

Madras HEALTH EDUCATION

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STATE HEALTH EDUCATION BUREAU
MADRAS

The workshop way of working

The workshop way (or method) of working is recognised as one of the most effective ways of learning and problem solving. In a workshop responsible and experienced people come together to work with specialists and consultants on interests and problems with which they have been confronted and which they find difficult to solve alone. The purpose of a workshop is to provide an effective media for learning and for solving problems. A workshop is characterized by:

- (i) participants working together; and
- (ii) participants working on their own problems and areas of interest.

In a workshop where different people come together to work on interests and problems, they are divided into smaller groups organised around these interests or problems. When people with different backgrounds and experience work together on common problems, a new concept emerges in which different ideas are seen in relation to the total problem. As they work together the differences will ensure that all angles will be explored. Concepts for practical value will emerge because each participant is expected to do something about presenting and evaluating the different ideas as they relate to the problems of the group.

The division of the workshop in the smaller groups gives everyone present an opportunity to participate and contribute. It is only in small groups that each participant can take part most effectively. It is clear that when the learner is placed in a small group for the purpose of studying some problem of his own choice, he is required by the setting to do something.

In organising a workshop the following should be given consideration—

- 1 *Initial planning.*
- 2 *Purpose of workshop (objectives).*
- 3 *Length of workshop.*
- 4 *Selection of staff.*
- 5 *Selection of participants.*
- 6 *Registration.*
- 7 *Organisation of working groups.*
- 8 *Actual group work.*
- 9 *Group presentations.*
- 10 *Evaluation.*

1. *Initial Planning.*—It is very difficult to say how much time is needed between initial planning and actual conduction. There is no hard and fast rule. Some authorities have recommended that initial planning start at least three months in advance of the proposed dates for the workshop. However, the time required will depend upon many factors, such as number of participants, length of workshop, problems to be solved, etc.

A planning committee is needed to do the essential preliminary planning and undertake preliminary activities essential for a successful workshop. Functions of the planning committee include:

Formulating and developing immediate and long-term objectives of the workshop.

Planning the programme which includes the making of a list of all possible elements of the programme, making arrangements for meals, lodging, transportation, etc.

Making necessary financial arrangements.

Selecting and informing participants well in advance.

Planning, evaluation and preparing and proforma desired for:

Self evaluation.

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Group evaluation.

Workshop evaluation.

Preparing registration forms. (These forms should include all the necessary information concerning participants which will be required for the final report and for final evaluation) preparation of name tags if desired.

Selecting and acquiring materials to be used by participants.

Preparing background material.

Determining the need for resource personnel and arranging for same.

Selecting the venue of the workshop, obtaining necessary permission and making necessary arrangements.

Making travel arrangements.

Arranging for casual leave or special leave of participants, if they will be on deputation.

Preparing a list of suggested reading.

Selecting films and filmstrips pertaining to topics to be covered in the workshop.

2. *Purpose of workshop (objectives).*—It is essential that before a workshop is organized, the needs to be served are determined and the objectives of the workshop should be clearly understood. The planning committee should formulate immediate and long-term objectives of the workshop. These objectives need to be clearly stated and the workshop should be planned with the objectives in mind.

The main purpose of a workshop is to find out, through democratic action, the facts about a problem (or a few related problems) and to find ways of solving the problem. This involves a comprehensive study of the problem. Every side of the problem should be presented and considered.

3. *Length of workshop.*—There is no fixed length for workshops; they vary in length. Some are in session for only a few days while others last from hour to eight weeks. Some colleges and universities have specified that the workshops conducted by them should continue for a given period of time for purposes of giving credit and have left the impression that all workshops should be the same length. However, the length is to be determined by the problem or problems to be solved and not by an arbitrary time limit which fails to take the purpose or objective into consideration.

The average length of time according to some authorities is from ten days to two weeks. Such a period often seems more desirable than does a longer period. In a longer period, the resources of the group may become exhausted and so workshops of shorter length may often prove more practical. Consideration must also be given to the fact that some workshop sessions are two or three hours in length, others six or eight.

4. *Selection of staff.*—Each group working on a problem needs the services of a consultant to ensure efficient and effective group work. For this, a staff is necessary. The persons selected should be specialists who have had wider experiences than the participants. The problems to be studied should be in the hands of the consultants before the workshop starts so that they can be prepared to make the maximum contribution. If the consultants selected are properly chosen, coverage of all sides of problems will be assured.

Staff meetings can also aid in the administration of the workshop within the consultants and the chairmen of working groups are combined, they are often considered as an advisory or "planning committee" and may meet periodically. Consultants selected should not come late or leave early. They should start with one group and stay with that group as it works through to a solution. It is usually better if consultants do not go from group to group as this may stand in the way of their making a maximum contribution.

5. *Selection of participants.*—There are different ways by which participants in a workshop are selected. Some workshops are set up on an elective basis and any one who desires may attend. In others, the participants are selected or elected to attend in order to work on a special problem or problems. If the workshop is held to solve a specific problem it may be desirable that representatives of all groups and interests involved participate. When this is the case, a selection method may be set up to assure that all concerned groups will be invited to send representatives. If there is advance registration the number of working groups can be estimated. The number of consultants needed can be secured. This will facilitate the securing of housing and meal arrangements when needed.

6. *Registration.*—Registration is an essential component of a workshop and provision should be made for this. Registration helps the organisers of the workshop in understanding more about the participants and their interests. Registration forms should provide such information as name, home address, official address, address during workshop and designation of the participants. At the time of registration information concerning meals, mailing address, time of incoming mail, information about transport provisions, etc., should be given.

7. *Organisation of working groups.*—It should be left to individual departments to choose the problem or problems on which they will work. In this way each person selects the group that he will work with during the entire workshop. Groups should always be small enough to ensure the participation of every member. As soon as groups are determined the meeting or working rooms should be assigned. In making these assignments, the size of the group and the size of the meeting rooms should be considered. Meeting rooms should be both comfortable and functional.

After the groups have been formed and the problems areas selected, the consultants should meet with the groups they are to serve. The members of each group should be

introduced to each other. Each group then elects its permanent chairman and recorder. Before the group makes its final choice of a permanent chairman and a recorder, the duties and the characteristics of such persons should be discussed so that the group can make a wise choice. A member of the group rather than the consultant or a staff member should serve as the chairman. The group should select one reporter who is given the task of reporting the group proceedings.

8. *Actual group work.*—The groups should be ready now to start talking about the problems on which they would like to work. As soon as each problem solving group assembles, the chairman should take charge and it is desirable that each person reintroduces himself giving detailed information concerning his background and experience. This is desirable as each person is in effect a resource for the whole group to use in the study of its problems.

The group should examine its problem or problem-areas. The participants should discuss and, as a group, define its problems. The problems can be broken up into sub-problems.

9. *Group presentations.*—As the groups study their problems and as they progress towards solutions, there will be need for co-ordination in order to prevent unnecessary duplication and wasted effort. During the course of the workshop it is good to have periodic progress reports presented to the whole body as these facilitate co-ordination. Periodic meetings of staff and consultants, chairman and recorders are often held to further secure needed co-ordination and groups are often requested to study and agree upon methods of recording group thinking and progress; this is especially important if the workshop effort is to result in the publication of a bulletin or proceedings. These group meetings may also aid chairman and recorders in planning future progress reports in presenting

special problems to individual groups, in studying leadership techniques and problems involved in leading a group, and in sharing experiences and information.

10. *Evaluation.*—Evaluation is an essential component of any programme. It is only through evaluation that how far the objectives have been achieved can be determined. Evaluation is essential for planning future programmes.

Evaluation of a workshop is a difficult task because the objectives of a workshop are different from those of the usual subject matter course. When objectives are changed the means of detecting and measuring outcomes must necessarily be changed.

Many workshops have been held on a great variety of problems and in many instances no attempt has been made to evaluate the results. Just as it is desirable to stop and take stock periodically during the course of the workshop through progress reports and staff conferences, it is also desirable to have representatives of the group, appraise the workshop and the progress made. The most effective evaluation is that which is planned for early enough to enable those responsible to collect data as the work progresses.

Early in the workshop, an evaluation or workshop committee should be elected by the group. *This committee should be representative of all the working groups* and its purpose is to study and evaluate the organisation, administration, operation of the workshop. Such a study and evaluation should result in constructive criticism, commendations and recommendations.

There are different types of evaluation. The main types to be considered in planning the evaluation of a workshop are:

(a) *Self evaluation.*—Through self evaluation an effort is made to cause the learner to direct his attention to his own thinking and activities as well as his role in the total workshop. Each participant thinks about himself, tries to see

himself, and considers whether he is doing his part as well as possible. In this evaluation, blank forms may be distributed to participants. Some simple questions such as the following may be included :—

What is my attitude towards the workshop at this stage ?

Do I understand what is being attempted ?

What have I contributed to the workshop ?

How can I overcome whatever deficiencies I feel I have ?

Am I doing my share ?

(b) *Small group evaluation.*—In the small-group evaluation an effort is made to have the working groups evaluate their progress as groups. This usually occurs in the following two ways :—

The group has an occasional evaluative session where the members talk about how they are doing and what they need for better success. The objectives are reviewed and considerable self appraisal is inherent in this process, since it is apparent that if the group is not doing well, individuals must be responsible.

Small-group evaluation may take place in the production of a written report at the end of each session. Such written reports usually start with a written statement of the original objectives, followed by a discussion of the degree to which they have been achieved.

(c) *The total group's evaluation.*—The participants and staff are much interested in how the workshop as a whole is meeting its objectives. There may be many large group sessions on this subject.

During the workshop, the workshop committee can plan such a session at any time. These sessions usually take the form of panels, where participants discuss their own feelings about the workshop and report the progress of their own groups.

At the end of each session a great deal of thought and effort is put into the final total group evaluation. This may be designed and managed by the working committee with the staff helping where it can.

The workshop committee is responsible for the overall evaluation of the workshop. This evaluation may be done through many activities but the following need special consideration :—

Analysis of evaluation forms completed by participants.

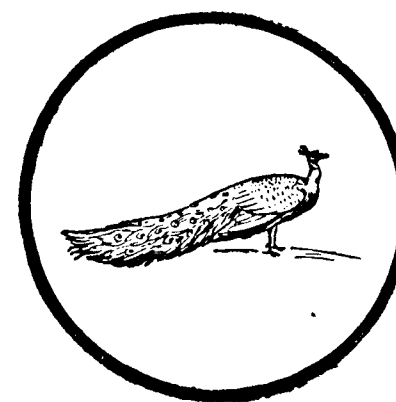
Compilation of data collected through observation.

