



Federal Democratic Republic of Ethiopia
Ministry of Health

**Control of Insects, Rodents and other
Biting Species Extension Package**

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1. Introduction

In our country, disease-carrying vectors such as insects, rodents, and other insects invertebrate biting species play a very important role in transmitting several important diseases, inflicting poisoning by biting and being nuisance. The vectors of Public Health importance included here are insect species such flies, mosquito, arthropods; e.g. Cockroaches lice, fleas, bed bugs; biting species e/g/ scorpion; rodents; rats and mice etc.

In addition to health risk, rodents (rats) cause also significant damage to crops and properties, especially in rural areas. Thus, the purpose of this package programme is to introduce a community based control programme against the above listed disease vectors and thereby produce a healthy productive people.

2. General Objective

To help the community to identify and control the disease carrying vectors and biting species and protect their own health.

3. Specific Objectives

- 3.1. To impart knowledge and skill to the community to enable them to control the disease carrying vectors, rodents, and biting species etc.
- 3.2. To reduce the presence of disease vectors, rodents and biting species around the living places, houses etc.
- 3.3. To help the people so that they would take preventive measures either individually or in-group against these vectors and biting species.
- 3.4. To reduce the economic loss which may be incurred by theses vectors and biting species.

4. Implementation Strategies

- 4.1. Familiarizing the community about the package programme.
- 4.2. Carrying out survey activity.
- 4.3. Drawing up action plan, which involves the community.
- 4.4. Conducting training of trainers.
- 4.5. Establishing co-ordination mechanism with community members, Governmental and non-Governmental agencies, who could be potential supporters of the package programme.
- 4.6. Involving the health institutions and health workers of the area.
- 4.7. Motivating, educating and organizing the community to actively participate in the programme, and there by bring about behavioural change.
- 4.8. Applying demonstration methods.
- 4.9. Exchange of experience.
- 4.10. Applying motivational methods.
- 4.11. Apply local rules and regulation.
- 4.12. Carrying out monitoring and evaluation activities.

5. Activities to be done for controlling insects, rodents and other vectors, and biting species:

- 5.1. Introducing the general package programme on control of insects, rodents and other biting species:-**
 - To administrative officials.
 - Health workers and health agents in the area.
 - To the local known personalities and leaders.
 - To Governmental and Non-Governmental agencies of the area.
- 5.2. Data Collection by Incorporating the Following: -**
 - Bring to the attention the places where insects, rodents and biting species breed in the area
 - Living standard of the household

- Conditions which would help to control insects, rodents and biting species in the locality.
- Find out why they were unable and the to prevent and control insects, rodents, and biting species.
- Determine the knowledge attitude and practice of the community regarding insects, rodents and other biting species.

5.3. Preparing work plan with the involvement of the community

- Drawing up work plan based on the preliminary survey finding with full community participation.
- Drawing up work plan for the activities, which can be carried out, by individuals and households on their own.
- Preparing work schedule weekly monthly or yearly as appropriate.

5.4. Giving training:

- Give action-oriented training to community segments i.e. trained or practical health workers, social workers, well known and influential community members, and administrative workers at different level that can be supporters for the package programme.

5.5. To the civic associations Governmental and Non-Governmental Organizations who can be potential supporters for the package such as:

- Administration (to get administrative support)
- Agriculture: (in order to get training and support from the development workers)
- Education (to give training to teachers and students on insects, rodents and biting species and to establish co-ordination mechanism.)

5.6. Involving Health Professionals Working in Health Institutions in the Area.

- In order to get direct technical support from the health professionals where the package is implemented.

5.7. Motivating, Educating, Organizing and Promoting Participation Level of the Community in order to Bring about Behaviour Change:-

- At household level give adequate and continuous training about the control and prevention of insects, rodents and other biting species.
- At meeting, Edir, religious place on public holidays give training about nature and health risks they pose and methods of their control.

5.7.1. Trainings to be given Regarding Insects, Rodents and Other stinging species.

5.7.1.1 Insects

- Most of the time insects survive by sucking blood.
- They are well known for transmission of disease.
- They transmit disease not only from man to man but also from animals to man.
- The main ones are the following: Louse, Flea, Bed-bug, Pubic louse etc.

