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ECONOMICS OF TOBACCO

Epidemiological studies and experiments on animals and cell lines, have proved beyond doubt that tobacco is a health hazard. Some well designed cohort and case control studies of the 1950s, and the US Surgeon General's report in 1964, forced various governments to consider corrective actions for control of tobacco use. Anti-tobacco community education was the first step initiated for this purpose. Other steps like reduction or ban on advertisements of tobacco products, tobacco free places for protection of non-smokers, increase in price of tobacco, *etc.*, also followed. However, no major action has been taken to reduce the availability of tobacco. Not only does the production of tobacco continue unabated, but steps are also being taken for increase in production and productivity of tobacco. The most important reasons for these contradictory actions, are the economics of tobacco, *ie* tobacco's contribution to revenue, and dependence of a large number of persons on its production, processing and sale.

The fear of loss of revenue is so deep rooted that even a country like the USA is using taxpayers' money to subsidize the tobacco industry¹. The common agricultural policy of the European Community subsidizes tobacco production to the tune of 1,300 million ecu a year (equivalent to US\$ 1,500 million). This amounts to 2,500 ecu (\$3,100) per minute, and is more in one year than the total amount spent on tobacco

subsidies by the US in the last 50 years². In India, the objectives of health departments for control of tobacco are in absolute contrast with the goals of agriculture agencies, which aim at promotion of tobacco production and promotion of tobacco marketing³. The revenue generated by tobacco and dependence of 5 to 7 million persons on tobacco, is often considered as sufficient reasons to defer a serious thought about tobacco's eradication. The political will and stern steps needed to counterbalance the economic and social impacts are lacking. Hence the governments have not taken major steps to eliminate or reduce tobacco cultivation, and thus availability to the community.

While generation of revenue for the governments and livelihood for people is one side of the economics of tobacco, the other aspect is the expenditure by patients and governments on treatment of diseases caused by tobacco. The loss to national productivity occurs due to reduced efficiency, disability or premature death of patients of tobacco related diseases. Tobacco is the single major cause of mortality all over the world. It has been estimated that in 1990s, 3 million deaths would occur every year all over the world, due to tobacco use. The annual global toll is likely to be 10 million by the year 2020⁴. In India, tobacco is responsible for about 800,000 deaths every year, mainly due to cardiovascular diseases, chronic obstructive lung diseases, and tobacco related cancers (Indian Council

of Medical Research, unpublished data). Based on data from Indian studies, the estimates for the annual number of persons developing diseases attributable to their tobacco habit in the mid 1980s, included 108,000 annual incident cases of cancers, 1.3 million prevalent cases of coronary heart disease, and at least 7.0 million prevalent cases of chronic obstructive lung diseases⁵.

Due to the large proportion of people affected by tobacco related illnesses in the community, health personnel believe that the money spent by the patients and government on treatment of tobacco related diseases is more than the revenue generated by tobacco. The belief gets strengthened due to the facts that tobacco induces more deaths before retirement age among users than among non-users; non-fatal tobacco illnesses create disability; tobacco users have increased absenteeism; and tobacco generates extra demand for medical care⁶, and creates an ecological imbalance⁷.

Differences of Opinion in Estimation of Economic Burden of Tobacco Use

Computation of economics of tobacco is a difficult arena, not only because of difficulty in converting certain effects into monetary equivalents, but also because of differences on inclusion or exclusion of some aspects in specific context of the country. For example, absenteeism due to tobacco related diseases may be important in some developed countries, but may assume a lesser importance in other circumstances, where certain amount of leave may be available to the patient. Difficulty arises in converting the misery associated with diseases caused by tobacco, and the pleasure derived by people using it. In any cost-benefit analysis on tobacco, there is no other way, but to assume that the two kind of feelings would balance each other. There is a continuing difference of opinion between those who have the health of the people in mind, and others who generally have a commercial angle in mind. The health proponents feel that effects like premature death, and loss due to decreased efficiency should be included as losses due to tobacco, whereas some people believe that the people are free to decide about smoking as long as they are paying for it, and for treatment of the tobacco related diseases. Those opposing inclusion of social costs believe that "if we can justify taxing one activity on the grounds that those who engage in it are risking their health, then we can justify taxing a large number of risky activities on the same grounds. Why

not impose special taxes on motorcyclists, skydivers, and compulsive overeaters, for example, in order to make them pay for the full costs of their health care?"⁸. The author of this review believes that consideration of social costs imposed by tobacco use are important, since social costs may be a hindrance to a society's progress. Any society would tend to reduce or remove any human behaviour which may endanger the freedom of others in the society or if it affects its progress, socially or financially (say in its GNP). The felling of trees was not considered important by many countries till the ecological importance of trees was realized. Due to this realization, many governments have controlled the cutting of trees, if owned by an individual. While individuals with a commercial point of view ignore the consideration of social costs during such calculations, they vociferously talk about social implication of a large number of people losing their jobs when the issue of replacement of tobacco cultivation is considered.