Consideration of objectives and the extent to which they were met.

Consideration of weaknesses and strengths of workshop.

Consideration of follow-up which should be done.

Preparation of report.



Diagnosis and treatment of Cholera

“Outbreak of cholera in an epidemic form is highly dreaded disease because of the high rate of mortality it causes and the quickness with which it sometimes sends the victims to the morgue. This, however, should be considered a matter of the past because recent studies in treatment of the sufferers have shown that nobody need die of cholera if he or she is put on treatment early in the course of the illness.

Important criteria on the basis of which a medical officer can diagnose a case of cholera, and the lines of treatment recommended on the basis of studies, are described in this article.”

—EDITOR.

DIAGNOSIS

Clinical features.—During the height of an epidemic, the diagnosis is easy. Profuse rice water stools, sunken eyes and cheeks, dry tongue and lips, shrivelled finger tips and toes, cold clammy and inelastic skin, feeble husky voice, vomiting, excessive thirst, painful muscular cramps particularly of fingers and toes, imperceptible radial pulse, blood pressure usually too low to be recorded on a manometer and suppression of urine are characteristics of a case of cholera in the acute stage.

In a case of diarrhoea and vomiting that comes under observation rather early, that is, when the patient is not much dehydrated or collapsed and is passing stool with plenty of faecal content rather than the characteristic rice-water appearance, cholera should be suspected if the patient comes from an infected locality or area. *In fact, all cases of*

*gastro-enteritis occurring in an epidemic form, however small should be considered as potential cases of cholera particularly in an endemic area. It may not be out of place to mention that there is no difference between epidemiological behaviour and clinical features of infections with *V. Cholerae* or by the *El Tor vibrio*.*

Symptoms resembling true cholera may be simulated by other clinical conditions, namely, food poisoning, fulminating bacillary dysentery, acute arsenic or antimony poisoning, choleraic form of malaria, typhoid fever or alcoholism. The stools in these cases always contain some biliary colouring matter. Prostration may not be so marked as in cholera. The diagnosis of an individual case is not so difficult if the clinical history is carefully obtained.

The diagnosis of the first few cases in an outbreak of cholera of a sporadic case or an typical case is, however, possible only if the causative organism is isolated by culture of stool.

In the majority of cases of cholera, stools are of rice-water type and are occasionally flecked with blood. They are liquid and stained with bile or contain faecal matter and also fine shreds of mucus in a lesser number of cases.

Microscopic examination of stool.—A provisional bacteriological diagnosis can be made in cases whose stool samples are heavily infested with *V. Cholerae* as determined by examination of a hanging-drop preparation made from the stool. The presence of minute organisms with very rapid scintillating rotatory movements suggests infection with *V. Cholerae*. A dried film made from a flake of mucus and stained with dilute carbol-fuchsin may show the characteristic common shaped vibrios arranged in typical fish-in-stream appearance in large numbers. A negative result obtained by examination of a single specimen does not rule out the diagnosis of cholera. The results of microscopic examination are, however, not of great value because they are usually positive in cases which are diagnosable on clinical grounds also.

Cultural test.—This diagnostic procedure is necessary for the investigation of all cases and particularly those which occur in the beginning of an epidemic and which are mild or are atypical in nature. It is also essential in identifying the carriers. Furthermore, it is the most expeditious and reliable method to detect the presence of *V. Cholerae* in the stool, if plating can be done direct from a bed-pan in the hospital laboratory situated not very far from the wards.

Collection of a specimen of stool for culture.—This should not be difficult in an acute case as the patient is passing copious watery motions. If necessary, a sterile soft rubber (No. 20-24 in adults) lubricated with sterile paraffin can be inserted into the anus up to a length of 6 to 8 cm. Vomitus may also yield a positive culture. Rectal swabs, may be used in place of a rubber catheter. The patient is put on his side with thighs flexed so that the knees are close to his chest. With one hand (gloves) the operator raises the upper buttock of the patient so that the anal canal comes into view. A swab, preferably moistened with sterile peptone water or normal saline, is inserted into the patient's anus and is given one or two twists. It is helpful if the patient bears down or takes a deep breath.

The material on the rubber catheter is transferred to a sterilised test tube. The rectal swab can also be inserted into a similar test-tube for transport to the hospital laboratory where it is attended to immediately. If however, the investigation is likely to be delayed for some time in the hospital laboratory or the specimen has to be despatched to a centre away from the hospital, the specimen of stool on the catheter or on the swab should be inoculated into a bottle containing the Venkataraman or Ramakrishna holding medium. If necessary the holding medium can be obtained on request from the *Cholera Research Centre, 3 KYD Street,*

Calcutta. This is supplied in 10 ml. quantities in sterilised screw-capped bottles. One to three grammes of stool is transferred into this fluid with the help of a sterilised spoon, a glass rod or a swab. It is important to avoid disinfectants or ordinary water coming into contact with a specimen of stool collected for examination.

The methods used in culturing stool for *V. Cholerae* are described in Appendix I to this Bulletin with a view to emphasise that a presumptive bacteriological diagnosis can be made within 12 to 18 hours of the receipt of a specimen of stool by a laboratory. It may be pointed out that colonies sufficiently large in size can be picked up from a plate with a loop in about 12 to 18 hours' incubation. They can be tested for agglutination with mono-specific agglutinating high titre antisera *V. Cholerae Ojawa Inaba*. The slide agglutination test which takes about 15 minutes to perform is sufficient to indicate that the organism grown is very likely to be the causative agent of cholera. It should be noted however, that this test is possible only if the culture made direct from a fresh specimen of stool is successful. The necessity of inoculating into enrichment medium before transference to a plate will obviously add to the time required for the presumptive diagnosis. Further more, the identity of the species can be established only after a number of other tests are completed.

It may be emphasised on the basis of the facts given above, that the Director of Health Services should make necessary arrangements during 'Cholera Season' to keep in readiness bottles or holding medium and sterilised rectal swabs for supplying to the Medical Officers in the field, in general practice and in the Infectious Diseases Hospital. These can be easily made in any provincial public health laboratory or in the bacteriology department of a Medical College. A circular should also be sent to all laboratories undertaking culture work to keep in readiness a culture medium of their choice for investigation of cases diagnosed as acute gastro-enteritis or clinical cholera.

TREATMENT OF CHOLERA

Although it is more than 80 years since Koch discovered the causative organism of cholera, our knowledge regarding the basic bio-chemical mechanism by which *V. Cholerae* alters the physiology of the host it infects, is still very meagre. The treatment, therefore, is based essentially on the patho-physiologic changes observed and in counteracting them.

Principles of treatment.—It can be seen from the stools and vomits that they consist mostly of water, a little of salts and very little of albuminous material. The loss of water results in diminished volume of blood. Debility, faintness and coldness, i.e., the symptoms that are observed in a case of haemorrhage, are also seen in a case of cholera. As the blood becomes thick, its passage through the capillaries is hampered and deficient supply of blood results in the failure of renal biliary and other secretions in the body. That these symptoms are independent of the disease in the gastro-intestinal tract is obvious from the fact that when weak saline is given intravenously, the skin recovers its elasticity, becomes warm and the patient regains strength to sit up.

Therefore the first and foremost principle of treatment of cholera is replacement of the fluid, a salt and alkali losses the patient has suffered before he or she is admitted to hospital. After the acute dehydration has been overcome, the patient requires further intravenous fluid depending on the volume of evacuations. If this is done promptly and scientifically, the patient can be kept going well till the disease in the gastro-intestinal tract subsides.

It has been shown that the stool in cholera remains essentially isotonic with the plasma throughout the entire course of illness. It is, therefore, quite clear that the intravenous fluid administered to keep up the blood volume should be isotonic with the plasma. On the other hand throughout the course of illness the bicarbonate concentration of the stool is found to be higher than in the plasma. It is obvious that the

severe acidosis in the cholera patient is a result of gastro-intestinal bicarbonate loss and replacement of this throughout the course of the treatment of cholera patient is absolutely essential. The potassium blood level but because of large body stores of potassium, the necessity for its repletion is not so urgent. As the loss of proteins and formed elements from the blood is so little, no replacement of these is indicated.

Average stool out-put is approximately 12 litres in a 5½ day period, though rarely a total of 60 litres of stool may be passed during the course of disease. The essential features of therapy, therefore are to correct dehydration by intravenous infusion of saline, treat the acidosis by administering bicarbonate or a bicarbonate precursor paraterally and prevent hypokalaemia by the administration of potassium salts either orally or parenterally. In other words, physiological replacement of losses has to be effected.

Besides this replacement therapy, the other principle in cholera is to eliminate the causative organism by administration of antibiotics. This shortens the duration of illness and reduces the total requirement of intravenous saline, bed space and nursing care.

Intravenous oral fluids.—A single intravenous solution containing approximately 150 mEq/l sodium, 100 mEq/l chloride and 50 mEq/l lactate or bicarbonate is simple to use but generally not available. Equally effective is 3 litres of isotonic saline solution to 1 litre of 2 per cent sodium bicarbonate or 2:1 ratio of isotonic saline to isotonic lactate (1/6 molar or 1.9 per cent) or isotonic sodium bicarbonate. The Director of Health Services should make sure that parteral fluids are available at most of the Health Centres for proper treatment of cholera cases.

Potassium is absorbed following oral injection regardless of stool volume or rapidity of the intestinal transit time. Fresh green cocoanut ('dab') milk contains about 73 mEq/l potassium. Approximately 200 ml. of oral 'dab' water for

each litre of stool loss corrects the potassium depletion. As an alternative, 10 ml. of a mixture containing 100 gram each of potassium citrate, potassium acetate and potassium bicarbonate per litre of water may be given three times a day orally.

If intravenous bicarbonate/lactate is not available, a 5 per cent, oral solution of sodium bicarbonate is palatable and may be given to the patient as this will partially correct the acidosis. It may, however, be noted that it is dangerous to treat the cholera patient by oral replacement therapy alone.

