The Rome Project of Coronary Heart Disease Prevention (*)

Research Group of the Rome Project of Coronary Heart Disease Prevention (**) 

Summary. — The Rome Project of Coronary Heart Disease Prevention (PPCC) is a primary preventive trial of coronary heart disease (CHD) representing the Italian section of the WHO European Multifactor Preventive Trial of Coronary Heart Disease. In cooperation with other European centers the PPCC intends to demonstrate: 1) the feasibility of modifying the levels of some coronary risk factors in population groups, and 2) the eventual reduction of CHD incidence in 5 years as a consequence of the above changes.

The study is based on the allocation to control or treatment of whole occupational groups called «factories». The preventive treatment aimed at changes of serum cholesterol, high blood pressure, smoking habits, physical inactivity, overweight and some other minor risk factors, is based on individual sessions for those men belonging to the upper 25 % of a risk score and on mass health education for the remaining 75 %.

Some options adopted by the PPCC beyond the basic protocol of the WHO collaborative group [4] are presented.

The PPCC started its activity in 1973 enrolling four factories (2 for control and 2 for treatment) for a total of 6,027 men aged 40–59 at entry.


(*) For composition of Group, see Appendix.

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Lo studio è basato sulla assegnazione a controllo o a trattamento di interi gruppi lavorativi denominati «factories». Il trattamento preventivo si propone di modificare la colesterolemia, gli elevati livelli pressori, l’abitudine al fumo, la inattività fisica, il sovrappeso corporeo ed alcuni altri fattori di rischio di minore importanza; esso si basa su sedute individuali per quegli individui appartenenti al 25% superiore della distribuzione del rischio globale definito secondo un punteggio, e su misure di educazione sanitaria a livello collettivo nel rimanente 75% dei soggetti.

Vengono illustrate inoltre alcune opzioni adottate dal PPCC in aggiunta al protocollo-base del gruppo collaborativo coordinato dall’OMS [4].

Il PPCC ha iniziato la propria attività nel 1973 arruolando 4 «factories» (2 per controllo e 2 per trattamento), per un totale di 6.027 soggetti di sesso maschile e di età iniziale compresa tra 40 e 59 anni.

The Rome Project of Coronary Heart Disease Prevention (PPCC) is a research programme on primary prevention aimed at contributing to the question whether artificially induced changes of some risk factors are followed by a decrease in the incidence of coronary heart disease (CHD) and of other complications of atherosclerosis.

The group represents the Italian section of the WHO Multifactor Preventive Trial of Ischemic Heart Disease coordinated by the Regional Office for Europe of WHO, Copenhagen, which pools also the London, Brussels–Ghent, and Warsaw centers. The operative coordinator at the European level is prof. Rose (London); the Brussels–Ghent center is responsible for the processing of the pooled data.

The international group cooperating in this research was formed on the basis of working groups and documents of the WHO–Regional Office for Europe, worked out in the years 1970 to 1973 and identified by code numbers EURO 5011 (3) [1], EURO 8202 (3), EURO 8202 (4), EURO 8202 (5), EURO 8202 (6) [2].

The Italian group, identified by the code indicated above (PPCC), has been formed on a basis of free cooperation between: the Center for Cardiovascular Disease at S. Camillo Hospital, Rome; the Center for the Control of Metabolic Disorders and Arteriosclerosis of the University of Rome; the National Institute of Health, and the Italian Institute of Social Medicine.

Epidemiological data gathered throughout the world during the last 25 years have shown some factors (hypercholesterolemia, arterial hypertension, cigarette smoking, overweight, lack of physical activity, etc.) to be associated with an excess of CHD risk. The risk of developing myocardial infarction, sudden death and other forms of CHD increases with increasing levels of the above factors.

It has not yet been established with certainty whether these factors are the causes of the disease and whether their modification leads to a reduced incidence of CHD.

Studies dealing with individual factors appear to indicate that by treating hypercholesterolemia or hypertension morbidity may be reduced; but a definite answer to this question has not yet been obtained. At present, it is thought both in Europe and the USA that by acting simultaneously on several factors the chances of reducing the incidence of myocardial infarction, coronary death, cerebrovascular accidents, cardiac failure etc. are increased.

