TEACHING EXERCISE - SMALLPOX SURVEILLANCE
SYLLABUS FOR THE DISCUSSION LEADERS

INDEXED

1. The aim of this exercise is -

(a) To stress the importance of surveillance activity in achieving the goal of smallpox eradication.

(b) To emphasize the need for a regular reporting system and for prompt and thorough investigation and containment of each and every outbreak detected.

(c) To discuss the methodology of active surveillance so as to determine the smallpox free status or otherwise of an area or locality.

2. Conduct of the exercise -

The exercise consists of four separate situations. Each situation should normally require about 10 minutes for consideration by the participants and 30 to 60 minutes for discussion.

3. The instruction should be through group discussion. The group leader should serve only as a director of the discussion by posing relevant questions. He should encourage participation of all in the group. On occasion, he may wish to state opposing views or provide hints to provoke or promote discussion on the right lines. Ultimately, the group itself should arrive at logical solutions. The group leader may then sum up what has been generally agreed upon and then proceed to subsequent situations.

4. Some points for discussion during the consideration of each situation are given. They are to serve only as a guide. There may be others which the group leader might wish to include.

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SITUATION - 1

Keeping your objective in mind, which is to completely interrupt the transmission of smallpox in the province as speedily as possible, what do you make of the present situation?

The disease incidence has shown a gradual decline no doubt, but the transmission is by no means interrupted. Why not?

What do you think of the vaccination coverage? Should it be improved?

The overall vaccination coverage should be considered as generally satisfactory.

1. To raise the vaccination coverage much beyond 90 per cent would be prohibitively costly in money and manpower and, even then, difficult to achieve:

    (a) All people are not always present in an area at any one time.

    (b) Children are being born every day, adding to the number of susceptibles.

    (c) Susceptible migrant populations are constantly moving in and out of areas.

2. Is such an effort necessary? Experience in other countries has shown that attempts to achieve eradication by intensive vaccination alone have rarely been successful. Whereas in many countries with levels of the vaccination coverage of less than 70 per cent, interruption of transmission has been speedily attained by an effective surveillance containment programme.

3. In brief, the Vaccination Programme should be continued to sustain or even enhance the level of immunity, so as to limit the spread of the disease. But the situation does not demand any undue or concentrated effort on this aspect of this programme.

What is your opinion of the existing surveillance activities in the province?

Take the notification system first

1. Most Districts have been reporting irregularly and some have sent in no reports at all for weeks on end. This is a poor state of affairs. Current information regarding smallpox must be available at Sub-District, District, Province and National level if a coordinated attack on the disease itself is to be successful.

2. No 'nil' report is being insisted upon. Non-receipt of reports does not mean that the concerned districts have had no cases. Acceptance of "no report" as being equivalent of "no cases" had often permitted many small outbreaks to mature into fully-fledged epidemics.

What about the other aspects of the Surveillance Programme in the Province?

From the data available, it is very difficult to assess the situation. No proper investigations of the outbreaks have been carried out. Of the Districts, NAMA, SANTHAL and BAMNAGAR are presently reporting cases; GAJJAR, DARO and AMBER are reporting irregularly or not at all; HARRAR, SULTANA and JAGOTI have reported cases earlier in the year but are not reporting cases now whereas SAIDBAD is regularly reporting a NIL incidence.

In view of the incomplete notification system and the inadequate investigation of the reported outbreaks, an accurate picture of the smallpox situation in the province is not available.

<u>What should you do then to make an appraisal of the surveillance activities?</u>

1. Perhaps you could call a conference of all the District Medical Officers of Health to obtain more information. However, based on the quality of records available at Provincial level, it would seem rather unlikely that they themselves could contribute very much.

2. Experience in other areas has shown that for the appraisal, development and continued effective functioning of a surveillance system, frequent field visits by staff at National, Provincial and District levels are absolutely mandatory. Reports, meetings and memoranda are no substitute.

<u>Having decided to visit the Districts to see things for yourself, which District would you begin with?</u>

Here the question of priority comes. No doubt you will have to visit all the Districts but some are obviously of greater interest and concern than others. In relative priority they would be as follows:

(a) Districts reporting cases during the past three months (NAMA, SANTHAL, BAMNAGAR and AMBER). These account for two-thirds of all cases in the Province during the year.

(b) Districts which are reporting irregularly or from which reports are delayed (GAJJAR, DARO, JAGOTI and HARRAR).

(c) Districts which have reported cases earlier in the year but are not reporting cases now (SULTANA).

(d) Districts which are regularly and promptly reporting a NIL incidence (SAIDBAD).

In trying to develop an overall plan of attack, naturally you will want to look first at the districts which are currently reporting cases, i.e. those in category (a) above. Of these, NAMA being the nearest to Headquarters as well as being adjacent to the highly endemic REDON Province (an added concern), may be visited first.

