7.

POLICY OPTIONS

7.

POLICY OPTIONS

VACCINE RESEARCH, DEVELOPMENT, AND PRODUCTION

The Federal Government to date has not investigated the causes or potential implications of the recent decline in the number of pharmaceutical manufacturers producing vaccines in this country. Nor has it fully evaluated the effects on private sector vaccine research, development, and production of Federal policies established by at least three different agencies within the Department of Health, Education, and Welfare (HEW): the National Institute of Allergy and Infectious Diseases (NIAID), the Bureau of Biologics (BOB), and the Center for Disease Control (CDC). (See chapters 2 and 6.)

Unless Congress acts, the Federal Government is not likely to conduct comprehensive investigations in either of these areas. Three potential implications of maintaining the status quo include these:

1. The commitment of the pharmaceutical industry to vaccine development and supply will remain tenuous and unpredictable.
2. HEW agencies with vaccine-related responsibilities will continue to work together informally and establish policies in accordance with their own jurisdictional interests:
   —NIAID will continue to finance vaccine research and development in accordance with its own priorities and limited funds.
   —BOB will continue to establish new criteria and interpret existing standards for vaccine safety and efficacy, emphasizing the premarketing evaluation of biological products.
   —CDC will continue to survey the incidence and prevalence of certain infectious diseases, coordinate the use of Federal funds to establish or maintain public immunization programs, and collect voluntarily submitted reports of adverse reactions to vaccines.
3. Congress will continue to receive single agencies' perspectives on vaccine-related issues. It will not develop an ongoing capability to survey both comprehensively and prospectively vaccine research, development, and production activity in either the private or the public sector. For the most part, congressional activities related to vaccine research and development will remain oriented toward specific issues or crisis situations.

If Congress believes that the impact of Federal vaccine policies on the commitment of the pharmaceutical industry to develop and supply vaccines needs to be assessed, or if it believes that the recent decline in number of vaccine manufacturers may portend a decline in the capacity of the pharmaceutical industry to develop and produce needed vaccines, then it might adopt one or more of the three options presented below.

OPTION A-1:

Establish a permanent interagency body within HEW to:

- **Develop priorities for facilitating and coordinating vaccine research, development, and evaluation in the public sector;**
- **Monitor vaccine research, development, and production in the private sector; and**
- **Report to Congress periodically.**

Federal agencies represented in this body could include HEW agencies with vaccine-related responsibilities, such as CDC, NIAID, and BOB, as well as other Government agencies (e. g., the Department of Defense) that influence vaccine research, development, and evaluation. In addition, vaccine research communities from the pharmaceutical industry and academe, as well as consumers, could be represented. This body could report either to the Secretary of HEW or to the Assistant Secretary for Health.

All Federal and private agencies represented in this body could contribute data that could be used to accomplish the following tasks:

1. Develop national priorities for basic, epidemiologic, and applied research that relates to vaccines.
2. Assess the level of public and private resource commitment to the identified priority areas of national vaccine research and development.
3. Recommend Federal funding levels and topics for vaccine research and development.
4. Monitor the capacity and willingness of the U.S. pharmaceutical industry to produce and supply vaccines.
5. Assess the capacity of the Federal Government to produce vaccines, should the need for Government production ever arise.
6. Assess the impact of all Federal laws, regulations, and policies that may affect manufacturers' commitment to vaccine research and development.
7. Report results from its continuing investigations and analyses to Congress in written documents, as well as congressional testimony, on a regular basis.

Specific questions that could be addressed by this body are identified in figure 11.

Figure 11.—Questions That a Government Interagency Body on Vaccine and Immunization Issues Could Consider

Federal Financing of Vaccine Research and Development

1. What criteria do Federal agencies such as NIAID that support vaccine research and development use to allocate research dollars? How do these agencies plan to use their resources in the future?
2. To what extent does the availability of Federal funds for vaccine research and development influence a pharmaceutical company's decision to develop a vaccine product?
   - Has NIAID or any other Federal agency influenced the willingness of a company to pursue the development of a vaccine other than pneumococcal vaccine?
   - Has Federal financing for vaccine research ever deterred a company from developing a vaccine?
3. Should public funds be given to private companies to support research that leads directly to the development of a marketable product on which a company can make a profit?
4. To what extent and in what ways can Government and private industry share the financial responsibility for researching, developing and selling new vaccines?
   - What percentage of vaccine research and development is financed by the Federal Government?