Antibiotic therapy.—It is necessary to attack the cholera vibrio with an antibacterial agent like tetracycline which has a rapid sterilising effect in the gut and reduces the duration and intensity of diarrhoea. The intravenous fluid requirements of the cholera patient are significantly reduced by this antibiotic therapy. The drug should be administered by mouth shortly after admission and 500 milligram is given orally every six hours for eight doses, preferably under the doctor's supervision. All tetracycline-treated patients become vibrio-free within 24 hours while those not treated with the antibiotic continue to excrete vibrios for six days.

Treatment Centres.—Pre-determined centres should be available to any potential patient within three hours of the onset of the disease. The Centre should be equipped with adequate pyrogen-free fluids and large gauge needles. In the absence of proper stills for pyrogen-free distilled water, the solutions should be prepared in freshly distilled water and autoclaved immediately. Cots, with a reinforced hole located in the centre for the patient's buttocks should be available. These may be made of canvas on a wooden frame or even boards elevated upon supports. This may be improvised out of any ordinary "Khatiya". A rubber sheet on the bed with an attached sleeve that fits through the hole would channel all excreta into a bucket or any other suitable receptacle on the floor so that the same can be measured without moving the patient. A wooden dip-stick suitably

calibrated may be used to estimate the amount of excreta. After use, this stick should be kept in a bucket containing an antiseptic. In a rural area, it may be necessary to dig in the mud floor of a thatched hut, a hole which should be large enough to hold an earthen vessel of about 8 to 10 inches in diameter under the buttocks of the patient lying on the floor, bed or mat. The stool is collected automatically in the pot which may contain 1 per cent cresol with advantage. If this is not possible, stool loss has to be guessed each time. The time and amount of all infusions, when initiated, and the output when discarded should be carefully recorded. A sheet of paper can be attached to the cot, wall or a stand nearby for this purpose.

Management of patients.—On admission, the patient is weighed and placed on a cholera bed. If the patient is too sick to stand, an attendant should hold the patient and both the individuals can be weighed together. Determine the patient's weight by subtracting the attendant's weight. If a scale is not available, the weight is estimated. Record pulse rate and blood pressure on admission and subsequently every two to four hours during the course of treatment. This is considered adequate by some workers for estimation of the state of hydration. Insert 18 gauge needle and transfuse the solutions already mentioned above at the rate of 100 ml. per minute. A smaller gauge needle or a scalp vein set is usually necessary for children. Superficial arm veins for adults and scalp vein for small children are preferred. A leg vein is less desirable because of the higher incidence of thrombo-phlebitis and embolic phenomenon in the lower extremities. In cases of severe dehydration and shock, the femoral vein in the adults and external jugular vein in children is utilised.

After the radial pulse is restored, infuse more slowly (25 ml. per minute). Remarkable improvement follows the correction of the fluid deficit in about four hours or so. Thereafter, the rate of infusion should be 3 ml. per minute.

2. Objective measurement of the state of hydration can best be obtained by determining specific gravity of plasma proteins by copper sulphate method, if facilities are available. After inserting the needle, draw 3 ml. of blood and leave the needle in place. Deposit the blood in a test-tube coated with either heparin or oxalate, and initiate the intravenous transfusion as rapidly as possible, preferably at a rate of 100 ml. per minute. The amount to be given is calculated on the basis of specific gravity determination. This volume of fluid should be given rapidly. There is no risk even in elderly patients with cardiac involvement as the calculated amount of fluid will not rehydrate beyond his usual physiological state. Once a patient is rehydrated, the infusion is slowed down to about 3 ml. per minute. After the acute dehydration is overcome, the patient will require further intravenous fluid, depending on the volume of evacuation and the duration of diarrhoea. The stools should, therefore, be measured and intravenous fluid given to equate the output. It is advantageous to determine plasma specific gravity after rehydrating the patient and then at least daily until the cessation of diarrhoea. This gives a more reliable indication about the patient's state of hydration and serves as an adequate check on the clinical observations.

3. Continue intravenous fluid to balance the measured-output.

4. The insensible water loss, generally estimated to be 1 ml. kg hour, in cholera endemic areas, comes to about 1 litre per day. This should be replaced. Oral administration of this amount of fluid contributes to the patient's state of well-being.

5. Give tetracycline 4,500 mg. orally every 6 hours for 8 doses. Any dose vomited out should be repeated.

6. Intravenous fluid therapy is terminated on the basis of (a) cessation of diarrhoea, (b) maintenance of pulse and blood pressure/stabilisation of specific gravity of blood plasma to normal level, (c) retention of fluids by mouth and (d) flow of urine.

After first 4 hours of treatment, the patient is given water by mouth upon demand. Coconut milk and fruit juices are usually the first liquids which are tolerated. Glucose and other sugar are often rejected during the first days of sickness. During the intermediate stage of the illness, barley, arrowroot or rice water with salt and sugar, whey or buttermilk may be added. After convalescence sets in, buttermilk and over-boiled rice to which salt and sugar are added, may be given. Proceed cautiously to soft rice, mashed green banana, mashed potatoes, fish, etc.

Daily rectal swabs of patients may be cultured for the presence of vibrio, and hospitalization is continued until three consecutive cultures are obtained.

Treatment in children.—The disease is more common and has a higher mortality rate in children than in adults. They cannot stand dehydration well; they are not just small adults and the formula that 4 ml. of saline infusion should be given per kg. of body-weight for each 0.01 ml. increase of specific gravity of plasma is not applicable in children under 15 kg. of weight. The most effective schedule for children has not yet been worked out. The initial infusion to be given without delay would be a bottle of normal saline followed by half a bottle of alkali solution intravenously at a rapid rate. External jugular or femoral vein may have to be used for the initial infusion. Later, it is continued in the arm or leg vein at a rate according to the child's condition and stool volume. The vein may have to be opened, but subcutaneous administration of saline is better avoided. Intraperitoneal infusion has not yet been properly evaluated. Tetracycline in pediatric dose should be started as early as possible and so also sips of water and green coconut milk. Calcium injections for tetany and sedatives for convulsion, if any, may also be used. Some cases respond dramatically to 50 per cent intravenous glucose. Sweetened fruit juice may suffice in the conscious patient.

Treatment in pregnant women.—Pregnancy necessitates extra precautions. Abortion is common, and no method is known to prevent such a catastrophe. Acidosis is harmful to the foetus; dehydration may cause involuntary uterine contractions comparable to cramps in the voluntary muscles; and circulatory collapse reduces the plasental blood flow. All these are liable to cause intra-uterine death of the foetus abortion, and premature labour. Cholera should be treated with all emphasis, management of pregnancy being secondary. Masterly inactivity could be the best policy unless there are special indications. For instance, ergometrine injection is given after abortion, dilatation and cureting being postponed. If the foetal head is in the perineum, low forceps may be applied. Placenta may be retained for a long time and it would be safe to leave it alone. An obstetrician may have to be consulted. Incidentally, pregnant women need not be exempted from anti-cholera inoculation.

Complications.—Complications are very unlikely in cases of cholera treated promptly. The following, however, may be taken note of:—

Actual renal failure.—The treatment is as for actual renal failure from other causes.

Failure to correct acidosis.—This is indicated by persistent cramps, vomiting, increasing dyspnoea, alkal pulmonary oedema and ultimately biventricular myocardial failure. Large quantities of saline infusion without rales, may produce signs and symptoms of acidosis. Treatment is by administration of additional intravenous bicarbonate or lactate.

Muscular weakness, ileus, abdominal distension, cardiac arrhythmia and occasional central nervous system involvement may result from hypokalemia, especially if potassium has not been given by vein or mouth. These effects can be easily treated by intravenous or oral potassium.

Over-hydration is impossible if a proper check is kept on the patient's state of hydration. It may however, be noted that increased jugular reflux and slow full pulse indicate the approaching pulmonary peripheral oedema. In such cases, the fluids should be withheld. More vigorous measures may be necessary.

Prevention of the spread during treatment.—Chlorinated lime should be applied to the dejecta, vomits of the patient, his personal clothing and utensils. It is important to discard all water in a house when a case of cholera is detected and to cook food afresh in the house after the patient has been removed to the hospital.

Visitors should not be allowed during treatment. As far as possible, the patient should not be put under care of the members of the family as a large proportion of the contacts become carriers.

Besides isolation and care of the patients, if treated at home, the medical officer-in-charge has to take care to disinfect the excreta, vomits and soiled clothes. The utensils used for the patients should be separated from those of the others and boiled. In the rural areas, the best way to dispose of excreta is to bury it with lime in a pit dug out at a reasonable distance. Attention should also be paid to the care of the community, especially in respect of (a) disinfection of all the water sources with bleaching powder and provision of adequate and safe water supply preferably from tube wells, (b) mass immunisation and (c) health education.

Contacts.—Strictly speaking, contacts and other carriers should be isolated till three consecutive stool specimens are negative.

THE PRINCIPLES OF TREATMENT

1. Cholera is an acute infectious disease characterized by severe diarrhoea, vomiting, rice-water type of stools, and marked prostration.

2. In endemic areas of the country, all cases of gastro-enteritis should be diagnosed as clinical cholera and treated as such without waiting bacteriological diagnosis.

3. Diagnosis of a sporadic case is helped by naked eye examination of stool and microscopic examination of a hanging drop preparation and of a stained smear. Final diagnosis is, however, based on cultural test of the stool and isolation of the organism in pure culture.

4. All the clinical features of cholera can be entirely explained by the isotonic loss of water and electrolytes via the gastro-intestinal tract.

5. Therefore, all the clinical and biochemical abnormalities in the cholera patient can be rapidly and consistently corrected by intravenous administration of fluids containing electrolytes approximately equal in concentration in the fluid lost.

6. Use of isotonic saline and isotonic sodium lactate or isotonic sodium bicarbonate (2 per cent) in 2 : 1 ratio is most efficacious in saving life if given immediately and adequately after the patient is admitted.

7. Administration of tetracycline in 500 mg. doses every 6 hours till 8 doses are given is helpful in reducing the duration and intensity of diarrhoea. All the same it is emphasised that intravenous saline therapy is essential to counteract dehydration resulting from diarrhoea and vomiting.

Excerpts from the "Technical Information Bulletin" of INDIAN COUNCIL OF MEDICAL RESEARCH.

ANNEXURE I

PREPARATION OF SOLUTIONS

Single intravenous solution :

Sodium chloride ($\text{Na}^+ \text{Cl}^-$) 5-8 g.

Sodium lactate ($\text{Na}^+ \text{C}_3 \text{H}_5 \text{O}_3$) 5-6 G.