Body Louse and Pubic Louse

Since louse and pubic louse are similar in nature we call them simply louse. However, the pubic louse is found around the armpit, around to joints and other hidden body parts. Parts of the body not kept clean, hair, dirty clothing's are suitable breeding and living place for louse. Louse live by sucking blood.

Health problems caused by louse and pubic louse

- Transmit louse borne typhus
- Relapsing Fever

Mode of transmission

As the causative agents of typhus and relapsing fever are in the body of the louse, they are transmitted to man:

- Through the bitten or wound inflicted by the louse; through the excretion of the louse, and when the louse is crushed on the skin of the body.

Preventive measures: -

1. Washing of the body at least once a week with clean water and soap.
2. Keeping the hair clean, Combing, cutting short and shaving.
3. Keeping clean regularly the armpit and other hidden part of the body
4. Using separate clothing for the day and night.
5. Washing regularly clothes and ironing if possible
6. Exposing nightclothes to sunshine.
7. Washing clothes infested with louse and exposing to sunshine.
8. Not crushing or killing the louse on the body or on the fingers.
9. When epidemic breaks out, report immediately to the health institutions at different levels and to the administrative body.

The following picture shows the human louse (body and head) and crab or pubic louse

The flea

The flea lays its egg on the ground; most of the time it is found in dirty and dusty floor, vacated house and on unclean pets (cat and dog) or around their abode. They obtain their food by sucking human and animal blood.

Health problems encountered

- Plague
- Cause lack of sleep and rest

Mode of transmission

- Plague is caused by microorganisms, which live on the flea.
- This disease is normally the disease of rat, and is transmitted when infected flea bites healthy rat and man.

The picture shows the magnified and normal size of a flea

Chigger flea (*tunga penetrans*) locally known as "mujele"**Health problems encountered**

Although no specific disease is known to be transmitted by Jigger flea, yet it makes wound in the leg and exposes to other diseases such as lock-jaw,

gangrene and as the result of the wound inflicted, abnormal posture of the leg is often seen.

When one tries to expel the Jigger flea from the leg with dirty needle or pointed sharp, the spot from which the Jigger flea is expelled creates painful hole, which does not heal quickly.

Jigger flea creates problem by penetrating the skin and multiplying in the skin. Jigger sticks to and penetrates and enters into the soft skin or through cracks in the part of the leg, feeds the fluid from the wound and lays eggs there by. Jigger flea is found in human leg, in dog, pig etc. After it gets out of human skin it continues multiplying on the surrounding soil.

Mode of transmission

- Jigger flea enters by penetrating the skin of the leg and hand and lays eggs. After few days one starts scratching the part of the body into which it entered. Unless the eggs are expelled intact with the bag (egg bag) the Jigger flea continues multiplying in the skin. Jigger flea causes extraction nails of leg and hand and deforms the leg.

Preventive measures

1. Keep cleanliness of house floor.
2. Expose to sunshine regularly bedclothes, bed and mattress (carpet).
3. Reduce as much as possible the close contact of dog and cat with human being.
4. Seal off rat entry cracks and holes; keep covered properly cereals and cooked food, and deny rats what to eat.
5. Maintain the cleanliness of the compound.
6. Wear shoes
7. Check and control the legs of people who live in Jigger flea endemic-areas and insure freedom from Jigger flea.
8. Expel the Jigger flea carefully with sterile or clean needle.

The following figure shows the jigger flea, its parts and its position in the skin of the leg

Bed-bug

Bedbugs multiply in bed mattress, which is not maintained clean, in cracks and joint of bed, in cracks of the wall, etc by laying their eggs.

Health problems caused

- Sucking of human blood
- Weakens the body by causing restlessness.

Method of control

1. Repair cracks in the walls and roof of the house.
2. Expose to sunshine and aerate bed, mattress (carpet) night clothing's etc.
3. Keep clean and tidy household items, chair, table etc.
4. Maintain the house clean.

The picture below shows an adult bed-bug

Flying species

Examples of flying species are such as mosquitoes, fleas, cockroaches etc. They are known to transmit disease.

The fly

Unless we keep our compound clean properly, it will create conducive condition for fly breeding. The fly travels from filth to human habitation and lives with human being creating health risk. The breeding places of fly are animal droppings and horse manure, decomposing organic wastes, meat kept in dirty condition, human excreta and dead and decaying animal body. The domestic housefly has four stages of life cycle.