In 1970, two European groups — in Sweden (Göteborg) and Great Britain (London) — started planning controlled trials of multifactor CHD prevention. The Göteborg project was based on the random allocation (to «control» or «treatment» groups) of subjects belonging to the general population whereas in the London project allocation was based on total groups (occupational units).

In November, 1970, the WHO Regional Office for Europe (Copenhagen) convened a working group in Rome [1] with the assignment to discuss methods to be employed in experiments of primary multifactor prevention of CHD on the basis of the preliminary reports presented by the two European centers (London and Göteborg) which were starting trials of this kind, as has already been pointed out. This working group laid down the general lines of methodology to be followed, and suggested that pilot studies be started with the object of assessing, in the course of one year, the feasibility of the programme according to either of the two schemes referred to above.

On the basis of 15 years of epidemiological experience gathered within the framework of international cooperation, the Center for Cardiovascular Disease of Rome (CMCV) undertook to follow the «London» scheme and to (a) carry out a pilot study during 1971; (b) explore the actual possibilities, both organizational and financial, of starting a large-scale trial within 1973; (c) cooperate with WHO in working out the detailed programme for an international cooperative study at European level, to be coordinated by WHO.

A pilot study was indeed carried out during 1971, and yielded encouraging results [3]. At the same time, applications were made for financial support and the administrations of occupational units that might be involved in the trial were approached; finally, a representative of CMCV took part in further restricted working groups set up by WHO (London, 1971; Brussels, 1971; Warsaw, 1972) for the purpose of working out the programme and exchanging information on the progress of pilot studies with representatives of the other centers participating in the trial.

In the meantime, the pilot study having been completed and the method having been worked out, the resources as well as the personnel to be employed
in the venture still proved insufficient; on the other hand, and apart from the strictly economic aspects, it became clear that the complexity of the project was such as to require, even within the Rome group, the cooperation of different institutions each specialized in certain well defined aspects of those envisaged by the project.

Several other institutions in Rome were therefore approached which might have been interested in the problem and every one of which could have cooperated with its own resources and personnel in shouldering specific tasks for which it was particularly equipped and experienced.

As a result of these negotiations the PPCC Research Group was formed in the spring of 1973, based on the free cooperation between the above mentioned institutions.

This group decided to take part in the collaborative programme coordinated by WHO and in which the London, Brussels–Ghent, and Warsaw groups were also participating. The Belgian and Polish groups, too, conducted short preliminary pilot studies with the object of proceeding to the main trial.

Practical implementation of the programme was started in 1971 in London, in 1972 in Brussels–Ghent, and in 1973 in Warsaw.

The pilot study carried out in Rome in 1971 proved satisfactory in that participation at preventive treatment sessions was good and a short term reduction by almost 40% in the estimated risk of CHD was obtained as compared with no statistically significant change in the untreated control group.

The experimental design of the collaborative protocol and its general characteristics were described in a paper published in the International Journal of Epidemiology (1974) [4] which appears in the Italian translation in this volume.

The design of the collaborative trial was based on a common basic protocol, envisaging also the possibility of extending certain aspects of the programme as well as the introduction, within limits, of some variants to the protocol.

The present paper aims to describe the options adopted by PPCC in respect of the basic WHO protocol and the general characteristics of the populations recruited for the study.

**Screening**

As recommended by the WHO protocol, all subjects belonging to the intervention groups were invited to take part in the screening procedure. One of the options initially contemplated for adoption by the Rome group consisted in submitting to the screening examination all the members of

the control population rather than the 10% random sample only, as suggested by the WHO collaborative groups. This would have offered a more accurate description of these populations as well as the possibility of assessing incidence more precisely by means of a final reexamination and to compare the high-risk subgroups of control and intervention “factories.” On the basis of the experience gathered during the pilot study, it was felt that this would not have substantially contaminated the results of control populations. Invitation of one of the control populations (MT) for the screening procedure which was started in 1973 and was performed on groups of subjects randomly drawn from the whole population considered, had to be given up owing to organizational difficulties when about 25% of the subjects concerned had been examined. In view of this experience it was decided to limit screening in the other control population (RRR) to a random 10% (in line with the WHO protocol).

Data obtained at screening were registered on a form which included all the basic information included in the WHO protocol and, in addition, a series of further optional informations selected by the Rome group in order to make the programme more complete. Two coding systems were contemplated: a horizontal one which is the WHO standard for international comparison (one punch card, WHO code) and a vertical one containing all information of local interest including most of those of the WHO scheme (two punch cards, Rome code).