Sodium bicarbonate ($\text{Na}^+ \text{HCO}_3^-$) 42 g.

Distilled water up to 1000 ml.

Isotonic saline :

Sodium chloride 8.9 g.

Distilled water up to 1000 ml.

Sodium bicarbonate 2 per cent :

Sodium bicarbonate 20 g.

Distilled water up to 1000 ml.

Sodium lactate 1/6th molar :

Sodium lactate ($\text{Na}^+ \text{C}_3 \text{H}_5 \text{O}_3$) 13-7 g.

Distilled water up to 1000 ml.

Sodium bicarbonate-isotonic :

Sodium bicarbonate ($\text{Na}^+ \text{HCO}_3^-$) 14 g.

Distilled water up to 1000 ml.

OTHER ITEMS

Parenteral solutions needed for treatment of possible complications :

Glucose solution 50 per cent.

Calcium gluconate.

Potassium chloride 15 per cent.

Drugs :

Tetracycline (oral).

Aramine/coramine-a vaso pressor agent for the occasional non-cholera patient who presents himself with similar complaints but does not respond to fluid replacement therapy.

8. Give fluid to balance the output as determined by using dip-stick at bed-side. Allow for insensible water loss, which may be replaced orally, by presenting oral fluid with potassium upon toleration. A soft diet can be given on demand.

9. Administer tetracycline orally 500 mg. every six hours for eight doses or 250 mg. every six hours for twelve doses.

10. Continue infusion therapy until cessation of diarrhoea.

11. The formula for fluid replacement does not apply to patients weighing under 15 kg. This has to be determined on the basis of the state of hydration in each case. Check by determining specific of blood/plasma.

12. No other drug is ordinarily needed.

Miscellaneous items required—

Alcohol 70 per cent.

Heparin or potassium oxalate and ammonium oxalate-anticoagulants for the preparation of specimen tubes/bottles.

Scale for weighing if the patient is too sick.—An attendant who holds the patient can be weighed along with the patient and then the patient's weight can be determined by subtracting the attendant's weight.

Anti-coagulants for collection of blood.—The syringe and the needle may be rinsed before use with concentrated heparin or the tube should contain 0.05 ml. of either a 0.05 per cent heparin solution or a two per cent solution of oxalate (12 g. of ammonium oxalate and 8 g. of potassium oxalate) dissolved in one litre of distilled water for each ml. of blood the tube is to receive. Three ml. of blood is sufficient and thus 0.15 ml. of either anti-coagulant is added to a test tube marked at three ml. and allowed to dry to a thin film. This is facilitated if a drying oven is available.

ANNEXURE II

SUMMARY OF TREATMENT OF THE CHOLERA PATIENT

1. Weigh the patient.
2. Place on cholera cot.
3. Record pulse rate and blood pressure. This is essential in the absence of arrangement for determining blood/plasma specific gravity.

4. Insert 18 gauge needle and initiate intravenous infusion of the fluid at the rate of 100 ml. per minute.

If, however, facility for determining specific gravity of blood/plasma is available, draw 3 ml. of blood after inserting the needle. Leave this in place and run the intravenous fluid through the same needle.

5. Give either 1,000 ml. of two per cent sodium bicarbonate for every 3,000 ml. of isotonic saline or a 2+1 ratio of isotonic saline to isotonic bicarbonate or lactate.

6. Record all intake and output at bed side.

7. Record pulse rate and blood-pressure every two to four hours with a view to determine the rate at which the fluid should be transfused and when it can be stopped.

When the radial pulse is restored, infuse more slowly (25 ml. per minute). Finally in 3-4 hours time patient usually shows remarkable improvement when the infusion is reduced to 3 ml. per minute.

If readings of specific gravity of blood/plasma are available calculate the amount of the fluid needed on the basis of 4 ml. kg. of body-weight for each elevation of 0.0001 over a plasma specific gravity of 1.025. Check state of hydration with specific gravity at least daily or more often as indicated.

The Age of marriage

Need for raising the age of marriage of women as a contributory measure in Family Planning

DEMOGRAPHIC STUDY

Raising the age of matrimony for women is the topic of the day. Diverse factors contribute to the problem; legislation alone cannot be the chief expedient for increasing the age of matrimony; social climate, dissemination of educative information through social welfare institutions are much needed. State laws may perhaps grip the attention of the people to speed up the process of social change. Knowledge on planned parenthood greatly increases the pursuit of happiness of parents, both in limiting the size of the family, and spacing pregnancy. And therefore motivation and will, are essentially needed for acceptance of any specific method of sizing up family. Such acceptance naturally tends to the practice of methods that are available.

In this context a study has been undertaken to assess whether or not there will be a reduction in the fecundity and or susceptibility (or sensitivity) for begetting children with the raising of the age of marriage on a random comparative study of different age-groups of women—e.g., all women *vs.* married women; women of a given age *vs.* married women of a particular age, so on and so forth.

The object of the study is simply to assess :

(1) Whether an increase in the age of women of marriageable group would tend to decrease the occurrence of births; and

(2) Whether the fertility rate among the age-group of 20-30 is higher than the age-group of 15-19.

Fertility rates for Madras City.—Fertility rates per 1,000 female population and per 1,000 married female population for the City for the period 1955-64 were studied on the

basis of the number of children born to women in each age-group 15-19, 20-24, 25-29, etc., for each year and the total population and married female population in the respective age-groups during the year.

The following deductions were drawn :—

1. The fertility rates per 1,000 female population and per 1,000 married female population for the age-group 20-24 are higher than the rate for the age-group 15-19 (statistically significant at both 5 per cent and 1 per cent level of significance).

2. The fertility rates per 1,000 female population alone are higher in the age-groups of 25-29 and 30-34 than those of the age-group 15-19 (highly significant at both 5 per cent and 1 per cent level of significance).

3. The fertility rates per 1,000 female population and per 1,000 married female population are at their peak in the age-group 20-24 (as shown in the graph).

4. The fertility rate per mille married female population is higher in the age-group 15-19 because the proportion of married females is very small (—of females in 15-19 age-group).

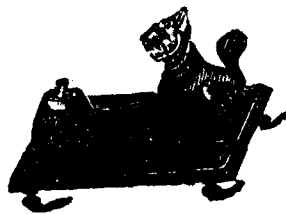
In respect of survey conducted for fertility rates per mille for selected municipalities in Madras (population over one lakh) the following deductions have been arrived at—*vide* statements appended hereto showing fertility rates for different age-groups in selected municipalities in the State and for rural and urban areas of the State as furnished by the Census Department.

Fertility rates for selected municipalities in Madras State follow the same trend as those for Madras City.

Fertility rates for rural and urban areas of the State are higher in the age-groups 20-24, 25-29 and 30-34 than in the age-group 20-24.

By increase in the age of marriage it may be expected that fertility would be lowered as it would cut down the reproductive span. The move to raise it still higher may have a direct effect on fertility but this question needs to be further investigated factually. The postponement of marriage does delay the onset of child bearing, and would reduce the actual reproductive period only when it is assumed that the age when the woman ceases reproduction will not be raised correspondingly.

It may therefore be concluded that the raising of the age of marriage may not subscribe to the decrease in the productivity of the number of children to any significant extent.



Convulsions In Children

DR. C. J. AIYA NADAR,

*Paediatric Physician, Government Children's Hospital,
Egmore, Madras.*

They are common in children and cause great anxiety among the parents. If they are treated early, many can be saved and the recurrence of attacks can be prevented in the majority of cases. Many of the convulsions can also be prevented by careful attention during delivery and by avoidance of infections among children.

Convulsions can be grouped under three age groups:—
(1) New-natal period (first one month after delivery),
(2) Infant period (up to 2 years), and (3) Childhood period (after 2 years).

Neo-natal period.—Birth injuries are the common causes. For example difficult deliveries and forceps deliveries will cause damage to the brain and the convulsions occur. Therefore, careful attention during delivery is important.

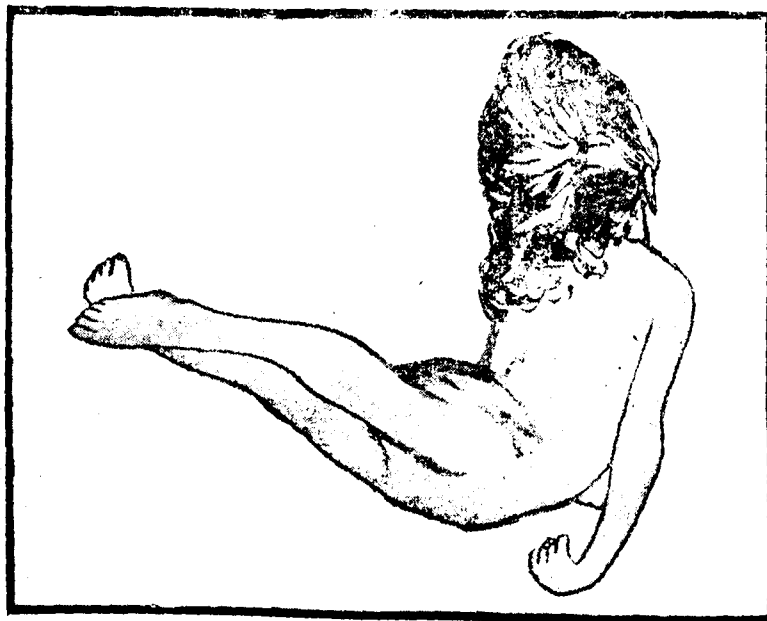
The next common cause is infection of the new born. For example, infected umbilicus and infection of the skin due to boils and abscesses and syphilis may cause convulsions. Meningitis (infection of the covering of the brain) also occurs during this period and will cause convulsions. The infection occurs through blood and blood gets infected usually due to throat infection. To prevent this any person having an infection like sore throat should not be allowed to come into contact with the baby. Mother must wash her hands before handling the baby.

If delivery is attended by ill-trained midwives umbilical sepsis can occur and cause convulsions.

Other rare causes are (1) Tetany due to calcium deficiency, (2) convulsions due to a deficiency of a vitamin factor (i.e.) pyridoxin and (3) mental deficiency due to defective development of the brain.

During infancy.—Febrile convulsions (pyrexial fits) are the most important causes. Any high fever may produce convulsions. Therefore, in such cases, anti-febrile therapy like sponging, administration of anti-pyrexial drugs like aspirin will prevent such attacks.

