.	Faculty from District Hospital, who has undergone training on Fluorosis	25-30	Lecture and Discussion, power point presentation	Clinical identifications of cases of non-skeletal, Dental and Skeletal fluorosis in field areas/community. Radiological findings, Comprehensive management of cases, Nutritional interventions and IEC.
ASHAs and ANMs Workers	Half day	PHCs of endemic village/CHCs	District Nodal Officer/District Consultant/ CMO district Hospital who have undergone training on Fluorosis.	30-35	Lecture and discussion in local language, using Powerpoint presentation	Details about fluorosis, demonstration of fluorosis cases (Dental/skeletal), prevention and control, IEC and nutritional interventions monitoring.
Policy makers (PHE, Dept of child dev., school health, education etc)	Half day sensitisation	District HQ.	State Nodal Officer/Consultant/ District trainers	25-30	Lecture-cum-demonstration powerpoint presentation	Details about the burden of fluorosis in the country, morbidity, clinical feature and interventions.
Advocacy PRI & VHSNC & Teachers	½ Day	District HQ	Faculty from State/District Hospitals/ District trainers	Block level workers	Lecture and discussion, powerpoint presentation	Consequences, importance of prevention, nutritional interventions, IEC

## 10. Comprehensive Detection and Management of Fluorosis afflicted individuals

The following guidelines were accepted for implementation of the National Programme on Fluorosis on the recommendation of the Expert Group which met in June 2009:-

- A. Early Detection of fluorosis
- B. Prompt Intervention

### A. Early Detection:-

It includes History retrieval, physical and radiological examination (if X-rays are available). During physical testing the cases are to be identified as suspected cases to be confirmed later by testing urine fluoride level and drinking water fluoride. The symptoms of the suspected cases are as follows:-

- a) Dental changes – chalky white tooth with mottled appearance
- b) Pain & stiffness of major joints ( not the joints in toes and fingers )
- c) Deformities of lower limb in children.
- d) Most importantly history of complaints – with focus on Non-skeletal Fluorosis

The confirmation of the cases shall be undertaken by following methods:

- a) Physical tests
- b) Radiological examination (if X-rays available ).
  - i. X-ray of forearm (AP view)
  - ii. X-ray of most affected part (AP and lateral views)
- c) Laboratory tests
  - i. Urine analysis for fluoride level
  - ii. Serum analysis for fluoride level (Not for community approach)
  - iii. Analysis of drinking water for fluoride level

### B. Practice of Interventions for recovery

The practice of Interventions is to be planned in the following manner:

- i. Preventive measures – This involves Diet Editing and Diet Counseling – ( Diet Editing = Removal of fluoride consumption. Diet Counseling = Promotion of nutrients through diet ). Testing urine fluoride level after 3 months.
- ii. Treatment – Fluorosis disease has no treatment. Medicines like, Calcium, Vit. C & D may be prescribed; but dietary intervention is the best.
- iii. Rehabilitation, if required, to be addressed.

i) **Health Education** is very important aspect of the total management. It is to be undertaken in the following way:

- Creating disease awareness among the community, State Health Dept., Doctors in all avenues
- Creating awareness about source of water (safe/unsafe) by: IEC, media, posters, wall paintings, etc.

ii) **Preventive Measures:**

- a) Providing defluoridated safe drinking water / if available; OR shift to safe ground water sources existing. ( through correct testing of Fluoride by the Consultant / Technician of NPPCF).
- b) Changing dietary habits
  - avoid use of fluoride rich foods, Black rock salt
  - avoid use of fluoride rich Dental products / drugs
  - use of food rich in calcium, vitamin 'C', anti-oxidants, etc.
- c) Water harvesting (rain water), so that safe ground water not depleted.
- d) health education with focus on fluoride toxicity and the need to avoid fluoride consumption.

iii) **Treatment:**

Though the cure for fluorosis has not been documented, some efforts can be aimed at: Reducing the fluorosis induced disability and improving quality of life of affected persons

The treatment has two components:

a) **Supplementation** with Vitamin 'C'; Vitamin 'D'; Antioxidants; Calcium; and correction of malnutrition. Even better is to ensure nutrient rich vegetables and fruits, dairy products etc

b) **Treatment of deformity**

(i) It may be Rickets; Urine and Drinking water Fluoride tested; reduce fluoride to normal range – 0.1 – 1.0 g/l

(ii) **Surgical management:** The surgery is indicated in selected cases for decompression of spine in case of compressive myelopathy and pathological fractures. Otherwise refer to tertiary care hospital for above management. The problem of early stages decompression, the Orthopaedic Surgeon or Neuro-Surgeon to decide based on the cases.

**(iii) Rehabilitation:**

Apart from treatment of deformity there is provision of providing free mobility aids like crutches, wheel chairs, tricycle etc., as prescribed by specialists for the affected persons.

**(iv) Physiotherapy**

Corrective plasters are to be given in a child aged 3 years having Genu Valgum where inter malleolar distance is > 3 inches. The corrective plaster (Plaster of Paris) is to be given repeatedly at 3-4 weeks interval and meanwhile the child is to be given medical treatment. Every child will require approximately 5-6 corrective plasters which shall be followed by appropriate lower limb orthoses / appliances. The same method can be applied for Genu Varum where intercondylar distance is to be measured before & after completion of treatment.

Orthoses: Correction of knee deformities can only be maintained by appropriate appliances like Mermaid Splint, KAFO (Conventional/ Metallic / Plastic). Some cases may require special orthopaedic shoes for correction & maintenance. The appliances may be required for few years till child is growing.

The selected districts are expected to provide these facilities.