Figure 1 l.-(Questions That a Government Interagency Body on Vaccine and Immunization Issues Could Consider-cont.

- What types of vaccine research do pharmaceutical companies conduct without Federal funds, and for what types do they rely on the Federal Government?

Federal Vaccine Safety and Efficacy Requirements

1. Has any manufacturer curtailed the development, clinical testing, or production of a vaccine because of the costs related to complying with procedures and standards established by BOB? If so, did any other manufacturer overcome these obstacles and market the product involved?
2. Can the need for, and effectiveness of, BOB's procedures and standards be demonstrated?
   - How does the reported incidence of faulty Vadcine products or vaccine-induced harm compare before and after BOB intensified its activities in 1972, or before and after BOB's predecessor, the, Division of Biologics Standards, wasestablished in 1955?
   - How does the record of safety and efficacy of vaccines marketed in the United States compare to the record of vaccines sold in other countries?
3. If current Federal vaccine safety regulations and policies are found necessary to protect vaccine recipients, but are also found to be impediments to vaccine innovation and production in the private sector, what types of activities could the Federal Government undertake to help overcome these impediments and yet help protect the public?

Federal Vaccine Purchasing Policies

1. To what extent do Government vaccine purchasing policies affect the market size for, and pharmaceutical companies' profits from, vaccines, thereby possibly influencing these companies' commitment to vaccine research, development and production?
2. What effect do the low-bid prices of vaccines sold to the Government have on the prices of vaccines sold in the private sector?

Federal Liability for Vaccine-Induced Injuries

1. To what extent, if any, are unresolvedvaccine liability issues affecting American pharmaceutical companies' overall commitment to vaccine research, development, and production activities?
2. If the courts continue to broaden vaccine manufacturers' liability for unavoidable injuries caused by their products, what impact will this liability have on the willingness of manufacturers to develop and supply vaccines needed by the Ameriean public?
   - Will pharmaceutical companies continue to develop and supply vaccines to be used in public immunization programs?
   - Will they continue to develop and supply vaccinesto be used inthe private sector?
   - To what extent will this unpredictable liability lead vaccine manufacturers to increase the prices of vaccines sold to the Federal Government, to the private sector, or both.
3. What types of actions might the Federal Government take to help cvercome vaccine liablity problems?
   - To what extent, if any, should it assume liability for vaccine-related injuries produced in public immunization programs?
   - To what extent, if any, should it develop approaches for compensathing victims of vaccine= related injuries?
   - Could it develop mechanisms to allow more comprehensive evaluations of the inherent risks associated with particular vaccines to be used in mass immunization programs?

Federal Government Vaccine Production.

1. Has the pharmaceutical industry ever refused to produce a vaccine that was technically possible to produce and proven to provide safe and effective protection against a known health hazard? If so, what factors led to its refusal?

subsidize—or initiate
vaccines by the pharmaceutical

3. Does the Federal Government already have the resources necessary to produce vaccines, or would Government production require additional investment in capital and human resources? if the latter, what would the costs be? How would these costs compare to those in private industry?

If given only an advisory status, an interagency body would primarily provide a forum for discussion. An advisory body would not likely be a threat to existing powers within HEW nor a threat to the pharmaceutical industry; however, it would have limited ability to make changes in the existing system of vaccine research and development.

An interagency body could be assigned authoritative functions. It could be assigned, for example, responsibility for establishing the priorities and coordinating Federal financing for vaccine research and development. Given authoritative functions, such a body would be better able to change Federal vaccine R&D resource allocations, if deemed appropriate. It also would be more likely to gain the respect of vaccine researchers in the public and private sectors. Centralization of this type of authority might lead to more efficient uses of vaccine research resources; however, centralized authority might create an additional layer of bureaucracy between vaccine researchers and Federal research financing agencies, leading to possible delays in some research efforts.