The occurrence for fever may be due to various causes and those causes should be investigated. For example, infection of the urinary tract, infection of the lungs and infection of the coverings of the brain (Meningitis) may be responsible for the fever.



Meningitis

(Note the curvature of the back and the stiff-limbs)

Other causes of convulsions during this age period are: Injury to the head due to a fall or hit, poisoning by lead due to eating of paints containing lead compounds or swallowing camphor or drugs used for asthma. Therefore, the mothers must be careful to keep the almirahs and shelves containing drugs closed with lock and key.

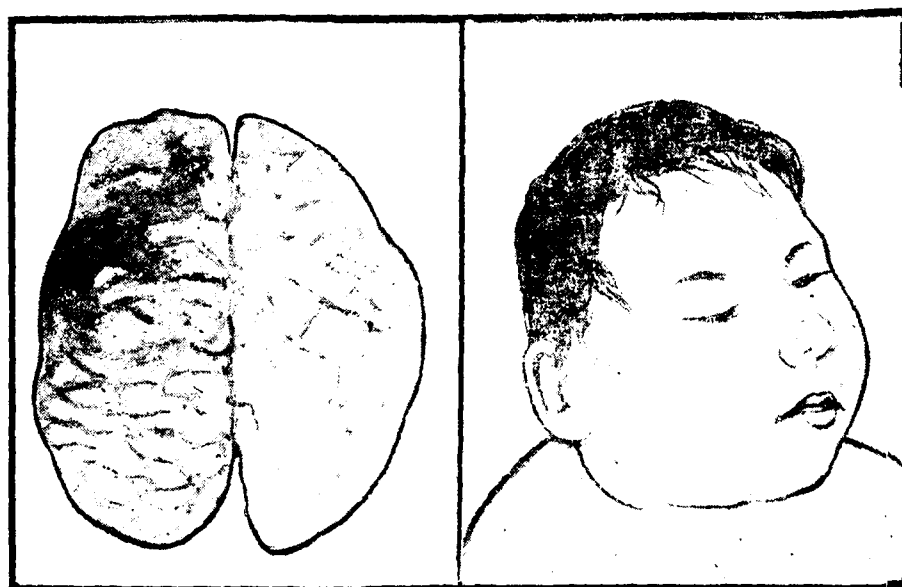
During childhood period.—During this period, epilepsy is a major cause. It is also called a pyrexial fits since there is no fever at the onset of the fits. But later, fever may supervene due to infections and these fits may continue or recur with or without appearance of fever. Even though, the cause may be due to hereditary tendency, these fits can be prevented to a large extent by taking drugs like Dilantin, Mysoline, Mesantoin, etc., for a long period at the advice of the doctors.

Brain tumors can also cause fits during this period. It may even be difficult to differentiate this from the epilepsy in early cases unless investigations like X-ray of skull, examination of the fundus of the eyes and E.E.G. are taken with the help of the doctor.

Other causes will be infections as mentioned under Infancy period. Rare causes are—

(a) *Hysteria.*—The patient tries to attract the attention of the superiors by developing fits suddenly in their presence. Thereby, he wants to get the sympathy of those people to achieve his own object. For example, a boy may develop fits so that he may not go to school. Such cases do not have fever; therefore to differentiate this from epilepsy, careful history of the patient will be useful. In these cases, the fits last longer than in epilepsy (i.e., in epilepsy, the fits last only for 2–3 minutes) and the patients are conscious during the attack and they will see that their limbs are not injured by hitting against neighbouring objects during the attack.

(b) Alkalosis due to frequent vomiting (blood becomes alkaline in reaction due to loss of acids during vomiting).



Bleeding in brain.

Microcephaly Small Head

(c) Low sugar in blood due to a tumour in the gland called pancreas (pancreas secretes insulin which burns sugar in the blood. In tumour of pancreas, there is too much secretion of insulin and so the blood sugar becomes very low) or due to injection of insulin in the treatment of diabetes in children which is a rare disease in our country though common in western countries.

To sum up, convulsions through common amongst children, can be prevented to a large extent in the majority of cases and in those cases of recurrent attacks due to epilepsy or other causes, investigations may be necessary to ascertain the exact cause for which medical attention is essential.

* The Alkaloids and Toxicity of Argemone Oil

WHAT CERTAIN EXPERTS FELT ABOUT THE ALKALOIDS AND TOXICITY OF ARGEMONE OIL IN EDIBLE OILS, VANASPATHI AND GHEE

What is Argemone oil poisoning ?

Epidemic Dropsy was formerly thought to be wet beri beri but is now regarded as a form of poisoning due to argemone oil which is present as an impurity in mustard oil and is now being one as an adulterant in vanaspathi.

This disease tends to occur as outbreaks affecting several members of the same family or community. It occurs at the same season of the year and resembles wet beri beri in several respects.

Symptoms:

- (i) Fever.
- (ii) Gastro-enteritis and nausea and vomiting.
- (iii) Neuritis.
- (iv) Glaucoma and mottling of the skin.
- (v) Oedema (Generalized) starting from the feet and extending upwards. There are often serious effusions into the pleura pericardium and peritoneum. Death may occur from acute heart failure.

Prevention :

(i) By avoiding the suspected food, e.g., vanaspathi, mustard oil.

(ii) By determining the presence of argemone oil by the use of certain tests.

* An extract from the minutes of the *ad hoc* meeting of the experts, held in Patiala House, New Delhi, on 20th March 1967.

A
SMALL FAMILY
IS A
HAPPY FAMILY

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Madras HEALTH EDUCATION

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MADRAS

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Role of communications in
Family Planning

BY

SHRI GOVIND NARAYAN

Much of the success of the family-planning programme must ultimately depend on how frequently and efficiently communication takes place at different levels. This was the subject of a speech by Sri. Govind Narayan, Secretary, Ministry of Health and Family Planning, delivered at the Indian Institute of Mass Communication, New Delhi, recently.

—Editor

For such a distinguished and well-informed group as this is, I need not waste any time in highlighting the importance, the urgency and priority of the family-planning programme. For a developing country like ours, striving hard to secure a better standard of living for the people, it is an absolute *Must* to make an all-out effort towards population control. Even for an individual family, building happy dreams of a brighter future, giving practical shape to all its love and affection for the children, trying to secure adequate standards of health for the mother and the children proper nutrition, education, clothing and looking after of the family, providing for the other necessary amenities, the adoption of the norm of a small-family has again to become a *Must*. By its very nature, the programme has to be a peoples' programme and everyone according to one's capacity and zeal has got to get involved in giving an active helping hand.

The role of the leaders of public opinion at the various levels, of the voluntary and social organizations, of the private and public sector industries and labour organizations, of the private medical practitioners and the social workers is undoubtedly of the highest importance, but the magnitude of the problem is so vast and the dimensions of the programme are so large that success without adequate leadership from the Government might be difficult. Government provides the much needed financial resources, the framework and the organization in order to bring everyone together to work for a common purpose in a co-ordinated manner.

Knowledge needs no bounds and, therefore, research in new methods, in improvement of the existing methods, in finding solutions to some of the baffling questions, becomes necessary. Research, therefore, is being taken care of in the programme in the fields of bio-medicine, reproductive physiology, demography, etc.

In order to sustain the tempo of a mass programme like this and to secure the maximum results out of our efforts, we must also know what impact the action programme is creating and what kind of results are being achieved. For this purpose diagnostic studies, concurrent evaluation and periodical independent evaluation are all necessary. Our programme has taken care of these.

The most important part of the programme, however, has to be the action programme and this has three important wings. The first is the organizational part which provides the structure, the financial resources, the manpower requirements and other inputs like vehicles, equipment, etc. The recruitment of personnel, its training and proper positioning, etc., all form part of this branch. Much of the success of the programme depends on the efficiency of this organization and its administration. The second important branch is that of the provision of services. We have proclaimed that our programme has the cafeteria approach

This means that all the known and recognized methods of family planning are included in our programme and the choice of the individual can be made for any one of them. There is no force or compulsion. The services, therefore, have to be provided to the people as close to them as possible and in accordance with the method of their choice, whether it be the conventional contraceptives or sterilization or IUCD or the oral. Proper facilities for the technical personnel, adequate supplies of the material needed by them, transport and equipment all form part of this branch.

The third and the most important branch, however, is that of communications.

No family-planning programme can succeed without the willing and active participation of the people. Unlike other health programmes, malaria eradication, for example, which requires only the people's co-operation but no decision-making or action, the family-planning programme depends on public knowledge, awareness, interest, motivation and actual adoption for its success.

Organization and services can only perform their function if there is successful communication with the people, especially with the 90 million couples eligible for family-planning. Communication includes many things. When a woman who has adopted a loop talks to her sister-in-law about it, that is communication. When our Minister seeks to enlist the support of political, social and religious leaders for the programme, that is also communication. An extension worker is communicating when she explains various contraceptive methods to small groups of village women.

However, the largest part of communication is in our attempts to radiate the idea of family-planning and gain support for it on a mass scale.

Before a married couple actually adopts family-planning, a good deal of communication is necessary. They have to be exposed to the message of family planning again and

again. This requires the employment of all types of communication techniques. We have to use all media of mass communication to create general awareness.

But it is not adequate to bring about behavioural changes. The awareness created by mass media has to be carried further by educational efforts of the field workers on to the level of attitude building and adoption of new practices.

The two-way communication by field workers would include the use of group discussion--decision method, community organization clinic education and counselling and effective follow-up supported by provision of good services.

In our country the task of communications is especially very difficult. In the first place, our country is a country of great diversity. It becomes extremely difficult to encode our message in such a way that could be acceptable to so many different groups with such large variations of social and cultural backgrounds and speaking so many different languages. A slogan that may be acceptable in north India may have no meaning or even a negative meaning in a village in Madras. From State to State we have different habits and traditions.

Secondly, we are a large country with a large population. Our population has already crossed the 510 million mark and is spread over 560,000 villages and 3,000 towns and cities.

Third is the low income and education level of our people. The experience of developed countries shows that it is easier and quicker to change the attitudes towards family-planning. In all the developed countries first the living standard rose high and then the birth rate dropped. But in our country we have to do it up-side down. In order to raise the living standard of our people, we have to bring down our birth rate. It is this reversed process that makes our task more difficult.

Finally, our attempts to transmit family-planning information and materials to create awareness and motivation to our vast population are hampered by the serious lack of mass media channels through which to communicate. Although

we have many newspapers, radio stations and cinema houses, our country falls far below the minimum standards worked out by the UNESCO for developing countries.