## **11. Information, Education and communication (IEC) for Prevention and Control of Fluorosis**

The IEC Plan covering awareness generation and to bring behavioural changes at the community level in affected districts are very important in order to prevent and control fluorosis in the community. For this, there is a need to educate community about adverse health effects of drinking water with high level of fluoride (above 1 ppm). To educate the community about the safe drinking water sources in their habitation and rain water harvesting measures to be adopted at the Panchayat Raj Level, are essential interventions.

Besides water contamination with fluoride, community should be sensitized to avoid all food items contaminated with Black Rock salt ( Vrat ka namak – a high source of fluoride).

The district level media team would be entrusted with the job of advocating with the various functionaries of the district including community level workers namely, ASHA, ANM, School teachers, Panchayat Members, etc. The details are tabulated below:-

## National & State Level

- a) Website of Ministry of Health & F.W.,
- b) Press release in National/State Papers regarding the Programme,
- c) Co-ordinate with Ministry of Rural Development to provide alternate source of water and list the sources on internet.

## District level activities

	Media/Agency	Method	Frequency	Content
1.	Local news papers	a) Press Release b) Questions & Answers	At initiation of the Prog. & repeat after six months	Aims & Objectives of the Prog. Services provided, symptoms, preventive measures
2.	Local T.V.	a) Video spot – 30seconds(before one of the most popular programme in the areas) b) Interviews with experts	Alternate days  Twice in a year	Causes of Fluorosis Treatment facilities Safe drinking water sources  Questions & Answers
3.	Local Radio	a) Audio spots b) Question & Answer Session	Once a day  Thrice in a year	Cases of Fluorosis Treatment facilities Safe drinking water sources
4.	Hospitals/Dispensary/ CHCs/PHCs	a) Posters (local language)	Repeat every year	Treatment facilities, Dietary interventions, Safe drinking water
5.	Directorate of Field Publicity, Song & Drama Division	a) Group discussion, b) Nukkad Natak c) Songs d) Seminars, etc. e) Films	Twice in a month	Treatment facilities Safe drinking water sources
6.	Health Personnel ANM, ASHA, Mahila Mandal Representatives	a) Discussion & inter personal communications	Every day	Treatment facilities Safe drinking water sources
7.	Schools/Home Science Colleges in the area	a) Posters b) Discussion with teachers c) Film show	One in a year	Safe drinking water sources, Avoid unsafe sources
8.	Doctors both Private & Govt. Hospitals	a) Seminar at district level	One day, once in a year to cover all concerns	Identification of Fluorosis cases, their referral and comprehensive management
9	Public Health Engineering Department personnel	a) Awareness meeting at district level	One day, once in a month to cover all concerned districts	Need to have safe sources of water; Harmful effects of Fluorosis

## Slogans for Prevention and Control of Fluorosis

- a) Peele dant, haddi jam yeh hay pani mey fluoride ka kam.
- b) Doodh, dahi, hari sabzi khao, fluorosis se mukti pao.
- c) Peeney ke pani mey fluoride hay jahan fluorosis hay vahan.
- d) Peeney ke pani ki janch karo, apenko fluorosis se bachao.

## **Diet Counselling**

Diet Counselling is a very important aspect in prevention. Besides bringing in change towards drinking of safe water it is also important that foods with high fluoride levels are avoided.

The list of foods to be avoided as well as recommended foods are at **Annex 8**.

Reinforcement of balanced diet with plenty of fruits and vegetables to provide the vitamins and minerals is a must. It is observed that in persons with good nutrition status the adverse effects of higher fluoride are much lower. People also need to be aware that besides water it is also important to avoid foods with high fluoride content.

The Dietary Guidelines may be seen at **Annex 9**.

## **12. Monitoring**

Regular monitoring by the District Nodal Officer and the State Nodal Officer is required.

The **monthly report** of all activities undertaken along with the expenditure incurred at the district level should be sent by the District Nodal Officer to the State Nodal officer and should reach the State by 10<sup>th</sup> of each month. .

The **quarterly report** is also to be sent by the District Nodal Officer which is to be examined by the State Nodal officer and forwarded to the Central Fluorosis cell and should reach by 15<sup>th</sup> of the subsequent month after the quarter as per the same format at **Annex 10** . Information at Serial Number 1 and 2 may not be provided for the quarterly reports but in case of any change in status of District Consultant or Lab Technician, the same may be informed.

The **six monthly report** as per the format at **Annex 10** along with the cumulative progress , should be sent to the Centre by 15<sup>th</sup> of October and 15<sup>th</sup> April every year by the State Nodal officer. Utilisation certificates and the Statement of expenditure to be forwarded to the centre every six months.