Implementation of this option would add a formal mechanism for interagency collaboration on vaccine-related issues and situations. Establishment of an interagency body with the tasks listed above could add a prospective or foresight emphasis to the actions of participating agencies. The proposed mechanism also might help to increase the awareness of individual agencies with vaccine-related responsibilities about the potential implications of their actions on the operation and policies of other agencies.

Creation of a vaccine interagency program would give consumers and vaccine manufacturers a forum of Federal regulators and administrators to which they could present their problems and perspectives. In addition, Government regulators could explain more fully to manufacturers and consumers the reasons for their actions.

OPTION A-2:

Establish either a small- or large-scale Federal vaccine production program.

The Federal Government does not produce vaccines for commercial or public use, Supporters of Government-sponsored vaccine production, many of whom work in academe or Government, have suggested that the pharmaceutical industry might fail to market certain vaccines that are safe, effective, and technically possible to produce—but unprofitable (Krugman, 1977). Opponents of Government vaccine production, many of whom work in the pharmaceutical industry, argue that Government production would reduce the incentives for production by private industry (Stessel, 1978).

SMALL-SCALE GOVERNMENT PRODUCTION PROGRAM

A Federal vaccine production program could be designed to produce only products that are not commercially available, i.e., “orphan” and experimental vaccines. In this case, Federal vaccine production would be restricted to only a few products that are designed for limited use among specialized populations or those products used in vaccine research programs..

A recent example of an orphan vaccine is Rocky Mountain Spotted Fever (RMSF) vaccine (Rocky, 1978). A new RMSF vaccine that appears to be more effective than the old one recently was developed by the U.S. Army. The National Institutes of Health

(NIH) is planning to conduct clinical trials of this vaccine, and at least one pharmaceutical company is currently evaluating its market potential. No manufacturer to date, however, has decided to sponsor clinical trials or to apply for product licensure.

A small Government program would help ensure the availability of orphan special-purpose vaccines, such as RMSF vaccine. Because a small program would likely leave intact industry's production of commonly used vaccines, it probably would not substantially affect industry profits from large-scale vaccine production programs.

The costs transferred to U.S. taxpayers for a small vaccine production program have not been estimated in this report, but would be much less than expenses associated with a large-scale program. The costs of settling lawsuits resulting from increased Government liability for injury caused by Government-produced vaccines are unknown. By charging for its vaccine products, the Government could recoup at least some of its expenses.

LARGE-SCALE GOVERNMENT PRODUCTION PROGRAM

Alternatively, a Federal Government production program could be designed to encompass, for example, the manufacture of all vaccines used in federally sponsored immunization programs. Examples of such vaccines include measles, mumps, rubella, polio, diphtheria, tetanus, pertussis, and influenza vaccines.

By establishing a large vaccine production program, the Federal Government would substantially control the availability of most vaccines in this country. It therefore would probably be able to ensure the production of commonly used vaccines, such as poliovirus vaccine, that currently have only one commercial manufacturer.

A large Government production program, however, might erode manufacturers' profits from vaccines. This erosion of profits could reduce even further the industry's diminishing commitment to vaccines, and might lead to a situation in which the Federal Government would be the sole producer of commonly used vaccines.

The costs associated with a large Government-operated vaccine production program have not been estimated in this report.

OPTION A-3:

Subsidize vaccine production by private industry.

Instead of establishing its own production program to ensure the availability of vaccines, the Federal Government could subsidize vaccine manufacturers of produce selected products. Payment could be provided either in the form of direct contracts for production or as a condition of purchase of vaccines by the Federal Government. In the case of pneumococcal vaccine, the direct contract method was used by NIAID when it contracted with Eli Lilly and Company to produce experimental pneumococcal vaccines. (See chapter 2.)

To date, the Federal Government has not required any manufacturer to produce one vaccine as a condition for its purchase of another vaccine. Conceivably, however, the Federal Government could require this. For example, a situation could arise in which two companies were bidding for a large contract to supply the Federal Government with a vaccine, such as measles vaccine, to be used in public immunization programs. If the Federal Government wanted to ensure the production of a relatively unprofitable special-use product, such as RMSF vaccine, it could award the measles contract to the company that guaranteed, for a price, that it would produce a specified amount of the special-use product.