<u>How long will it take you to tour all the Districts?</u>

It is considered that Districts of high priority might require a 4-5 days'visit, while those of low priority only 1-2 days. So, if an average of 3 days were spent in each district, a tour of the districts would be completed in five to six weeks.

<u>What should be done with the Senior Sanitarians?</u>

As they have had no training it is clear that they had best be taken along, since training in the field under actual problem conditions will be far more effective than class-room training.

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SITUATION - 2

What do you gather from the weekly reports received from the Health Centres?

1. Consistency of records - The number of cases recorded by the DMOH are more than the number of cases recorded at the Provincial level. Not only is there a discrepancy in figures, but also in a couple of instances some delay has occurred in forwarding the report to the Provincial Headquarters. Handling of reports at the District level is obviously defective.

2. Weekly notification - None of the Health Centres is submitting regularly a weekly report. A weekly report noting 'nil' cases (if none are detected) must be insisted upon. For Health Centres which are not reporting, it is unknown whether there are no cases or whether reports are simply not being submitted.

What conclusions do you draw from the data pertaining to the outbreaks in the District?

1. Source of infection - For none of the outbreaks has a source of infection been determined. The word "local" means nothing as, inevitably, infection must have been introduced from somewhere. The source of infection for at least 80 per cent of the outbreaks should be specifically known.

2. Promptness of reporting of the first case - Nine of the 10 outbreaks were reported within six weeks after onset of the first case. While speed of reporting could obviously be improved, this is not the most important problem in this District as it is well recognized that outbreaks can be effectively controlled if reported within six weeks after onset of the first case.

3. Effectiveness of containment - If containment is effective, no cases should occur more than two weeks after notification of the outbreak. In five of the outbreaks, however, cases have occurred more than two weeks later. In outbreak No. 2, cases have persisted for three months.

4. Visits by District staff - To be certain that investigation and containment measures are adequate, District staff should routinely visit each outbreak as soon as notified and weekly thereafter for six weeks after onset of the last case. The District staff in NAMA have obviously been grossly deficient in fulfilling their duties.

After studying the surveillance records in the District, what do you do next?

1. You might mark on the District map provided, the locations of all known outbreaks and the number of cases that have occurred, to examine the distribution pattern of the disease.

2. You would want to visit the outbreak areas to see how they have been dealt with by the local staff.

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Time may not be sufficient to visit all the outbreak areas. In a couple of days one could visit, say, three outbreak areas. Which of the outbreak areas would you then select and on what basis?

1. You should want not only to obtain as comprehensive a picture as possible of the epidemiological features of the disease occurrence but also to assess the adequateness of the containment measures taken in various situations.

2. Three recent outbreaks might be selected for study:

   (a) NAHRIN - outbreaks have been frequent in this area.

   (b) NAMA city - urban areas have been a continuing problem in most countries and often serve to sustain transmission long after it has been interrupted elsewhere.

   (c) BURKA - a very remote area.

3. The outbreak in NAHRIN, being very recent, might well be taken up first.

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SITUATION - 3

You have arrived at BUZDARA Village whose population is about 300. You have the particulars of the patients given to you by the Health Centre Medical Officer. What do you note from this information?

1. Information regarding eleven patients is given, whereas in the District records only nine cases were said to have occurred in this village. Obviously necessary attention is not being paid to accurate reporting. This must be emphasized as being absolutely vital. In some areas "old cases" are not reported (e.g. cases D and E). If cases are suppressed in this manner it is wholly impossible to assess the relative extent and intensity of smallpox in the various areas. All cases discovered in the course of investigation of an outbreak, no matter when they occurred, must be reported.

2. Five families have been infected and all cases except for one woman 55 years old (said to have been vaccinated in childhood) were below 12 years of age and were unvaccinated prior to the time of exposure (i.e. two weeks before onset of illness).

3. Looking at the dates of onset of rash, one finds patient "D" was the first to have contracted the disease. Is this the probable first case of smallpox in the village from whom one might learn of the source of infection? Note that case "E" in a different family experienced the onset of rash only two days later. It is likely that both were infected by the same person, probably an earlier case in the same village.

What observations do you have on the vaccination coverage and the time required for vaccination?

1. The population of the village is said to be 300, whereas only 260 have been vaccinated, despite the fact that vaccinators have worked for nearly five days. Experience has shown that it should not take more than one or, at most, two days to thoroughly vaccinate this size village. By vaccinating early in the morning and late in the evening, those who are not usually available during the day time can be vaccinated.

2. Note also that four patients developed the disease after containment vaccination was carried out. If proper containment has been done, all cases which occurred subsequently should have been among persons vaccinated during the incubation period (e.g. cases "H" and "J"). The fact that cases "K" and "L" occurred show clearly that containment was not satisfactory.