**Year wise selected districts under National Programme for Prevention and Control of Fluorosis:**

Year	State	Districts
2008-09	Andhra Pradesh	1. Nellore
	Gujarat	2. Jamnagar
	Rajasthan	3. Nagaur
	Madhya Pradesh	4. Ujjain
	Orissa	5. Nayagarh
	Tamil Nadu	6. Dharmapuri
2009-10	Assam	7. Neygaon
	Bihar	8. Nawada
	Chhattisgarh	9. Durg
	Andhra Pradesh	10. Nalgonda
	Jharkhand	11. Palamau
	Karnataka	12. Mysore, 13. Bellary
	Kerala	14. Pallakad
	Maharashtra	15. Chanderpur 16. Nanded
	Punjab	17. Sangrur
	Uttar Pradesh	18. Unnao, 19. RaeBarelli
	West Bengal	20. Bankura
2010-11	Andhra Pradesh	21. Karimnagar, 22. Prakasam
	Assam	23. K.Long, 24. Kamrup
	Uttar Pradesh	25. Pratagarh, 26. Firozabad
	Karnataka	27. Chikkaballapur, 28. Kopel, 29. Davangere, 30. Tumkur
	Madhya Pradesh	31. Dhar, 32. Seoni, 33. Chindwara, 34. Mandla
	Punjab	35. Firozpur
	Haryana	36. Mahendragarh, 37. Mewat
	Bihar	38. Banka, 39. Aurangabad, 40. Bhagalpur, 41. Gaya, 42. Jammui, 43. Nalanda, 44. Shekhpura
	Jharkhand	45. Garhwa, 46. Chatra
	Orissa	47. Angual, 48. Naupada
	Gujarat	49. Sabarkantha
	Rajasthan	50. Ajmer, 51. Rajsamand, 52. Bhilwara, 53. Tonk, 54. Jodhpur
	Maharashtra	55. Latur, 56. Washim, 57. Yavatmal
	W. Bengal	58. Birbhum, 59. Purlia, 60. D.Dinajpur
2011-12	Andhra Pradesh	61. Guntur, 62. Mehboob Ngr.
	Bihar	63. Kaimur, 64. Munger
	Jharkhand	65. Hazaribagh
	Kerala	66. Alppuzha
	Maharashtra	67. Beed
	Uttar Pd.	68. Mathura
	W. Bengal	69. Maldha
	Karnataka	70. Bangalkot, 71. Bangalore(U), 72. Bijapur, 73. Raichur, 74. Chitra Durga, 75. Gadag, 76. Gulbarga, 77. Hassan, 78. Kolar, 79. Mandia 80. Ramnagaram 81. Shimoga

	Rajasthan	82. Bikaner, 83. Churu, 84. Dausa, 85. Dungarpur, 86. Jaipur, 87. Jaisalmer, 88. Jalore, 89. Pali, 90. Sikar, 91. Udaipur
	Madhya Pradesh	92. Betul, 93. Jhabua, 94. Raigarh, 95. Sehore, 96. Alirajpur, 97. Dindori, 98. Khargoon, 99. Raisen 100. Shajapur
<b>2013-14</b>	Rajasthan	101. Banswara, 102. Sawai Madhopur
	Chhattisgarh	103. Kanker
	Gujarat	104. Vadodra
	J&K	105. Doda
<b>2014-15</b>	Rajasthan	106. Karauli, 107. Chittaurahgarh, 108. Ganganagar 109. Jhalawar, 110. Jhunjhunu
	Gujarat	111. Banas kantha

## Qualifications for District Consultant

Qualifications for the District Consultant and Laboratory Technician have been communicated vide letters No. G.20011/3/2011-Nut&IDD Cell dated 11<sup>th</sup> May 2012, 17<sup>th</sup> September 2012 and 15<sup>th</sup> July 2013.

Overall, the qualifications are as below:

### District Consultant (Fluorosis)

#### 1. Essential Qualification

(a) **For Medical Person:** Post Graduate Degree (MD) in Community Medicine/ Public Health/ Biochemistry/ Microbiology/ Pathology/ Community Resource Management/ Environment Health or equivalent.

**OR**

(b) **For Non Medical Person :** Doctorate Degree (PhD) in Biochemistry/ Nutrition/ Microbiology/ Molecular Biology/ Life Sciences/ Public Health/ Community Resource or equivalent

#### 2. Desirable

At least 3 years experience after Post Graduate medical qualification/Doctorate qualification for non medical in research/ teaching/ laboratory services/ programme implementation etc.

**Note :** In case of **non-availability** of medical person with MD Qualification or Non Medical person with PhD qualification, the essential qualification can be relaxed for medical person as MBBS/ BDA or for Non Medical person as M.Sc in the subjects specified above. The desirable experience in such cases where relaxed qualifications are being considered would be 6 years in research/ teaching/ laboratory services/ programme implementation etc.

**Laboratory Technician**      1 post

Qualification as per State Government recruitment.

**Field investigators**      ( for six month only) **3 posts**

10+2 with science at least 50% aggregate marks. Preference will be given to candidates with 60% & above marks.

## **Job Responsibilities**

### **District Consultant (Fluorosis)**

- To conduct Survey for assessment of magnitude of fluorosis in the district
- To collect the information of fluoride levels in water from PHED dept & mapping the endemic villages of the districts. To establish the laboratory for fluoride estimation of water, urine and serum
- To assist in training programmes for various categories of personnel
- Monitoring and maintenance of data base
- To coordinate for IEC and BCC activities for generating awareness and behavioral changes about Fluorosis in endemic districts
- Coordination with DHS/State Nodal Officers, Public Health Engineering Department (PHED) and other stakeholders
- Preparation of reports and regular reporting of data
- Line listing of fluoride affected villages, Lab facilities available in district for fluoride testing, persons who can benefit with medical intervention in consultation with M.O, and Centres/ hospitals for corrective surgeries

### **Lab Technician:**

- To collect water and urine samples from schools and villages for analysis of fluoride level.
- Analysis of the samples
- To submit laboratory reports to District Consultant/ District Nodal Officer regularly
- To assist in preparation of reports
- Assist in training and IEC activities

### **Field Investigators:**

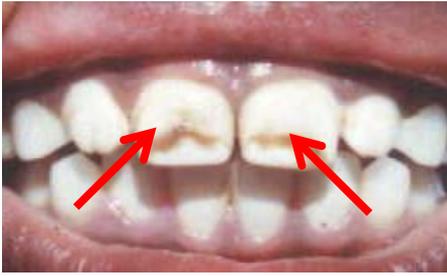
- To assist in conducting survey for dental fluorosis in school children and skeletal and non-skeletal fluorosis in villages.
- Assist in collection of water and urine samples
- Compilation of survey data and reports