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VACCINE SAFETY AND EFFICACY

The Center for Disease Control's (CDC) system for monitoring adverse reactions to licensed vaccines (see appendix 3.7) may permit detection of certain types of rare adverse reactions not detected in premarketing clinical trials. (See chapters 3 and 6.) As currently planned, however, the system will not generate data that will permit calculation of incidence rates of adverse reactions among defined populations.

If Congress believes that the collection of data more comprehensive than those collected under CDC's system is unnecessary, then it could take no action and await more complete assessment of the effectiveness of this system. If Congress believes that the establishment of an active or mandatory postmarketing surveillance (PMS) system is desirable, however, it could authorize one or more agencies of the Department of Health, Education, and Welfare (HEW) to conduct active surveillance of licensed vaccines.

Potential participants in an active PMS system are vaccinees, health professionals, the Government, industry, and academe. A successful system would be one with positive incentives for these five potential participants collectively to provide, collect, and analyze data in a way that would permit comprehensive evaluations of the safety and efficacy of vaccines in general use.

The ultimate source of financing for PMS would be consumers; the two indirect sources would be vaccine manufacturers and the Federal Government. The distribution of the direct operating costs of a PMS system probably would influence the distribution of authority to operate the system. If the bulk or all of these costs were borne by the Federal Government, then the Government probably would have greater authority and control over the operation of the system than it would if these costs were incurred by vaccine manufacturers.

PMS costs could be distributed on the basis of the perceived distribution of benefits. If, for example, PMS is perceived to benefit all members of society (e.g., PMS could lead to the development of safer vaccines that produce herd immunity), then perhaps the cost of PMS should be borne by society at large. The use of Government funds would distribute the costs of PMS among all members of society who pay Federal income taxes. If, however, PMS is perceived to benefit only vaccine recipients, then perhaps the costs of PMS should be borne only by them. If this judgment were made, then PMS costs could be borne directly by vaccine manufacturers, who in turn would pass their costs on to vaccine purchasers in the form of higher prices. In the private sector, vaccine purchasers are, for the most part, vaccine recipients. In the public sector, however, the major vaccine purchaser is the Federal Government.

The two options presented below are not mutually exclusive. Congress could require HEW to implement a PMS system in the private sector which would rely on the mandatory cooperation of vaccine manufacturers and the voluntary cooperation of health professionals in private practice. In addition, or alternatively, Congress could establish a mandatory PMS system to collect and analyze data regarding adverse reactions to vaccines administered in the public sector.

OPTION B-1:

Authorize FDA to require vaccine manufacturers to conduct postmarketing surveillance (PMS) of adverse reactions to specific vaccines and intensify Federal efforts to encourage voluntary reporting of such reactions by private sector physicians and clinics.

The Food and Drug Administration's (FDA) Bureau of Drugs (BOD) uses at least three mechanisms to evaluate the safety of marketed prescription drugs. First, for selected new drugs, i t can require pharmaceutical manufacturers to conduct PMS as a condition of approval for marketing. This mechanism is usually reserved for use in situa - tions in which the efficacy of, and public need for, a new drug has been satisfactorily established, but the safety of the drug was not satisfactorily evaluated in premarketing clinical investigations. Second, FDA operates an adverse drug reaction reporting program, in which it receives, tabulates, analyzes, and makes publicly available data from adverse reaction reports voluntarily y submitted by practicing health professionals (Welsh, 1979). Third, FDA requires pharmaceutical manufacturers to submit at least annually to FDA reports they receive from health professionals concerning adverse reactions to their prescription drug products. (See appendix 3.2.)

FDA is seeking congressional approval for more substantial and expanded authority for its PMS activities. The agency is seeking stronger statutory authority on which to base its PMS regulations. It is also seeking authority to require that PMS be conducted for any approved prescription drug that, according to FDA's evaluation, represents a potential hazard to the public's health. Congressional passage of the Drug Regulation Reform Act of 1979 (S. 1045) would give FDA the postrnarketing authority that it wants.