Economic Implications of Tobacco Control

The socio-economic effects of tobacco use may be due to direct medical care costs, which relate to payments (by the individual patients, their relatives/ friends, or government) for diagnosis and treatment of the illnesses or for correction of the disability due to tobacco related diseases. Indirect morbidity costs due to tobacco use are a result of decreased efficiency — even if apparent illness has not set in — and the loss of productivity due to absenteeism and disability. Some scientists believe that the period during which tobacco was used should also be included in such calculations as the person is not contributing to productivity during this time. The indirect costs of mortality are due to premature death. Other social costs due to tobacco include ecological effects due to use of wood for curing tobacco and use of paper for cigarette wrapping, packaging and advertising; reduced land for food production; loss due to fires caused by tobacco (cigarettes cause at least one quarter of all fires⁷); expenses on fighting the fires caused with tobacco; expenses on maintaining the cleanliness of public areas littered by cigarette butts, discarded packages, matchboxes, matches, etc; and higher maintenance cost of ventilating systems due to smoking^{6,7}. The costs due to fires may become very important in some countries. For instance, in Hong Kong, 33 per cent of all reported fire accidents between 1976 and 1983 were considered by the fire

service department to have been caused by smoking. There is also evidence that smokers have more automobile accidents and accidents at work than non-smokers⁹.

Estimates have been made on the effect of intervention packages for gradual reduction of tobacco use, on revenue to the government. Atkinson and Townsend¹⁰ estimated the effect on revenue of a package to reduce smoking by 40 per cent by increasing tax, reducing advertising, and implementing a serious sustained health publicity programme. Even though the reduction in national health services usage was expected to be marginal, the overall savings due to health services use, sickness benefits and widows' benefit, amounted to £31 million annually. After subtraction of costs due to retirement pensions and expenditure on health education, the net annual savings in 1976-80 was expected to be £17 million. It was estimated that increased tax on cigarettes would bring extra revenue of £85 million. Another analysis of the economic impact of a 20 per cent reduction in smoking from 1973 to 1981 in the United Kingdom, showed an estimated £42 million increment to the GNP, at 1973 values¹¹.

It is also argued that if tobacco does not exist, people would spend the same money in some thing else, which would offset a substantial portion of the loss due to lost tobacco revenue, besides creating newer job opportunities. Warner and Fulton¹² simulated the effect of removal of tobacco from Michigan, USA, a non-tobacco state, for the years 1992 through 2005, on the number of jobs and tax revenues. The results indicated that if there was no expenditure on tobacco products and if this spending was redistributed to other goods and services according to consumers' normal spending patterns, (and to other taxes, to replace half of lost cigarette excise tax revenues), Michigan would have had 5600 more jobs in 1992. By the year 2005, a tobacco-free Michigan would still have almost 1500 more jobs. If, contemporary rate of decline in tobacco consumption had doubled, the State would have had over 300 more jobs in 1992 and would have nearly 800 more in 2005. The loss in tobacco revenue due to elimination of tobacco, if not replaced, would have been \$254 million in 1992, but the loss due to doubling of the expected decline in smoking would have been \$14 million during that year.

Some studies from developed countries have tried to find the differentials in health care costs among smokers and non-smokers. The categorization according to smoking habit was made due to the fact that smoking is the commonest tobacco habit in these countries. The 1992 report of the US Surgeon General stated that the estimated average life time medical cost for a smoker exceed those for a non-smoker by more than \$ 6,000¹³. A comparison of paid claims from a large health insurance group's indemnity plan in USA, from January 1 to November 30, 1988, showed that tobacco users had more admissions, longer average length of stay, higher average outpatient payments (\$ 122 vs \$ 75) and higher average insured payments (\$ 1,145 vs \$ 762)¹⁴. Due to the premature mortality among smokers, insurance companies in USA charge higher for life insurance of smokers. Three insurance companies owned by the tobacco industry charge smokers nearly double for life insurance, as smokers are twice as likely to die as compared to non smokers (Time, October 12, 1992).

