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COMMUNITY PROGRAMME TO CONTROL CANCER OF THE CERVIX

by

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Chapter 1

A. Introduction

According to the WHO Expert Committee on Cancer Control (1962), cancer control consists of a series of measures based on present medical knowledge in the fields of prevention, detection, diagnosis, treatment, after-care and rehabilitation, and aimed at lowering appreciably the number of new cases, increasing the number of cures and reducing the invalidism caused by the disease.

At the present time cancer is regarded as a problem of public health and, consequently, its control must be conducted by means of measures covering the entire population of a country. These measures may be carried out either by governmental health services or by private agencies or by a combination of the two working in close co-operation.

In the present state of scientific knowledge effective cancer control can only be achieved through adequate means for prevention, early detection, diagnosis, well-conducted treatment, follow-up and rehabilitation.

[1] Deceased 17 September 1965.

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Accordingly the community programmes (city, district or county) must be drawn up according to the facilities and patterns of each community, and must be integrated in a regional or even in a general national programme.

In small, developed countries it is relatively easy to organize and carry out such community programmes. This is not, however, true of large countries in course of development, where good medical services and well-trained personnel are to be found only in the large cities. In the latter countries, cancer-control programmes in most of the communities are necessarily of very modest scope and must depend largely on facilities offered by the main cities of the country.

The cervix is undoubtedly the site of the disease in which cancer-control measures are most effective.

There are some favourable conditions for the control of cancer of the cervix. They are worth stressing as follows:

(a) cancer's danger signals are easily observed by patients;

(b) the accessibility of the organ facilitates its examination;

(c) the existence of predisposing conditions permits the adoption of preventive measures;

(d) exfoliative cytology can be carried out very simply and yields valuable information;

(e) inspection can be extensively improved by colposcopy;

(f) biopsy is easy and precise, and can be repeated without great inconvenience;

(g) examination can be made at a low cost;

(h) the methods of treatment are very effective;

(i) the follow-up of the patient does not involve complicated measures or heavy expense;

(j) rehabilitation is in most cases complete

B. Prevention, detection and mass screening

In spite of the important role played by hospitals or autonomous detection centres and even by physicians' offices in the improvement of early diagnosis in a community, mass screening is the only way to achieve the aims of a public health programme.

The detection centres are generally established in cities with a very dense population, well prepared by the cancer educational campaign, and they receive for consultation patients referred by well-oriented general practitioners. The distribution of patients by clinical stages in these units does not give a complete picture of the whole country. Medical facilities, the ratio of urban to rural population, transport facilities, social and economic standards, and the existence or absence of public education in cancer are among the conditions which influence the time-lag in cancer diagnosis. The prevention and detection of cervix cancer must be carried out according to the patterns of each community.

Some detection clinics limit their activities to the examination of asymptomatic people, in order to detect cancer in its earliest stage. But where this is done it is not easy to select the cases to be examined, particularly in relation to the female genital organs. It is more logical to extend the examination to all women, considering that the general objective of detection is to discover cancer cases, within a given population, a good time before this could result from the sole initiative of the patients themselves, prompted by alarming symptoms.

Mass examination is able to change the general picture of cancer stages at the time of diagnosis. In the first screening covering the entire population of a community, the rate of detected cancer-of-the-cervix cases is very high, because it is only when such an occasion arises that many women with a long-standing history of cancer present themselves for medical examination.

In many countries, the prevention and detection clinics confine themselves to the female genital organs. It is, however, advisable to extend the examination to other accessible organs such as breast, skin and visible mucous membranes. Mass examination programmes, if too ambitious, are very difficult of accomplishment. Hammond (Statistical Research Section, American Cancer Society) said that maximum benefits

might be achieved by giving a thorough medical examination, together with appropriate tests, to the entire adult population, every three months. On the assumption that such an examination takes about one hour of a doctor's time, it would require the full time of 258 000 doctors to examine everyone in the United States over the age of 25, four times a year. This exceeds the total number of physicians in that country, while the question of cost is an added consideration.