They are egg, oval stage, larval, pupal and adult stages. The life cycle is completed, depending on temperature, from 6 to 42 days.

However, in many instances the housefly completes its life cycle from 2-3 weeks, but during cold weather it may take up to three months. Flies lay their eggs often in animal dropping (cow dung, horse manure) in organic wastes disposed from the house. The egg is transformed into larva within 8 to 16 hours, then the larva is transformed into mature larva from 3 to 6 days. The mature larva is transformed into pupa in 3-7 days. The pupa is transformed into adult fly within 2-10 days.

The picture below shows the life cycle of house fly

Diseases caused

- Bloody diarrhoea
- Ascariasis
- cholera
- eye illness (trachoma)
- Amoebiasis etc.

Mode of transmission

- Lands on filth, picks up microbes with its hairs in its legs and wings and then rests on food and drink and contaminates the food items.
- Feeds on filth, and then vomits on food or drink to make them soluble. This contaminates the food and drink.
- Contaminates food by excreting on the food.
- Transmits trachoma organisms from sick to healthy persons

Preventive measures

1. Proper collection of solid and liquid waste, burning or burying properly.
2. Building latrine, using and maintaining properly.
3. Covering up food and keeping properly.
4. Washing properly food utensils, and keeping clean.
5. Keeping the house and its surrounding regularly clean.
6. Keeping personal hygiene, specially that of the children.
7. Keeping domestic animals separate from human, in barn and maintaining the barn clean.
8. Collecting animal droppings and horse manure, burying properly and using it as fertilizer for garden.
9. To eliminate flies applying carefully insecticides.

Mosquitoes

In order to prevent malaria and other mosquito borne diseases, it is essential to eliminate mosquitoes.

To eradicate mosquito, we have to know their living place, their nature and habits.

Mosquitoes mostly live and multiply in hot and hidden places.

Mosquitoes breed in marshy areas, under bridges and rod sides, in broken and discarded household materials, especially those that can hold water.

Mosquitoes prefer to live where there are plenty of waste waters.

Malaria mosquito

Disease transmitted

- transmit malaria
- cause disturbance and restlessness by biting

Mode of transmission

- The female anopheles mosquito feeds by sucking blood, hence transmit malaria parasite from sick to healthy person.

Preventive measures

1. Draining marshy area, which contains water.
2. Cleaning irrigation canals and controlling growth of bushes around the canal
3. To kill mosquito larva, spread burnt oil over stagnant water.
4. Closing doors and windows during darkness
5. Keeping cleanliness of the houses and animals sheds.
6. Burying properly broken and discarded household materials, which are likely to hold water.
7. Spraying the house with insecticide, if the insecticide is DDT, Spray once in 6 months, and not plastering the walls, or painting.
8. Using insecticide impregnated bed net.

The picture shows an adult female anopheles mosquito

Cockroaches

The cockroach is found mainly in food storage cupboards, place in dark corners cracks of walls, especially in food preparation areas etc.

Health problems caused

- Has revolting bad smell
- Diarrhoea
- Bloody diarrhoea
- Intestinal disease
- Cholera

Mode of transmission

Cockroach can be found in houses and buildings. For feeding it wanders around food preparation, food storage, garbage bin, liquid waste drainage pipe, around latrines etc.

It could carry various pathogenic organisms and can contaminate food and beverage, thus could transmit disease.

Preventive measures

1. Keeping the house and its environ clean.
2. Cover food and store in proper place.
3. Keep solid waste in waste storage bin
4. Spray cautiously pesticides

The picture shows an adult cockroach

5.7.3 Stinging species

In many places well known stinging species are snake, scorpion and tarantula. In many instances they are found in hotter climate, but can be found also in temperate areas. Generally they live in out of sight-hidden places, and suddenly inflict accident by stinging. Be it scorpion or snake and they sting human beings, urgent medical treatment has to be taken, otherwise the poison injected can kill, or there is a little chance to be saved.

Health problems caused

Can cause danger of poisoning, may cause accident, which will lead to death.

