American
Heart
Association
Monograph

Mass Field Trials of the Diet-Heart Question

Their Significance, Timeliness, Feasibility and Applicability

AN ASSESSMENT OF
SEVEN PROPOSED
EXPERIMENTAL DESIGNS

Report of the Diet-Heart Review Panel of
the National Heart Institute — June, 1969

Published by the
AMERICAN HEART ASSOCIATION, INC.

AHA Medical/Scientific Statement

Dietary Guidelines for Healthy American Adults

A Statement for Health Professionals From the Nutrition Committee, American Heart Association

Ronald M. Krauss, MD, Chair; Richard J. Deckelbaum, MD; Nancy Ernst, RD; Edward Fisher, MD; Barbara V. Howard, PhD; Robert H. Knopp, MD; Theodore Kotchen, MD; Alice H. Lichtenstein, DSc; Henry C. McGill, MD; Thomas A. Pearson, MD, PhD; T. Elaine Prewitt, DPH; Neil J. Stone, MD; Linda Van Horn, PhD, RD; Richard Weinberg, MD, Members

In 1957 the American Heart Association proposed that modification of dietary fat intake would reduce the incidence of coronary heart disease (CHD), which had become the leading cause of disability and death in the United States and other industrialized countries.[1] Since then the AHA has issued seven policy statements on diet and CHD as reliable new information has become available.[2-8] In each of these statements emphasis was placed on consumption of total fat, saturated and certain unsaturated fatty acids, dietary cholesterol, and sodium because of their significant contribution to risk of CHD. Later, excessive alcohol intake was considered because of its association with hypertension, stroke, and other diseases. Such knowledge has encouraged other health organizations and the federal government to make similar recommendations.

In May 1989 representatives of nine health organizations and governmental bodies met under the aegis of the AHA, reviewed the scientific evidence, and concluded that most Americans can improve their overall health and maintain it with a few specific but fundamental dietary changes.[9] The following guidelines are consistent with those promoted by each organization:

- Eat a nutritionally adequate diet consisting of a variety of foods.
- Reduce consumption of fat, especially saturated fat, and cholesterol.
- Achieve and maintain an appropriate body weight.
- Increase consumption of complex carbohydrates and dietary fiber.
- Reduce intake of sodium.
- Consume alcohol in moderation, if at all. Children, adolescents, and pregnant women should abstain.

Current AHA recommendations regarding diet and related lifestyle practices for the general population are based on evidence indicating that modification of specific risk factors will decrease incidence of CHD.[8] These risk factors include cigarette smoking; elevated levels of plasma cholesterol, particularly low-density lipoprotein (LDL) cholesterol; low levels of high-density lipoprotein (HDL) cholesterol; increased blood pressure; diabetes mellitus; obesity, especially visceral adiposity; and physical inactivity.

To reduce the impact of these risk factors on the occurrence of CHD in the general population, in 1996 the AHA recommends the following population-wide dietary and lifestyle goals:

- Elimination of cigarette smoking
- Appropriate levels of caloric intake and physical activity to prevent obesity and reduce weight in those who are overweight
- Consumption of 30% or less of the day's total calories from fat
- Consumption of 8% to 10% of total calories from saturated fatty acids
- Consumption of up to 10% of total calories from polyunsaturated fatty acids
- Consumption of up to 15% of total calories from monounsaturated fatty acids
- Consumption of less than 300 mg/d of cholesterol
- Consumption of no more than 2.4 g/d of sodium
- Consumption of 55% to 60% of calories as complex carbohydrates
- For those who drink and those for whom alcohol (ethanol) is not contraindicated, consumption should not exceed 2 drinks (1 to 2 oz of ethanol) per day

Dietary Guidelines for Americans

In formulating the following dietary recommendations, the AHA Nutrition Committee endeavored to make them consistent with those issued by the US Dietary Guideline Committee.[10] Although the AHA guidelines were developed specifically for prevention of heart and blood vessel disease, they can contribute to prevention of other diseases, including some forms of cancer, renal disease, and osteoporosis. The AHA guidelines are also consistent with current recommendations for prevention and management of diabetes.[11] These chronic diseases account for the majority of the morbidity and mortality in the population, highlighting the importance of providing the public with scientifically based dietary and lifestyle guidelines.