However, on an analysis of the problem in terms of a partial solution, it is possible to carry out a reasonable plan, adopting the following measures:

(a) limitation by sex and age; as a first step, only women over 30 should be included;

(b) limitation to accessible organs and organs that can be examined with simple instruments;

(c) exclusive use of tests that are precise, reliable and cheap, and that yield full results;

(d) conduct of the examinations in existing consulting rooms, hospitals, health centres, out-patient clinics, doctors' offices or even in adapted rooms, through the co-operation of institutions of various kinds in lending rooms, equipment and, possibly instruments;

(e) large-scale use of mobile medical groups, whose productiveness is very high;

(f) single examination in each year, but persons to be advised to report again in the event of the appearance of suspicious signs;

(g) enlistment of the co-operation of voluntary organizations, mainly for the patients' registration, public education and other facilities.

Although such a programme covers only a part of the problem, it represents an important segment of it, in which the results are more sure.

According to several papers presented to the 8th International Cancer Congress, held in 1962 in Moscow, mass examinations are carried out in various countries in the East. These examinations are termed "preventive" and are restricted to a few organs. Limits are also set in respect of sex and age. Obstetric nurses are used for gynaecological examination, mainly in the rural areas. Serobrov & Kaufman stated that in 1960 mass preventive examinations covered 36 million people in the Soviet Union and that in the last 10 years the relative number of patients with cancer of the cervix decreased two-and-a-half times.

Gross, Golova, Aimova & Wolfova - working in a centre in Prague, devoted exclusively to the supervision of patients sent by polyclinics - found 145 cases of cervix cancer, most of them in initial stages, among 8000 patients examined.

In Hungary, according to the data given by Vikol, there is one Institute of Onocology linked to a network of 34 district cancer services. Women over 30 years of age are selected for periodic cancer-detection examinations. They are screened for precancerous conditions and tumours of genitalia, breast, skin and visible mucosas. This kind of examination was performed, from 1952 to 1960, on 4 114 762 women. In 1960, 389 933 women were screened, 2973 tumours were detected, and 61 205 women disclosed precancerous conditions.

The type of organization which carries out the detection of cervix cancer is not of particular consequence: the work can be executed in cancer or general hospitals, in special clinics, in health centres, or even in physicians' offices. This consideration does not, however, apply to the medical and allied personnel. Even where the examination forms part of a mass screening programme, it should not be performed by untrained practitioners or obstetric nurses.

The taking of vaginal smears by untrained personnel or even by the patient herself cannot be recommended. It is difficult to determine the border-line between detection and diagnosis. Therefore, the methods used for detection must be able to facilitate or even to establish diagnosis. Because it is not reasonable to limit the investigation to cancer of the cervix, the screening must be completed by Schiller's test, by taking specimens from the endocervix and endometrium, and by pelvic examination, colposcopy and biopsy. These procedures can be performed only by a qualified physician. Another argument against the taking of vaginal smears by untrained persons is the high proportion of unsatisfactory cytological specimens - inadequately taken, improperly fixed or not well prepared for mailing.

According to reports in the relevant medical literature, the vaginal smear gives reliable results ranging from 70 per cent. to 98 per cent. These figures show that the cytological examination of vaginal smear, when in isolation as a screening method, entails the risk of a high proportion of false negatives.

The prevention and detection of cancer of the cervix are easily carried out in well-staffed and well-equipped hospitals, where diagnosis can be completed and the treatment undertaken. Autonomous detection centres, out-patient departments, health units, small hospitals and physician's offices cannot offer the same facilities: they are obliged to send the specimens obtained, and even refer the patient himself, to other institutions in order to confirm the diagnosis. It is advisable to reduce to a minimum the number of patients to be sent to other institutions, particularly when this involves travel to other places.

As is indicated in Chapter 2, concerning the Brazilian experience, the best solution is to organize mobile medical groups, each headed by a highly qualified physician and spending the time needed in each community to cover the assigned population group. Upon completion of its task the mobile group visits another community.

The physicians in charge are able to make a careful medical examination, using colposcopy, performing biopsies, and establishing a diagnosis, with the help of the reports on the testing of the specimens previously sent to the laboratory. In this way a large majority of those patients who have to be sent to other parts of the country are destined solely for treatment, not for diagnosis.

A well-organized mass screening proved to be the best method used in the control of cancer of the cervix. Knowledge of the size and composition of the population gives an epidemiological significance to the screening, establishing the incidence and prevalence of the disease and facilitating the evaluation of the etiological factors.

