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NEW PERSPECTIVES: THE FIRST TEN YEARS CANADIAN DEVELOPMENTS

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Introduction

Opening remarks

In 1974 Marc Lalonde, at the time Canada's Minister of National Health and Welfare, released a discussion paper entitled *A new perspective on the health of Canadians — a working document* [1], which following the work of Thomas McKeown [2-4], proposed as a planning model, a concept of health based on four sets of factors, namely: *human biology; the environment; health care organisation;* and *lifestyle*. In essence this paper suggested that significant improvements in the health status of modern industrialized societies are more likely to arise from health promotion/disease prevention approaches (1) than from further massive investments in more and more complex and expensive medical practices and technology. Later in my presentation I propose to describe the role played by the Department of National Health and Welfare (DNHW) on the Canadian health scene during the past decade. However before describing what has happened in the past ten years I think it would be useful to consider the historical and geopolitical background against which *New Perspectives* was written.

Geopolitical considerations

Canada, with a surface area of 10 million km^2, yet with a population of only 25 million people, is the largest country in the western hemisphere and the second largest in the world. This immense area, 89% of which has no permanent settlement, spans 6 time zones. It should also be noted that the vast majority of Canada's population lives within 150 km of the US border. The very low population density of much of the country (2), imposes its own limitations on the development of integrated national social programs (3).

Politically, Canada is a federal state, divided into 10 provinces and 2 territories, with specific government responsibilities being distributed between the federal and provincial governments. Under the Canadian constitution, the administration of health services is, with a few exceptions, the direct responsibility of the provincial governments.

Evolution of the Department of National Health and Welfare (DNHW)

Jurisdiction regarding public health in Canada has evolved within the confines of the Constitution Act (formerly the British North America Act, 1867). This Act gave Canada independent "Dominion" status within the British community of nations. The 1867 Constitution contained few references to health matters, the federal government of the day being only given jurisdiction over quarantine and marine hospitals, the provincial legislatures being given powers over the establishment, maintenance and management of hospitals, asylums, charities and charitable institutions in and for the provinces. This constitutional division of responsibilities resulted in the national government taking very few

(1) *e.g.* The improvement of social organisation, individual lifestyles, elimination of environmental hazards, etc.

(2) *e.g.* The Northwest Territories which cover an area of 3.4 million km^2 have a population of only about 40,000.

(3) Canada's geography and its widely dispersed population have led, over the years, to a series of interventions by the federal government into many aspects of the economy and the life of the nation. The building of the Canadian Pacific Railway is perhaps the best known example. As we shall see, Canada's present health system is largely the result of a series of federal initiatives. History and geography have combined to make such government interventions generally acceptable to the majority of Canadians.

health initiatives during the first half century of Canada's independent existence. A Dominion (*i.e.* federal) Department of Health was not, in fact, established until 1919(4), some 52 years after Confederation. However the federal government, over the years, had acquired certain additional responsibilities in the health field, including the medical examination of immigrants, control of foods, drugs and narcotics, responsibility for health services for certain groups of Canadians, (*e.g.* Indians and Inuit, the armed forces, veterans, and penitentiary inmates) and for some international health matters. In 1928 the Department of Health became the Department of Pensions and National Health when it assumed responsibility for World War I veterans; in 1944 this Department was dissolved when all matters concerning war veterans were transferred to the Department of Veterans' Affairs and the DNHW was created; a more detailed chronology is described by Cameron [5].

During the period between the wars the federal government's mandate in the health field continued to evolve to include such matters as the coordination of provincial health services, provision of health consulting services to the provinces, and some limited planning and research activities(5).

National Health Insurance in Canada

National Health Grants (1948)

In 1948 the DNHW announced the establishment of the National Health Grants Program, under which grants were made available to the provinces to assist them with the improvement of health services in specific fields. The Canadian Prime Minister of the day, Mr. Mackenzie King, in announcing the Program in Parliament stated that "these measures also represent the first stages in the development of a comprehensive health insurance plan for all Canada". At this time conditional grants–in–aid were already established in Canadian federal/provincial financial relations. In fact, one of the first acts of the fledgeling Dominion Department of Health in 1919 had been the introduction of the Venereal Disease Control Grant. The success, and ease of administration, of this grant suggested that this procedure might be used in the future as a means of attacking a variety of national health problems. Two other noteworthy events in the evolution of Social Services in Canada occurred between the wars. Firstly, in 1927 conditional federal grants–in–aid were used to launch a national old–age pensions program, jointly financed by the federal and provincial governments(6). Secondly, in 1928, a parliamentary committee adopted a resolution to the effect "that it would be within the power of Parliament to contribute by grants to such provinces as adopted health insurance legislation according to the precedents set by the Old Age Pensions Act". The passage of events was undoubtedly influenced by the advent of World War II, but in 1948, after many delays, much discussions and disagreement, the National Health Grants Program(7),(8), which was to last 26 years, finally became law (for further information, see Herron [6]).

Hospital Insurance and Diagnostic Services Act (1957)

The passing of the Hospital Insurance and Diagnostic Services (HIDS) Act in 1957, by which the federal government offered to share with the provinces the cost of specified hospital services, was a most important milestone on the way to a national health insurance plan for Canada. By 1961 all provinces had agreed to participate in this program.

The rapid expansion of federal support of provincial health services at this time gave rise to further modification of the structure of the National Health Grants program. While this program was to continue to evolve throughout the 1960s to meet emerging provincial needs, other developments were underway which would eventually lead to its orderly termination.

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(4) The Dominion Council of Health, a federal/provincial consultative body with powers to advise the national government on health matters was also established at this time.

(5) There is no doubt the relative financial strengths of the federal and provincial governments enabled the federal government, by exercising the "power–of–the–purse", to take a number of initiatives in the health field at this time. The federal government's responsibilities with respect to trade and commerce and the criminal law also provided opportunities for movement into the health field.

(6) These grants set some important precedents in that they were: *(i)* "continuing" grants, as opposed to their predecessors which tended to be of a temporary nature; and *(ii)* the federal share of the resulting joint programs was firmly established in relation to provincial spending.

(7) The program initially consisted of ten separate grants: Health Survey Grant; General Public Health Grant; Tuberculosis Control Grant; Mental Health Grant; Venereal Disease Control Grant; Crippled Children Grant; Professional Training Grant; Cancer Control Grant; Public Health Research Grant; and the Hospital Construction Grant. In the first year of their existence $29,895,300 was made available to the provinces under this program.

(8) When Newfoundland joined Canada in 1949, the grants were increased to provide funds for the new province and in 1952 arrangements were made to include the Yukon and the Northwest Territories. In 1953 the dollar value of the Hospital Construction Grant was reduced by 50% and three new grants — the Laboratory and Radiological Services Grant, the Medical Rehabilitation Grant, and the Child and Maternal Health Grant — were added to the program. In 1958 the level of the Hospital Construction Grant was increased substantially and its terms of reference were widened to include renovation to existing structures as well as to new construction.

Medical Care Act (1968)

The final major step towards a fully comprehensive national health insurance program for Canada was taken in 1968 when the Medical Care Act became law, and by 1972 all provinces and territories had joined the federal government in a cost–shared comprehensive medical insurance program. *It had thus taken 40 years for the 1928 parliamentary committee resolution on national health insurance to come to fruition.* (*cf.* Taylor [7] for further reading on the evolution of national health insurance in Canada).