"Dietary Guidelines for Healthy Americans" was approved by the American Heart Association Science Advisory and Coordinating Committee on June 20, 1996.

Requests for reprints should be sent to the Office of Scientific Affairs, American Heart Association, 7272 Greenville Ave, Dallas, TX 75231-4596.

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The National Diet-Heart Study Final Report

National Diet-Heart Study
Research Group
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U. S. Public Health Service,
National Heart Institute

THE AMERICAN HEART ASSOCIATION, INC., NEW YORK
1968

Am J Dis Child—Vol 133, Oct 1979

Cardiovascular Disease Risk Factor Variables During the First Year of Life

Gerald S. Berenson, MD; Caroline V. Blonde, MD, MPH; Rosanne P. Farris, RD; Theda A. Foster, MS; Gail C. Frank, RD, MPH; Sathanur R. Srinivasan, PhD; Antonie W. Voors, MD, DPH; Larry S. Webber, PhD

JOURNAL OF PUBLIC HEALTH POLICY
4:398-421, 1983

Research and Demonstration Projects in Community Cardiovascular Disease Prevention

HENRY BLACKBURN

Reprinted from CIRCULATION
Vol. XXI, No. 6, June, 1960
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The Electrocardiogram in Population Studies

A Classification System

By HENRY BLACKBURN, M.D., ANCEL KEYS, PH.D., ERNST SIMONSON, M.D., PENTTI RAUTAHARJU, M.D., AND SVEN PUNSAR, M.D.

THE BLOOD PRESSURE IN A POPULATION

BLOOD PRESSURE READINGS AND HEIGHT AND WEIGHT DETERMINATIONS IN THE ADULT POPULATION OF THE CITY OF BERGEN

BY

JOHS. BØE, M. D., SIGURD HUMERFELT, M. D.
AND FRØYSTEIN WEDERVANG, CAND. OECON.

BERGEN
A.S JOHN GRIEGS BOKTRYKKERI

Acta Medica, 1957, Suppl. 321

BUILD AND BLOOD PRESSURE STUDY

Volume I

1959

Society of Actuaries

JAMA, Nov 16, 1970 • Vol 214, No 7

The Coronary Drug Project

Initial Findings Leading to Modifications of Its Research Protocol

The Coronary Drug Project Research Group

Circulation 63, No. 6, 1981.

Implications of Findings in the Coronary Drug Project for Secondary Prevention Trials in Coronary Heart Disease

THE CORONARY DRUG PROJECT RESEARCH GROUP

JAMA 1957; 164:397

ETIOLOGICAL ROLE OF SODIUM CHLORIDE INTAKE IN ESSENTIAL HYPERTENSION IN HUMANS

Lewis K. Dahl, M.D.
and
Robert A. Love, M.D., Upton, N. Y.

The Framingham Study

The Epidemiology of Atherosclerotic Disease

Thomas Royle Dawber

A Commonwealth Fund Book

Harvard University Press
Cambridge, Massachusetts
and
London, England
1980

Am J of Public Health
1957;47:4

II. Coronary Heart Disease in the Framingham Study

THOMAS R. DAWBER, M.D.; FELIX E. MOORE, F.A.P.H.A.; and
GEORGE V. MANN, M.D.

DIET AND HEALTH

Implications for Reducing Chronic Disease Risk

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Food and Nutrition Board
Commission on Life Sciences
National Research Council

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DECEMBER 1977

Printed for the use of the Select Committee on Nutrition and Human Needs

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A STUDY OF THE AETIOLOGY OF CARCINOMA OF THE LUNG

BY

RICHARD DOLL, M.D., M.R.C.P.

Member of the Statistical Research Unit of the Medical Research Council

AND

A. BRADFORD HILL, C.B.E., Ph.D., D.Sc.

Professor of Medical Statistics, London School of Hygiene and Tropical Medicine; Honorary Director of the Statistical Research Unit of the Medical Research Council

Mortality in relation to smoking: 20 years' observations on male British doctors

RICHARD DOLL, RICHARD PETO

British Medical Journal, 1976, **2**, 1525-1536

PATHOGENESIS OF CORONARY DISEASE IN AMERICAN SOLDIERS KILLED IN KOREA

William F. Enos Jr., M.D., Arlington, Va., Capt. James C. Beyer (MC), U. S. Army
and
Robert H. Holmes, M.D., Washington, D. C.