Such an examination is recommended for the population groups of women over 30 years of age.

To organize and carry out a mass screening programme it is necessary (apart from determining the number of women to be examined) to draw up a complete plan taking into consideration the medical and other personnel needed, the place of examination, the period of time required, the public education possibilities, the links with other centres where the specimens and patients are to be sent after detection, the registration arrangements, and the estimated costs.

To co-ordinate the work of the detection units and that of the mobile medical groups, a central or basic unit is necessary. This unit may be a cancer or general hospital in the area, to which the following tasks should be entrusted:

(a) planning of the programme;

(b) public education;

(c) professional teaching and training;

(d) choice of examination methods to be used;

(e) examination of specimens sent by mail;

(f) examination of patients referred for complete diagnosis;

(g) treatment;

(h) registry functions;

(i) statistics and collection of data for epidemiological studies;

(j) follow-up;

(k) after-care rehabilitation.

In order to increase the number of people examined, the mass screening must be entirely free of charge. Financial support should therefore be amply secured.

C. Diagnosis, treatment, reference centres, cancer hospitals, clinics and university departments

The diagnosis of cancer and precancerous conditions of the cervix can at the present time be established with accuracy. Colposcopic, cytological and histological investigations can be conducted very carefully and may offer precise information.

Physical examination, pelvic examination, X-ray and other tests indicate the stage of the disease.

A complete medical examination is recommended even for cases referred for treatment (after diagnosis).

Treatment of cancer of the cervix is still undertaken by means of surgery and radiotherapy. Chemotherapy may yield some benefits in advanced cases or be used in combination with surgery or radiotherapy, with the object of achieving improved results.

Precancerous conditions are treated by their removal or, in special cases, by cold cauterization. Cancer *in situ* can be treated by conization or cervix amputation in the case of young women and by simple hysterectomy in the case of older women.

Diagnostic reference centres, operated by public health or private agencies, may be very helpful for the small communities, mainly in offering facilities for cytology and pathology.

Complete diagnosis and treatment should be carried out only in institutions that are very well equipped and staffed. These conditions are generally found in cancer hospitals, cancer clinics and in gynaecological departments of universities and general hospitals of a high standard.

D. Follow-up, after-care and rehabilitation

A well-organized recording system is a necessary adjunct to an effective follow-up. It is preferable that the re-examination of the patient should be performed at the same institution where she was previously treated, and even by the same doctor who administered the treatment. This may in some cases give rise to social and economic difficulties because of travel and bed-and-board expenses, and, if so, financial assistance and other facilities must be provided.

In cancer of the cervix, a follow-up system is imperative not only to check the results, and thereby obtain valuable statistical data, but because of the possibility of detecting a recurrence in time for further treatment to be effective.

After-care must be planned with skill, according to the needs and possibilities of each case. Post-operative radiotherapy and other prolonged after-treatment should be so planned as to offer to the patient who has left hospital all necessary facilities pending complete rehabilitation.

After-care should be continued even in cases where the patient has no chance of making a complete recovery and declines progressively.

Home care is indispensable in such cases, and is most effective when organized as a hospital service. The co-operation of some voluntary agencies is likewise useful in connexion with the housekeeping and as a means of improving the social, economic and psychological condition of the patient. Some advanced cases cannot stay at home and it will be necessary to provide for their care, preferably in hospitals accepting patients suffering from chronic diseases or in small nursing homes. Special hospitals for such cases are not recommended.

E. Professional education and training

The effective control of cancer calls for the services of a group of medical and other personnel technically competent and having a predominant interest in cancer problems.

In the special field of cancer of the female genital organs, stress must be laid on the training of physicians in methods of detection and diagnosis.

Pelvic and specular examination should be part of the routine of every physical examination. The general practitioner should also be familiar with methods of taking smears from the cervix for cytological examination and be able to apply Schiller's test and perform a punch biopsy. The necessary training can be given at the pre-graduate and post-graduate levels in the departments of gynaecology of universities and in cancer hospitals. The distribution to all general practitioners of special pamphlets containing relevant instructions will be found helpful. It is necessary to include the general practitioner in the cancer control programme, because he is the first to see the patient, and on his approach to the case and decisions the future of the patient often depends.