Of the three types of FDA mechanisms cited above; only one, i e., the voluntary adverse reaction reporting system, is used by FDA's Bureau of Biologics (BOB) to evaluate the safety of marketed vaccines. (See chapter 3.) BOB also relies on CDC's voluntary adverse reaction reporting system for data regarding the safety of marketed vaccines.

BOB does have regulatory authority to evaluate licensed vaccines and remove unsafe or ineffective ones from the market. (See appendix 3.1.) This Bureau may lack the authority, however, to mandate the collection of data it needs to comprehensively evaluate the safety of 1icensed vaccines. BOB is attempting to establish its regulatory authority to require vaccine manufacturers to submit to BOB records of reports of adverse reactions to their products; at present, it has no such authority. Further, BOB has not required a vaccine manufacturer to conduct PMS of a new vaccine as a condition of licensure. (Its regulatory authority to do so is not evaluated in this report.)

By including vaccines and other biological products in the postmarketing sections of the HEW-proposed Drug Regulation Reform Act of 1979 (S. 1045), or similar legislation such as that introduced by Senator Edward M. Kennedy (S. 1075), Congress would likely ensure that BOB would have more substantial authority to evaluate the safety of marketed vaccines **than** it has at present. This legislation would give BOB the same statutory authority that it would provide for BOD.

If Congress does not include vaccines in the proposed legislation cited above, then, for its assessment of the safety of marketed vaccines, BOB will have to: 1) remain dependent on the reports of adverse reactions voluntarily submitted by health professionals

and vaccine manufacturers; 2) attempt to promulgate more postmarketing regulations using its existing statutory authority; or 3) seek congressional approval for expanded postmarketing authorities under separate legislation.

The costs of PMS to vaccine manufacturers have not been estimated in this report. Some pharmaceutical manufacturers have claimed to have spent between $500,000 and $1 million on PMS activities for a prescription drug (Kennedy, 1979). Most manufacturers' PMS-related expenses probably would be passed on to vaccine purchasers in the form of higher product prices. In the private sector, the costs of PMS would likely be incurred by vaccine recipients. Any PMS costs incurred by manufacturers for products used in the public sector would 1ikely be incurred by the Federal Government.

To encourage voluntary reporting of cases of adverse reactions to vaccines by health care practitioners in the private sector, the Federal Government could create health care provider education and participation programs. Such programs could increase practitioners' awareness of potential adverse reactions, encourage them voluntarily to submit reports of such reactions, and provide them with results generated from the nationwide surveillance system.

Implementation of this option probably would yield more data regarding the safety of licensed vaccines than are yielded at present. Because of the difficulties involved in determining the number of vaccine doses administered to defined populations in the private sector, however, it would not be likely to yield data that could be used to calculate the rate at which such reactions occur. Data generated through case reports collected through this type of system, however, could supplement data from CDC's voluntary case reporting system in the public sector.

On the negative side, implementation of this option might reduce pharmaceutical manufacturers' commitment to vaccine research, development t, and production. Some manufacturers might perceive mandated participation in postrnarketing surveillance as unnecessary and costly, and consequently, might terminate the vaccine component of their business.

Further, mechanisms which the Federal Government might employ to solicit information regarding adverse reactions to vaccines administered by physicians in the private sector, including the mechanisms described above, are likely to fail. The Federal Government at present has no effective means by which to compel private sector physicians to report the number and types of vaccinations they administer, let alone the number of adverse reactions to these vaccinations. Private sector physicians' participation in public health data reporting systems in the past, in tuberculosis and venereal disease reporting programs, for example, has been less than enthusiastic. Private sector physicians may be especially reluctant to report adverse reactions to vaccines for fear of malpractice suits alleging physician negligence in administering a vaccine as the cause of an adverse reaction.

OPTION B-2:

Convert CDC's passive, voluntary case reporting system to an active, mandatory postmarketing vaccine surveillance system to monitor reactions to vaccines used in public immunization programs.

Congress could authorize HEW to undertake active postmarketing surveillance of selected vaccines administered in public health c1inics under federal] y sponsored immunization programs. Given such authorization, CDC could require participating State and

local health departments to maintain records of the number of doses of vaccines administered and actively to solicit information regarding adverse reactions.