J.A.M.A., July 16, 1955

Circulation, Volume XLVIII, July 1973

Coronary Heart Disease Epidemiology Revisited

Clinical and Community Aspects

By FREDERICK H. EPSTEIN, M.D.

MODERN CONCEPTS OF CARDIOVASCULAR DISEASE

Vol. XLVIII FEBRUARY 1979 No. 2

Predicting, Explaining, and Preventing Coronary Heart Disease

AN EPIDEMIOLOGICAL VIEW

Frederick H. Epstein, M.D.
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University of Zürich

AMERICAN JOURNAL OF EPIDEMIOLOGY
Vol. 108, No. 2

1978

THE COMMUNITY-BASED MODEL OF LIFE STYLE INTERVENTION TRIALS[1]

JOHN W. FARQUHAR

Circulation 1976;53:589

Salt, Volume and the Prevention of Hypertension

EDWARD D. FREIS, M.D.

Arch Intern Med/Vol 128, Dec 1971

Evans County Cardiovascular and Cerebrovascular Epidemiologic Study

Guest Editor: John C. Cassel, MD, MPH

C.J. Hames

NEJM 1982;307:976

THE EFFECT OF TREATMENT ON MORTALITY IN "MILD" HYPERTENSION

Results of the Hypertension Detection and Follow-up Program

HYPERTENSION DETECTION AND FOLLOW-UP PROGRAM COOPERATIVE GROUP*

American Journal of Clinical Nutrition 1965; 17:281–295

Quantitative Effects of Dietary Fat on Serum Cholesterol in Man

D. M. HEGSTED, PH.D.,* R. B. MCGANDY, M.D.,† M. L. MYERS, S.M.‡ AND F. J. STARE, M.D.§

Circulation, Volume XLII, July 1970

Primary Prevention of Hypertension

HYPERTENSION STUDY GROUP

Chairman: J. EDWIN WOOD, M.D.; *Members:* J. GORDON BARROW, M.D., EDWARD D. FREIS, M.D., RAY W. GIFFORD, M.D., WALTER M. KIRKENDALL, M.D., RICHARD LEE, M.D., HELEN WILLIAMSON, R.N.

Consultant: HERBERT ABRAMS, M.D.

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DIET AND SERUM CHOLESTEROL

DO ZERO CORRELATIONS NEGATE THE RELATIONSHIP?

DAVID R. JACOBS, JR., JOSEPH T. ANDERSON AND HENRY BLACKBURN

Annals of Internal Medicine 90:85-91, 1979

Cholesterol in the Prediction of Atherosclerotic Disease

New Perspectives Based on the Framingham Study

WILLIAM B. KANNEL, M.D., M.P.H.; WILLIAM P. CASTELLI, M.D.; and TAVIA GORDON; Bethesda, Maryland, and Framingham, Massachusetts

Annal of Internal Medicine
1961;55:33

Factors of Risk in the Development of Coronary Heart Disease—Six-Year Follow-up Experience

The Framingham Study

WILLIAM B. KANNEL, M.D., THOMAS R. DAWBER, M.D., F.A.C.P., ABRAHAM KAGAN, M.D., F.A.C.P., NICHOLAS REVOTSKIE, M.D., AND JOSEPH STOKES, III, M.D.
Framingham, Massachusetts

American Heart Association Monograph Number 29

Coronary Heart Disease in Seven Countries

Edited by

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Minneapolis, Minnesota.

THE AMERICAN HEART ASSOCIATION, INC., NEW YORK
1970

Metabolism

Clinical and Experimental

VOL. XIV, NO. 7 JULY, 1965

Serum Cholesterol Response to Changes in the Diet
I. Iodine Value of Dietary Fat versus 2S−P

By ANCEL KEYS, JOSEPH T. ANDERSON AND FRANCISCO GRANDE

Serum Cholesterol Response to Changes in the Diet
II. The Effect of Cholesterol in the Diet

Serum Cholesterol Response to Changes in the Diet
III. Differences Among Individuals

Serum Cholesterol Response to Changes in the Diet.
IV. Particular Saturated Fatty Acids in the Diet

Reprinted from CIRCULATION
Vol. XIX, No. 2, February, 1959
Printed in U.S.A.