To cover the needs of a mass screening programme, a large number of cytologists and pathologists need to be assigned together with numerous cyto-technicians.

The cytological centres should aim at offering adequate training on a permanent basis and facilities for teaching activities should be available in such centres. Young physicians should be encouraged to devote themselves to cytology, after completing their training in pathology and gynaecology.

In a mass screening programme what kind of physician may be entrusted with the examinations?

The use of gynaecologists would offer a good solution but this is not feasible, particularly in small communities. Health centre doctors are not technically equipped to perform the task without prior training. A series of some five or six lectures is wholly insufficient, and cannot enable them to make the necessary judgements.

A simpler and more effective alternative is to train a small number of doctors by means of an intensive course of three to four months' duration with a view to forming mobile medical groups. Through special fellowships, the selected doctors can devote themselves, on a full-time basis, to learning all the methods used in detection and diagnosis as well as studying other aspects of gynaecology. They can then be integrated in the control programme and co-operate in the educational campaign. These mobile groups offer the great advantage of covering large areas and taking care of a single year of several communities.

F. Public education

It is advisable, before starting the examination of the female population in a mass screening programme to issue some instructions and explanations through a well-planned publicity campaign.

Posters, pamphlets, radio, television, film-reels, newspapers and magazines are suitable vehicles for delivering the messages to women. Lectures for small groups are also recommended.

With a view to (a) persuading people to be examined and (b) obviating any tendency towards cancerophobia the following points should be born in mind:

(a) the necessity of submitting to a periodical examination, intended for the detection of any kind of disease, should be emphasized;

(b) it is not advisable to indicate that the examination is destined exclusively for the detection of cancer;

(c) preventive measures can be taken upon the detection of certain conditions which, if not treated, may develop into dangerous diseases;

(d) early detection permits of timely treatment, which in turn yields the best results;

(e) periodical examination offers the best safeguard;

(f) if not detected and treated in time, cancer may prove dangerous in persons who are apparently free of disease.

Chapter 2

THE BRAZILIAN EXPERIENCE

A. Cancer control

Cancer control in Brazil is exercised through a very large network of institutions and units under the supervision of the National Cancer Service of the Ministry of Health.

However, owing to the fact that the great majority of these institutions and units are private and autonomous, springing up in many different parts of a very large territory, it is extremely difficult to make them adhere to the rules established by the National Cancer Service.

The following is a list of entities which co-operate in the control of cancer:

36 cancer societies or leagues operating in all States, raising money, conducting public education, giving financial support for services, research and professional education;

1 foundation named "Offensive Against Cancer", providing funds for control and research;

2 cancer institutes, located in Rio de Janeiro and São Paulo, each with a capacity of 300 beds, where prevention, detection, diagnosis, treatment, rehabilitation, professional education and research are carried out;

9 cancer hospitals comprising altogether 890 beds confining their activities to the clinical aspects of control;

21 tumour clinics, operating in general hospitals;

43 autonomous detection clinics, most of them devoted exclusively to gynaecological cancer;

special cancer units in university and general hospitals, mainly in the gynaecological departments;

6 reference centres for pathology, cytology and other laboratory tests;

1 hospital with 80 beds for advanced cases;

3 services specializing in home care (attached to cancer hospitals);

1 women's organization against cancer (Rede Feminina de Combate ao Câncer) with 22 divisions in different States, 150 sub-divisions and over 50 000 members;

1 children's club (Clube do Siri) with about 10 000 members.

According to their respective aims, every component of cancer control is covered by one or more groups of these different entities.

B. Detection

As has already been pointed out, prevention and detection constitute the most effective means of controlling cancer of the cervix. Accordingly, emphasis is laid in this part of the report on the steps now being taken in Brazil to extend the use of prevention and detection methods.

Thanks to the pioneer activities of Professor Arnaldo de Moraes, former head of the Gynaecological Institute of the University of Brazil, the systematic application of measures for the prevention and detection of cervical cancer started in 1948, when a "Prevention Clinic for Gynaecological Cancer" was inaugurated. Cytology and colposcopy were used, from the beginning, as routine procedures. Professional and public education followed the technical measures.

The co-operation of Hinselmann in colposcopy, and of Franz and Limburg in special pathology, who taught their techniques to the Institute staff, greatly contributed to the progress of the work. The Gynaecological Institute thus became a true centre of training for physicians anxious to learn the new procedures.