Estimates on cost of tobacco use (smoking) have been made for many states of USA, indicating that the losses to the country are substantial. Cummings *et al*¹⁵ estimated that in New York State, USA, smoking-attributable deaths comprised 17.7 per cent of all deaths. Cigarette smoking was responsible for an average of 30,359 deaths, 409,129 years of productive life lost, and nearly \$4 billion in economic costs annually¹⁵. Based on the assessment of the medical costs and lost earnings due to tobacco smoking, the total cost of smoking in Georgia during 1985 was \$1.5 billion¹⁶.

Studies conducted in USA, Canada, Sweden, New Zealand, Egypt, China and India, have estimated the economic implications of tobacco use in the country. Using demographic and epidemiologic data according to accepted principles of health economics, the studies have tried to estimate the direct and indirect morbidity and mortality costs, due to use of tobacco. Comparison of the existing health care costs with a hypothetical situation where the Canadian society would be smoke free, was one of the earliest of such exercises. The per capita cost of health care for the year 1980, attributable to tobacco smoking was \$ 35.54 for males and \$ 29.14 for females, or 15.17 per cent and 10.47 per cent of the actual per capita costs for males and females, respectively¹⁷. The health care costs associated with smoking would have been \$ 2.4 billion in 1980, against

the income of \$ 1 billion generated by tobacco during the same year¹⁸.

A report submitted to the American Cancer Society estimated that the cost of medical and hospital bills due to cigarette related illnesses in 1975, was about \$15 billion, and the loss of income from lost workdays, due to cigarette related illnesses amounts to \$3 billion per year. Balanced against the revenue of \$12 billion due to tobacco products in 1975, the cost of tobacco use to the USA, amounted to \$6 billion¹⁹. Another study estimated the total financial cost of smoking to the US society in 1990 as \$2.59 per pack of cigarettes²⁰.

The progress on measures on control of tobacco is being calculated in terms of the loss saved to the state/country or in terms of the potential life years lost, due to tobacco smoking. The number of years of potential life lost due to tobacco in different states of USA, in 1990, ranged from 6,720 (Alaska) to 498,297 (California). The proportion of smoking attributable mortality to total deaths varied between 13.4 per cent (Utah) and 24.0 per cent (Nevada), in different states²¹. From January 1989, tax on cigarettes in California, USA, was increased by 25¢ per pack, and 20 per cent of this revenue was used for anti-smoking media campaign and other educational programmes to reduce tobacco use. The programme resulted in fall in the adult smoking prevalence from 26 per cent in 1988 to 20 per cent in 1993, which resulted in an estimated savings of \$386 million in direct medical costs in the state in 1993²².

A recent study on the subject in USA, controlled for ethnicity, poverty status, education, medical insurance status, region, seat belt use, body mass index, and chronic medical conditions, estimated the marginal costs attributable to smoking. This was done on 35,000 US residents responding to the 1987 National Medical Expenditure Survey, based on a multistage econometric model and weighted to represent the US population aged 19 years and above. The smoking attributable direct costs amounted to \$37.6 billion (6.7% of the total medical expenditures). Smoking attributable indirect mortality costs were \$41.4 billion²³.

The total cost of cigarette smoking to the New Zealand health services was conservatively estimated at \$185.4 million (in 1989 dollars). Most of this excess cost (\$128.3 million) was due to hospital care, and

the remaining cost was for excess prescription medicines use and for general practitioner consultations²⁴.

In a single year, Sweden loses 29,000 working person years owing to various smokers' illnesses while, at the same time, smoking caused 3,900 cases of total disability²⁵. Another Swedish survey has estimated the social costs of smoking at more than \$660 million in monetary terms for early eighties, with \$135 million for extra medical costs and \$533 million for production shortfalls²⁶.

Similar have been the results of exhaustive exercises carried out in developing countries. The health related economic costs caused by smoking in China, in 1989, were estimated to be upto 27.1 billion Chinese Yuan, compared to which the revenue from the tobacco industry during 1989 was 24 billion Yuan. The direct costs of smoking (medical expenses) were 6.94 billion; the indirect morbidity costs were 2.58 billion; whereas the indirect mortality costs amounted to 17.55 billion Yuan²⁷.