An active, mandatory surveillance system to monitor reactions to vaccines administered in the public sector would involve varying degrees and types of participation from the following: vaccinees, physicians or other health professionals in State and local health departments who administer vaccines, and Federal Government scientists (e. g., epidemiologists and statisticians). Tasks assigned various participants would be to:

1. Maintain vaccination records (i.e., records of who got what vaccine, where and when).
2. Solicit, verify, and tabulate the number and types of adverse reactions experienced by vaccinees over a given time period (Kramer, 1979).
3. Compile data regarding the number and types of adverse reactions to particular vaccines, analyze these data, and calculate rates for the incidence and prevalence of specific adverse reactions.
4. Publicize the results among health professionals, State and local health departments, and the public.
5. Reassess the relative benefits and risks of licensed vaccine products for which an unacceptably high incidence of serious adverse reactions is found.

Mandatory use of a PMS system for- all vaccines used in public immunization programs probably would not be warranted. A mandatory PMS system for vaccines administered in the public sector could be used to monitor selected vaccines at various stages of development. Thus, licensed products that pose reasonably well-known risks, but meet a special societal need, could be monitored along with products that appear to represent new immunizing breakthroughs, but which may also have unknown toxicities.

Congress itself could develop criteria for the use of PMS to monitor vaccine safety, to or it could assign this responsibility to the Secretary of HEW. One reason for assigning the task of developing PMS criteria to the Secretary of HEW might be to allow participation of HEW agencies with specific areas of expertise, such as CDC, FDA, and NIH. Precedent for- assigning the task of developing criteria to the Secretary of HEW is the assignment to the Secretary under the “eminent hazard” section of the Food, Drug, and Cosmetic Act (2 I USC 355E) of authority to remove from interstate commerce any drug shown to be an eminent hazard to the public’s health. In contrast, precedent for establishment of criteria by Congress is the Delany amendment contained in the 1958 Food Additive Amendments to the Food, Drug, and Cosmetic Act, under which Congress required FDA to remove from interstate commerce any carcinogenic (cancer-producing) food additive.

Under the swine flu immunization program, active postmarketing monitoring of adverse vaccine reactions led to a more thorough evaluation of the safety of swine flu vaccine than was originally intended. This program was operated by Federal, State, and local government agencies, and many people were vaccinated in public programs. CDC, in cooperation with State and local health departments, was able to collect and analyze data generated by participating health professionals. Thus, the approximate incidence of Guillain-Barre Syndrome (GBS) associated with swine flu vaccination, one case per 100,000 vaccinees, could be calculated. (See appendix 5.1.) If swine flu vaccine had not been given to as many people (40 million) over such a short period of time (about 3 months), and if more people had received the vaccine in the private sector (from community-based physicians), the association between GBS and swine flu vaccine probably would be less clear.

A PMS system that accomplishes all of the tasks described above would allow for more comprehensive evaluations of the safety of vaccines used in public immunization programs than are possible at the present time. Such a system, however, would require more resources than CDC's voluntary, case reporting system. The amount of additional resources that would be required to establish and maintain such a system, however, cannot be precisely estimated. This amount would depend, first, on the degree of sophistication of the mandatory PMS system that might be developed, and given this, on the adequacy of CDC's currently available resources.

Virtually all of the costs of a mandatory PMS system for vaccines administered in the public sector would be borne by U.S. taxpayers. The Federal Government would direct and control the entire PMS effort and would rely very little, if at all, on resources from vaccine manufacturers. Any costs incurred by vaccine manufacturers, furthermore, most likely would be passed on to taxpayers in the form of higher prices for federally purchased vaccines.

Mandatory PMS activities could be a disincentive for local and State public health clinics to participate in federally sponsored public immunization programs. Such activities could cause clinics to increase their operating expenses and to divert a substantial portion of their currently limited resources from other activities.