Cornerstones of Medicare. – The basic principles on which Canada's national medical and hospital insurance scheme are based require that any provincial health plan must offer: *comprehensive services* (9); *universal coverage; reasonable access to services; portability of benefits;* and *nonprofit administration by a public agency.*

Health Resources Fund Act (1966)

The Health Resources Fund Act was yet another 1960s federal initiative in the health field. Recognizing that to ensure the smooth operation of the comprehensive national insurance plan, an adequate supply and mix of well–trained health professionals would be required, the federal government created the Health Resources Fund. This fund provided $427 million over a 17 year period (1966–1982) in financial assistance to Canada's health professional schools and teaching hospitals, for the planning, acquisition, construction, renovation, and equipping of health training and research facilities.

Health research in Canada: the federal role

The Public Health Research Grant, the "new" National Health Grant and the phasing out of the original National Health Grants

I would now like to say a few words about the role that the federal government has played in the support of health research in Canadian universities (10). The Public Health Research Grant (PHRG), one of the original 10 grants introduced in 1948, was initially funded at a level of $100,000, scheduled to rise to $500,000 in five years (11). Public health research was defined, at the time, "as including all research conducted in the field or in the laboratory, which related to health in the community".

By the end of the 1960s it was clear that the National Health Grants Program had largely served the purpose for which it had been intended, *i.e.* that of improving Canada's health services to the point which allowed for the smooth introduction of comprehensive national hospital and medical insurance. In 1969 a decision was taken to phase out the Program (with the exception of the PHRG and the Professional Training Grant (12)) by 1974. It soon became apparent however, in view of dramatic escalation that was occurring in health care costs that there was a pressing need for more research into the health system itself, particularly into the actual delivery of care. To meet this need a new National Health Grant (NHG) was introduced in 1969 specifically to provide support for research, demonstration, training and similar short–term activities of national interest in order to stimulate and develop improvements in the field of health services (13).

The National Health Research and Development Program (NHRDP)

The next step (effective on April 1, 1973) was the amalgamation of the NHG with the PHRG to form a single DNHW program for the support of public health and health services research in Canada, with total funding *ca.* $10.0 million in the 1973–1974 fiscal year. Since 1975 this program has become known as the National Health Research and Development Program (NHRDP). The NHRDP budget currently stands at $18 million.

The Medical Research Council (MRC)

I would not wish to give the impression that the NHG and PHRG programs were the only federal funding sources for health and medical research in Canada throughout the 1960s and 70s. Canada has had a long history of federal support for basic research, which in the days before World War II came

(9) It should be noted however that certain services which are not insured under the national plan, may be available to specified groups in some provinces. In general, dental services, prescription drug costs, and the costs of eye–glasses are not reimbursed. However, some provinces have special programs to assist children, senior citizens and the indigent etc. in these areas. Private insurance plans are also available on a voluntary basis to provide coverage for some services not included in the government plans.

(10) DNHW also has a considerable "in–house" research effort particularly in the areas of food and drug safety and environmental protection.

(11) It was soon apparent that this amount was inadequate and research expenditures were allowed from some of the other grants. In the two decades 1948–1967 about $25 million was allocated to research under the National Health Grants Program. In 1966 the PHRG was expanded to accommodate all research carried out under the overall grants program. Its annual funding level at this time was $4,424,510.

(12) The Professional Training Grant provided funding to the provinces to assist them with the training of health manpower in areas deemed deficient by the individual provincial governments.

(13) The new National Health Grant had an initial budget of *ca.* $1.0 million, scheduled to rise to $4.4 million by the end of the 1972–1973 fiscal year.

predominantly from the National Research Council (NRC), which had originally been set up in 1917 as a scientific advisory group to the government during World War I(14).

In 1960, the NRC's Division of Medical Research became the Medical Research Council of Canada (MRC)(15),(16), which initially existed as a wholly–owned subsidiary of the NRC, but becoming fully independent in 1969 by when its budget had grown to *ca.* $30.1 million (by 1974 the MRC's annual budget had grown to about $40 million and is now *ca.* $150 million). Its mandate was and still is the support of biomedical and clinical research in Canada's health professional schools (*i.e.* medicine, veterinary medicine, pharmacy, dentistry). The MRC does not operate its own laboratories, its funds are used exclusively for funding university research.

New Perspectives (1974)

Introduction

The steady escalation of health care costs noted in the late sixties and early seventies suggested forcibly that other approaches to maintaining and improving the health of the nation needed to be considered. This led to the consideration at the departmental level of non–traditional approaches to health matters, which were highlighted in *New Perspectives* in 1974 [1]. Essentially this document envisages an individual's state of health as being the result of the influences of four broad sets of determinants (or factors) namely: *Human biology; environment; lifestyles;* and *Health care organisation.* I would like to expand briefly on each of these headings.

Human biology

The human biology factor incorporates everything derived from fundamental human biology, including: inherited genetic factors; the processes of growing up and aging; basic human body structures and systems(17).

Environment

The environment factor includes everything that has an influence on human health that is external to the body and over which the individual has little or no control. For instance, the safety of the water we drink, the air we breathe, and the radiation and toxic chemicals to which we are exposed(18). Other environmental factors to consider would include the effectiveness of the sewage systems we use and the effects of "acid rain". Problems associated with a negative social environment *e.g.* unemployment, poverty, the problems of urban living or living in climatic extremes (*e.g.* the arctic) should also be taken into account.

Lifestyles

The first two "health fields" deal with factors over which the individual has little or no influence, however the lifestyle factor concentrates on personal practices which can influence an individual's health status for good or ill. Among these self–imposed risks would be: excessive alcohol consumption (permanent physiological damage, accidents and social problems *e.g.* family violence); cigarette smoking (many cancers, heart and respiratory diseases); the abuse of therapeutic drugs, particularly certain psychotropic drugs (dependance); and the abuse of mood modifying chemicals (cannabis derivatives, LSD, etc.) and solvents (dependance, violent behaviour, permanent personality degeneration and brain damage).

Other self imposed risks would include: poor dietary habits, (obesity, diseases of the circulatory system, and dental problems); lack of exercise, particularly for persons with stressful sedentary occupations, (hypertension, peptic ulcers); sexual promiscuity, (STD's, cervical cancer etc.); and failure to adopt reasonable safety conscious approaches to work and leisure, (seat–belts in automobiles and approved safety equipment at work or at play).

Health Care Organisation

The final factor considered in the health field approach is Health Care Organisation. Essentially this refers to the health care system as we know it (doctors, nurses, hospitals, pharmacies, ambulance services, physiotherapists, chiropractors, dentists etc.) and its relationships with the individual seeking access to it.

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(14) At first, the NRC grew relatively slowly, initially only supporting extramural research; it eventually opened its own laboratories in Ottawa in 1932. In 1938 the NRC set up an Associate Committee on medical research, which in 1947 became the Division of Medical Research, with a budget of $288,000, with specific responsibilities for financing medical research in Canadian Universities. The NRC continued to carry out in–house research and to support extramural research up to 1978, when its University support role was assumed by a new council, the Natural Sciences and Engineering Research Council (NSERC). The NRC's in–house operations are currently undergoing a considerable expansion, some of which have a distinct health orientation, including the $60 million Biotechnology Research Institute, scheduled to open in Montreal in 1985. NRC's current operating budget is $304 million while that of NSERC is $291.6 million.