## Remuneration of Contractual Staff :

Contractual staff	Remuneration the 12 <sup>th</sup> Plan	Earlier provisions
<b><u>National Level</u></b>		
National Consultant	<b>Rs. 60,000/-pm.</b>	Rs. 50,000/- p.m
DEO (Central level)	<b>Rs. 15,000/-</b>	Rs. 6,500
<b><u>District Level</u></b>		
District Consultant	<b>Rs. 45,000/-pm</b>	Rs. 35,000/-pm
Lab. Technician	<b>Rs. 11,000/-pm</b>	Rs. 10,000/-pm
Field Investigators (3 for six months)	<b>Rs. 11,000/-pm</b>	Rs. 10,000/-pm

## DENTAL FLUOROSIS दन्त्य फ्लोरोसिस

1



**White, Yellow spots on the teeth. Spots away from the gums and seen as horizontal streaks and in pairs (arrow).**  
 दातों पर सफेद, पीले धब्बे जो मसूड़ों से दूर आड़ी रेखाओं के रूप में दिखते हैं।  
 (तीर से इंगित)

2



**Chalky white appearance of teeth with pits (arrow).**  
 चूनें जैसे सफेद दांत जिन पर गड्ढे पड़े हुये हैं।  
 (तीर से इंगित)

3



Teeth

**showing yellow or brown horizontal lines (arrow)**  
 दातों पर पीली, भूरी आड़ी रेखाएँ (तीर से इंगित)

4



Teeth

**showing brown or black spots (arrow)**  
 दातों पर भूरे, काले धब्बे (तीर से इंगित)

### **DENTAL FLUOROSIS & DIRTY TEETH**

**दन्त्य फ्लोरोसिस एवं गंदे दांत**  
**Upper teeth showing Dental Fluorosis & Lower showing Dirty Teeth along the gums (arrow).**  
 ऊपर के दांत दंत फ्लोरोसिस को प्रदर्शित करते हुये तथा नीचे के दांत मसूड़ों की तरफ से गंदे होने का प्रदर्शन करते हुये (तीर से इंगित)

5



### **DENTAL CARIES**

**दन्त्य क्षय:**  
**Cavities between 2 teeth or under the gums. Different disease than Dental Fluorosis.**

दो दांतों के बीच अथवा मसूड़ों के नीचे दंत क्षय:  
 दंत फ्लोरोसिस से अलग बीमारी (तीर से इंगित)

6



## How to test pain in major joints (possibly Skeletal Fluorosis)

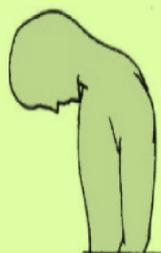
मुख्य जोड़ों में दर्द की पहचान कैसे करे  
(संभावित कंकालीय फ्लोरोसिस)

### Normal Individuals

Normal, healthy individual can bend his body and touch the floor/toes



Normal, healthy individual can touch the chest with chin



Normal, healthy individual can stretch the hands, fold the arms and touch the back of the head



### Those individuals with joint pain

Unable to bend, without folding his knees



Unable to bend the neck, touching the chest with chin not possible



Unable to stretch the hands, fold the arms and touch the back of the head



## SCREENING FOR DENTAL FLUOROSIS (DF) & BONE DEFORMITIES (BD) IN SCHOOL CHILDREN

<b>NAME OF THE SCHOOL &amp; ADDRESS:</b> _____	
<b>CLASS:</b> <input type="text"/>	<b>SECTION:</b> <input type="text"/>
<b>STRENGTH OF STUDENTS :</b> <input type="text"/>	<b>STUDENTS PRESENT ON THE DAY OF SURVEY:</b> <input type="text"/>
<b>TOTAL STUDENTS WITH DF:</b> <input type="text"/>	<b>TOTAL STUDENTS WITH BD:</b> <input type="text"/>

S. NO.	NAME OF THE STUDENTS	SEX (M/F)	AGE (YRS.)	HEALTH COMPLAINTS (TICK IF YES)				NAME OF THE VILLAGE, FROM WHERE THE STUDENT WITH DF & BD HAILS FROM		URINE SAMPLE PROVIDED (Y/N)	FLUORIDE CONTENT IN URINE SAMPLE (mg/l)		
				Dental fluorosis	SHORT STATURE	BOW LEGS	KNOCK KNEE						
1												•	
2												•	
3												•	
4												•	
5												•	
6												•	
7												•	
8												•	
9												•	
10												•	

<b>NAME OF THE CLASS TEACHER:</b> _____	<b>SIGNATURE:</b> _____	<b>DATE:</b> <input type="text"/>
<b>NAME OF THE Prog official &amp; designation:</b> _____	<b>SIGNATURE:</b> _____	<b>DATE:</b> <input type="text"/>

\* School Code No., Name of the student, Class, Section, should be written on the plastic bottle during urine samples collection  
 \*\* Use extra sheet(s), if the number of students afflicted with DF in one class is more than 10.



**SCHOOL SUMMARY** (SUMMARY OF CLASSES (3to 5) IN A SCHOOL)**SURVEY OF DENTAL FLUOROSIS (DF) & BONE DEFORMITIES (BD) IN SCHOOL CHILDREN**