The department of Family Planning is fully conscious of this deficiency and we are giving full attention to rectify them within our resources. We are constantly seeking to introduce innovations in the technology and strategy of our motivational programmes.

Here I would like to give you in a nut-shell the various steps that we have taken in this field. Firstly, with the support of the Planning Commission and the Ministry of Finance we were able to allocate a sum of Rs. 10 crores for the Fourth Five-Year Plan for communication programmes. As you all know health and family planning is a State subject. Therefore, the major portion, i.e., about 6.3 crores has been allocated by us to the State Governments. At the Centre we have given 3.7 crores to strengthen the various media units of the Union Ministry of Information and Broadcasting. With the remaining amount we have set up a mass education and media division in our department.

The Mass Education and media division has the responsibility to formulate the broad strategy of the programme and co-ordinate the activities of the various organizations and provide prototypes of publicity materials, exhibitions, etc., to the States.

Special Family Planning cells have been created in the 22 regional stations of All-India Radio to gather information and pass on to various programme divisions so that it could be injected in all programmes.

We have plans to provide 50,000 transistor sets to our workers at the sub-centre level to equip them with the latest information on the programme.

Thirty field publicity units have been added in the fleet of the Directorate of Field Publicity.

Six regional exhibition units have been set up in the Directorate of Advertising and Visual Publicity. Funds have also been provided to strengthen the mailing arrangements of this Directorate.

Six Song and Drama Officers have been added to the Song and Drama Division. They would organize and strengthen activities through this medium which is found to be very effective with rural audiences.

We are making efforts to enlist the co-operation of all the newspapers in the country. Feature writers in six regional offices are being appointed to provide more stories from the field to newspapers. More advertisements on family planning are issued now. It is encouraging that more and more newspapers are devoting space to family planning. Last year as many as 150 newspapers brought out special supplements. Our emphasis is more on language newspapers.

In order to reach the illiterate masses in towns and rural areas, more stress is being put on outdoor publicity. Big hoardings and bus boards are being displayed all over the country.

Family planning slogans, songs and information are being increasingly broadcast by the All-India Radio.

The Films Division have started putting a 30-second tail-piece to every news reel produced by them. This means that every theatre in the country would screen some information on family planning in every show. This is in addition to the quickies and documentaries on family planning.

Songs on family planning written by well-known film lyricists and sung by Mohammad Rafi have been prepared. Their gramophone records will be available in the market very soon.

Full use will be made of the medium of cinemas by having films, quickies, slides, etc. This will be aided by our mobile vans and projectors.

An inverted equilateral red triangle has been adopted as family-planning symbol to identify the facilities and services. Honorary Education Leaders have been appointed at the State, District and Block levels.

The Education and Information wings of the State and District Family-Planning Bureaux have been strengthened by providing officers and other resources. One audio-visual van per district with all equipment and exhibition sets have also been provided. Field workers trained in the science of group and interpersonnel communication have been posted at all clinics in urban and rural areas.

My purpose in giving you these details is not to create an impression that all that has to be done is being done. On the contrary I want to stress here that much more requires to be done.

It is a programme of dimension that commands the involvement of every single individual in the country for its success. It has to become a peoples' movement.

All I can say is that we have made a definite beginning and we have taken the direction which leads to success.

Courtesy : " Family Planning News "

OUR POPULATION

" The population of India as on 30th April 1967 is estimated to be over 509 million. The actual population figure is placed at 509,175,997."

Source : " Centre Calling "

History of Family Planning in India.

DR. H. KRISHNA RAO,

Regional Director

Central Family Planning Programmes.

Intensive Family-Planning Programme in India is of recent origin.

The control of births has been advocated for the last 50 years.

In 1916 Pyare Kishnan Watal published his book on "The Population Problem of India".

Prof. Narvae opened a birth control clinic in 1925.

On June 11, 1930, the Mysore Government opened the first Government sponsored Birth Control Clinic at Vani Vilas Hospital, Bangalore.

In 1932, the Senate of the Madras University, the Government of Madras and the All-India Women's Conference supported birth control.

The India National Congress set-up the National-Planning Committee under the Chairmanship of Jawaharlal Nehru which supported family planning.

1935-36—Margaret Sanger, at the invitation of All-India Women's Conference, visited India.

1935—Dr. Pillai of Bombay started the society for study and promotion of family planning.

1939—"Birth Control World-wide" opened clinics in Uttar Pradesh.

Lt.Col. B. L. Raina started Matra Sowa Sangh in Ujjain, Madhya Pradesh.

In 1940, Sri P. N. Saprú successfully moved a resolution in the Council of States for establishment of birth control clinics.

The Health Secretary and Development Committee, appointed in 1945 by the Government of India, recommended provision of birth control services for Health reasons.

1949, the Family Planning Association of India was formed under the able guidance of Lady Dhanvantha Rama Rao.

April 11, 1951, the Health Panel of the Planning Commission appointed a committee to report on population growth and family-planning programmes.

Dr. Abraham Stone visited India under the auspicious of the W.H.O. to advise on establishment of studies on Rhythm.

Population Council sent Dr. Frank Notestein to study population problems.

Research.—The Family-Planning Research and Programme Committee set-up two sub-committees on—

- (1) Socio-Economic and Cultural studies.
- (2) Biological and quantitative aspects of population.

The studies were undertaken by—

- (a) Indian Statistical Institute (Fertility Studies).
- (b) National Sample Surveys.
- (c) Patna University.
- (d) Gokule Institute of Politics and Economics.

PROGRAMME MAKES PROGRESS IN THE PLANS.

First Five-Year Plan.—The Government of India decided on a population policy in First Five-Year Plan with an allocation of Rs. 65,00,000.

Basic requirement then was to study (1) plan of strategy for the programme, (2) research—Demographic—Biomedical—Social Education.

An Officer-in-charge of Family-Planning was appointed under Director-General of Health Services, later converted to post of a Director.

Second Five-Year Plan.—With experience of First Five-Year Plan, the Government of India launched a more vigorous programme in the Second Five-Year Plan.

Financial allocation of Rs. 149 millions—1956-61.

Demographic Training and Research Centre was established in Bombay.

A Contraceptive Testing Unit was also established in Bombay in Cancer Research Institute.

Family-Planning Services was made the responsibility of State Health Services—A State Family-Planning Officer was appointed.

Family-planning programme was made a Centrally sponsored programme. Seventy-five per cent assistance for service programmes and 100 per cent for education was provided.

The State set up a number of family-Planning centres mostly in M.C.H. centres and hospital of towns and cities.

Third Five-Year Plan.—It is first phase of intensive development period, programme was further extended—More clinics and static units were established. About Rs. 250 million was allotted.

EXTENDED FAMILY-PLANNING PROGRAMME.

In 1963, Director, Family-Planning, critically reviewed the programme and suggested a fast moving, flexible organization and extended family-planning programme.

The extended family-planning programme with basic objectives of:—

- (a) Reduce birth-rate from 40 to 25 per thousand.
- (b) To lay stress on the people feeling the need as a group that a small family is desirable.

(c) Knowledge of the methods of Family-Planning.

(d) Value of such methods to have them.

(e) Making supplies readily available without psychological, geographical barriers.

The change in emphasis in the programme necessity demanded a change in organization.

It has to be strengthened greatly with workers at as low a unit of population to serve as possible.

Appreciable number of trained persons were made available for administrative leadership for field operations. This required training.

A scheme was formulated to establish large number of training centres.

By 1967, 29 Training Centres were set.

The Central Family-Planning Institute was established as a major technical resource for research and training.

Reproductive physiology units were set up in Research Institutions and Universities.

IMPORTANT DEVELOPMENT.

An important development during the period was emergence of IUCD.

Favourable verdict was given by the I.C.M.R. on IUCD in 1965.

Government of India accepted the advice and accepted IUCD for a mass programme.

This needed more organization and increased number of women doctors in the programme.

Thus a reinforced programme was launched in 1965.

Provision of Rs. 95 crores was Fourth Five Year Plan.

The Family-Planning Evaluation Committee and Planning recommended an allocation of 239 crores.

POPULATION PROBLEM OF INDIA.

Has been studied by Demographers and Economists and others.

It is stated the population of 438 million in 1961 will be 723 in 1981.

To meet the challenge we have today evolved--a promotional target oriented--time bound programme.

GUIDING PRINCIPLES OF PROGRAMME NOW ARE---

1. Creating social acceptance of programme.
2. Education of every individual that small family is valuable to him.
3. Wide dissemination of knowledge of methods.
4. Easy accessibility of service agency.
5. Initiating action on social factors that affects fertility such as rising age of marriage--improving status of women through education and employment.
6. Making family-planning programme as a part of the General Health Services of the country and in turn integral part of overall community development.

We have technical knowledge sufficient to control births.

To some extent the man-power.

The crux of the problem in the programme is primarily one of organization.

We have tried different types of organization.

It is felt that separate organization is required for planning and development of operations of different kinds at Central, State, District, Peripheral levels.



How Adults Learn?

What is learning?

Learning and teaching is a two-way process of transactions in human relation between the teacher and the taught. People cannot be taught but they can learn. Learning includes bringing changes in the knowledge and understanding (insight), attitudes interests; practices and skills so that through this learning people can solve their problems by their own actions and by their own efforts.

An individual has been given the five senses of touching, smelling, hearing, seeing and tasting. He has also been given memory, intelligence and other facilities of learning. He is like a bundle of potentialities which must be developed to utilize for better purposes so that he may benefit himself, his family members, his neighbours and the community of which he is a member.

Learning is fundamental process of life. Every individual learns and through learning develops the modes of behaviour by which he lives. It affects the entire life of a person. It goes on occurring at all ages. Only rate of learning differs.

What makes People learn?

In every person, there is a fundamental desire to learn. Awakening this desire in motivating or preparation for learning. The basic motives in human beings are:—

(a) Physiological drives such as hunger, sex and need for shelter.

(b) Social drives such as feeling of belonging to a group and being accepted by the group, etc.

(c) Drive for the desire to self-realisation of creativity such as love for art, music, literature.

The inner desire to do something is inborn as far as primary motives are concerned (like that of sex, hunger, etc.) but the secondary motives are based on the desire created by outside forces and a person learns about this even though he is not born with them.

People learn when they have a strong desire to do so and they have interest in the subject-matter.