(15) The MRC is an independent Crown corporation reporting directly to parliament through the Minister of National Health and Welfare. It is not, and has never been, part of the DNHW.

(16) The MRC was, at that time, specifically excluded from the support of public health research, however this restriction was removed in 1978.

(17) Many chronic conditions (*e.g.* arthritis, diabetes, congenital malformations, mental retardation) can be traced to "faulty" human biology.

(18) Herbicide and pesticide residues, gasoline additives (lead compounds), industrial agents (*e.g.* PCB's, building materials such as asbestos and UFFI).

Developments (1974-1984)

General comments

It is now time to look back over the past 10 years and to review the developments that have occurred in the health field in Canada in the wake of *New Perspectives*. There is no doubt that "les grandes lignes" of the document have markedly influenced the thinking of Canadian health planners and policy makers at both the federal and provincial levels over the past decade. It must be remembered that *New Perspectives* was never intended to lead to rigid definitions of problems or allocations of resources to one field or another, on the contrary, its intent was to present a framework for the analysis of the components of, and contributing factors to, all health problems.

The federal government has taken several initiatives within the spirit of *New Perspectives* in the health field since 1974, and progress is being made. The admittedly slow pace at which this is occurring is perhaps not too surprising when one considers all the conflicting forces and interests that come into play (19) when attempting to introduce new approaches to the national health question [8].

Different groups can draw on parts of *New Perspectives* which, when taken out of context, can be used to support their sectional interests. Industrialists, who, by and large, do not welcome anti-pollution regulations aimed at cleaning up the environment, can point to the lifestyle section of the paper and say that if an individual gets ill as a result of smoking, drinking or not exercising, it is his or her own fault, so why should the "system" have to pay for the treatment. Taken to its extreme this line of thinking could eventually lead to the "reprivatisation" of medical and hospital care [8].

Health goals

While conflicts such as those mentioned above may have slowed the follow-up to *New Perspectives*, the Government of Canada is firmly committed to doing all it can to improve the health status and quality of life of all Canadians and in response to *New Perspectives* has adopted a number of strategic goals for the nation's health, namely: *(i) the elimination of health hazards (mental and physical) in the environment; (ii) improvement of the availability, accessibility and quality of health services for all Canadians; (iii) alteration of lifestyle in a manner that will promote individual behaviour conducive to good health and avoidance of unnecessary risks* [9]. To these health goals should be added that of *elimination of poverty* to complete Canada's social goals for the 1980s [9].

Health strategies

In order to achieve these goals a number of general strategies (20) have been developed [9] based on: *(i) health promotion; (ii) regulatory approaches; (iii) research; (iv) health care efficiency;* and *(v) specific goal setting.*

In their report published in 1982 [10], the federal/provincial/territorial *ad hoc* Committee on national health strategies, using potential years of life lost and patient-days in hospital as criteria for evaluating mortality and morbidity, and using activity limitation as a proxy for quality of life, identified the following seven health problems as needing special attention: *accidents; arthritis and joint disorders; cancer; cardiovascular and cerebrovascular diseases; maternal and infant health problems; mental disorders;* and *respiratory diseases.* The *ad hoc* Committee strongly suggested that strategies related to health risk reduction and early detection of disease offered the most promise of success. Treatment, rehabilitation, research, evaluation and data collection with respect to priority problem areas should receive priority attention.

Developments in specific fields

Health Care Organisation

General. – What then has DNHW done in the past decade in each of the four health fields? I would like to start with the health care organisation sector, since it is here that the government may be said to have had the greatest impact. One of the main recommendations of *New Perspectives* was to the

(19) At the government level the sincerely held but often conflicting political philosophies held by the federal and some provincial governments do not always lead to ready federal/provincial cooperation in the health area. The vested interests of certain groups with stakes in one or more parts of the "health industry" would see attempts to contain health care costs as a threat to their livelihood and would not welcome the redirection of funds from the health care system to health promotion programs or to environmental control.

(20) In theory there are 20 possible permutations and combinations of health fields and strategies, but individual problems will define which combination is the preferred approach in any given case. This can be illustrated by a consideration of one of the priorities identified by the *Ad Hoc* Committee, namely accidents, in particular automobile accidents. Under the *health promotion* heading the problem can be approached through: driver education programs; advertising campaigns directed against "drinking and driving". The *regulatory* strategy could include: seat belt legislation; impact standards for automobiles; reduced speed limits; "drinking and driving laws (0.08 etc.)". The *research* strategy could include a wide range of studies such as: driver behaviour; evaluation of value of paramedical personnel; improved surgical techniques. Finally the *health care efficiency* approach would include: the availability and organisation of emergency services; trauma, burn and intensive care units; adequate numbers and availability of highly trained personnel. Under the *goal setting* strategy one could aim at reducing mortality and morbidity due to accidents by a given percentage in a given time.

effect that while continued high levels of health expenditures (currently estimated to be approximately $30 billion annually)(21) must be devoted to the health care system, the other three fields should begin to receive progressively larger shares of the health expenditure "cake" in the future. The transfer of resources to the other sectors has occurred to some, but as yet, to a very small extent(22).

Established programs financing act (1977). – Prior to 1977 the federal government (under the HIDS and Medical Care Acts) matched provincial spending on health, dollar for dollar, thus effectively leaving the control of overall health expenditure levels with the provinces. This system was changed in 1977 to one whereby the federal government made funds available to the provinces for a number of established programs (including health and University–level education) by way of cash grants, worked out in relation to population and the GNP, and the transfer of certain taxing powers to the provinces. However, these federal funds were no longer tied to specific health expenditures. This effectively limited the rate of growth of the federal health contributions while at the same time giving the provinces more control over health expenditures within their borders.

Canada Health Act (1984). – Individual provinces have different mechanisms for financing their shares of health insurance costs(23). In order to limit their expenditures some provinces began to charge hospital patients "user fees"(24) and others began to allow physicians (who are reimbursed on a fee–for–service basis in accordance with payment schedules established by the provincial medical insurance plans) to "extra–bill"(24) their patients (*i.e.* to levy an additional charge to patients over and above the payment schedule).

The growth of extra–billing and user charge practices gave rise to concerns at the federal level that one of the main pillars of medicare, namely that of "reasonable access" was being eroded(25). After failing to obtain an undertaking from the provincial governments, which impose user charges and permit extra–billing, to strictly control these practices the federal parliament acted unilaterally in April of this year when it unanimously passed the Canada Health Act whereby, as of July 1, 1984, federal financial contributions to provincial health care plans will be reduced by the total amount of extra–billing and user charges allowed in the province concerned(26).

Canadian Health Care Policy (1984). – The Canada Health Act restates the mandate of the DNHW as being the *protection, promotion, and restoration of the physical and mental well–being of residents of Canada* and, significantly, adds *"to facilitate reasonable access to health services without financial or other barriers"*(27).

Lifestyles

General comments. – Turning now to the lifestyle factor, the area where individuals have the power to make personal decisions on the risks they take that can influence their own health status. It must be admitted that this issue raises a number of philosophical questions such as: just how far should government go in trying to modify human behaviours and how much control do individuals really have over their lifestyles (28). There can be no doubt however that public interest in lifestyle issues has grown steadily over the past 10 years. The armies of joggers, cyclists and cross country skiers that one sees in Ottawa would have been much less numerous 10 years ago, and virtually non–existent 20 years ago(29),(30).