Serum Cholesterol in Man: Diet Fat and Intrinsic Responsiveness

By ANCEL KEYS, PH.D., JOSEPH T. ANDERSON, PH.D., AND FRANCISCO GRANDE, M.D.

CHICAGO HEART ♥ ASSOCIATION Inc.

BULLETIN

VOLUME 26 JANUARY-JUNE, 1948 Nos. 1-6

Mode of Life and the Development of Heart Disease: Research for a Preventive Hygiene

ANCEL KEYS

Director of the Laboratory of Physiological Hygiene and Professor in the School of Public Health, University of Minnesota

Reprinted from ANNALS OF INTERNAL MEDICINE, Vol. 48, No. 1, January, 1958
Printed in U. S. A.

LESSONS FROM SERUM CHOLESTEROL STUDIES IN JAPAN, HAWAII AND LOS ANGELES* †

By ANCEL KEYS, Ph.D., *Minneapolis, Minnesota,* NOBORU KIMURA, M.D., *Kyushu, Japan,* AKIRA KUSUKAWA, M.D., *Fukuoka, Japan,* B. BRONTE-STEWART, M.D., *Oxford, England,* NILS LARSEN, M.D., F.A.C.P., *Honolulu, Hawaii,* and MARGARET HANEY KEYS, B.Sc., *Minneapolis, Minnesota*

Federation Proceedings
1949;8:523–529

THE PHYSIOLOGY OF THE INDIVIDUAL AS AN APPROACH TO A MORE QUANTITATIVE BIOLOGY OF MAN[1]

ANCEL KEYS

From the Laboratory of Physiological Hygiene, University of Minnesota

MINNEAPOLIS, MINNESOTA

Reprinted from PHYSIOLOGICAL REVIEWS
Vol. 33, No. 3, July, 1953
Printed in U.S.A.

Body Fat in Adult Man[1]

ANCEL KEYS AND JOSEF BROŽEK

From the Laboratory of Physiological Hygiene, School of Public Health University of Minnesota, Minneapolis, Minnesota

SEVEN COUNTRIES

A Multivariate Analysis of Death and Coronary Heart Disease

Ancel Keys

with
Christ Aravanis
Henry Blackburn
Ratko Buzina
B. S. Djordjević
A. S. Dontas
Flaminio Fidanza
Martti J. Karvonen
Noboru Kimura
Alessandro Menotti
Ivan Mohaček
S. Nedeljković
Vittorio Puddu
Sven Punsar
Henry L. Taylor
F. S. P. van Buchem

A Commonwealth Fund Book

Harvard University Press
Cambridge, Massachusetts
and London, England
1980

Circulation, Volume XXVIII, September 1963

Coronary Heart Disease among Minnesota Business and Professional Men Followed Fifteen Years

By ANCEL KEYS, PH.D., HENRY LONGSTREET TAYLOR, PH.D.,
HENRY BLACKBURN, M.D., JOSEF BROZEK, PH.D.,
JOSEPH T. ANDERSON, PH.D., AND ERNST SIMONSON, M.D.

Archives of Internal Medicine

Volume 128, Number 2, August 1971

Original Articles

Mortality and Coronary Heart Disease Among Men Studied for 23 Years

Ancel Keys, PhD; Henry Longstreet Taylor, PhD; Henry Blackburn, MD;
Josef Brozek, PhD; Joseph T. Anderson, PhD; and Ernst Simonson, MD, Minneapolis

Reprinted from Circulation
Volume XLV, April 1972

Probability of Middle-Aged Men Developing Coronary Heart Disease in Five Years

By ANCEL KEYS, PH.D., CHRIST ARAVANIS, M.D., HENRY BLACKBURN, M.D., F. S. P. VAN BUCHEM, M.D., RATKO BUZINA, M.D., B. S. DJORDJEVIC, M.D., FLAMINIO FIDANZA, M.D., MARTTI J. KARVONEN, M.D., PH.D., ALESSANDRO MENOTTI, M.D., VITTORIO PUDDU, M.D., AND HENRY L. TAYLOR, PH.D.