An analysis of the economic consequences of smoking in Egypt in 1981/82 showed that 57,496 person years were lost due to premature death as a consequence of tobacco use. The direct and indirect costs to the country due to tobacco use was 969.3 million LE, against a benefit of 535.1 million LE during the same year. Thus, the loss to Egyptian society due to tobacco, in 1981/82 was 434.2 million LE, which amounted to 91 per cent of the taxes raised on tobacco products²⁸.

Due to paucity of available information on the economics of tobacco for India, the Indian Council of Medical Research (ICMR), New Delhi is initiating studies on measurement of costs for management of tobacco related diseases. These include the estimation of costs for management of tobacco related cancers, coronary heart disease, and chronic obstructive lung diseases.

The study on cost of management of tobacco related cancers, raised a cohort of such patients and followed them up periodically for three years or till death. At the time of first contact, the patients were interviewed to find out the duration of the illness, and the efforts made for diagnosis and treatment (specific or non-specific) of the illness. The item-wise expenditure incurred by the patients, or their relatives/friends, was

recorded. The items included for this purpose were the expenditure on consultation, investigations, treatment, transport for the purpose, and any additional cost incurred for lodging and boarding. Enquiry was also made to ascertain whether they incurred any loss of wages for treatment of the disease, or if the disease resulted in loss of their job. The patients have been followed up till death or till a period of three years with no evidence of disease after treatment. At each follow up contact, information was collected item-wise, on expenditure by the patients or their relatives/friends.

The studies on estimation of cost of management of coronary heart disease and chronic obstructive lung diseases, adopted a cross sectional approach and obtained data on the annual expenses incurred by the patients, their relatives/ friends. Data necessary to estimate the expenditure by government on treatment of tobacco related illnesses are also being collected. The results of this study are likely to provide the much needed objective information in the area, and would help policy makers in decision making.

The studies on economics of tobacco generally indicate that the costs incurred by society due to tobacco use more or less match the benefits received by the society. Such calculations have not included the costs of ecological effects of tobacco. If value is accorded to these effects, the losses due to tobacco, to the society would far outweigh the benefits. If tobacco was to be introduced today in any society, it would be impossible to get clearance from any controlling authority in any country. The myth about economic importance of tobacco has been a major factor in slow actions for reduction in production of tobacco. It is expected that studies on economics of tobacco would help in breaking this myth.

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This write up, published on the occasion of World No Tobacco Day (May 31, 1995) has been contributed by Dr. K. Chaudhry, Asstt. Director-General, ICMR Headquarters, New Delhi.

ABSTRACTS

Some Research Projects Completed Recently

Clinical and bacteriological study of dental caries in children.

The study was carried out to determine the prevalence of dental caries in school children aged 10-15 yr from different socio-economic strata. The bacterial isolates, the serum and salivary immunoglobulins and CMI responses to *Streptococcus mutans*, were also evaluated in these children.

Among the 1092 children studied, the prevalence of dental caries was found to be 39.19 per cent with an average mean DMFT (delayed, missing and filled teeth) per child being 1.02. A significant relationship was found between dental caries and the source of drinking water, oral hygiene measures used, type of cleaning agents used, frequency of cleaning and intake of sweets. However, no significant relationship was found between dental caries and the type of diet or the type of sweets and the type and frequency of drinks. The prevalence of caries was maximum at the age of 10 years.

A total of 285 specimens comprising 116 specimens each of dental plaque material and carious material from children with dental caries and dental plaque

material from 53 matched controls, were studied for the presence of microorganisms.

The incidence of *Bacteroids melaninogenicus* *assacharolyticus* group and aerobic Gram negative bacilli was higher in controls as compared to children with caries. There was no significant difference in the isolation rate of *Streptococcus mutans* in patients and controls.

Immunoglobulin levels were estimated in 379 children (169 with low caries, 57 with high caries and 153 controls). Serum IgG levels were higher but salivary levels were lower in carious children as compared to controls. The serum IgA and IgM levels of patients and controls were not significantly different. The salivary IgA levels were lower in children with caries, whereas salivary IgM levels were below detectable levels in both children with caries and controls. Significantly high levels of *S. mutans* specific serum IgG were found only in children with high and low caries whereas specific salivary IgG levels were more or less in the similar range in children with low and high caries as well as controls. *S. mutans* specific serum IgA levels were high in children with caries compared to controls. An interesting finding was that children with high caries

showed low levels of *S. mutans* specific salivary IgA levels whereas those with low caries showed high levels of specific salivary IgA. This clearly indicated that *S. mutans* specific salivary IgA plays an important role in protection against dental caries.

