



OUTBREAK CONTAINMENT IN THE SOMALIA SMALLPOX ERADICATION PROGRAMME INDEXED

by

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INTRODUCTION

Smallpox eradication depends both on surveillance - the detection and reporting of smallpox cases, and on containment - the process of stopping the spread of smallpox from infected cases to susceptible contacts. Containment is made up of four separate essential components:

isolation;  
vaccination;  
daily follow-up;  
area search.



OBJECTIVES FOR CONTAINMENT

The Somalia Smallpox Eradication Programme established as an operational target the interruption of transmission within 15 days of outbreak detection. With good supervision, this target is achievable in 100% of outbreaks. Cases occurring within 15 days were presumably infected prior to the onset of containment and do not represent containment failures.

ESSENTIALS OF CONTAINMENT

1. Isolation

In Somalia isolation has traditionally been in isolation camps. This method provided better supervision and tighter isolation.

During May and June two major disadvantages of isolation camps were detected. Because of the desire of smallpox patients to stay with their families in the villages, significant case-hiding resulted from a fear of being taken away to isolation. As 100% reporting is essential to eradication, case-hiding is a significant problem. A second negative effect of the isolation camps was the fact that they shifted the focus of containment from the infected village, the area at highest risk, to the isolation camps. Village containment and the search for additional cases suffered.

Home isolation as initially programmed for Somalia also proved ineffective. The small huts of the nomads, usually about four metres in diameter, with five to 10 family members and frequent visitors were not satisfactory for isolation. Visits to sites of home isolation in June 1977 showed that in most cases the guards were guarding the huts but not the patients.

To meet the programme objectives of effective isolation, separate isolation units were developed in each infected village. Each unit was developed around a central structure, a temporary shelter, hut, or tent to house the patient(s). Surrounding this structure a thorn haro (a traditional method of isolation used both for houses and animals) was built. To be effective, the haro had to be large enough to include the latrine area.

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Isolation is only as effective as the training and the supervision of the isolation guards whose duties are:

- (a) to keep the patient in isolation (inside the haro);
- (b) to keep visitors including vaccinated family members outside and away from the haro;
- (c) to carry food, water, and fire into the haro;
- (d) to keep the single entrance of the haro closed at all times.

The proximity of the isolation unit to the infected area has one additional distinct advantage in that it provides immediate isolation for new cases on detection. The payment of five shillings per day per patient for each day spent in isolation makes it acceptable to most patients.

All cases admitted to isolation, including definite smallpox patients must be vaccinated on entry. This rule is to prevent the needless infection of a misdiagnosed case.

Twenty-four hour daily supervision of isolation by resident supervisors, epidemiologists, and counterparts is essential.

## 2. Vaccination

Smallpox can only spread from an infected case to unvaccinated contacts. Therefore vaccination of known and possible contacts of each smallpox case is of highest priority. As vaccination even as late as four days after exposure can prevent disease, full containment should be completed on the day of detection. In smaller villages this can usually be achieved in a few hours. In larger villages priorities need to be set:

- (a) the infected house;
- (b) known face-to-face contacts;
- (c) the infected village;
- (d) the nearby villages up to 10 km in any direction;
- (e) relatives' homes irrespective of a history of contact.

To ensure complete vaccination a line listing of all residents including absentees is essential and can be conveniently recorded in an exercise book. Each house should be listed on a separate page so as to leave space for visitors and missed persons. Column headings should include name, age, previous vaccination, date of vaccination, date vaccination read as successful, initials of person reading successful vaccination, date of fever and remarks. Special attention must be given to absentees and visitors.

Vaccination of the infected village is carried out by two to four-man vaccination teams. Training on vaccine mixing, vaccination technique, and sterilization as well as on-site field inspection are required to ensure effective vaccination. The use of three-man teams has many advantages. One vaccinator is left in the infected village at all times to supervise containment and to vaccinate visitors and in turn the remaining two vaccinators can then devote their time to the listing and vaccination of residents in the 10 km area. As many villagers are absent during the day, night halt with evening and early morning vaccination is required.

## 3. Daily follow-up

The weakest component of current containment is the daily follow-up search of each house in the infected village to detect any new cases and to identify and vaccinate absentees and unprotected visitors. In an infected village everyone should be vaccinated regardless of previous vaccination history. Left-arm scars are not always associated with vaccination or immunity. Training and retraining on the importance and methods of follow-up and its

supervision are priority tasks of all supervisors. Confirmation of takes is an additional task of this daily follow-up. As in the initial vaccination activity night-halt and night-checks are needed to ensure full coverage.

#### 4. Area search

To ensure that smallpox has not spread outside the containment area, the surrounding 10 km area must be searched house-to-house at night. The search should be conducted at least three times: at initiation of containment, two weeks later, and at closure of containment.

#### CONTAINMENT EFFICIENCY

Containment failures can be of two types: Type I, new cases in infected villages, 15 or more days after detection. Type II, spread of smallpox to another infected village after initiation of containment.

Containment failures by month of detection can be estimated from containment records. As post-containment cases are slow to be added to the original line listing, the following estimates of Type I containment failures are minimum figures.

TABLE 1. SMALLPOX CONTAINMENT FAILURES BY MONTH OF DETECTION: APRIL-JULY 1977

Month of detection	No. of outbreaks	No. with cases after 15 days	% failure
April	60	7	11.7
May	175	21	12.0
June	416	10	2.4
July	214	3	1.4

Type II failures are only now being identified. Their quantification requires not only the identification of the source of a new outbreak but also the determination of whether the contact occurred before or after the initiation of containment in the source village. Type II containment failures are in almost all cases related to a failure of isolation, the patient leaving isolation or an unvaccinated visitor entering the isolation. As the number of outbreaks decrease and supervision improves this type of failure should decrease.

#### CONCLUSION

The method of containment has been well proven. Its effective implementation is a daily challenge to all supervisors.

Note: This paper was written as an operational guideline for containment at a time when active smallpox was still present in Somalia (28 August 1977).