The Biology of
HUMAN STARVATION

by

ANCEL KEYS

JOSEF BROŽEK AUSTIN HENSCHEL

OLAF MICKELSEN

HENRY LONGSTREET TAYLOR

WITH THE ASSISTANCE OF

Ernst Simonson, Angie Sturgeon Skinner, and Samuel M. Wells

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SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF MINNESOTA

With Forewords by

J. C. Drummond, Russell M. Wilder, and Charles Glen King
and Robert R. Williams

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VOLUME 24, NOVEMBER 1969 Am J of Cardiology

Sudden Death in Arteriosclerotic Heart Disease

The Case for Preventive Medicine*

LEWIS KULLER, M.D., DR. P.H.
Baltimore, Maryland

Vol. 86, No. 5, pp. 697-706 J Pediatr 1975

Coronary heart disease risk factors in school children: The Muscatine study

Ronald M. Lauer, M.D.,* William E. Connor, M.D., Paul E. Leaverton, Ph.D., Mary Ann Reiter, B.S., and William R. Clarke, M.S.,** *Iowa City, Iowa*

(*JAMA* 1984;251:351-364)

The Lipid Research Clinics Coronary Primary Prevention Trial Results

I. Reduction in Incidence of Coronary Heart Disease

Lipid Research Clinics Program

(*JAMA* 1984;251:365-374)

The Lipid Research Clinics Coronary Primary Prevention Trial Results

II. The Relationship of Reduction in Incidence of Coronary Heart Disease to Cholesterol Lowering

Lipid Research Clinics Program

Acta Medica Scand
1950;Suppl 246:137

The Relation of Nutrition to Health

A Statistical Study of the Effect of the War-time on Arteriosclerosis, Cardiosclerosis, Tuberculosis and Diabetes

By

HAQVIN MALMROS

From the Medical Clinic, The University Hospital, Lund, Sweden

Statistical Aspects of the Analysis of Data From Retrospective Studies of Disease [1]

NATHAN MANTEL *and* WILLIAM HAENSZEL, *Biometry Branch, National Cancer Institute,* [2] *Bethesda, Maryland*

Journal of the National Cancer Institute
1959;2:719

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EPIDEMIOLOGIC STUDIES OF CORONARY HEART DISEASE AND STROKE IN JAPANESE MEN LIVING IN JAPAN, HAWAII AND CALIFORNIA: PREVALENCE OF CORONARY AND HYPERTENSIVE HEART DISEASE AND ASSOCIATED RISK FACTORS[1]

M. G. MARMOT,[2] S. L. SYME,[2] A. KAGAN,[3] H. KATO,[4] J. B. COHEN,[2] AND J. BELSKY[5]

Relation between Change of Blood Pressure and Age

W. E. MIALL,* M.D. ; H. G. LOVELL,* B.A., F.S.S.

Brit. med. J., 1967, **2**, 660–664

The Lancet · Saturday 7 May 1977

THE TROMSØ HEART-STUDY

HIGH-DENSITY LIPOPROTEIN AND CORONARY HEART-DISEASE: A PROSPECTIVE CASE-CONTROL STUDY

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CARDIOVASCULAR DISEASES IN THE UNITED STATES

IWAO M. MORIYAMA, DEAN E. KRUEGER,
and JEREMIAH STAMLER

1971 / HARVARD UNIVERSITY PRESS
Cambridge, Massachusetts

Lancet 1953;2:1053

CORONARY HEART-DISEASE AND PHYSICAL ACTIVITY OF WORK

J. N. MORRIS
M.A. Glasg., M.R.C.P., D.P.H.

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J. W. PARKS
M.B.E., M.D. Camb., D.C.H.