1.	Total nos. of students in class 3 to 5 the school:	<input type="text"/>	1a. Nos. of boys:	<input type="text"/>	1b. Nos. of girls:	<input type="text"/>
2.	Total nos. of students examined for DF	<input type="text"/>	2a. Nos. of boys:	<input type="text"/>	2b. Nos. of girls:	<input type="text"/>
3.	Total nos. of students afflicted with DF	<input type="text"/>	3a. Nos. of boys:	<input type="text"/>	3b. Nos. of girls:	<input type="text"/>
4.	Percentage of students afflicted with DF:	<input type="text"/>	4a. % of boys:	<input type="text"/>	4b. % of girls:	<input type="text"/>
5.	Total nos. of students afflicted with BD	<input type="text"/>	5a. Nos. of boys:	<input type="text"/>	5b. Nos. of girls:	<input type="text"/>
6.	Percentage of students afflicted with BD:	<input type="text"/>	6a. % of boys:	<input type="text"/>	6b. % of girls:	<input type="text"/>
7.	Total nos. of students afflicted with DF & BD:	<input type="text"/>	Percentage of students			<input type="text"/>
8.	Total nos. of villages from where the students afflicted with DF & BD hails from:					<input type="text"/>
	(a) Nature of source(s):	HP <input type="checkbox"/>	TW <input type="checkbox"/>	OW <input type="checkbox"/>	RW <input type="checkbox"/>	RO <input type="checkbox"/>
		PWS <input type="checkbox"/>	Any other: _____			
	(b) F <sup>-</sup> content in water source in school:	(i) <input type="text"/>	•	<input type="text"/>	mg/l	(ii) <input type="text"/>
						<input type="text"/>

Name of the Coordinator, who summarized the data:		_____					
Signature:		Date: <input type="text"/>					

**BLOCK SUMMARY***(SUMMARY OF SCHOOLS Surveyed IN A BLOCK)***SURVEY OF DENTAL FLUOROSIS (DF) & BONE DEFORMITIES (BD) IN SCHOOL CHILDREN**

1.a	Total nos. of schools in the block:	<input type="text"/>	<input type="text"/>	<input type="text"/>	1b	Total nos. of schools surveyed in the block:	<input type="text"/>	<input type="text"/>	<input type="text"/>			
2.	Total nos. of students in the block:	<input type="text"/>	<input type="text"/>	<input type="text"/>	2a. Nos. of boys:	<input type="text"/>	<input type="text"/>	<input type="text"/>	2b. Nos. of girls:	<input type="text"/>	<input type="text"/>	<input type="text"/>
3.	Total nos. of students examined for DF	<input type="text"/>	<input type="text"/>	<input type="text"/>	3a. Nos. of boys:	<input type="text"/>	<input type="text"/>	<input type="text"/>	3b. Nos. of girls:	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.	Total nos. of students afflicted with DF	<input type="text"/>	<input type="text"/>	<input type="text"/>	4a. Nos. of boys:	<input type="text"/>	<input type="text"/>	<input type="text"/>	4b. Nos. of girls:	<input type="text"/>	<input type="text"/>	<input type="text"/>
5.	Percentage of students afflicted with DF:	<input type="text"/>	<input type="text"/>		5a. % of boys:	<input type="text"/>	<input type="text"/>		5b. % of girls:	<input type="text"/>	<input type="text"/>	<input type="text"/>
6.	Total nos. of students afflicted with BD	<input type="text"/>	<input type="text"/>	<input type="text"/>	6a. Nos. of boys:	<input type="text"/>	<input type="text"/>	<input type="text"/>	6b. Nos. of girls:	<input type="text"/>	<input type="text"/>	<input type="text"/>
7.	Percentage of students afflicted with BD:	<input type="text"/>	<input type="text"/>		7a. % of boys:	<input type="text"/>	<input type="text"/>		7b. % of girls:	<input type="text"/>	<input type="text"/>	<input type="text"/>
8.	Total nos. of students afflicted with DF & BD:	<input type="text"/>	<input type="text"/>	<input type="text"/>					8a. Percentage of students	<input type="text"/>	<input type="text"/>	<input type="text"/>
9.	Total nos. of villages from where the students afflicted with DF & BD hail from:	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>				

Name of the coordinator:

_____											
Date:	<input type="text"/>	Signature	<input type="text"/>								

**DISTRICT SUMMARY***(Summary of schools surveyed in all blocks)***SURVEY OF DENTAL FLUOROSIS (DF) & BONE DEFORMITIES (BD) IN SCHOOL CHILDREN**

1.	Total nos. of schools surveyed in district:	<input type="text"/>	<input type="text"/>	<input type="text"/>			
2.	Total nos. of students in all the blocks:	<input type="text"/>	<input type="text"/>	<input type="text"/>	2a. Nos. of boys:	<input type="text"/>	<input type="text"/>
					2b. Nos. of girls:	<input type="text"/>	<input type="text"/>
3.	Total nos. of students examined for DF	<input type="text"/>	<input type="text"/>	<input type="text"/>	3a. Nos. of boys:	<input type="text"/>	<input type="text"/>
					3b. Nos. of girls:	<input type="text"/>	<input type="text"/>
4.	Total nos. of students afflicted with DF	<input type="text"/>	<input type="text"/>	<input type="text"/>	4a. Nos. of boys:	<input type="text"/>	<input type="text"/>
					4b. Nos. of girls:	<input type="text"/>	<input type="text"/>
5.	Percentage of students afflicted with DF:	<input type="text"/>	<input type="text"/>		5a. % of boys:	<input type="text"/>	<input type="text"/>
					5b. % of girls:	<input type="text"/>	<input type="text"/>
6.	Total nos. of students afflicted with BD	<input type="text"/>	<input type="text"/>	<input type="text"/>	6a. Nos. of boys:	<input type="text"/>	<input type="text"/>
					6b. Nos. of girls:	<input type="text"/>	<input type="text"/>
7.	Percentage of students afflicted with BD:	<input type="text"/>	<input type="text"/>		7a. % of boys:	<input type="text"/>	<input type="text"/>
					7b. % of girls:	<input type="text"/>	<input type="text"/>
8.	Total nos. of students afflicted with DF & BD:	<input type="text"/>	<input type="text"/>	<input type="text"/>	8a. Percentage of students	<input type="text"/>	<input type="text"/>
9.	Total nos. of villages from where the students afflicted with DF & BD hail from:	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>	<input type="text"/>

Name of the coordinator:

---

Date:








Signature

## PROFORMA FOR HOUSEHOLD LEVEL BASELINE SURVEY

गृह स्तर की सूचना हेतु प्रपत्र

Proforma No.	<input type="text"/>	Name of the village:	<input type="text"/>	Name of the Block:	<input type="text"/>
प्रारूप संख्या		गांव का नाम		ब्लॉक का नाम	
1. Name of the head of the family:		2. Are you aware / heard of fluoride poisoning / Fluorosis disease?			(Tick ✓)
परिवार के मुखिया का नाम		क्या आपने फ्लोराइड विषाक्तकरण या फ्लोरोसिस बीमारी के बारे में सुना है।			Y हाँ <input type="checkbox"/>
					N नहीं <input type="checkbox"/>
3a. Source of drinking water:		3b. Type of source(s):		Any other (Specify):	
(Tick ✓)		(Tick ✓)			
Private	Public	HP	TW	OW	RW
PSW	Pond	Any other (Specify):			
पीने के पानी का स्रोत	निजी	सरकारी	स्रोत का प्रकार	हैण्डपम्प	नलकूप
				खुला कुआ	वर्षा जल
				नल का पानी	तालाब
				अन्य (स्पष्ट करे)	

**Fill the following box (S. No. 4 to 8) after filling the Page 2: क्रमांक 4 से 8 तक के बाक्स, पेज न. 2 की प्रविष्टि के पश्चात भरें।**

4a. Total no. of family members:	<input type="text"/>	4b. Male	<input type="text"/>	4c. Female:	<input type="text"/>
परिवार के सदस्यों की कुल संख्या		पुरुष		महिला	
5a. No. of pregnant woman in the family:	<input type="text"/>	5b. No. of lactating mother in the family:	<input type="text"/>	5c. Any abortion (A) / stillbirth (S) in the family (last 1 Year):	(Tick ✓)
परिवार में गर्भवती महिलाओं की संख्या		परिवार में स्तनपान कराने वाली महिलाओं की संख्या		कोई गर्भपात/मरे हुये बच्चे का जन्म परिवार में (पिछले एक वर्ष में)	Y हाँ <input type="checkbox"/>
					N नहीं <input type="checkbox"/>
6. No. of children affected with DF:	<input type="text"/>				
दांत फ्लोरोसिस से ग्रसित बच्चों की संख्या					
7. No. of family members affected with early warning signs:	<input type="text"/>				
परिवार में खतरनाक स्थिति के पूर्व लक्षणों से ग्रसित सदस्यों की संख्या					
8. No. of family members affected with Skeletal Fluorosis:	<input type="text"/>				
परिवार में कंकालीय फ्लोरोसिस से प्रभावित सदस्यों की संख्या					

Name of the Field Investigator who did the survey:	<input type="text"/>	Signature:	<input type="text"/>	Date:	<input type="text"/>
सर्वेक्षण करने वाले कार्यक्षेत्र अन्वेषक का नाम		हस्ताक्षर		दिनांक	

Name of the Supervisor:	<input type="text"/>	Signature:	<input type="text"/>	Date:	<input type="text"/>
पर्यवेक्षक का नाम		हस्ताक्षर		दिनांक	

<b>NOTE:</b>	Guideline for filling-up the Proforma : For Example
	Block Name is DEGANNA = DG (1 <sup>st</sup> & 3 <sup>rd</sup> Letters of Block Name)
	Village Name is RAMPURA = RAM (First 3 letters of Village Name)
	Field Investigator ID No. = 18
	Household Number = 100
	D G R A M 1 8 1 0 0
	HP – Hand Pump; TW – Tube Well; OW – Open Well; RW – Rain Water; PSW – Pipe Supply Water
नोट	प्रारूप भरने के लिए दिशानिर्देश : उदाहरणार्थ ब्लॉक का नाम डेगाना = डीजी ( ब्लॉक के नाम के प्रथम एवं तृतीय शब्द) गांव का नाम रामपुरा = राम ( गांव के नाम के प्रथम तीन शब्द) कार्यक्षेत्र अन्वेषक आईडी संख्या = 18 परिवार संख्या = 100



## Village Summary (Summary of all members of all households in a village)

ग्राम की संकलित सूचना (परिवार के सभी सदस्यों की संकलित सूचना)

Name of the village: गांव का नाम		Name of the block: ब्लॉक का नाम	
1. Total no. of households surveyed in the village: गांव में सर्वेक्षण किये गये कुल घरों की संख्या		2. % of household members is aware / heard of Fluorosis disease? % परिवार के सदस्यों ने फ्लोरोसिस बीमारी से अवगत है ?	
2a. Total no. of members in all households in the village: गांव में सभी घरों में सदस्यों की कुल संख्या		2b. Male: पुरुष	2c. Female: महिला
3. No. of Private / Public water sources in the village: गांव में निजी/सरकारी पानी के स्रोतों की संख्या		(a) Private निजी	(b) Public सरकारी
4. The Type & No. of water sources: पानी के स्रोतों के प्रकार और संख्या		(i) HP हैण्डपम्प	(ii) TW नलकूप
		(iii) OW खुला कुआ	(iv) RW वर्षा जल
		(v) PSW नल का पानी	(vi) Pond तालाब
		(vii) Any other अन्य कोई	Total No. sources कुल स्रोत (i + ii + iii + iv + v + vi + vii)
5. No. of pregnant women in the village (during survey period): गांव में गर्भवती महिलाओं की संख्या ( सर्वेक्षण के दौरान)			
6. No. of lactating mothers in the village (during survey period): गांव में स्तनपान कराने वाली माताओं की संख्या ( सर्वेक्षण के दौरान)			
7. No. of abortions / still births taken place in the village (last 1 year): गांव में गर्भपात/मृतजन्म बच्चों की कुल संख्या (पिछले 1 वर्ष में)			
8a. Total no. of children affected with DF: दन्त्य फ्लोरोसिस से प्रभावित बच्चों की कुल संख्या		8b. Prevalence (%) of DF in children: बच्चों में दन्त्य फ्लोरोसिस की व्यापकता (%)	
9a. No. of persons affected with early warning signs: खतरनाक स्थिति के पूर्व लक्षणों से ग्रसित सदस्यों की संख्या		9b. Prevalence (%) of early warning signs: खतरनाक स्थिति के पूर्व लक्षण की व्यापकता (%)	
10a. No. of persons affected with Skeletal Fluorosis: कंकालीय फ्लोरोसिस से ग्रसित सदस्यों की संख्या		10b. Prevalence (%) of Skeletal Fluorosis: कंकालीय फ्लोरोसिस की व्यापकता (%)	
11a. No. of persons consuming fluoride containing food items: फ्लोराइड युक्त खाद्य पदार्थों का सेवन करने वाले सदस्यों की संख्या		11b. Percentage of population consuming fluoride containing food items: फ्लोराइड युक्त खाद्य पदार्थ सेवन करने वाले सदस्यों की व्यापकता (%)	
Name of the Supervisor: पर्यवेक्षक का नाम		Signature: हस्ताक्षर	
		Date: दिनांक	