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(21) The federal share of the $30 billion figure was $9.5 billion in 1983–1984; the balance being made up of provincial (*ca.* $13 billion) and private (*ca.* $7.5 billion) spending. In 1981 Canada's health spending accounted for 7.6% of the GNP. Corresponding figures for other countries would be: USA (9.7%); the Netherlands (8.8%); Australia (7.5%); the UK (6.7%); and the OECD average (7.3%).

(22) In 1979, the government of Canada adopted a new system of policy and expenditure management designed to better relate federal expenditures to approved government policies and to help to limit government spending. This has given rise, among other things, to the creation of a new government department, the Ministry of State for Social Development, which in turn has led to a closer integration of all federal social expenditures, and with a total sectorial budget ("envelope") established for 5 years in advance. Now new programs in one social area can only be started at the expense of existing programs.

(23) Premiums or through general or specific provincial tax revenues.

(24) It should be noted that Canadian law precludes private companies from selling insurance to cover user charges or extra–billing. This was specifically designed to prevent the development in Canada of a "two–tier" medical care scheme, as for example, in the UK. Private insurance plans are available however to cover services not included in the original cost–sharing agreements (such as dentistry, prescription drugs, special nursing, etc.).

(25) The total amount of these charges born directly in the area of insured services by the patient had risen to *ca.* $70.0 million per annum by 1983.

(26) It should perhaps be mentioned, that the administration of the health system, still rests clearly with the provinces, and matters such as the licencing of health professionals is still carried out at the provincial level.

(27) In this context it is interesting to note that public opinion polls have shown that the national health insurance plan is the most popular of our federal government programs.

(28) This is particularly true when one considers such factors as the individual's responsibilities towards others (family), income level, level of knowledge, etc.

(29) Undoubtedly Canadian national pride was wounded when it was widely reported in the media some years ago that the average 30 year old Canadian was less fit than the average 60 year old Swede — no doubt giving a stimulus to fitness promoting activities!

(30) It is interesting to note that the avid public interest in lifestyles has created a new part of the "health industry" (with its own "vested interest") — namely the "fitness industry" with the proliferation of health clubs, fad diets, fat farms, etc. and given a significant boost to the fortunes of the sports apparel and equipment industry.

Health promotion in DNHW. – Canada, has, in many ways, become a leader in health promotion [11]. It has long been realised that there is a need to supplement the efforts of the public education system in matters related to health. Sensing the need for it to take a leadership role in the national health promotion effort, DNHW has, in recent years, taken a number of initiatives in this field to help to create a climate conducive to individual informed decision making.

The success of health promotion programs is difficult to evaluate, partly due to the lack of suitable methodologies and controls. It is often impossible to say for sure what would have happened if the program had not been in place. It is also usually necessary for a particular program to be in place for many years before any evaluation can be carried out. It must be stressed that health promotion is in many ways an exercise in marketing (of "good" health), an activity governments rarely engage in.

All the Department's health promotion activities were brought together in 1978 with the formation of the Health Promotion Directorate (31), which to date has directed most of its major efforts towards a number of "at risk" groups (*e.g.* young people, women and the aged).

Alcohol. – Although statistics indicate the number of alcoholics in Canada is diminishing, it is estimated that nearly a million Canadians abuse alcohol, resulting in economic losses of approximately $2.0 billion annually, not to mention the attendant human suffering and loss of life (alcohol is reported to be involved in 50% of all fatal accidents). One Health Promotion initiative in this area, "Dialogue on Drinking", encourages frank discussion of the consequences of alcohol abuse, particularly within families.

Despite the scepticism expressed in some quarters there does seem to be an increasing public awareness of the problems of alcoholism. This level of public concern is reflected to some extent by such things as the general acceptance of tougher drinking and driving laws, and the greater acceptance of non-alcoholic beverages at social gatherings.

Tobacco. – The Health Promotion Directorate also directs considerable energies to combatting cigarette smoking. One major effort — "The generation of non smokers" is directed at youth and its primary objective would be the emergence of a generation of young people who will have grown up as non-smokers. It is noteworthy that Canada has recorded an overall reduction in cigarette smoking in recent years. In addition to health promotion strategies (32), the federal government can also approach this problem by other methods including taxation, stricter controls on cigarette advertising, and by encouraging Canada's tobacco farmers to switch to alternate crops (33). Earlier in this talk I discussed the question of the conflict of interest involving health promotion programs. Very few people now question the fact that cigarette smoking is harmful to health. It should be noted however that total consumer spending on tobacco products in Canada, amounts to *ca.* $4.3 billion annually, that the domestic tobacco industry in Canada (growing and fabrication), employs *ca.* 18,000 people and tobacco taxes contribute *ca.* $2.0 billion to federal and provincial government revenues annually.

Nutrition. – Canada has had a long history of nutrition intervention programs, but nutrition has recently been identified as a priority area for the national health promotion program [12]. The Department has produced a widely used publication, *Canada's food guide*, which advocates basic food selection that reduces fat, sugar, and salt consumption and balances energy intake against physical activity.

Nutrition strategies proposed by DNHW include: informing and equipping the public; promoting a supportive social environment; promoting self-help and citizen participation and stimulating health education programs. The major issues being addressed are: the relationship between nutrition and key chronic diseases (cardiovascular disease, cancer, hypertension); relations between economic and nutritional status; specific nutritional needs at specific points in life; weight-related problems; special nutritional needs of the disabled and the expanding and changing needs of the public for nutrition information.

Preventive medicine. – The Department has been active in the general area of preventive medicine (*e.g.* immunization) for many years, and its Laboratory Centre for Disease Control continues this work, in, for example, the monitoring of the incidence of infectious diseases. The report of the federal task force on the periodic health examination [13], published in 1979 is another example of DNHW's recent ventures in preventive medicine. It is an authoritative guide that physicians can use to tailor medical check-ups to the patients' age, sex, and risk status and to convey the appropriate preventive health information.

(31) The Directorate has attempted to address a number of lifestyle issues directly and, through its contributions program, to mobilise community efforts towards these ends.

(32) An example of the success of the federal efforts to "create a climate" for health promotion, would be the enactment by some municipalities (and the acceptance of these laws by the public) of laws restricting the use of tobacco in public places.

(33) This is proving difficult, as few of the possible alternate crops produce the same cash yield per hectar. Some limited success has been had with peanuts as a replacement crop.

Another venture in preventive medicine is in the area of mass screening programs, which are being considered and evaluated for the early detection of some forms of cancer (34).

Environment

Turning now to the environment factor, the Health Protection Branch (HPB) of DNHW and its forerunners have been active for over a century now in the protection of Canadians from impure foods and drugs, and in such areas as air and water quality (35).

The HPB is also responsible for environmental health protection in Canada. Work in this area has undoubtedly been stimulated by the fact that both the general public and news media have become very "environment conscious" in recent years.

In the 1970s we saw a classic example of how solving, or attempting to solve, one problem will often create others. In the wake of the energy crisis of 1973 many programs were put into place to conserve oil, which led to an increased use of alternate fuels, including coal, resulting in vastly increased amounts of the oxides of nitrogen and sulphur, the precursors of "acid rain", being fed into the atmosphere. "Acid rain" is not only a potential national but international problem, which to date has primarily been of concern to the environmentalists, but possible associated health problems (*e.g.* leaching of trace metals into lakes and water supplies) are only just beginning to surface. Other approaches to saving oil have involved improving the insulation levels of houses, places of work, etc. One result of this being that the number of "air changes" normally occurring in a building do not take place, leading to a considerable deterioration of the indoor air quality, possibly leading to a considerably higher incidence of respiratory diseases, among the occupants (particularly the children) of highly insulated homes.