Cell mediated immunity was studied in 360 children (160 with low caries, 45 with high caries and 155 controls). Low stimulation index was observed in case of high caries while children with low caries showed high stimulation index indicating that in case of recent infection CMI plays an important role. The control children revealed stimulation index levels between those of children with low and high caries.

It is thus concluded that humoral and CMI immune responses to *S. mutans* in dental caries play an important role.

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Air oxygen as carrier gas in anaesthesia.

The study was carried out to determine the usefulness of air oxygen as carrier gas in balanced anaesthesia technique.

A total of 60 patients of both sexes in the age group of 16-60 years with an ASA grading of I/II who were to undergo anaesthesia for more than one hour were

selected for the study. Anaesthesia was given from the Pedius B Usha Drager anaesthesia apparatus. The patients were divided in two equal groups; one group on spontaneous ventilation and the other on controlled ventilation using pancuronium as per requirement of surgery.

Clinical parameters remained within normal limits during anaesthesia in both groups. Recovery in both groups was good and the incidence of post-operative complications was low. The awakening time was 5.12 ± 0.57 min in patients breathing spontaneously compared to 2.32 ± 0.84 min in those on controlled ventilation. No patient had awareness of any intraoperative event.

The use of air as carrier gas may be superior to nitrous oxide as the side effects encountered while using nitrous oxide were not seen. Further, the Pedius B machine can be easily operated in remote areas.

The disadvantage of using air as carrier gas was in the form of loss of mild analgesic and anaesthetic effects of nitrous oxide necessitating higher doses of volatile and intravenous anaesthetics. The Pedius B machine also had some disadvantages such as water condensation, argon accumulation *etc* with the oxygen concentrator.

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ICMR NEWS

The following meetings of various technical groups/committees of the Council were held:

Meetings of the Scientific Advisory Groups (SAGAs)/Project Review Committee (PRC) held at New Delhi:

SAG of the Division of Basic Medical Sciences April 17, 1995

SAG for Traditional Medicine Research April 18, 1995

SAG of the Division of Epidemiology and Communicable Diseases April 21, 1995

PRC on Indo-German Project on Cancer

April 21, 1995

Participation of ICMR Scientists in Scientific Events:

Dr. M.D. Gupte, Officer-in-Charge, CJIL Field Unit for Epidemiology of Leprosy at Avadi, Madras, participated in a joint meeting of Immunology (IMMYC) and Chemotherapy (THEMYC) of Mycobacterial Diseases as also the IV meeting of the THEMYC Steering Committee at Geneva (April 24-27, 1995).

Dr. B.D. Nag, Dy. Director, Regional Occupational Health Centre, Bangalore, participated in the XXVII

Session of the Codex Committee on Pesticide Residues at the Hague (April 24 - May 1, 1995).

Dr. V.P. Sharma, Director, Malaria Research Centre, Delhi, participated in the Conference on Water Resources; Health, environment and development at Townsville (April 26-28, 1995). Dr. Sharma also participated in the II meeting of the Panel of Experts on Environmental Management (PEEM) Collaborating Centres and PEEM Steering Committee meeting at Brisbane (May 1-4, 1995).

Dr. Kamala Krishnaswamy, Dy. Director (Sr. Grade), National Institute of Nutrition, Hyderabad, participated in the IV Expert Panel meeting of Diet and Cancer Projects at Mexico (April 26-28, 1995).

Dr. Z.M. Patel, Asstt. Director, ICMR Genetic Research Centre, Bombay, participated in the XXIII International Conference of Medical Women's International Association at the Hague (May 7-12, 1995).

Dr. G.V. Satyavati, Director-General, ICMR, visited Geneva for technical discussions for collaboration between WHO and ICMR through the Special Programme for Research and Training in Tropical Diseases (May 8-9, 1995). The DG, ICMR and Secretary (Family Welfare), Ministry of Health and Family Welfare, held discussions for collaboration between the Government of India and WHO Special Programme for Research in Human Reproduction on Reproductive Health Research (May 10-12, 1995).

COUNCIL'S TRAINING PROGRAMMES FOR 1995-96

Virology

At the National Institute of Virology, Pune:

- Diploma in Medical Virology (June 1995 - May 1996).