In addition to the subjects’ personal data, the following informations were registered on the forms: physical activity at work (*) assessed according to two different criteria; physical activity at leisure; car driving on working days; cigarette smoking (*); consumption of alcoholic beverages, tea and coffee; psycho-emotional stress, family history of certain specific disorders (myocardial infarction, cerebral hemorrhage or thrombosis, arterial hypertension, diabetes) in parents and first degree relatives with indication of the number of cases; habitual cough or phlegm or episodes of acute bronchitis (*), bronchopneumonia or pneumonia during the last three years (*) and shortness of breath on exertion (*) (questionnaire modelled upon the MRC chronic bronchitis original); personal history of angina pectoris (*), myocardial infarction (*) and intermittent claudication (*) (standard questionnaire of the London School of Hygiene); previous or present diseases; use of hypolipemic, antidiabetic or hypotenative agents; hypolipemic diet.

Certain anthropometric measurements were also obtained (height with (*) and without shoes, sitting height, weight with shoes and without jacket (*). weight without clothes, biacromial diameter, bicipital diameter, skinfold

(*) Characteristics suggested by the WHO collaborative group.
thickness in triceps and subscapular areas); arterial blood pressure was measured according to an international standard technique (*); certain blood parameters were measured after a 12-hour fast (total serum cholesterol (*), serum triglycerides, serum lipoprotein electrophoresis, fasting blood glucose, blood glucose one hour after a standard 50 g glucose load, serum uric acid) and a 12-lead standard electrocardiogram was recorded (reading according to the Minnesota code).

Data and measurements were collected according to standardized procedure.

**Identification of high-risk subjects**

Owing to the relative slowness of the screening operations, calculation of the risk score as suggested by the WHO protocol, based on the additive scoring of 5 factors (age, serum cholesterol, systolic blood pressure, smoking habits, physical activity at work) and the ranking of scores in order to identify the upper 20% of the risk would have considerably delayed the start of treatment in particularly high-risk subjects. It was therefore decided to make an immediate preliminary selection and to invite for individual treatment whose factors’ levels exceeded arbitrarily selected values, viz. systolic blood pressure (average of 4 measurements) ≥ 160 mm Hg; diastolic blood pressure (average of 2 measurements) ≥ 95 mm Hg; serum cholesterol ≥ 240 mg/dl; serum triglycerides ≥ 170 mg/dl; basal blood glucose ≥ 100 mg/dl; glucose tolerance test (50 g oral glucose — 1 h) ≥ 160 mg/dl; serum uric acid ≥ 6 mg/dl. Only once the screening procedure was completed and all data had been obtained, was it possible to calculate the WHO score for all subjects. It was found that only a negligible number of subjects not selected according to the method outlined above were found in the upper 20% of the WHO score rank.

Subsequently, and always making use of the five factors contemplated in the WHO score, individual probabilities of developing CHD were computed according to two solutions of the multiple logistic function derived from the Italian and European data of the « Seven Countries Study » [5, 6]. Later, since the ranks of the WHO score and those based on the two estimated probabilities did not coincide, and taking into account the greater reliability of the latter as compared to the former, it was decided to include in the official list of high-risk individuals all those who according to the probability rank had been so classified, even if their WHO score was below the 8th decile.

(*) Characteristics suggested by the WHO collaborative group.

Intervention on risk factors

a) Individual treatment.

All subjects recalled for individual treatment were given explanations on the significance of the risk factors considered for their selection, as well as on other factors such as overweight, hypertriglyceridemia and glucose intolerance.

According to the WHO protocol, the general dietetic principles for lowering or keeping low the serum cholesterol level were illustrated to all participants, independently from such level, with special emphasis on the importance of reduced intake of cholesterol and saturated fatty acids, the latter to be partly replaced by polyunsaturated fats. The hypocholesterolemic diet was tailored according to the needs of the individual case in terms of caloric intake when overweight was present. In Rome, individuals with serum cholesterol levels $\geq 300$ mg/dl were immediately given drug treatment, essentially clofibrate. In another sub-group including subjects with serum cholesterol values $\geq 250$ but $< 300$ mg/dl drug treatment could optionally have been started after 6 months of diet only, if this had not brought about a consistent drop in hypercholesterolemia. As suggested by the WHO collaborative group, hypertensive subjects as previously defined were considered for treatment if the high blood pressure found at screening was confirmed at the first individual treatment session. First choice medication was a combination of reserpine, clopamide and dihydroergocristine *per os* in amounts varying from case to case. Patients already satisfactorily controlled with other types of drugs were allowed to continue as before, except for intensifying treatment if necessary. Further, appropriate dietary recommendations were offered: in addition to limiting sodium intake, overweight subjects with hypertension were advised to follow a low-calorie regimen.