Another energy related environmental problem has arisen in Canada from the use of urea–formaldehyde foam (UFFI) as a home insulating material. Many Canadians who have insulated their homes with UFFI (often with the help of government grants!) are reporting a wide range of negative, albeit non–specific, health effects and have found that their houses have not only become uninhabitable but unsalable.

Human biology

While our understanding of basic human biology continues to advance there is need for much more basic research to be carried out. While the dangers to health resulting from alcohol, smoking, poor diet and environmental hazards are well known, detailed understanding of the causes and progress of many diseases is often lacking. In fact, despite recent advances in molecular biology we are still ignorant of the basic causes of many diseases (*e.g.* the exact mechanism by which smoking leads to cancer). However recent developments in recombinant DNA, cell fusion and other biotechnological procedures give us cause for optimism in the future. The federal government has recognized this fact and has made significantly increased funding available to the MRC. The Council's annual budget has increased from $40 million in 1974–75 to $150 million in 1984–85. In this context it should be noted that total direct expenditures on medical and health research in Canada (federal, provincial and private) are currently in the order of $250 million, with an equal amount being spent on indirect costs.

Conclusion

What role has research played in the development of public health in Canada? This is a very difficult question to answer. Many of the major decisions, made at government level, such as those that lead to the introduction of national health insurance, have been made for essentially political reasons, and I would submit that in a democracy no one can really quarrel with this fact. The decision to give priority to promotion/prevention programs was also essentially a political one, motivated by the spectre of ever mounting health care costs. We should however, not overlook the fact that the origins of many health promotion programs lie in earlier epidemiological research (smoking and lung cancer being a classical example).

To give some examples of where research has contributed significantly to the scientific basis underlying DNHW's environmental health program, we might consider: *(i)* research on enteric viruses in drinking water, used as a basis for evaluating the need for including viruses in the *Guidelines for Canadian drinking water quality*; *(ii)* research on measurements of asbestos in air, used in advising Labour Canada and the provinces respecting asbestos standards; *(iii)* development of short–term assays for carcinogenicity, used to screen new chemicals under the Environmental Contaminants Act; *(iv)* research on air pollutants, used as a basis of advice on National Air Quality Objectives under the Clean Air Act; and *(v)* research on respiratory ailments among grain handlers, used as a basis for

(34) Mention might be made specifically of one project partially supported by the NHRDP, the national breast cancer screening trial, directed by Dr. A. Miller of Toronto to assess the value of mammography in the early detection of breast cancer in women in the 40–49 and 50–59 age groups. It is estimated that by the time the program is complete, 90,000 women will have been recruited into this $18 million study.

(35) A recent survey for instance has indicated the very high importance that Canadians attach to drinking water quality.

improved working conditions in federal elevators and transportation terminals and for the development of dust standards under the Canada Labour Code, Part IV.

Areas where major advances have been made in recent years in clinical medicine and where research has played a part would include transplantation techniques, helped by the discovery and successful use of modern immuno-suppressant drugs such as cyclosporin. Mention could also be made of advances in diagnostic medical imaging (CT, NMR, PET, etc., all made possible by the "microchip"), which holds much promise for the future, particularly in the area of mental disease, where the etiology of the major affective disorders is still a virtually unknown quantity.

Finally, we might think about what health problems we may face in the next decade. There are some things known with certainty and many imponderables. We know for instance that in Canada, as in most developed countries, we face a rapidly aging population. In 1976 Canada's population aged 65 or over numbered 2 million, by the year 2000, 3 million Canadians will be 65 or older. A pressing need is therefore developing to look into the best way to provide care to and to maintaining a desirable quality of life for our aging population. This will in all probability need to be an integrated health and social approach. It is now appreciated much more than it was in 1974 that there is a distinct relationship between health status and economic status at all ages. This will undoubtedly lead to more "quality of life" considerations and to a greater integration of health and social programs in the future.

Thank you for the invitation to participate in the 50th anniversary celebrations of the Istituto Superiore di Sanità. It has been both a pleasure and an honour to have had the opportunity to address this gathering.

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PRESENTATION OF UNIDO: PUBLIC PHARMACEUTICAL INDUSTRY IN THE SERVICE OF HEALTH

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Mr. Chairman, distinguished Delegates, Ladies and Gentlemen, the university departments have always been the birthplaces of scientific discoveries. The Italian universities have been among the first in creating new technologies since the 18th century when by careful experiments, Spallanzani (1729-1799) introduced the use of sterile culture media. The soundness of his discovery was not only confirmed by the fact that the art of preserving food by canning developed therefrom but his work directly led to the work of Pasteur. Since then, until recently, the manufacture of vaccines was developed on a non-commercial basis and since then the public health institutions have been the link beween the university departments and the pharmaceutical industry by transforming the scientific discoveries into an applicable form, that is developing technologies. The public health institutions are in an exceptional situation to perform scientific and technological work. They are both suppliers and consumers of the new technological innovations and the experience gained as consumer can be directly fed back to the Research and Development.

The modern pharmaceutical industry is about forty years old and it was started by the introduction of industrial scale production of sulphonamides and penicillins which truly transformed the medical practice. The research resulted in a new generation of drugs though each time the improvement is relatively smaller. This feature of diminishing therapeutic returns on innovations is typical within a wide range of therapeutic categories. The big private and transnational pharmaceutical companies are research based and market oriented. Their research expenses are paid by introducing new products on the market which are patent-protected.

Simultaneously with the development of the private sector of the pharmaceutical industry in the industrialised countries, the public sector has also developed from small hospital pharmacies and public health institutions.

Its activity is mainly to provide a service for the national health care and social programmes which is very different from those of the private industry.

However, the existence of these two sectors of the pharmaceutical industry is well balanced in the industrialised countries because both of them have their own market. On the one hand there is a purchase power and on the other a significant segment of the population is aware of the newest developments in health care. The situation in developing countries is completely different since only 20-25% of their population have access to health services. 74% of the world population is living in the developing countries and shared only 21.8% of the global consumption of pharmaceuticals in 1982. The pharmaceutical production in developing countries was US $ 15.1 billion in 1982 which corresponded to 17.8% of the global output. Africa accounted for only 0.5% of the world pharmaceutical production and 3% of consumption while its population is about 10% of the world population. In 1979, in industrialised countries 8% of the GNP was spent on health care, while this figure in developing countries was only 1-2%. In developing countries 56% or more of the health budget was spent on drugs, but it was only US$ 1.5 per capita annually. As a consequence, the apparently small market cannot justify the development of both sectors of the pharmaceutical industry in most developing countries.