COST-EFFECTIVENESS ANALYSIS OF VACCINATION PROGRAMS

The policy options presented below are based in part on OTA's cost-effectiveness analysis (CEA) of pneumococcal vaccination presented in chapter 4. Findings and issues related to this CEA are discussed in chapter 6. Options are categorized as follows: 1) general applications, 2) specific use in reimbursement decisions, and 3) methodological and data problems.

General Applications of CEA

Most decisions made in health care, or any field, take into account some informal weighing of costs and outcomes or benefits. Formal CEA, however, has not been widely used in health care decisionmaking. Despite a substantial increase in the rhetoric of "cost-effective decisionmaking," the technique of CEA has remained principally a phenomenon of academic journals. (See appendix 4.3.)

This state of affairs may now be changing. Increased awareness on the part of policymakers, providers, and the public of the sometimes inadequate state of knowledge about the efficacy, effectiveness, and costs of medical technologies, combined with tight budgets, may lead to increased evaluation of these technologies. Such evaluation might include the use of formal CEAs.

CEAs and benefit-cost analyses (BCAs) are explicitly included in the mission of the new National Center for Health Care Technology (NCHCT) of the Department of Health, Education, and Welfare (HEW). The legislative authority for NCHCT, however, covers only the conduct of CEAs; it does not cover their application.

Selection of the following option would likely increase the Federal Government's use of cost-effectiveness analysis.

OPTION C-1:

Federal agencies could include formal CEA in the process of allocating funds for vaccination and other health care programs.

Federal agencies that might use CEA in allocating funds for vaccine-related programs include the National Institute of Allergy and Infectious Diseases (NIAID), the Center for Disease Control (CDC), and the Health Care Financing Administration (HCFA). (See chapter 6.)

A possible advantage of this option is that, when used appropriately, cost-effectiveness criteria could lead to more rational allocation of Federal resources. Thus, the judicious use of CEA might lead to better selection of programs to reduce health care costs or improve health status. As suggested by the case study of pneumococcal vaccine, for example, vaccination would produce health benefits that could not be derived from treatment, and for some age groups, vaccination appears to be relatively inexpensive. (See chapter 4.)

No reasonable estimate can be made of potential reduction in overall health care costs that might result from using CEAs. That reduction would depend on how widely CEAs were used and for what decisions (for individual technologies, for entire programs, and so on), and on external factors such as the incentives affecting use of health care resources. If certain technologies or programs were utilized on the basis of CEA projections of savings, for example, those savings might not yield a reduction in overall health care expenditures; the funds might be diverted to other health care programs. Overall public expenditures on health care might still be determined by political, economic, and cultural forces.

A potential disadvantage of greater application of CEA information is directly related to the very strength of the technique. CEA is a technique for improving the rationality of decisionmaking—at least in terms of economic efficiency. Cost-effectiveness analysis has the potential to improve the efficiency-related aspects of resource allocation, but can do little to aid the noneconomic aspects of rationality. CEAs often exclude considerations of equity, politics, and distribution. When a bottomline dollar-figure is generated in a CEA, the excluded factors may not appear important; further, some included, but subjective, factors (such as choice of discount rate) may become hidden.

Another potential disadvantage of this option is the possibility that Government time and funds would be spent on formal CEA when an informal or less rigorous analysis would serve as well. The lack of criteria for determining the need for forma] analysis may result in overapplication of the technique.

CEA and Its Relationship to Reimbursement for Vaccinations

Only two preventive vaccines are currently marketed for general use by persons over age 65: influenza vaccine and pneumococcal vaccine. According to OTA's cost-effectiveness analysis, vaccination against pneumococcal pneumonia provides health benefits that cannot be derived from treatment of that disease. (See chapter 4.) Under most conditions, health benefits can be obtained at either a very low cost or even a small savings. Furthermore, vaccination against pneumococcal pneumonia is more cost-effective among the elderly than any other age group, Kavet has demonstrated that vaccination against influenza also yields health benefits among the elderly that treatment cannot provide; further, under certain circumstances, influenza vaccination among the elderly

might be cost-saving (Kavet, 1972). Other vaccines that likely will be designed to reduce the incidence, morbidity, and mortality of infectious diseases that affect the elderly are being developed.