From 1948 to 1961, 13 500 patients were examined and 952 cases of cancer of the genital organs were detected.

Cancer *in situ* was diagnosed in 79 cases. The proportion of stages I and II increased three times. The five-year survival rate of the entire group of operated patients rose from 50 per cent. to 62.5 per cent.

The success of this first attempt stimulated the establishment of other detection clinics throughout the country, in the form of autonomous out-patients services or special departments attached to hospitals. In Rio de Janeiro alone there are at present 20 such establishments in operation. However, they are concentrated in the main cities, where there are medical facilities and a dense population.

The detection clinics confined themselves to gynaecologic cancer, with some of them extending the examination to the breast. Only in the last three years have the skin and accessible mucous membranes been included in a few detection clinics.

The detection of cancer is pursued also in special "check-up" clinics and in institutes of preventive medicine.

In spite of the benefits rendered to the patients in question, the work accomplished by these clinics is without value from a public health standpoint. The lack of effective co-ordination between the clinics leads to a waste of the information collected.

In general, the method of examination aimed at the prevention and detection of cervical cancer is as follows:

(a) history

(b) colpocytology

(c) coposcopy

(d) Schiller's test

(e) pelvic examination

(f) biopsy

Biopsy is performed according to the information obtained through the other items. The rates of biopsy ranged from eight per cent. to 17 per cent. according to the reports given by some detection clinics.

The rates of cervix cancer cases and their distribution by stages in autonomous detection clinics are entirely different from those recorded in the gynaecological departments of general hospitals. While a majority of the women attending the detection clinics do not present suspicious signs or symptoms, most of the patients referred by general practitioners to the hospitals frequently come from small and remote communities; others come on their own initiative, disturbed by alarming symptoms and in an advanced stage of the disease. In this group, the delay follows a systematic pattern - illustrated in the following comparison of staging figures obtained five years ago in a detection clinic and in a general hospital:

Detection clinic: Carcinoma _in situ_ - 14 per cent; Stages I and II 77 per cent; Stages III and IV - nine per cent.

General hospital: Carcinoma _in situ_ - 0 per cent; Stages I and II 35 per cent; Stages III and IV - 65 per cent.

The only way to change this situation is to establish detection clinics in every hospital and to extend the detection procedures to all communities, by means of an expanding mass examination programme.

C. Mass screening in Brazil

Pilot project on mass examination in the State of Rio de Janeiro

According to the surveys conducted by the National Cancer Service, the relative frequency rates of cervical cancer (proportion of cancer of the cervix to all kinds of cancer in the female group) differ radically in the various regions of the country. While the rate is about 29 per cent. in Rio de Janeiro and São Paulo, it reaches 60 per cent. in the north-east (Bahia and Pernambuco).

These figures merely convey a general idea of the problem without establishing the incidence and prevalence of cervical cancer.

Mass and periodical examinations covering the population of the different regions afford the best means of collecting epidemiological information, since the screening is thus based on prior knowledge of the size and composition of the population to be studied.

To test the feasibility of a mass screening programme at the national level, a pilot project is at present being conducted in the State of Rio de Janeiro.

This State was chosen because of its relatively small area (42 000 km^2) divided into 62 counties with a total population of 3.5 million inhabitants. It represents an average of the economic level, standard of living and general facilities of the country as a whole. At the same time, the patterns of the component counties vary widely. While some of the counties comprise densely populated industrial cities without rural areas, others have a very low rate of urban population.

In 1955 Mario Pardal, head of the Gynaecological Department of the Antonio Pedro Hospital (the largest hospital in Niterói, the largest city in the State of Rio de Janeiro) started a campaign to remedy a situation that was attested by the high rate of advanced cases of cervical cancer referred to the hospital (stages III and IV, 65 per cent.). The campaign was called "Periodical Gynaecological Examination", and was intended to reach women over 30 and ensure an earlier diagnosis of gynaecological and breast malignancies. Benign tumours and other lesions were also included, as incidental targets of the campaign.

As a means of promoting the earlier referral of cases, a campaign of public education was also started in which the importance of periodical examinations was stressed, though without specific reference to cancer. Every medium of propaganda - posters, pamphlets, short films, press and radio - was used. Lectures were given in more than 100 different places.