OF THE TREASURY MEDICAL SERVICE

The Lancet · Saturday 17 February 1973

VIGOROUS EXERCISE IN LEISURE-TIME AND THE INCIDENCE OF CORONARY HEART-DISEASE

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D. J. SHEEHAN

Medical Advisory Service to the Civil Service Department,
London

(*JAMA* 1982;248:1465-1477)

Multiple Risk Factor Intervention Trial

Risk Factor Changes and Mortality Results

Multiple Risk Factor Intervention Trial Research Group

ARTERIOSCLEROSIS

The Report of the 1977 Working Group to Review the 1971 Report by the National Heart and Lung Institute Task Force on Arteriosclerosis

December 1977

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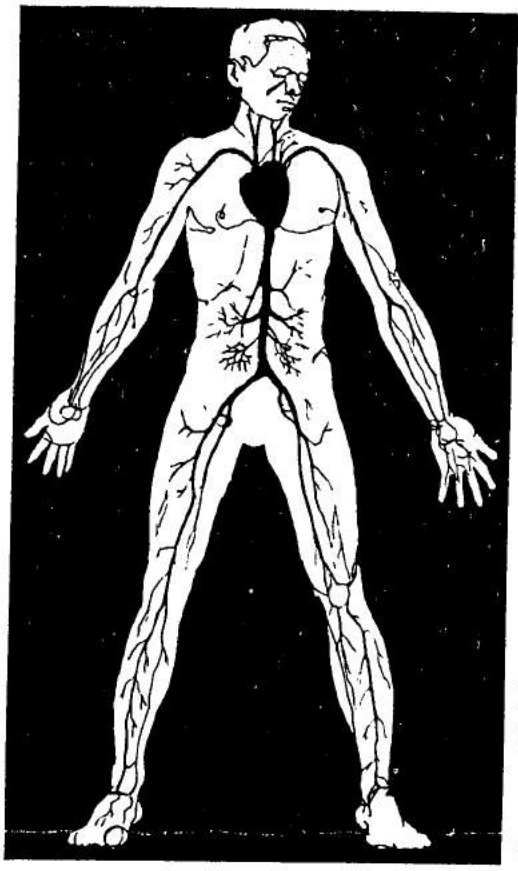
1948-1978
National Heart, Lung, and Blood Institute

ARTERIOSCLEROSIS



(A REPORT BY THE) NATIONAL HEART AND LUNG INSTITUTE-TASK FORCE ON ARTERIOSCLEROSIS.

NATIONAL INSTITUTES OF HEALTH

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DHEW Publication No. (NIH) 72-137

ARTERIOSCLEROSIS

A
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AND LUNG
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TASK FORCE
ON
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Original Contributions

PHYSICAL ACTIVITY AS AN INDEX OF HEART ATTACK RISK IN COLLEGE ALUMNI[1]

RALPH S. PAFFENBARGER, JR., ALVIN L. WING, AND ROBERT T. HYDE

CARDIOVASCULAR SURVEY METHODS

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Laboratory of Physiological Hygiene, School of Public Health,
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WORLD HEALTH ORGANIZATION

GENEVA

1968

International Journal of Epidemiology
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Sick Individuals and Sick Populations

GEOFFREY ROSE

Rose G (Department of Epidemiology, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK). Sick individuals and sick populations. *International Journal of Epidemiology* 1985, 14: 32–38.
Aetiology confronts two distinct issues: the determinants of individual cases, and the determinants of incidence rate. If exposure to a necessary agent is homogeneous within a population, then case/control and cohort methods will fail to detect it: they will only identify markers of susceptibility. The corresponding strategies in control are the 'high-risk' approach, which seeks to protect susceptible individuals, and the population approach, which seeks to control the causes of incidence. The two approaches are not usually in competition, but the prior concern should always be to discover and control the causes of incidence.

THE DETERMINANTS OF INDIVIDUAL CASES

In teaching epidemiology to medical students, I have often encouraged them to consider a question which I first heard enunciated by Roy Acheson: 'Why did *this* patient get *this* disease at *this* time?'. It is an excellent starting-point, because students and doctors feel a natural concern for the problems of the individual. Indeed, the central ethos of medicine is seen as an acceptance of responsibility for sick individuals.