After noting the above, how do you proceed to assess the investigation and outbreak containment measures carried out by the local staff? Describe step by step

1. First, one should see the village leader, inform him of the purpose of the visit and solicit his cooperation.

2. Second, see all the patients given in the list by visiting the household, and confirm that the diagnosis has been correct.

Confirmation could be -

(a) on clinical grounds, by examining the current cases

(b) epidemiologically, by examining other cases among the contacts

3. Third, after confirmation of the diagnosis, determine which was the first (index) case in the outbreak, and make enquiries to determine the source of infection.

(a) To be certain that one is really dealing with the index case, the approximate dates of onset for all cases must be determined as accurately as possible. It is desirable to double-check this information by determining from the patients or their families which became ill first and which second and the interval of time between their onsets of illness. (Experience has shown that information such as this can be obtained, even from illiterate villagers, provided the investigator is persistent and patient.)

(b) The source of infection will be someone with a smallpox rash with whom the patient has been in face to face contact during the period one to three weeks (7 to 17 days) before onset of rash.

(1) Frequently, this information can be obtained simply by asking the patient from whom he acquired the disease.

(2) Alternatively, one must determine as precisely as possible the movements of the patient during the one to three weeks before onset of rash. One should also enquire about all visitors and relatives during this period and determine from whence they came.

(c) If the steps under (b) above fail to reveal the source, one must question whether or not the patient being investigated is, in fact, the first case in the village or area. Members of the household, neighbouring households and households of friends and relatives should be carefully questioned about possible cases and deaths and all should be examined to try to discover an earlier "missed" case. Further investigation at schools, with village leaders, malaria agents, etc., may be necessary.

In the infected village, how would you carry out the search for additional cases and how long would it take to do this?

The village has only 300 people, i.e. 60 households. With three or four people, i.e. each to search 15 or 20 households, one can determine if all have been vaccinated and if there have been any recent or current cases. This should require no more than 3-4 hours.

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SITUATION - 4

Obviously, from the existing reporting system, it is not possible to say for certain whether the District is, in fact, free of smallpox: (1) reporting is deficient and (2) the Health Centres do not cover the entire area geographically. The only way to determine if there are any hidden foci of infection is to carry out a search operation.

How do you carry out this search?

In malaria eradication programmes, we know that the surveillance agents make house-to-house visits at regular intervals for case detection. No doubt it is ideal to screen the entire population in an area but the time factor involved and the manpower needed make this process unsuitable. It is possible, however, to tour the area under consideration to make enquiries at key points to which information might be communicated and to places where people assemble such as market places, tea shops and schools.

In so doing, one would need to be alert to all sources of information and no information should be dismissed as inaccurate. No doubt, false information and wrong reports will be received. However, one has to check for authenticity each and every report received from whatever quarter. There is no alternative.

What would you do under the present circumstances considering that you haven't the time to search the entire Province thoroughly?

1. Here again is the question of priority. Health Centres and hospitals should always be visited as it is to these places that patients may be brought; health staff on their visits to villages may learn of cases. All should be visited:

   (a) To stress the importance of prompt and regular reporting of cases (including NIL incidence).

   (b) By making enquiries regarding suspect cases or deaths in the area to alert the Health Centre staff of the importance of all health staff seeking such information in the course of other duties.

2. The next most useful places to visit are the schools. In rural areas, such schools being few and far between, children come not only from the local village but also from the surrounding villages, up to distances of 10 kilometres or more. By asking children if there recently have been or currently are any smallpox cases in their villages, one may in fact screen an entire area which the school serves.

You have then eight Health Centres and 11 schools to visit. How would you organize these visits? How long will it take you to complete the tour?

1. Considering the locations of the Health Centres and the distances involved, you could easily visit 2-3 Health Centres in a day and so complete the tour of all the Health Centres in three days.

2. As for search and enquiry at the schools, to save time you could utilize the services of the Senior Sanitarians. You could drop them at schools on your way to a Health Centre and then arrange to collect them, or you could go to a Health Centre direct and while you are busy there the Senior Sanitarians could visit nearby schools and return, as the case may be.

3. En route, enquiry may be made at markets and tea shops.

While a single investigation of this type does not provide an absolute guarantee that there are no cases of smallpox in the area, it does provide an indication that major outbreaks are not occurring. At the same time, it stimulates reporting and concern about smallpox at local levels so that, if cases occur, they are more likely to be reported.

If investigations of this type are repeated on several occasions with intervals of 3 to 6 months between each investigation and, on each occasion, no cases are detected, one becomes increasingly confident that smallpox transmission in the area has been stopped. If smallpox were present, it would have to continue to spread in a continuing chain of infection and the chance of detecting one or more cases in this chain would become increasingly greater. Thus, repeated investigations of this type are recommended.