Initially, all of the examinations were made at the out-patient section of the Antonio Pedro Hospital. Later, however, some were also made in small ("peripheral") units situated in various districts of Niterói as well as in other communities.

The total number of such units amounted to 15. It was not possible to develop a wider network of units, since the necessary personnel - serving on a voluntary basis - could not be found.

This initial effort produced valuable results. The proportion of advanced cases of cervical cancer (stages III and IV) fell from 65 per cent. to 35 per cent. A sound methodology was established, and the medical staff enlarged their knowledge through lectures and training.

An analysis of the records collected showed that the majority of advanced cases came from remote parts of the State, and that the figure of 35 per cent. could be still further reduced through the extension of cancer detection to the whole State, by means of a new programme called "Cancer prevention and detection - mass examination pilot project in the State of Rio de Janeiro".

In 1961, on the basis of this first experience, the "Offensive Against Cancer" Foundation, in association with the Gynaecological Department of the Antonio Pedro Hospital, inaugurated a programme for mass examination in the State of Rio de Janeiro. Financial support for the programme was given by the Government of the State, the National Cancer Service and the "Offensive Against Cancer" Foundation.

Population-based mass screening. The pilot project limits the examination to women in the over-30 age-group, comprising 517 639 women. As regards those under 30 years of age, an examination is made only in cases disclosing suspicious symptoms. Of the group of 517 639 women, 54 per cent. reside in urban, 46 per cent. in rural areas.

The composition of the population by county is, of course, also known. The ratios of urban to rural population differ widely in the various counties, and this fact is always taken into account in the assessment of results.

Units. Three kinds of units are at present used in the pilot project in order to carry out the existing tasks:

(a) Basic or central unit, in the Antonio Pedro Hospital in Niterói, with the following functions, services and facilities:

(i) prevention, detection and diagnosis in connexion with cases referred, either directly or by the other units, to the Hospital, which disposes, for these purposes, of one well-equipped out-patient ward in which six patients can be examined simultaneously; this ward can also be used for the instruction and training of physicians;

(ii) a cytological laboratory, with a capacity for processing and interpreting 250 specimens daily;

(iii) a laboratory of pathology capable of making 40 histological examinations for the project daily;

(iv) a laboratory for other tests;

(v) radiology;

(vi) cancer registry;

(vii) full treatment facilities for cases referred through the pilot project;

(viii) medical and allied personnel, including the co-ordinator of the pilot project, to handle the work in all sectors;

(ix) training of personnel. (This is conducted by the staff under the supervision of the co-ordinator. Preference is given to women doctors for the clinical work in the peripheral units. Every day they attend lectures and receive three hours of training in the out-patient department, over a period of four months. The subjects of instruction are: history of the case, gynaecological examination and diagnosis, physical examination, cytology, colposcopy, pathology and biopsy techniques, together with public health education. Nurses and clerks also receive training before being assigned to a peripheral unit. The Department of Pathology and Cytology provides the facilities for the training of doctors and technicians);

(x) a planning body for the pilot project. This is directed by the co-ordinator and composed of the heads of department, together with a social worker and an epidemiologist;

(xi) an epidemiology section, which collects data from the records, prepares statistical material, and undertakes relevent research work.

(b) Permanent peripheral units (at present 17 in number) situated in different parts of Niterói and in other cities. These units are provided with the necessary facilities for detecting and even diagnosing cases of cervical cancer. Their productiveness is relatively low, for the reason that the staff is permanent and the number of patients decreases after the initial examination. They are responsible for the public education programme and for liaison with the central unit.

(c) Temporary peripheral units, operated by mobile medical groups for the period of time required to cover the given population group. The mobile groups move from one community to another, and each is composed of a woman doctor, a nurse, a social worker and volunteers from the Women's Organization against Cancer (Rêde Feminina de Combate ao Câncer).

The temporary units are lodged, for the requisite period of time, in hospitals, out-patient departments, health centres, factory clinics, doctors' offices and even in converted houses or rooms. The premises are provided free of charge by the local authorities as a contribution to the programme; unlike the permanent units, the temporary units are thus enabled to avoid any expenditure for buildings and equipment.