Reproductive Biology

At the Institute for Research in Reproduction, Bombay:

- Training Course on Techniques in Human Semenology (May 15 - June 2, 1995).
- Training Course on Techniques in Immunology, Cell Biology and Molecular Biology (November 2-25, 1995).
- Training Course on Techniques in Neuroendocrine Research (February 6-10, 1996).

Endocrinology

At the National Institute of Nutrition, Hyderabad:

- Annual Training Course on Endocrinological Techniques and their Application (August/September, 1995).

Nutrition

At the National Institute of Nutrition, Hyderabad:

- M.Sc. in Applied Nutrition (June 1, 1995 - February 28, 1996).

- Annual Training Course in Nutrition (December 1, 1995 - February 28, 1996).

Oncology

At the Institute of Cytology and Preventive Oncology, New Delhi:

- Workshop on Molecular Biology of Viruses and Cancer alongwith Oligo DNA Synthesis and Polymerase Chain Reaction (September 18-22, 1995).

Occupational Health

At the National Institute of Occupational Health, Ahmedabad:

- Orientation Course on Occupational Health for Industrial Medical Officers (November 13-24, 1995).
- Training Course on Air Pollution Monitoring and Risk Assessment (December 13-19, 1995).

Medical Entomology

At the Vector Control Research Centre, Pondicherry:

- M.Sc. in Medical Entomology (From August 1995: for 2 years).

Laboratory Animal Technology

At the Laboratory Animal Information Services Centre, National Institute of Nutrition, Hyderabad:

- Training Course for Laboratory Animal Technicians (June - July, 1995).

Haematology

At the Institute of Immunohaematology, Bombay:

- Training Course in Blood Group Serology and Blood Bank Methodology for Medical Officers (August 1 - September 29, 1995).
- Training Course in Blood Group Serology and Blood Bank Methodology for Technicians (August 1-31, 1995).
- Training Course in Advanced Haematology and Immunohaematology (September 11-29, 1995).

ICMR PUBLICATIONS

	Price (Rs.)
Nutritive Value of Indian Foods (1985), by C. Gopalan, B.V. Ramasastri and S.C. Balasubramaniam, Revised and Updated (1989), by B.S. Narasinga Rao, K.C. Pant and Y.G. Deosthale	21.00
Growth & Physical Development of Indian Infants and Children (1972, Reprinted 1989)	10.00
Studies on Weaning & Supplementary Foods (1974, Reprinted 1986)	6.00
Studies on Pre-School Children (1974, Reprinted 1986)	6.00
A Manual of Nutrition (Second Edition 1974, Reprinted 1992)	4.50
Low Cost Nutritious Supplements (Second Edition 1975, Reprinted 1994)	4.00
Menus for Low Cost Balanced Diets and School Lunch Programmes Suitable for South India (Third Edition 1977, Reprinted 1991)	4.50
Menus for Low Cost Balanced Diets and School Lunch Programmes Suitable for North India (Second Edition 1977, Reprinted 1994)	4.50
Some Common Indian Recipes and their Nutritive Value (Fourth Edition 1977, Reprinted 1991) by Swaran Pasricha & L.M. Rebello	10.00
Nutrition for Mother & Child (Third Edition 1978, Reprinted 1991) by P.S. Venkatachalam & L.M. Rebello	9.00
Japanese Encephalitis in India (Revised Edition 1980)	5.00
Some Therapeutic Diets (Fourth Edition 1988, Reprinted 1992) by Swaran Pasricha	4.50
Nutrient Requirements & Recommended Dietary Allowances for Indians (1990, Reprinted 1994)	14.00

Fruits (1983, Reprinted 1992) by Indira Gopalan & M. Mohan Ram	7.00
Count What You Eat (1989, Reprinted 1991) by Swaran Pasricha	9.00
Diet & Diabetes (Second Edition 1993) by T.C. Raghuram, Swaran Pasricha & R.D. Sharma	18.00
Dietary Tips for the Elderly (1990, by Swaran Pasricha & B.V.S. Thimmayamma	3.50
Diet and Heart Disease (1994) by Ghafoorunissa and Kamala Krishnaswamy	26.00
*Depressive Disease (1986) by A. Venkoba Rao	58.00
**Medicinal Plants of India Vol.2 (1987)	136.00
**The Anophelines of India (Revised Edition 1984) by T. Ramachandra Rao	150.00

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**25 per cent discount allowed to individuals.

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