It is an integral part of good doctoring to ask not only, 'What is the diagnosis, and what is the treatment?' but also, 'Why did this happen, and could it have been prevented?'. Such thinking shapes the approach to nearly all clinical and laboratory research into the causes and mechanisms of illness. Hypertension research, for example, is almost wholly preoccupied with the characteristics which distinguish individuals at the hypertensive and normotensive ends of the blood pressure distribution. Research into diabetes looks for genetic, nutritional and metabolic reasons to explain why some people get diabetes and others do not. The constant aim in such work is to answer Acheson's question, 'Why did *this* patient get this disease at this time?'.

The same concern has continued to shape the thinking of all of us who came to epidemiology from a background in clinical practice. The whole basis of the case-control method is to discover how sick and healthy individuals differ. Equally the basis of many cohort studies is the search for 'risk factors', which identify certain individuals as being more susceptible to disease; and from this we proceed to test whether these risk factors are also causes, capable of explaining why some individuals get sick while others remain healthy, and applicable as a guide to prevention.

To confine attention in this way to within-population comparisons has caused much confusion (particularly in the clinical world) in the definition of normality. Laboratory 'ranges of normal' are based on what is common within the local population. Individuals with 'normal blood pressure' are those who do not stand out from their local contemporaries; and so on. What is common is all right, we presume.

Applied to aetiology, the individual-centred approach leads to the use of relative risk as the basic representation of aetiological force: that is, 'the risk in exposed individuals relative to risk in non-exposed individuals'. Indeed, the concept of relative risk has almost excluded any other approach to quantifying causal importance. It may generally be the best measure of aetiological force, but it is no measure at all of aetiological outome or of public health importance.

Unfortunately this approach to the search for causes, and the measuring of their potency, has to assume a heterogeneity of exposure within the study population. If everyone smoked 20 cigarettes a day, then clinical, case-control and cohort studies alike would lead us to conclude that lung cancer was a genetic disease; and in one sense that would be true, since if everyone is exposed to the necessary agent, then the distribution of cases is wholly determined by individual susceptibility.

Within Scotland and other mountainous parts of Britain (Figure 1, left section)[1] there is no discernible relation between local cardiovascular death rates and the softness of the public water supply. The reason is apparent if one extends the enquiry to the whole of the

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Based on a lecture to the Xth Scientific Meeting of the International Epidemiological Association, 27 August 1984, Vancouver.

JAMA, Aug 25, 1975—Vol 233, No 8

Coronary Heart Disease in the Western Collaborative Group Study

Final Follow-up Experience of 8½ Years

Ray H. Rosenman, MD; Richard J. Brand, PhD; C. David Jenkins, PhD; Meyer Friedman, MD; Reuben Straus, MD; Moses Wurm, MD

May 1976 The American Journal of CARDIOLOGY Volume 37 903

Multivariate Prediction of Coronary Heart Disease During 8.5 Year Follow-Up in the Western Collaborative Group Study

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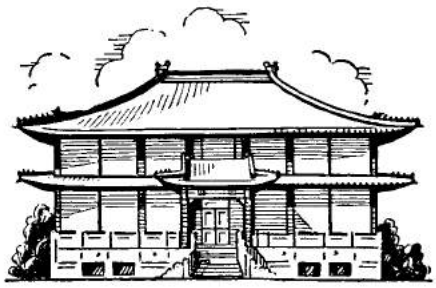

Chinese Lessons to Western Medicine • A Contribution to Geographical Medicine from the Clinics of Peiping Union Medical College

by I. SNAPPER

Professor and Head of the Dept. of Medicine, Peiping Union Medical College, Peiping, China. • With a Foreword by GEORGE R. MINOT, Professor of Medicine, Harvard University.

132 Illustrations

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Director, Heart Disease Control Program
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Western Hemisphere Editor, Journal of Atherosclerosis Research.

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J. chron. Dis. 1967, Vol. 20, pp. 511–524. Pergamon Press Ltd. Printed in Great Britain

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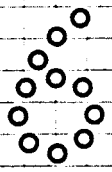

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SMOKING *and* HEALTH

REPORT OF THE ADVISORY COMMITTEE TO THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE

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Prevention of coronary heart disease

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World Health Organization, Geneva 1982

Community control of cardiovascular diseases

Evaluation of a comprehensive community programme for control of cardiovascular diseases in North Karelia, Finland 1972–1977

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