Individual advice apt to induce subjects to give up or reduce cigarette smoking and to increase physical activity did not differ substantially from that contemplated in the WHO protocol. It was also suggested that patients should engage in some non-competitive type of exercise.

Following the recommendation of the international group, even in the absence of high serum cholesterol or blood pressure values, overweight subjects were encouraged to reduce, by observing a low-calorie, low-fat, low-carbohydrate diet and by limiting their alcohol intake if this was excessive, as well as by increasing the amount of physical exercise.

Intervention on high levels of serum triglycerides, on diabetes or glucose intolerance, and on high serum uric acid values represented an option of the Rome group.
In subjects with excess triglyceride blood levels, dietary measures were prescribed consisting in reduced intake of total calories, fats (especially saturated ones), carbohydrates (especially refined sugars) and, if necessary, more or less drastic limitation of alcoholic beverages. Drug treatment was reserved for individuals with triglyceride levels $\geq 300$ mg/dl, as well as for those with values between 170 and 300 mg/dl in whom 6 months of dietary restrictions had proved unsuccessful.

In cases of clinical diabetes not previously diagnosed, intervention consisted in the prescription of an adequate diet and, if necessary, oral hypoglycemic agents and/or insulin. Previously known diabetics already undergoing treatment were given dietary advice and pharmacological therapy only if their metabolic control was unsatisfactory. Subjects with chemical or latent diabetes were advised to follow a low-carbohydrate, and in case of overweight, a low-calorie diet.

A diet low in purine bodies was recommended to individuals having a high uric acid serum level as defined above; only in cases of very high uric acid serum levels ($\geq 10$ mg/dl) was drug treatment with allopurinol prescribed.

For the first year after screening, four individual treatment sessions were planned for the subjects selected as described above; hypertensive patients were offered six sessions.


During the first year after initial examination, collective activities of health education involving all subjects in the treatment groups (including those given individual treatment) consisted in:
- distribution of printed material conveying information on CHD and its prevention;
- distribution of a booklet of dietary instructions concerning, above all, the relationship between diet and serum cholesterol;
- distribution of a booklet encouraging physical exercise;
- distribution to all smokers of a booklet of anti-smoking propaganda;
- showing of films on health education and against smoking;
- propaganda posters displayed at the places of work;
- a series of public sessions of dietary instruction held by doctors and dieticians;
- distribution of cooking recipes prepared by experts in nutrition and dietetics, as well as of food exchange tables.
Re-screening

Periodical reexamination with a technique similar to that employed for initial screening is contemplated by the Italian section of the Project with annual frequency for treatment groups and with biennial frequency for the control populations (limited to those examined at entry).

As regards treatment groups, it is planned to invite a random 10% of all subjects examined, all those considered high-risk patients according to the definitions outlined above, as well as the hypertensives even if they do not fall into the high-risk categories.

A further examination, confined to blood tests and measurement of blood pressure, is planned once a year for high-risk subjects, hypertensives, and non high-risk individuals with elevated blood lipids (cholesterol $\geq 250$ mg/dl and/or triglycerides $\geq 200$ mg/dl).

Monitoring of morbid events

Data on mortality will be obtained, for subjects still working, from the administrations of the occupational units, and for those already retired by comparing the lists of retired persons with data obtained from the Registry.

The cause of death, as officially certified, will be verified as far as cardiovascular diseases are concerned, by enquiries at the public or private hospitals where death has occurred or from the attending physicians.

In view of certain difficulties, which had been foreseen and were in fact encountered, in obtaining nominal lists of workers who had remained absent from work 3 weeks or more on account of illness, it was decided in Rome to convene all those belonging to treatment groups once a year with the object of recording an electrocardiogram and administering a questionnaire; the same questionnaire was sent to those who had not shown up for the electrocardiogram, in order to obtain a written reply giving some indication of the state of health of these individuals. This method of postal enquiry is currently applied also to retired subjects belonging to control units. The clinical data obtained by these various methods are coded according to the system contemplated in the WHO protocol. For the diagnosis of myocardial infarction in particular, the classification and criteria laid down by the WHO infarction registers have been followed with slight modifications.