People learn when they clearly understand and accept the goals. They learn when they realize that the knowledge and the skill that they may acquire will be of benefit to them.

People learn in according to their capacities which vary from person to person. We must have faith in people's capacities to learn.

People learn in accordance with their previous experiences. They will learn when they receive satisfaction from what they learn.

People learn when they are ready and according to their maturity.

People learn from those [they get influenced by or from those they consider an authority.

People learn most from their personal experiences and when they are actively involved. Learning, therefore, is an active process.

People learn more from living situations.

People learn from the teacher and his activities (we therefore must practise what we preach).

People learn from the environments in which they live, work, play and go about. Every environment is a learning situation. In the community, therefore, the norms and standards of the family and the society influence their learning. Whatever the people learn is to meet the approval of the social group to which they belong. The local, social, cultural, political, administrative, religious and other practices and customs influence learning.

People learn according to their value systems, their likes and dislikes; their fads, superstitions and taboos.

Previously ingrained habits influence learning and the century old practices and customs die hard.

People learn if the learning is within their capacity and reach and the solution to their problems which the learning might offer is easy.

People learn if they are sound in their physical, mental and social health and have the required energy to do so.

People learn according to their perceptions.

People learn if the learning is timely and is related to the local situations, environments and pressing problems.

People learn if the learning programme has been planned with them.

People learn if the contents of learning are clear, correct, emotionally balanced, related to their level of knowledge, understanding and are not antagonistic to their current beliefs and practices.

People learn better if the physical surroundings and facilities available in the learning situations are conducive and congenial. It is, therefore, implied that what will be learnt in a given situation, varies.

People learn if the learning situation provides sufficient flexibility, freedom to think and act, opportunities to clarify ideas, opportunities to do and experiences by self-involvement.

People learn better when a person organizing the learning experience has a correct attitude and adopts most effective methodology which incorporates admixture of various methods supported by most effective and suitable media and teaching aids.

Some learning situations or methods.

Individual person to person contacts with the people and particularly the local leaders.

Surveys by the technical staff themselves as learning situations.

Family contacts through home visits and question-answer or face to face discussions.

Advisory centres as foci for learning.

Utilization of clinics for talks, demonstrations and discussions; for example, pre-natal and well-baby clinics.

Demonstrations—Methods' demonstration or demonstrations of results of efforts. These could be organized in schools, homes, streets, factories, in open areas or in mobile vehicles—may be in front of the fair price or ration shops.

Organization of regular nutritional courses for general public.

Community organisations and their involvement in group discussions in self-surveys, self-analysis, programme planning and execution as well as evaluation.

Organizing group feeding programmes in schools, industries and using them for educational purposes—may be in cafeterias, dining rooms or other eating places.

Encouraging growing of vegetables and fruit gardens, small live-stocks, etc.

Creating radio forums.

Organizing literacy campaigns and utilizing similar campaigns organized by other agencies.

Using mass methods of approach which includes lectures, film shows, filmstrips, stills and film slides; posters charts, photographs; exhibitions; plays and puppet shows; story telling; books, pamphlets, bulletins, newspapers, magazines; circular letters and libraries. Mass methods could also be used for the group situations for which the group must be prepared in advance, exposed to mass methods and must be followed by discussions and further action for learning.

Difference between the learning of adults and children.

The adult learning is influenced by the mental blocks created as a result of past experiences. These blocks hinder his capacity to learn and even sometimes may provide a favourable incentive to undertake some such actions as the learning may have desired. The child is more eager to learn as his mind is full of curiosity and eagerness to see the world and learn. Intelligence develops upto the age of 16 to 18 years. The adult has some advantages over the child as follows :—

(a) The adult being less active wastes less energy than a child and he has a greater control over his activities.

(b) Having a lot of experience an adult has definite interests and is clear about what he wants to do.

(c) Having a rich background of experiences, the preceptual learning is more effective in adults.

— Source : C.F.P.I., New Delhi.

MARRIAGE BEST CURE.

The best cure for delinquency among boys is marriage, T. L. Iremonger, a Parliament Member told the British House of Commons in a recent debate on the treatment of Juvenile delinquents.

Girls are, on the whole, better adjusted to society than boys and they are more effective in rehabilitating their husbands than in any current Government effort, said Iremonger. He called public rehabilitation efforts a cover for "Shutting people up in understaffed establishments having no clue what to do with them."

Source : "Science News".

"How to Interest People in things they don't want to know"

[Comments for Panel Discussion by Victor M. Ratner,
Benton and Bowles at the National Safety Congress, Chicago.]

Let's start with some of the specific questions which have been raised by you.

For example:

"Is it possible to interest people in what they don't want to know?"

Or:

"In order of importance, which of the following have the greatest positive reaction, from the standpoint of safety precautions: *pictures*, the *written word*, the *spoken word*, *personal experience*?"

And just one more, of the many questions received:

"Are mass media effective in influencing a change in people's *habits*, to the same degree as in the purchase of something which gives immediate satisfaction?"

If I were to give you direct, brief answers to each of these questions . . . well, here they are:

"Is it possible to interest people in something they don't want to know?"

The answer is "Yes"—in almost every case.

"What creates the greatest positive reaction . . . ?"

I would place "personal experience" and "face-to-face" communication so far ahead of the "written word" and "pictures" as to put them into separate categories.

Furthermore, I would suggest that—in such a complex area as safety precautions—you cannot begin to hope to move people very much or very far with the "written word" and "pictures" alone; unless these are somehow used together with "personal experience" and "face-to-face" speech.

As for our third question: "Are mass media as effective in changing people's habits, as they seem to be in getting people to buy specific merchandise . . .", my answer, here, would be a large and flat "No."

But to try to discuss any one of these questions adequately would take, I'm afraid, hardly less than an 8-hour session . . . on each!

Fortunately, I must be brief. So I will try to cut down to only a few basic principles of communication, as I see them.

If we're lucky, these may serve to guide us toward answering almost any question you want to raise—even if we cannot precisely pin our answers to the mat.

No one can!

Let's look, then, at the first question again:

"Can we really interest people in anything they don't want to know?"

If we stopped at that, the answer, of course, would be that we cannot.

But this needn't be discouraging. For Aristotle pointed out, a long time ago, that "all men have the desire to know"—and this is true, even if it be only a desire to know who is going to win next Sunday's foot-ball game.

Certainly, every normal human being is interested in many things. Certainly, he is interested in himself and in his family. And just as certainly, the real question you face is this:

"How can I best relate what I want to say to something he is already interested in?"

If you can, you can reach him, and you can teach him.

But you must realize that this is a *two-step* process, not a one-step process. You must *first* take the trouble to interest your man. And *then*, you do your teaching.

Putting this another way—one of the axioms of effective communication says that: “You must start with where your *audience* is, not with where *you* are”.

And surely, anyone you are trying to reach has *some* interest, *some* need, *some* desire, to which you can relate yourself and your message; something in which *he* is interested, rather than something in which *you* are interested.

You must find this need or desire—and use it to anchor an emotional or intellectual “bridge” between you and your audience. And you then send your message to them over this “bridge”. If you don’t, it’s as though you are shouting from bank to bank across a wide river. A very wide river!

This, as it happens, is fundamental to all teaching and to all selling; whether you’re trying to sell a man a new house, a new car, a new hat... or a new idea.

For the basic act of selling is to try to *relate* something to *someone else’s need or desire*.

You must make him feel that this something *will* serve one of his needs or desires—or why *should* he buy what you have to sell, whether it be better schools for his community, or a brand of beer, or even the Brooklyn Bridge?

You see. I am not discussing the *morality* of selling but the *act* of selling.

And it is safe to say that, until you *have* figured out what need or desire you can serve in someone else—and until you state it convincingly to him—you cannot begin to sell a person, or even interest him, in anything.

This reminds me of something I once said on another occasion. I was discussing a curious prejudice about the power advertising. Oddly enough, it is a prejudice in *favour* of advertising, in the minds of its friends; and simultaneously, a prejudice *against* advertising, in the minds of its critics.

Where do you *start*, when you’re planning any type of communication?

If you want it to be effective, you must begin (either consciously or unconsciously) with a full realization of the fact that all communication has something very like the structure of a sentence.

A sentence, as you know, always has a *subject*, a *verb*, and an *object*.

And the meaning of each of these influences—and modifies the meaning of the others; and of the sentence as a whole. Therefore, even a slight change in any *one* of these can make quite a drastic change in the meaning of the sentence.

Consider, for example, a sentence as simple as:

“John Loves Mary.”

You could probably write a whole novel about changing just one word here:

“John loves *Sally*.”

You see, Mary is John’s wife. And Sally is her sister!

Or change it to: “*Jim* loves Mary.”

The confusion is compounded. Jim is Sally’s husband!

You see how intimate the relation between the subject and object can be? What does this suggest about “communication?”

Well, like every sentence, every communication has three elements—each of which determines the meaning and values of the other two.

There is a *subject*—which is the “content” of your communication; *what* it is you want to say.

There is the “form” in which you say it—*how* you express and transmit the “content”, which includes both the medium and the words you use.

It is the often-repeated claim that "*advertising creates desires*".

Or, stated negatively, that "*advertising makes people buy things they don't want*".

I think both the friends and critics of advertising are repeating a myth which has no substantiating data behind it. They have only hunches and opinions about it. Let me add mine.

Advertising, I am convinced, cannot *create* a desire. It can only capitalize on an existing one. This, advertising which sold orange juice to mothers, derived its inherent power out of the desires mothers have to feed their children well. That desire was there, long before advertising or orange juice.

Such advertising told mothers about a new and healthier way to feed their children—a useful educational function, but *not* the creation of desire.

And does anyone, here think that advertising "*creates the desire*" in women to look *more beautiful* or to wear *new clothes*?

This is something which started, I believe, in the Garden of Eden. And I refuse to think of the serpent, there, as the First Advertising Man!

It's much the same with automobiles and washing machines, and even beer. People have basic desires for such things. That's the *only* reason advertising can help to sell them.

And similarly, you must effectively relate the very important story you have to tell to some basic desire of people—in their terms, not your terms—and then you can hope to move them.

But let's try to get even more fundamental than this, in analyzing just what it is your communications must try to do.

And then there is your "*audience*"—the object of your communication.

Obviously, until all three—"content", "form" and "*audience*"—are carefully and successfully related to each other, your communication is not likely to have the result you want it to have.

What you have to say *must* be properly and precisely related to your "*audience*".