Each mobile group has some special equipment, including a small colposcope.

So far, only six such groups have been organized, since it was thought advisable to proceed by gradual stages so that the initial results may be assessed and the costs calculated.

Having first gathered the necessary information about the selected community, the members of a mobile group start an educational campaign with the aid of the Women's Organization against Cancer. Posters, pamphlets, radio, press, films are among the media employed intensively over a period of a few days. In this way, when the time comes for the examinations the number of applicants is usually very large.

D. Development of the project and initial results

The data collected in a number of mass screening programmes carried out in certain cities in Canada and the United States indicate that the proportion of women examined amounted to about one half of the female population over 20 years of age. The

screening was generally limited to the cytological examination of smears taken by nurses from the vaginal pouch.

As already mentioned, the mass screening in the Brazilian pilot project includes physical and pelvic examination and Schiller's test, colposcopy and, where appropriate, biopsy. The examination is also extended to breast, skin and accessible mucosas. Pre-cancerous conditions, benign tumours and other lesions are also detected in these examinations.

On the assumption that 50 per cent. of the female population over 30 years of age will participate in the first screening, about 250 000 examinations will have to be made. The most productive work is done by the mobile groups, since they devote themselves exclusively to this task. They work eight hours a day, performing 32 examinations, but are allowed to work overtime. It has been found that a maximum of 50 examinations can be performed daily, the personnel being paid overtime according to the number of additional examinations (beyond 32).

The six mobile groups now in operation are expected to perform about 60 000 examinations a year. With the addition of the 20 000 examinations which, it is estimated, will be performed in the central and the permanent peripheral units, the mass screening may cover about 80 000 women a year. Depending on the results of the first year, the number of mobile groups may be increased so as to expedite the estimated 250 000 examinations and start the second screening in the communities already visited. If, however, the number of mobile groups remains at six, it will take three years to complete the first screening.

To facilitate the task of the mobile groups the State of Rio de Janeiro was divided into six areas, made up of a group of counties.

As the activities of the mobile groups started only recently, it is not yet possible to assess the results of the pilot project with precision. However, some data recorded in the central and the permanent units are available, as follows:

To date 20 000 records of women examined in the out-patient department of the central unit and in some of the peripheral units have been assessed. Over 22 000 cytological examinations have been made. The cytological specimens from the cervix have always been taken with an Ayre blade from the squamo-columnar junction and from

any area of the cervix which is abnormal. When the presence of blood or pus cannot be explained by lesions of the cervix, specimens are collected from the endocervix and endometrium. A similar procedure was followed in the case of old women.

According to Papanicolaou's classification, 39 per cent. of group III and 96 per cent. of groups IV and V had cancer.

Systematic colposcopy started later and therefore only 7000 colposcopical examinations could be computed. The number of atypical changes amounted to 17.5 per cent. The colposcopic findings were very helpful permitting of a selective biopsy. In about three per cent. of the cases with a negative cytology, colposcopic findings led to a diagnosis of cancer.

Biopsy of the cervix was performed in about 12 per cent. of the examined cases. In the first group of cases, when colposcopy was not systematic, punch biopsy was used. Afterwards biopsy was always selective. When histology showed atypical cells or carcinoma _in situ_, a biopsy by conization was recommended, followed by a careful histological study of the specimen, in order to determine whether or not an invasive carcinoma existed.

Of the 20 000 cases assessed, 540 had cancer, representing 2.25 per cent. This very high proportion was doubtless due to the fact that most of the patients were referred to the hospital (general unit) long after the onset of the disease. In some peripheral units the percentage was lower - in certain cases, one per cent.

In a second screening this rate fell to 0.6 per cent.

In the city of Niterói, about 50 per cent. of the 42 000 women over 30 years of age have already been examined, but the collation of the data related to this group is not yet completed. Clinical and epidemiological aspects suggested by an analysis of the data assembled in the registry of the pilot project will provide a complete report on the results obtained.

The notes that follow concerning Araruama County give an idea of the work performed by the mobile groups in communities regarded as "difficult".

This county covers an area of 643 km^2 and a population of 30 904 inhabitants, giving a density of 48 inhabitants per km^2. The female population (over 30 years) is 1011 (urban), 3550 (rural), making a total of 4561. The economic level and the standard of life of the inhabitants are very low.