To promote the pharmaceutical industry in the public sector of developing countries will not necessarily create an industry per se to be responsible to all health needs but will help to build a capability for production of the most important pharmaceuticals. The public pharmaceutical industry in developing countries like the industrialised countries concentrates on the essential drugs which have a very small

margin but which offer a permanent availability and supply for the national health programmes. This approach is not attractive for the private pharmaceutical industry which is bound to the big pharmaceutical companies as their subsidiaries or by licensing agreements, joint ventures etc. and it concentrates mainly on specialities. In the public sector the driving force is not economic in nature but is intended to serve the health needs by reaching even the poorest, that is to provide a source of supply for the largest possible segment of the population. In many instances cost benefit analysis may show that it would be cheaper to buy the above drugs on the international market than to develop manufacturing facilities. However, there could be other benefits as follows:

a) convertible currency saving, by purchasing bulk drugs instead of final dosage forms;

b) the formulation of dosage forms is paid in local money;

c) when the production output is meeting the demand, there is no need for it to lay in stock;

d) the packaging is appropriate to the local requirements and the labels can be printed in local languages;

e) since the national quality control facility is part of the public sector, if it exists, there is no need for parallel development;

f) manpower development is provided by the manufacturing establishment.

Moreover, the weakness of the cost benefit studies is that they cannot calculate the worth of a human life saved. The public pharmaceutical sector is often criticised and its existence is put in question. However how can it be valorized even if only 1% of the children population is saved? The public pharmaceutical industry has to be recognised as a major contributor to the public health care programmes and in particular as a supplier of essential drugs, infusions, vaccines and sera. In spite of the criticism which is focused on the fact that the public pharmaceutical industry cannot fulfill all requirements, UNIDO assisted in the development of manufacturing units since, according to our view, the public pharmaceutical industry is indispensable for the developing countries.

The very specific feature of the public pharmaceutical industry is that by creating a certain self–reliance it provides service on a permanent basis.

The importance of this self–reliance was underlined 6 months ago when a heavy earthquake occured in a developing country and a UNIDO assisted pilot plant was the single facility in the country which made a remarkable effort of supplying drugs around the clock to save life, since other possible suppliers from outside needed at least a week to react. Without this small unit, more people would have died. In another emergency case, infusion solution could not reach a developing country in less then 5 days from Europe, but by that time they had no use any more. These examples show that situations can occur where neither economic nor market forces play any role, but where a capability is needed to serve the public.

Conventional vaccines are entirely produced by the public pharmaceutical industry in developing countries. Recently the United Nations Industrial Development Organization (UNIDO) has launched a programme on the Industrial Production of Biologicals (IPB) to assist developing countries in strengthening the existing production facilities for vaccines and creating new capabilities. The IPB programme is supplementing the Expanded Programme on Immunization (EPI) of WHO, which has already established the delivery system and created a market for vaccines in developing countries.

Recognising the importance of the public pharmaceutical industry both in industrialised and developing countries, it should be emphasised that its main endeavour in developing countries is how to serve the poorest segment of the population. Up to now UNIDO has carried out over 100 projects to establish public pharmaceutical industries in developing countries and to strengthen the already existing public sector how to be more self–sufficient both in managerial and technological aspects. UNIDO also conducted two consultation meetings for strengthening the position of developing countries when negotiating contractual arrangements and transfer of technology. For a more detailed view of UNIDO's activities in the sector of the pharmaceutical industry see Annexes 1, 2 and 3.

I would like to express my gratitude for the invitation to attend this august assembly and to have the chance of expressing UNIDO's views on the role of the public pharmaceutical industry in the service of health. This conference of Istituto Superiore di Sanità has given all of us an inspired example of how to serve the public health. I would like to wish the Institute continued success in the forthcoming 50 years and also to the Government of Italy who has always rendered considerable service to the public pharmaceutical industries in developing countries. I trust that this meeting will open up new horizons in the co–operation between the Italian Government and industry and UNIDO, since the main preoccupation of all the parties in this field is to serve the public health.

Thank you.

Annex 1. – *List of UNIDO missions carried out for country profiles on the pharmaceutical industry*

	Prepared by
1. The pharmaceutical industry in Asian countries:	UN Asian and Pacific Development Institute in co-operation with UNIDO
(*a*) Thailand	
(*b*) Indonesia	
(*c*) Philippines	
(*d*) Singapore	
(*e*) Malaysia	
2. Pharmaceuticals in the developing world policies on drug, trade and production:	APEC TTI project
Volume I – General report	
Volume II – Country profiles	
(*a*) Africa	
(*b*) Asia	
(*c*) Latin America	
3. Production plan for the Arab pharmaceutical industry in selected Arab countries:	UNIDO/IOD.299
Volume I – General aspects	UNIDO/IOD.299
Volume II – Drugs and pharmaceuticals	UNIDO/IOD.299
Volume III – Medical appliances	
4. Establishment of a pharmaceutical industry sector in the East African community	
5. A survey of Pakistan pharmaceutical industry	UNIDO experts
6. Development of the pharmaceutical industry in Afghanistan	UNIDO experts (SIS/AFG/77/804)

Annex 2. – *List of projects*

1. – Some large scale projects under implementation

Title

Modernisation of facilities for the manufacture of anti-malarial drugs

Techno-economic feasibility study for the utilization of medicinal and aromatic plants

Primary health support services programme

Strenghthening the Royal Drugs Research Laboratory

Processing of medicinal plants cultivated and collected in Nepal

Establishment of a pilot plant for processing of meat by-products

Pilot plant for baby food production

Assistance in the production of pharmaceuticals based on the Thai traditional pharmacopoeia

Pilot production of medicines using indigenous raw materials

Assistance au développement de la production de vaccins, d'huiles essentielles et de produits pharmaceutiques

Réhabilitation et création des unités de fabrication locale des médicaments

Creation of a base for a pharmaceutical industry

Production de médicaments à base de plantes medicinales

Assistance for the production of plant derived pharmaceuticals

Assistance à la production de produits pharmaceutiques à partir de plantes médicinales

Assistance in the establishment of a pharmaceutical plant in Zanzibar

Establishment of a multipurpose plant for the production of synthetic drugs

Establishment of a multipurpose pilot plant in Cuba for the production of synthetic drugs

Centre for the development of the pharmaceutical industry

Assistance to the Ministry of Industry for the pharmaceutical sector

Establishment of a regional research centre for biotechnology and genetic engineering

Establishment of a centre for biotechnology applied to pharmaceuticals

2. – Finalised projects

Pilot unit for the production of essential oils

Establishment of a unit for the extraction of active ingredients from medicinal plants

Pilot plant for the production of medicaments in the Cape Verde Islands

Assistance to the Central Analytical Laboratory

Assistance for the establishment of a central quality control laboratory

Production of oral rehydration salts

Intravenous fluids plants

Establecimiento de una planta piloto de hecogenina

Establishment of a regional fermentation programme for the production of antibiotics and other pharmaceuticals in Latin America

3. – Training programmes

Belgium	Training programme in pharmaceutical technology
Romania	In-plant group training programme in medicinal and aromatic plants in Romania
France	Industrial pharmaceutical in-plant group training programme

4. – Symposiums and technical meetings

India	UNIDO – Escap workshop on the essential oils industry
India	Technical consultation on production of drugs from medicinal plants
Sweden	Seminar on national self-reliance in blood and blood fractions for developing countries
China	Workshop on the pharmaceutical industry combined modern-traditional pharmacy for promoting technical co-operation among developing countries
Cuba	Regional seminar on the industrial application of microbiology
Vienna	Panel meeting of industrial experts on the pharmaceutical industry
Vienna	*Ad hoc* expert group meeting on biomedical equipment
Hungary	Technical consultation on production of drugs in a multipurpose plant