● HP – Hand Pump; TW – Tube Well; OW – Open Well; RW – Rain Water Harvesting; PSW – Piped Water Supply  
● हैण्डपम्प नलकूप खुला कुआ वर्षाजल नल का पानी



## District Summary (Summary of all blocks)

जिले की संकलित सूचना

Name of the District:																	
जिले का नाम																	
1. Total no. of households surveyed in all the blocks in the district:																	
जिले के पूर्ण ब्लॉक में सर्वेक्षण किये गये कुल घरों की संख्या																	
2a. Total population of the district:							2b. Male:					2c. Female:					
जिले में कुल जनसंख्या							पुरुष					महिला					
3. No. of Private and Public water sources in the district:							(a) Private					(b) Public					
जिले में निजी व सरकारी पानी के स्रोतों की संख्या							निजी					सरकारी					
4. The Type & No. of water sources:		(i) HP		(ii) TW		(iii) OW		(iv) RW		(v) PSW		(vi) Pond		(vii) Any other		Total No. sources	
पानी के स्रोतों के प्रकार और संख्या		हैण्डपम्प		नलकूप		खुला कुआ		वर्षा जल		नल का पानी		तालाब		अन्य कोई		कुल स्रोत (i + ii + iii + iv + v + vi + vii)	
5. No. of pregnant women in the district (during survey period):																	
जिले में गर्भवती महिलाओं की संख्या (सर्वेक्षण के दौरान)																	
6. No. of lactating mothers in the district (during survey period):																	
जिले में स्तनपान कराने वाली माताओं की संख्या (सर्वेक्षण के दौरान)																	
7. No. of abortions / still births taken place in the district (last 1 year):																	
जिले में गर्भपात/मृतजन्म बच्चों की कुल संख्या (पिछले 1 वर्ष में)																	
8a. Total no. of children affected with DF:							8b. Prevalence (%) of DF among the children:										
दन्त्य फ्लोरोसिस से प्रभावित बच्चों की कुल संख्या							बच्चों में दन्त्य फ्लोरोसिस का व्यापकता (%)										
9a. No. of persons affected with early warning signs:							9b. Prevalence (%) of early warning signs:										
खतरनाक स्थिति के पूर्व लक्षणों से ग्रसित सदस्यों की संख्या							खतरनाक स्थिति के पूर्व लक्षण की व्यापकता (%)										
10a. No. of persons affected with Skeletal Fluorosis:							10b. Prevalence (%) of Skeletal Fluorosis:										
कंकालीय फ्लोरोसिस से ग्रसित सदस्यों की संख्या							कंकालीय फ्लोरोसिस की व्यापकता (%)										
11a. No. of persons consuming fluoride containing food items:							11b. Percentage of population consuming										
फ्लोराइड युक्त खाद्य पदार्थों का सेवन करने वाले सदस्यों की संख्या							fluoride containing food items:										
							फ्लोराइड युक्त खाद्य पदार्थ सेवन करने वाले सदस्यों की व्यापकता (%)										
Name of the Supervisor:												Date:					
पर्यवेक्षक का नाम												दिनांक					

## Technical Specification for Fluoride Ion meter

### FLUORIDE ION METER FOR MEASUREMENT OF FLUORIDE IN DRINKING WATER, URINE & SERUM

#### Technical Features

- Large colour graphic LCD display which can show parameter (s) together or each parameter individually.
- Display should provide additional information of showing reading with connections, time, date, sample ID, User ID, Calibration information, temperature, etc.
- Up to 5 point calibration.
- Meter should have Auto Read continuous display facility.
- ISE measurement should have Auto Blank, Linear Point to Point & Non linear point to point.
- Low Concentration Range Stability.
- At least 1500 point Data logging with time and date.
- USB and RS232 for transfer of data to PC
- Software upgradation facility of equipment through Internet.

#### Technical Specifications

##### **ISE**

Range	: 0 to 100 ppm
Resolution	: Up to 3 significant digits
Units	: mg/L, ppm, ppb.

**Power** : Universal AC Power Adapter, 90 – 260 VAC, 50 - 60 Hz

#### ACCESSORIES TO BE SUPPLIED WITH EQUIPMENT

1. Fluoride Combination, Epoxy Body Electrode	- 2Nos.
2. Fluoride Calibration Standard, 1.0 ppm & 100 ppm, 400 ml each	- 1 No.
3. TISAB III, at least 400 ml	- 2Nos.
4. TISAB II, at least 3 Liters	- 1 No.
5. Electrode filling solution, 5 x 60 ml in one packet	- 1No.
6. Electrode holding Stand	- 1No.