Are you speaking to men . . . women . . . conservatives . . . liberals . . . to ball-players or ballet-dancers? Unless you vary your content to some degree, for each group, you cannot hope to communicate with it fully.

And how you say it *must* be properly and precisely related to both your "*content*" and "*audience*".

You speak English to Englishmen and French to Frenchmen. Unless you also use the more subtle "*languages*" appropriate to each sub-group when you speak to it, you cannot hope to communicate fully.

When these three are not effectively related . . . well, we have all been exposed to communications which fall tragically short of communicating.

And it is here, I think, that we find the fundamental differences between an amateur communicator and a good professional communicator.

The amateur is generally in love with his message. He tells his own way, in media of his personal preference. He is known as "*message-oriented*". He feels that *what he has to say* is so fascinating and important that everyone will drop everything to listen to it and absorb it.

Your children are such amateur communicators.

The professional communicator, on the other hand, tends to be as much "*audience-oriented*" as "*message-oriented*".

He is always conscious of whom he is trying to reach ; of how that person thinks and feels ; and he directs his efforts, he shapes his message and his media, as best he can, *to fit his audience.*

To do this, he must start with his audience in mind. And that, I think, is where all persuasive communication must start.

You, too, can start with rather precise definitions of just whom you can realistically expect to reach. This is never the "many" people you would like to reach.

It should be, rather, the "few" people you can really hope to reach.

I would earnestly suggest that, in your communication efforts, you aim for a small success rather than for a glorious failure. The small success will be hard enough to come by/

To do this, you should start with defining some small audience on whom you can hope to make a significant impact. The smaller the better. For, then, you can more specifically define your audience and its interests. You can learn, or guess, what is particular to these people and you can then relate your message to their particular feelings, rather than your own.

This brings us to the question of the best media for reaching them—and here you run into all sorts of myths and fantasies about our modern communication media.

What I am about to say, now, may sound unorthodox to some of you. And it may sound paradoxical, coming from the vice-president of a large, New York advertising agency, who also spent some 14 years working for a major net work.

All I can say is that I am serious; and that I am prepared to debate the validity of my observations until hell freezes over—or until all our citizens really learn how to avoid having accidents at home—whichever comes first.

While I must over simplify this enormously because of our time limitations, the essential point I would make is this :

Our mass media—our so-called "major media of communication"—are relatively *minor media*, when it comes to *moving serious ideas into the heads of people.*

They have, I believe, only a secondary role to play in helping you with your problems ; and it is important that you do not divert too much of your limited resources chasing after these media. They are not the first or second or even third media you should think of, in your efforts really to reach people, and to teach them serious things for their own good.

The basic reason I say this can be summed up very imply. Our mass media are busily at work in doing three different things :

They move *entertainment.*

They move *merchandise.*

They move *ideas.*

I place them in that order because this is the order in which we are successful with them.

Our mass media are most effective, today, in distributing entertainment across the nation ; whether in the form of popular programmes on the air, or by comic strips in the newspapers—the most widely-read feature of any newspaper.

They are next most effective in moving merchandise into people's heads and homes.

And our mass media, in themselves, are least effective in moving serious ideas to the public. The evidence for this is overwhelming.

This should not suggest to you I am criticizing our mass media. I am not. Like everything else, they are designed to do some jobs very much better than others. And you don't hold it against a watch that it cannot tell you what the temperature is.

There is no time, of course, to try to examine the reasons why I am sure that mass media are intrinsically weak media for moving serious ideas into people's heads, *deeply enough to change people's behavior.*

While they have a role to play in this area, the whole point I am trying to make is that it is a secondary role, not a primary one. And it will be far more useful to you, I think, to direct your attention to what really is your primary medium for the work you want to do.

It happens to be the most powerful and most effective communication medium at anyone's disposal. If I were to try to wrap it all up into one phrase, it would be:

Face-to-face communications.

All of you, I believe live and work in communities. You all live locally. But then, . . . no one lives nationally—except perhaps, John Foster Dulles, and he lives internationally;

Because you live and work in communities, you can all participate in, create and further "community action" programmes of one sort or another.

In these, you can all use "face-to-face communications", with small groups of people, who are gathered together in one room, where they can see and hear each other talk.

Does this sound like a dull or hard prescription?

All I can say is that, the older I get, the more convinced I become that the only hope of moving serious ideas into people's heads effectively, is for us to set aside the seduction of our modern, technologically advanced, mechanical media—and to refocus our attention on the basic. Old fashioned methods of "face-to-face communication".

For this is still the only way in which most people get most of the ideas which move them;

Therefore, my basic recommendation is this:

If you really want to teach people something, you cannot take "short cuts" in doing so. The results we get from the "short-cuts" don't seem to warrant the time, effort and expense we put into them.

If you want to take your efforts seriously, you must, I think, figure out ways to communicate with people in small groups, where there is a "live" discussion, among people gathered together in one room.

I know you can only reach a relatively few people this way, compared to the thousands and the millions you think you might reach by television or newspapers or magazines.

And I know it is very difficult to develop such programmes, and that they have little glamour about them.

It would, indeed, be nice if we could take the "short-cuts" to reaching lots of people, in lots of places, all at the same time.

But even if you could get enough time and space in the mass media, beyond your wildest dreams, there is really no good evidence I have ever seen that such "short-cuts" to the people in themselves would work for you.

What, then, is left?

Thank you.



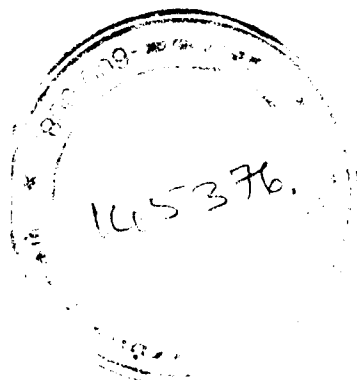
Diseases of Cattle Communicable to Man.

<i>Disease.</i>	<i>Actiological agent.</i>	<i>Usual method of human infection.</i>
(1)	(2)	(3)
VIRUS DISEASES—		
Cow-pox	Caccinia virus	Skin abrasion.
Foot-and-mouth disease	Virus	Contact and milk.
Milker's nodules ..	Do.	Contact.
New-castle disease ..	Do.	Do.
Ribt valley fever ..	Do.	Mosquito bite.
Vesicular Stomatitis ..	Do.	Method uncertain.
California enccephalitis.	Do.	Mosquito bite.
Louping ill	Do.	Tick-bite.
Rabies	Do.	Animal bite.
RICKETTSIAL DISEASES—		
Q-fever	Coxiella burneti	Tick-bite.
BACTERIAL DISEASES—		
Anthrax	Bacillus anthracis	Contact.
Brucellosis	Brucella abortus } Brucella melitensis } Brucella suu. }	Milk and contact.
Diphtheria	Corynebacterium diphtheriae.	Milk and contact.
Haemorrhagic septi- caemia.	Pasteurella multocida.	Bite.
Leptospirosis	Leptospira. sp.	Skin abrasion.
Listerellosis	Listerella monocytogenos.	Uncertain.
Pseudotuberculosis ..	Pasteurella pseudotuberculosis.	Do.
Relapsing fever (endemic).	Spirochaetes	Mite-bite.
Salmonella infection	Salmonella sp.	Ingestion.

<i>Disease.</i>	<i>Actiological agent.</i>	<i>Usual method of human infection.</i>
(1)	(2)	(3)
BACTERIAL DISEASES—cont.		
Scarlet fever	Streptococcus pyogenes.	Milk and contact.
Septic sore throat ..	Streptococcus pyogenes.	Milk.
Tuberculosis (bovine type).	Mycobacterium tuberculosis var. bovis.	Milk or contact.
Vibriosis (vibrio abortion).	Vibrio foetus	Contact.
Melioidosis	Pseudomonas Pseudomallei.	Mosquito bite.
Staphylococcus infection.	Staphylococcus aureus.	Ingestion, contact.
Tularaemia	Pasteurella tularensis.	Contact, insect bite.
FUNGUS DISEASES—		
Actinomycosis	Actinomyces bovis	Method uncertain.
Aspergillosis	Aspergillus sp.	Inhalation of spores.
Coccidioidomycosis ..	Coccidioides immitis	Inhalation and wound infection.
Cryptococcosis	Cryptococcus neoformans.	Uncertain.
Nocardiosis	Nocardia sp.	Infected milk.
Rhinosporidiosis ..	Rhinosporidium seeberi	Uncertain.
Ring-worm	Microsporium sp. } Trichophyton sp. }	Contact.
PROTOZOAN DISEASES—		
Sarcocystiasis	Sarcocystis sp.	Food and water.
Trypanosomiasis (African).	Trypanosoma gambiense } Trypanosoma rhodesiense }	Tsetse-fly bite.
Toxoplasmosis	Toxoplasma sp.	Uncertain.
NEMATODE DISEASES—		
Creeping eruption (Larva Migrans)	Bunostomum phlebotomum.	Through unbroken skin.
Gongylonemiasis ..	Gongylonema pulchrum.	Ingestion.
Metastrongylidiasis ..	Metastrongylus colonogatus.	Do.
Ostertagia infection ..	Ostertagia sp.	Food and water.

<i>Disease.</i>	<i>Aetiological agent.</i>	<i>Usual method of human infection.</i>
(1)	(2)	(3)
NEMATODE DISEASES—cont.		
Sheep wire-worm infection.	<i>Haemonchus contortus</i> .	Water.
Syngamiasis	<i>Syngamus laryngeus</i> ..	By mouth.
Trichostrongylus infection.	<i>Trichostrongylus</i> sp. ..	Food and water.
CESTODE DISEASES—		
Beef tape-worm infection.	<i>Taenia saginata</i> ..	Uncooked beef.
Hydatid disease ..	<i>Echinococcus granulosus</i> .	Eggs from dog faeces.
TREMATODE DISEASES—		
Fascioliasis	<i>Fasciola hepatica</i> ..	Raw plant food.
Schistosomiasis ..	<i>Schistosoma japonicum</i> }	Through skin.
	<i>Schistosoma bovis</i> ..	f
ARTHROPOD DISEASES—		
Acariasis	<i>Sarcoptes</i> sp. ..	Contact.
CHEMICAL POISONING:		
Milk sickness ..	White-snake root ..	(Cows eat the root) Milk.

Source: Division of Zoonoses,
National Institute of Communicable Diseases,
Delhi.



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[illegible]

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