5. – Tcdc meetings

Morocco	Meeting on co-operation among developing countries
Mexico	Expert group meeting for the establishment of a regional research centre for bio-technology for Central America
Peru	Expert group meeting for the establishment of a regional research centre for biotechnology and genetic engineering for South America
India	Consultation meeting on transfer of technology and technical know-how between developing countries in the field of pharmaceutical industry

Annex 3. – *Selected documentation relating to pharmaceutical industry*

Papers issued for the "Expert working group meeting on the establishment of pharmaceuticals in developing countries". Budapest, Hungary, 5–9 May 1969

ID/WG.37/1	Patent aspects of the pharmaceutical industry
ID/WG.37/2	The pharmaceutical industries in the second development decade
ID/WG.37/3	Establishment of pharmaceutical industries in developing countries: Report and proceedings of the Expert working group meeting
ID/WG.37/4	UNIDO and the establishment of pharmaceutical industry sectors in developing countries
ID/WG.37/5	Quality control in pharmaceutical manufacture
ID/WG.37/6	Therapeutic needs and production of drugs
ID/WG.37/7	FAO assistance to developing countries in the production of veterinary biologicals
ID/WG.37/8	Present regulatory statutes involving quality and efficacy in the export and import of pharmaceuticals in selected countries
ID/WG.37/9	The development and application of veterinary pharmaceuticals
ID/WG.37/10	How to conduct a realistic marketing, economic and financial study of the growth potential of a pharmaceutical industry in a developing country
ID/WG.37/11	Present regulatory statutes involving quality and efficacy in the export and import of pharmaceuticals in selected countries
ID/WG.37/12	Some conditions and prerequisites for establishing pharmaceutical industry in developing countries
ID/WG.37/13	The establishment of a pharmaceutical industry in a developing country – a case history
ID/WG.37/14	Pharmaceutical plant models and training centres
ID/WG.37/15	Active principles, drugs, pharmaceutical intermediates and pharmaceutical preparations extraced or prepared from botanicals
ID/WG.37/16	Pharmaceutical industry in India
ID/WG.37/17	The importance of accurate drug information
ID/WG.37/18	Consideration of drug efficacy and safety

Papers issued for the "Second panel of experts on the pharmaceutical industry". Vienna, Austria, 28 February – 3 March 1978

ID/WG.267/4 Rev. 1	Report of the "Second panel of experts on the pharmaceutical industry". Vienna, Austria
ID/WG.267/1	Guidelines for the preparation of a national list of drugs and national formulary
ID/WG.267/2	Ways of ensuring adequate supplies of chemical intermediates required for the production of drugs in developing countries
ID/WG.267/3	The steps involved in establishing a pharmaceutical industry in developing countries
ID/WG.267/5	Reports on drugs from the national drug list which because of their essentiality could be produced in the developing countries

Papers issued for the "Technical consultation on production of drugs from medicinal plants in developing countries". Lucknow, India, 13–20 March 1978

ID/WG.271/6	Report of the "Technical consultation on production of drugs from medicinal plants in developing countries". Lucknow, India, 1978
ID/WG.271/1	Plants of the African pharmacopoeias used in the treatment of tropical diseases
ID/WG.271/2	Industrial requirements for processing medicinal plants
ID/WG.271/3 Corr. 1	An integrated approach to research on medicinal plants
ID/WG.271/4	Medicinal plants for curing diseases other than communicable, tropical and infectious

Papers issued for the "Regional seminar on industrial application of microbiology in pharmaceutical industry". Cuba, 2–9 July 1979

ID/WG.300/1	Future trends in industrial applications of microbiology in pharmaceutical industry
ID/WG.300/2	Microorganisms and their role in the fermentation processes including biosynthesis of antibiotics
ID/WG.300/3	Technology for the production of tetracyclines and erythromycin
ID/WG.300/4	Estado actual de la tecnología de producción fermentativa de sustancias naturates
ID/WG.300/5 Rev. 1	The fermentation process and production of Gentamicin C. An aminoglycoside antibiotic complex
ID/WG.300/6	Ampicillin – detailed description of raw materials used, production process, yields at different stages and cost of production. Technology for manufacture of 6 amino penicillanic acid
ID/WG.300/7	Brief description of the manufacturing processes of antibiotics
ID/WG.300/8	The latest state of technology in the production of natural substances by fermentation

ID/WG.300/9	Erythromycin production in the pharmaceutical industry
ID/WG.300/10	Algunas características de la industria químicofarmaceútica en los países del grupo andino
ID/WG.300/11	Production of oxidative fermentation including acetic acid
ID/WG.300/12	Antibiotics consumption and manufacturing facilities in Latin America, strategy and policies
ID/WG.300/13	Draft report – Regional seminar on industrial application of microbiology

Papers issued for the "Pharmaceutical meeting on the production of essential drugs in developing countries". Budapest, Hungary, 16–23 September 1979

ID/WG.304/1	Analgesics and/or anti-inflammatory agents
ID/WG.304/2	Antidepressant drugs
ID/WG.304/3	Antibiotics
ID/WG.304/4	Prevention and treatment of infectious diseases by immunization
ID/WG.304/5	Vitamins
ID/WG.304/6	Antituberculotics
ID/WG.304/7	Antimalarial agents

Documents: "First consultation on pharmaceutical industry 1980". Meeting of "Committee of experts on pharmaceuticals and *ad hoc* panel of experts" 1981/1982

ID/WG.292/3	Report of meeting on pharmaceutical industry, 1979
ID/WG.304/4	Prevention and treatment of infectious diseases by immunization, 1979
IOD.254	International consultation meeting in the field of establishment and development of pharmaceutical industries, 1979
ID/222	Report of the technical consultation on production of drugs from medicinal plants in developing countries, Lucknow, 1978
ICIS.146	Assessment of the pharmaceutical industry 1978–2000. A report for the global preparatory meeting on pharmaceuticals, 1980
IOD.336	Draft report, meeting on production of essential drugs, 1979
ID/WG.317/2	Preliminary draft of the main clauses to be considered in drafting a licensing agreement on the pharmaceutical industry, 1980
ID/WG.317/1	Issues that might be considered at the first consultation on pharmaceutical industry, 1980
ID/WG.317/3	Draft report, meeting on pharmaceutical industry, 1980
ID/WG.331/9	Provisional list of documents, meeting on pharmaceutical industry, 1980
ID/WG.331/3	Preparation of guidelines, background paper, pharmaceutical industry, 1980
ID/WG.331/8	Illustrative list of drugs prepared by UNIDO in consultation with WHO, 1980
ID/WG.331/2	Relevant issues to be taken into account when negotiating transfer agreements, 1980
ID/WG.331/4	The pricing and availability of intermediates and bulk drugs, 1980
ID/WG.331/5	The availability, terms and conditions for the transfer of technology for the manufacture of essential drugs, 1980
ID/WG.331/6	Global study of the pharmaceutical industry, 1980
ID/259	First consultation on the pharmaceutical industry report, 1980
UNIDO/PC.14	Background paper for discussion on availability, pricing and technology of essential drugs, 1981
ID/WG.267/1	Guidelines for the preparation of a national list of drugs and national formulary, 1978
ID/WG.267/2	Ways of ensuring adequate supplies of chemical intermediates required for the production of drugs in developing countries, 1978
IOD.336	Draft report, meeting on production of essential drugs, 1979
ID/222	Plants in developing countries, Lucknow, India, 1978. Report of the technical consultation on production of drugs from medicinal plants in developing countries, Lucknow, 1978
PC/R.4	Turn-key arrangements for the transfer of technology for the production of bulk drugs (draft), 1980
ID/WG.385/3	Contractual arrangements for the setting up of a plant for the production of bulk drugs or intermediates, 1982
UNIDO/PC.14	Background paper for discussion on availability, pricing and technology of essential drugs, 1981
ID/WG.385/1	Arrangements for the transfer of technology for the manufacture of bulk drugs and intermediates, 1982
PC.52	Availability, pricing and technology of essential drugs and their intermediates, 1982
PC.51	Directory of sources of supply of 26 essential bulk drugs, their chemical intermediates and some raw materials, 1982
ID/WG.385/2	Arrangements for the transfer of technology for the formulation of pharmaceutical forms. Contractual conditions and background notes, 1982