Dietary surveys

Dietary enquiries, optionally adopted by all national groups but technically different, are planned in random subsamples of treatment factories. These will be carried out in two different ways: (a) individual subjects will...
be asked to keep a dietary diary for 7 consecutive days, after having been given appropriate directives; (b) a questionnaire concerning dietary habits will be filled in on direct questioning of subjects and with the aid of illustrated auxiliary material (kindly supplied by the National Institute of Nutrition). In addition, in order to assess compliance with prescriptions and dietary advice, each subject will fill in, both on the occasion of the first visit and at every subsequent re-screening, a questionnaire concerning some qualitative dietary habits.

Sociological and psychological enquiries

Sociological enquiries and others of psychological type are contemplated in Rome in the shape of pilot studies in subsamples both of the treatment and control populations. A questionnaire has been prepared which is intended to gather information on certain sociological parameters and on the subjects' attitude to problems of health, disease and prevention. Another type of questionnaire is an attempt to ascertain whether the knowledge of being a high-risk patient as regards cardiovascular disorders (as shown by the results of screening) triggers states of anxiety which might be harmful and might even increase the risk.

Theoretical studies on the assessment of coronary risk

Studies are under way to increase knowledge on some aspects of multivariate analysis of coronary risk; for this purpose Italian and foreign material from the «Seven Countries Study» [5, 6] is used in conjunction with mathematical models, mainly the multiple logistic function. The main purpose of these studies, as far as the present project is concerned, is to find useful solutions for the assessment of the initial risk and of its subsequent changes for evaluating the effects of the preventive treatment applied along the programme.

Standardization of methods

In addition to standard questionnaires (for the part in common with the WHO protocol) and to previously agreed criteria for the diagnosis of CHD, uniform procedures were adopted for anthropometric and blood pressure measurements and ECG recording following the rules stated in the Rose and Blackburn's manual [7].

Special attention was devoted to blood pressure measurements, electrocardiogram and serum cholesterol assay.

For the training of medical and paramedical personnel in blood pressure measurement, the magnetic tapes of the London School of Hygiene were used.

Although one of the coders of the group is in line with the Minnesota Reference Center, for the coding of electrocardiograms according to the Minnesota Code, standardization with the London Reference Center (St. Mary's Hospital) is constantly maintained.

Standardization of serum cholesterol, as measured by the Abell–Kendall method [8], has been started following the lines of the WHO protocol. The first stage was done with a rather simple method, carried out in collaboration with the Perugia Reference Center (prof. Fidanza). The second stage, which is still under way, is done in cooperation with the Prague WHO Reference Center.

Standardization of triglyceridemia will subsequently be achieved with this same Center.

Speaking of standardization in the biochemical field, in addition to programmes at international level, some methodological problems are being investigated concerning reproducibility of cholesterol assay in refrigerator–stored serum, variability of standard sera along the time, use of a semi-automatic cholesterol assay, and comparison of blood sugar as measured by the reflectance and by the enzymatic method.

**Statistical power**

The statistical power of the present study is limited in view of the small number of subjects considered; nevertheless, it may contribute to the solution of the problem of multifactorial CHD prevention if its data can be pooled with those of other European groups. However, it cannot be excluded in advance that even the Rome study by itself could come very close to a statistically significant result (just like every other study conducted elsewhere).

Considering only high–risk subjects in the treatment groups (about 600) and assuming their probability of developing CHD to be reduced by 35 to 40 % for a period of 5 years (as has been achieved for 5 months in the pilot study) and if the expected incidence of CHD is about 10 % per year, the resulting difference between controls and treated subjects as to CHD would not be far from statistical significance (p of $\chi^2$ ranging between 0.1 and 0.05).