Mode of transmission

1. Clear bushes, fill holes, cut grass etc. of the house and around it which might serve as hiding places.
2. Eliminate flat stone, perforated wooden materials, which can be used as hiding places from the compound.
3. In general, keep cleanliness of the compound and its environment.
4. In order to minimize the chance of being stung and poisoned, protect the leg and the lower leg arms by wearing shoes.
5. Check the bedding, clothing and shoes before putting on.

6. When cleaning the collection of stone, wood etc. wear gloves, if not available tie rag around the hands.
7. Pay attention when walking on stony and hilly places.
8. When taking out stone from the quarry, use gloves, if not, do not take out the stone towards the body.
9. Avoiding catching or holding snake, scorpion, spider and the like specially instruct children not to do such thing.
10. Clean with warm water and soak the spot, which it stung, and let the bitten spot bleed.
11. In addition, for other first aid action, refer to the first Aid Package.
12. The person who is stung should be taken immediately to the nearest health institution.

5.7.1.4 Rodents

Rodents, which are known to inflict injury on man, directly or indirectly, are: mouse, rat, marmot and the like. Rodents feed by sharing man's food item such as flour, corn food, cereals and others at home, and in the field, they cause damage to cereals and tuber plants thus reduce production.

They disturb peace and sleeplessness by running about in the house for search of food.

Rats destroy clothing, bite man, especially children, they penetrate cereal store and scatter the content. They destroy germinating cereals, and the field mouse destroy tuber plants, roots of false banana (INSET) carrot, potato etc.

Health problems caused

- Murine typhus,
- Plague
- Salmonellas
- Rat bite fever
- Fiver
- Injury inflicted by bite cause lack of sleep.

Economic problems

- Destroy cereals in the field and in storage
- Cause damage to clothing body and similar materials
- Destroy living house and building of organizations.

Mode of transmission

- By eating food and beverage which are contaminated by faeces and urine of infected rats.
- By eating without proper cooking pork, which is infected by dead rat.
- When fleas, which live on infected rat, bite human being.
- When infected rat bites human being.
- When spreading dirt brought through shoes from infected area on food and utensils.

Preventive measures

1. Sealing off (rat proofing) holes and cracks in the house and its surrounding.
2. Identifying their harbourage holes and killing by pouring boiling water or by suffocating with smoke.
3. Denying food by storing properly cover any foodstuff and properly disposing leftover foods.
4. Eliminating possible places of harbourage and hiding.
5. Collecting any solid waste, burning in a pit.
6. Building cereal stores and living houses in such a way to prevent passage and walking places for rodents.
7. Using trap
8. Using cat

5.8 Using demonstration method

- Demonstrate to the community easily understandable methods that the community can apply on their own how to prevent and control insects, rodents and stringing species.

5.8.1 Demonstration

5.8.1.1 Bedbug

1. Insure that there are bedbugs and their eggs.
2. Wipe out from the wall and the roof and destroy them.
3. Sealing off cracked wall by using prepared mud, plastering with cow-dung or mortar
4. Taking out chairs, and other items in which bedbugs are likely to hide, kill by pouring boiling water.
5. Kill bedbugs by taking out and expose to sunshine items, which are used for sleeping, sitting, such as carpets mattresses etc.
6. Using insecticide by consulting experts if available in the area.

5.8.1.2 Flea

1. Clean always the house
2. Plaster the floor of the house once a week with cow dung and mud
3. Aerate by exposing to sunshine daily night clothing and carpets
4. Fill and plaster cracks and holes after compacting with stone and earth.
5. Using pesticides by consulting agricultural expert.

5.8.1.3 Louse

1. Ensure always whether there are body or hair louse.
2. Shaving all hairs on the body and burning or burying.
3. Soaking in boiling water at least for 10 minutes, turning over and exposing to sunshine all day and night clothing.
4. Expose those items, which cannot be soaked in boiling water such as mattress, hide, carpet and clothing and kill the louse. However do not

kill by using hand fingers, use pebbles, or wood splint, and burn or bury them, because of the possibility of disease transmutations.

5. Wash the body and head hair at least once a week.
6. Disinfect night and day clothing using boiling water and steam.
When steaming, the clothing should have contact with water.
Steaming done after the boiled water is transformed into steam.
Steaming should continue at least for 20 minutes, care should taken to avoid leaking of steam.
7. If epidemic breaks out spray 10% DDT or 1% Malathion on day and night clothing and leave the clothes at least for one day to eliminate the pests.