Documents on the "Second consultation on the pharmaceutical industry". Budapest, Hungary, 21 to 25 November 1983

ID/WG.393/5	Progress report
ID/WG.393/6	Contractual arrangements for the production of drugs – issue paper
ID/WG.393/1	Items which could be incorporated in contractual arrangements for the transfer of technology for the manufacture of those bulk drugs/intermediates included in UNIDO's illustrative list
ID/WG.393/4	Items which could be included in contractual arrangements for the setting up of a plant for the production of bulk drugs (or intermediates) included in UNIDO illustrative list
ID/WG.393/3	Items which could be included in licensing arrangements for the transfer of technology for the formulation of pharmaceutical dosage forms

ID/WG.393/7	Contractual arrangements for the production of drugs – background paper
ID/WG.393/8	Availability, pricing and transfer of technology for bulk drugs and their intermediates – issue paper
ID/WG.393/9	Availability, pricing and transfer of technology for bulk drugs and their intermediates – background paper
ID/WG.393/10	The development of drugs based on medicinal plants – issue paper
ID/WG.393/11	The development of drugs based on medicinal plants – background paper
ID/WG.393/12	The manufacture of vaccine in developing countries – issue paper
ID/WG.393/13	The manufacture of vaccines in developing countries – background paper
ID/WG.393/14	Relevant topics to be taken into account in the preparatory phase technology transfer arrangements for the production of pharmaceuticals
ID/WG.393/15	Summary of industrial property protection on pharmaceuticals in developing countries
ID/WG.393/16	Multipurpose plant for the production of UNIDO's list of essential drugs based on raw materials and intermediates
ID/WG.393/2	Directory of sources of supply of 26 essential drugs, their chemical intermediates and some raw materials
UNIDO/IS.388	Water use and effluent in the pharmaceutical industry
UNIDO/SS.389	Prospects for production of vaccine and other immunizing agents in developing countries
ID/WG.393/17	The need of drug policies
ID/WG.393/18	Industrial profiles of pharmaceutical production units for formulations and bulk drugs

Papers presented at the "Workshop on the pharmaceutical industry (Combined modern–traditional pharmacy) for promoting technical co–operation among the developing countries". Beijing and Hangzhou 1–14 November 1982

1. An introduction to Chinese materia medica
2. Basic concepts of Chinese traditional medicine
3. Clinical application of traditional and herbal drugs
4. A resumé of the goals and philosophies underlying UNIDO's programmes in the industrial utilisation of medicinal and aromatic plants in developing countries
5. Modern research on Chinese traditional and herbal drugs
6. Chinese traditional dosage forms and their modernisation
7. Industrial developments in the production of Chinese traditional and herbal remedies
8. Standardisation of Chinese materia medica

Papers on miscellaneous subjects – Pharmaceutical industry

ID/WG.37/11	Present regulatory statutes involving quality and efficacy in the export and import of pharmaceuticals in selected countries, 1970
IIS file no. 8431	Bleaching of beeswax – Industrial inquiry service
IIS file no. 8229	Gelatine capsules – Industrial inquiry service
IIS file no. 8435	Pharmaceutical adhesive plaster – Industrial inquiry service
IIS file no. 7724	Quinine – Industrial inquiry service
UNIDO/ID/68	Manual on the establishment of industrial joint venture agreement in developing countries
UNIDO/ID/98	Guidelines for acquisition of foreign technology
UNIDO/ID/264	The growth of the pharmaceutical industry in developing countries
ID/CON.3/14	Report on implications of activities of UNIDO – UN world population conference
UNFPA/WPPA/4	The world population plan of action. Some implications and practical measures for it
UNFPA/WPPA/8	Guidelines for implementation of world population. Plan of action in less developed countries
UC/INT/75//015	Effects of industrialization on population
UNIDO/IO.384	Population, economics, development and industrialization
UNIDO/IOD/338	Biomedical equipment. Expert group report, 1979
UNIDO/IO/R53	Biomedical engineering in developing countries, 1983

Papers on some selected studies in the pharmaceutical industry

ITD.346	International contraceptive study project on raw materials and local production of contraceptives in developing countries, 1975
LIB/SER.D/20	Information sources on the pharmaceutical industry. UNIDO guides to information sources, No. 20, 1976
UNIDO/IOD.76	Basic principles for the transfer of technology for the establishment of a pharmaceutical industry in developing countries, 1977
UNIDO/EX.24	Report of panel on pharmaceutical industry, 1977
ID/WG.267/1	Guidelines for the preparation of a national list of drugs and national formulary, 1978
ID/WG.267/2	Ways of ensuring adequate supplies of chemical intermediates required for the production of drugs in developing countries, 1978
ID/WG.271/1	Plants of the African pharmacopoeias used in the treatment of tropical diseases, 1978
ID/WG.271/2	Industrial requirements for processing medicinal plants, 1978
ID/WG.267/3	The steps involved in establishing a pharmaceutical industry in developing countries, 1978
ID/WG.271/3	An integrated approach to research on medicinal plants, 1978
ID/WG.271/4	Medicinal plants for curing diseases other than communicable, tropical and infectious, 1978
ID/WG.267/4/Rev.1	Report on meeting on pharmaceutical industry, 1978
ICIS.74	Summary of the draft world–wide study of the pharmaceutical industry, preliminary draft, 1978
ID/WG.267/5	Reports on drugs from the national drug list which because of their essentiality could be produced in the developing countries, 1978

ID/204	The growth of the pharmaceutical industry in developing countries: problems and prospects, 1978
UNIDO/IOD.207	Note on UNIDO activities relating to pharmaceutical products in the context of primary health programmes, 1978
ID/208	Manufacture of Tetracycline and Oxytetracycline (in technologies from developing countries), 1978
ID/WG.282/65	Production of Ethambutol (in technologies from developing countries), 1978 Coconut water as intravenous fluid (as above) Ergotoxine strain of ergot (as above) Methaqualone and methaqualone hydrochloride (as above) Oil from shark liver (as above)
ID/WG.292/2	The pharmaceutical industry in developing countries, its potential, and the national and international action required to promote its development, 1978
ID/WG.282/79	Appropriate technology in drug and pharmaceutical industries, background paper, 1978
ID/WG.282/45	Provision of drugs by appropriate technology, 1978
ID/WG.282/93	Choice and adaptation of appropriate technology in production of drugs and pharmaceuticals in developing countries, 1978
UC/INT/81/068	Workshop on the essential oil industry, 1981
UNIDO/IOD.13	Effect of industrialization on population
UNIDO/EX.100	Assessing the availability of raw materials for the basic production of 20 essential drugs, 1979
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