However, a direct comparison with corresponding high–risk subjects in the control groups is no longer possible because initial screening of the latter has not been completed. The prospects of the Italian trial, considered by
itself, may therefore be summed up as follows: it is hoped (a) to demonstrate the possibility of modifying coronary risk factors in a substantial way in population groups and therefore the estimated theoretical risk, even in a country like where CHD incidence is comparatively low; (b) to be in line from this point of view with the other European groups and with studies carried out elsewhere; (c) to demonstrate, in terms of incidence, a trend favourable to the hypothesis that the risk is reversible, even if the findings are not statistically significant; (d) to contribute to the pool of data of the European collaborative group; (e) perhaps to obtain indirect proof of the reversibility of CHD risk by means of special statistical–mathematical analyses.

**Occupational groups recruited in Rome**

The Italian Section of the European collaborative trial has been able to recruit four occupational groups including a total of over 6,000 men aged 40 to 59 at entry.

The four groups are indicated by conventional codes. In view of the allocation to treatment or control, the groups have been paired on the basis of presumed similarities, mainly as to occupation.

The WEC group (treatment) consists of 2,220 employees of a public service company engaged in certain urban services. The employees are partly office clerks, partly technical staff of varying degrees of qualification plus a very small contingent of heavy manual labourers. Mean physical activity was considered to be moderate.

The RRR group (controls) which was paired with the above group, consists of 1,061 employees of another public service company. The personnel consists mainly of technicians and manual workers presumably with moderate physical effort.

**Table 1**

**Men enrolled, invited and examined in factory WEC**

<table>
<thead>
<tr>
<th></th>
<th>W E C</th>
<th>40-44</th>
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<th>50-54</th>
<th>55-59</th>
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<tr>
<td>Roster</td>
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<td>634</td>
<td>553</td>
<td>335</td>
<td>2,220</td>
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<tr>
<td>Invited</td>
<td>698</td>
<td>634</td>
<td>553</td>
<td>335</td>
<td>2,220</td>
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<tr>
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<td>470</td>
<td>214</td>
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<td>85.0</td>
<td>72.8</td>
<td>87.2</td>
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<tr>
<td>% examined (out of invited)</td>
<td>93.4</td>
<td>89.7</td>
<td>85.0</td>
<td>72.8</td>
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**Table 2**

Men enrolled, invited and examined in factory RRR

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<tr>
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<td>37</td>
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<tr>
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<td>29</td>
<td>33</td>
<td>14</td>
<td>97</td>
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<tr>
<td>% examined (out of roster)</td>
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<td>9.2</td>
<td>8.9</td>
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<td>% examined (out of invited)</td>
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<td>85.3</td>
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**Table 3**

Men enrolled, invited and examined in factory DPE

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<tr>
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<tr>
<td>Invited</td>
<td>174</td>
<td>204</td>
<td>288</td>
<td>245</td>
<td>911</td>
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<tr>
<td>Examined</td>
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<td>225</td>
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<td>% examined (out of roster)</td>
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**Table 4**

Men enrolled, invited and examined in factory MT

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<tr>
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<tr>
<td>Examined</td>
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<td>190</td>
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<td>494</td>
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<tr>
<td>% examined (out of roster)</td>
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<td>% examined (out of invited)</td>
<td>76.9</td>
<td>88.8</td>
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<td>81.2</td>
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Groups DPE (treatment) with 911 subjects, and MT (control) with 1,835 subjects are made up of employees of public administrative bodies, all doing strictly clerical work and therefore presumably very uniform from the occupational point of view.

Although the sizes of «control» and «treatment» factories differ in the two pairs, the overall numbers of controls and treated subjects are rather similar.

Screening operations started in June 1973 and were completed (with the limitations concerning the control groups as indicated above) by the end of 1974. Tables 1–4 show the rosters, the number of subjects examined and the percentages of participation. The latter, in spite of not being particularly high, may be considered rather satisfactory (ranging from 77.5 to 87.2 %), previous experience having shown the difficulty of obtaining more active participation in a large city.

REFERENCES


COMPOSITION OF THE RESEARCH GROUP

The PPCC is the Italian section of the WHO European Multifactor Preventive Trial of Ischaemic Heart Disease.

It is based on the free cooperation of the following Institutions:
- Centro per la Lotta alle Malattie Dismetaboliche e all’Arteriosclerosi dell’Università, Roma (CAU);
- Istituto Superiore di Sanità, Roma (ISS);
- Istituto Italiano di Medicina Sociale, Roma (IMS);
- Centro per le Malattie Cardiovascolari, Ospedale S. Camillo, Roma (CMCV).

The Members of the Research Group having scientific or professional responsibilities are the following:

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