- **The Supplier should provide 3 year warranty for the equipment & 2 year AMC**
- **Supplier should provide list of users of the equipment in Health Sector during the last five years.**

**Foods with high Fluoride ( to avoid) and Recommended Foods**

<b>Food Items contains high F<sup>-</sup> DO NOT EAT</b>	<b>Recommended Foods</b> (proteins, carbohydrates, essential, micronutrients and antioxidants to eat on a daily basis)
<b>Black tea</b> (with or without lemon)	
<b>Black rock salt</b> in salad/raita/fruits/baked or steamed corn	Balanced Diet
<b>Black rock salt</b> containing food and snacks e.g <b>Samosa</b> <b>Chole Bhature</b> <b>Golgappe/ Pani Poori</b> <b>Bhel poori/ Papdi Chat</b> <b>Namkins/ Bhujia/ Dalmoth</b>	<b>Calcium:</b> Milk, Yogurt (Dahi), Paneer, , Green leafy vegetables ( specially amaranth, fenugreek and drumstick leaves) til seeds, ragi etc.
<b>Jaljeera/ Nimboo pani added with black rock salt</b>	<b>Iron:</b> , All Green leafy vegetables, cereals and millets especially bajra and ragi, pulses
<b>Achar with black rock salt</b>	<b>Vitamin C:</b> Amla, Lemon, Guava, orange, lime, grapes, Tomato, Pineapple etc. Sprouted dals
<b>Readymade masala</b> packet with black salt e.g. / <b>Garam masala/chat masala/ Rajma Masala/ Chole Masala, Pav Bhaji Masala etc.</b>	<b>Other Antioxidants present in:</b> All Fruits + Vegetables.
<b>Hajmola/ Churan/Imli and other digestive tablets</b> laced with black rock salt	<b>Magnesium:</b> Nuts, cereals, pulses , green leafy vegetables , Lotus stem, mango etc.
<b>Canned Fruit Juices/ Fruit juice with masala salt/ preserved food items</b>	<b>Zinc:</b> Pulses, Legumes, mushrooms, pumpkin etc.
<b>Chips/Kurkure and other salty packaged snacks</b> (Packet would reveal the ingredients)	

## **DIETARY GUIDELINES**

Right nutritional behavior and dietary choices are needed to achieve dietary goals. The following 15 dietary guidelines provide a broad framework for appropriate action:

1. Eat variety of foods to ensure a balanced diet.
2. Ensure provision of extra food and healthcare to pregnant and lactating women.
3. Promote exclusive breastfeeding for six months and encourage breastfeeding till two years or as long as one can.
4. Feed home based semi solid foods to the infant after six months.
5. .
6. Ensure adequate and appropriate diets for children and adolescents, both in health and sickness.
7. Eat plenty of vegetables and fruits.
8. Ensure moderate use of edible oils and animal foods and very less use of *ghee/ butter/ vanaspati*.
9. Avoid overeating to prevent overweight and obesity.
10. Exercise regularly and be physically active to maintain ideal body weight.
11. Restrict salt intake to minimum.
12. Ensure the use of safe and clean foods.
13. Adopt right pre-cooking processes and appropriate cooking methods.
14. Drink plenty of water and take beverages in moderation.
15. Minimize the use of processed foods rich in salt, sugar and fats.
16. Include micronutrient-rich foods in the diets of elderly people to enable them to be fit and active.

Source: Dietary Guidelines for Indians, National Institute of Nutrition, 2011



<p>No. of villages  No of samples tested  Samples found above 1ppm</p> <p><b>4. <u>Urinary Analysis</u></b></p> <p>Total samples analysed  No. above prescribed limit  Percentage samples above limit.</p> <p><b>6 <u>IEC activities</u></b></p> <p>6.1 Articles/press release in local newspaper/ mag  6.2 Video spots/interview with expert on local TV  6.3 Audio spots/Q&amp;A session on local radio/  Community Radio  6.4 Locations where posters are put up  6.5 Pamphlets/booklets distributed  6.6 Seminars  6.7 Nukkad natak  6.8 Songs/Dances  6.9 Any other :</p> <p><b>7. <u>Training at the District level</u></b></p> <p>7.1 No.of medical officers trained  7.2 No. of Paramedicals trained  7.3 No. of Health workers trained  7.4 No. of ASHA/AWW trained  7.5 Personnel in schools/WCD Dept/PHE etc  trained  7.6 PRIs/ VHSNC members/ Teachers trained</p> <p><b>8. <u>Medical Management of Fluorosis.</u></b></p> <p>8.1 Supplementation (No of persons )  ( specifying the vitamins &amp; minerals)  8.2 Physiotherapy/ orthoses ( No)  8.3 Surgical intervention (specify type)  8.4 No. provided with mobility aids</p> <p><b>9. <u>Provision of safe water</u></b></p> <p>9.1 No. of water sources declared unfit  9.2 No of safe water sources made  available by PHED</p> <p><b>10. <u>Coordination with PHED</u></b></p> <p>10.1 No of meetings held with PHED  10.2 Specific measures taken by PHED  in affected areas covered under the programme</p>			
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**11. Line listing completed for**

- |  |        |
|--|--------|
| 11.1 Fluoride affected villages                                | Yes/No |
| 11.2 Lab facilities available in district for fluoride testing | Yes/No |
| 11.3 Persons who can benefit with medical intervention         | Yes/No |
| 11.4 Centres/hospitals for corrective surgeries                | Yes/No |

**12. Remarks/ Suggestions**