Neither hospital nor health centre existed, and it was at first feared that it would be impossible to find a suitable place in which to install the unit. Finally, a retired physician lent his office, located in a small, old house. The equipment, though obsolete, was adequate for the examinations.

The mobile group, headed by a woman doctor, was accommodated in private homes - there are no hotels in the city.

The educational campaign lasted three days and was very successful.

In the first two weeks more than 30 consultations were held daily. Subsequently, some difficulties arose. The clerk in charge of the records and registry resigned and it proved impossible to obtain a replacement. The number of applicants decreased. It was decided to interrupt the activities, 600 examinations having been made, and nine cases of cancer detected.

This experience was very helpful in showing that it is possible to carry out a mass screening even in communities without facilities. The problem of recruiting auxiliary personnel is a fundamental one. It is however, anticipated that with the help of the Women's Organization Against Cancer a solution can be found.

It is not yet possible to calculate the exact cost of each examination. However, in order to reduce the expenses to a minimum, the following principles and procedures have been adopted:

(a) limitation by sex (women only) and by age;

(b) limitation by cancer site, through the application of the criterion of accessibility to common physical examination;

(c) limitation of tests;

(d) large-scale use of temporary units, seconded by other organizations as a contribution to the project;

(e) use of mobile medical groups;

(f) reliance on voluntary help in the registration of patients public education and the provision of other facilities.

The examination is entirely free of charge. Selected cases, whether of cancer or other disease are referred to the patient's private doctor or to medical organizations, including the central unit of the pilot project.

Summary

The cervix is the site of the disease in which cancer-control measures are most effective. Mass screening is the best method of achieving the aims of a public health programme. The prevention and detection of cervical cancer must be carried out with due regard to the conditions prevailing in each community.

It is not advisable to limit the examination to pre-symptomatic women, because the general objective of detection is that cancer cases should be discovered much earlier than they would be through the initiative of the patients themselves.

Mass examination is able to change the general picture of cancer stages at the time of diagnosis.

The type of organization which carries out the detection of cervix cancer does not matter very much. The work can be done in cancer or general hospitals, in special clinics, in health centres, or even in physicians' offices. The taking of vaginal smears by untrained personnel, or even by the patient herself, cannot be recommended.

To co-ordinate the work of the detection units a central or basic unit is necessary.

Complete diagnosis and treatment should be carried out only in institutions that are well equipped and well staffed. These conditions are generally found in cancer hospitals, cancer clinics and in gynaecological departments of universities and general hospitals of a high standard.

A well-organized recording system is a necessary adjunct to an effective follow-up. After-care must be planned with due regard to the needs and possibilities of each case. Home care is indispensable in advanced cases, and is most effective when organized as a hospital service.

In the special field of cancer of the female genital organs, prominence should be given to the instruction of physicians in methods of detection and diagnosis. To cover the needs of a mass screening programme, a large number of cytologists and pathologists must be engaged, together with numerous cyto-technicians. It is not practicable to have the examination performed by gynaecologists in every community. General practitioners can be instructed and trained in three to four months' time.

Public education must be undertaken with great care; it should stress the importance of early diagnosis and the advantages of periodical examination.

In Brazil, cancer control is carried out through a large network of institutions and units under the superivsion of the National Cancer Service of the Ministry of Health. The large majority of these institutions and units are private ones. 1490 beds in cancer hospitals are available.

The prevention and detection of cervical cancer are conducted in 43 autonomous clinics, and in the out-patient departments of cancer, university and general hospitals.

Cytology, Schiller's test and colposcopy are used as a matter of routine in most of the detection clinics. Biopsy is performed according to the information obtained through the other items.

A mass screening programme was planned in Brazil. A pilot project for mass examination in the State of Rio de Janeiro is under way. A group of 517 000 women over 30 years of age has been selected for examination. It is expected to cover about 50 per cent. of this group - a proportion already reached in Niteroi, the largest city in the State.

An analysis of 20 000 records has already been made. A reduction of the proportion of stages III and IV from 65 per cent. to 35 per cent. has already been achieved. The cancer rate was 2.25 per cent.

Experience in a small and underdeveloped community, where a mobile medical group carried out examinations, illustrates the difficulties that arise and how they can be overcome.