5.9 Exchange Of Experience

- Enable other households to start and exchange experience with those households who have made progress in implementing the package programme on eliminating insects, rodents and stinging species.

5.10. Applying motivational methods

- Present gifts as appropriate to those household who have made good participation in the implementation of the package program.
- Give certificate of recognition
- Give material rewards from local resource
- Cite as exemplary in public meetings

5.11 Applying local rules and regulations

- Work by synchronizing government policies and regulations with the local ones.
- Encourage local community to prepare their own action plan on their own decision.
- Implement government policies and regulations.

5.12 Carry out monitoring and evaluation activities

- Monitor and follow up action plans that have been drawn on weekly, monthly or yearly basis.
- Involve the community in evaluation of the action plans achieved.

6. Expected outputs/results

Indicators for the achievement of the package program on disease carrying vectors, Rodents and biting species control

1. Vector borne diseases, rodents and other biting species injuries will be reduced.
2. Community participation will be increased on the control of the above listed animal agents.
3. The community will have increased knowledge and attitude about the control of the agents of diseases and injuries listed above.
4. The presence of disease vectors, rodents and biting species will be reduced around the home and its environment.
5. People will take action to control the disease agents, rodents and biting species on their own free will.
6. More additional members of the community who support the package program will be created.
7. The tradition of coordinated work pattern will be developed.
8. People will exchange experience and be able to contribute their share on their own accord.

7. Problems, which may be encountered and their possible solutions in the process of implementing the package program of preventing and controlling insects, rodents and stinging animals.

7.1. Problems, which may be encountered.

- Cultural and traditional influences.

- Not getting people's co-operation as desired.
- Low level of living standard.
- Inadequacy of support directly or indirectly from those who are key persons in the implementation of the package program.

7.2 Possible Solutions

- Give continuous and varied education to the community.
- Encouraging individuals, families and the community to use local resources to implement the package program
- Doing everything possible to improve people's living standards
- Motivating continuously those individuals directly or indirectly who are key persons for the implementation of the package program.
- The health institutions and health workers in the area should follow up, evaluate program and should give their suggestions for solving the problems.

8. Short methods of communication.

8.1. Settings for communicating messages.

- House to house visit at household level.
- At village level.
- At schools.
- At health institutions.
- At places of worship (churches and mosques).
- At markets.
- At development offices.

8.2. Methods of communicating messages.

- Person to person (by discussing).
- By conducting meetings (large ones).
- Through group discussion.
- Using demonstration method.
- Using drama, songs, poems, story telling.

- Using exhibition method.
- At public holidays by delivering short acts.
- Using tape recorder.
- Using posters, pamphlets, and Brochures.
- Using locally available mass media, such as radio, T.V, newspapers.
- Using health education audiovisuals.

8.3. Messages to be communicated.

Will be accomplished on the basis of the detailed package program action plan.

9. Monitoring and evaluation

9.1. Monitoring

- Number of people given education on package program: male _____ female _____ Total _____.
- Number of meetings and number of people who attended regarding the control of disease carrying agents, rodents and other biting species _____.
- Type and number of audiovisual materials used in the implementation activities _____.
- Presence of Tunga Penetrans (Jigger flea) among adults and children in the area.
- Presence of vectors, rodents and other biting species in the house and compounds.
- Presence of bushes and grass in the compound.
- Storage for grain/cereals are rat proofed.
- The house and compound is not breeding and hiding places for vectors, rats and other biting species. The floor of the house has no cracks and waste materials are not thrown about carelessly.

9.2. Evaluation

- General objective of the program.
- Action plans prepared to implement the program.
- Resources used for implementation.
 - human resources by profession and number.
 - finance from the community and external source.
 - Materials from the community and donation.

Strategies for implementation

- Field trip.
- By collecting information and analysing.
- By discussing with beneficiaries.

Activities achieved

- Using indicators (percent, in number, ratio).
- Strong points identified.
- Weak points identified.
- Changes brought about by the implemented activities on people's knowledge.
- Problems encountered.
- Suggestions given for solving the problem.