The Federal Government has only one authorized mechanism to pay for preventive vaccinations among the elderly: Congress can authorize HEW to include a particular vaccine in federally sponsored public immunization programs. (See chapter 6.) In 1976 and 1978, for example, Congress authorized and funded public immunization programs against influenza with a special emphasis on vaccinating the elderly. Congress has refused, however—in part because of unresolved liability issues (see chapter 5)—to authorize HEW to establish an ongoing influenza vaccination program.

Congress could enact legislation to authorize the inclusion of pneumococcal vaccine in federally financed mass immunization programs. Mass immunization with pneumococcal vaccine, however, is not currently recommended by the Advisory Committee on Immunization Practices (ACIP), which advises CDC on immunization issues. ACIP specifically recommended that pneumococcal vaccine be administered only to individuals who are at particularly high risk of contracting or dying from pneumococcal pneumonia or bacteremia (U.S. Ex. Br., CDC, MMWR, 1978). ACIP's recommendation probably was based on the observation that pneumococcal diseases are probably not highly contagious in the general population; pneumococcal vaccine, therefore, most likely protects only those who receive it (i. e., herd immunity resulting from vaccine probably would be negligible). Traditionally, the Federal Government has directed its public immunization programs against childhood diseases, in particular against communicable infectious diseases.

An alternative or supplementary method of financing vaccinations among the elderly would be the use of Medicare. At present, however, the Medicare law specifically excludes reimbursement for vaccinations. Congressional action would be needed to change the law.

OPTION D-1:

Amend the Medicare Law to permit reimbursement for preventive vaccinations.

Congress could permit Medicare to pay for immunizations by amending the 1965 Amendments to the Social Security Act to strike the word "immunizations" from the list of benefits specifically excluded from coverage in the law [42 USC 1395(y)].

In amending the Medicare law, Congress itself could establish criteria for the selection of immunizing agents to be included in the Medicare benefit package, or it could assign this responsibility to HEW. Examples of types of agents that might be considered for inclusion in the benefit package are these:

- Agents that help prevent diseases that particularly affect the elderly.
- Agents designed for use in special high risk populations.
- Agents that are not included in publicly financed immunization programs.
- Agents that have been proved both safe and efficacious, and possibly cost-effective, when used by individuals 65 years and older.

Some type of special payment mechanism for vaccinations under Medicare might be necessary. Under the current system, Medicare beneficiaries might have to pay a substan-

tial copayment (deductible and coinsurance) before receiving a vaccination. The total cost of pneumococcal vaccination in the private sector is about $11. Because of copayment requirements, some beneficiaries might forego vaccination, thus defeating the purpose of authorizing reimbursement.

Possibly, a schedule of payments for preventive services such as immunizations could be established without copayment requirements. For preventive services, a schedule of payments without copayment requirements might be sensible, because preventive services—unlike treatment services for most diseases—are not insurable risks; on the contrary, preventive services are predictable events designed to help reduce the risks of disease in the future. Financial incentives to encourage Medicare beneficiaries to demand such services, subsequent to their inclusion in the benefit package, therefore, may be desirable.

One mechanism that could be used to encourage the use of selected vaccines by Medicare beneficiaries is the inclusion of a coupon for one or more vaccinations in a mailing of the beneficiaries' monthly Social Security checks. Subsequent to administering the vaccinations, physicians could submit these coupons to Medicare for reimbursement.

On the one hand, there appear to be several reasons to pay for preventive vaccines under Medicare. First, it seems to make little sense to pay for the treatment of infectious diseases, such as influenza and pneumococcal pneumonia, and not to pay for vaccinations to help prevent them. With treatment costs rising at unprecedented rates, the economic value of a relatively inexpensive preventive vaccine is increasing. Second, studies of pneumococcal vaccine and influenza vaccination document a benefit of vaccination that cannot be attained with treatment, namely, a gain in years of life. Moreover, the effectiveness of antibiotic treatment of pneumococcal pneumonia may be declining (Austrian, 1964; Jacobs, 1978).

On the other hand, there may be reasons not to change the Medicare law to permit payment for vaccinations. First, it is possible that Medicare payment for vaccination would not increase the total number of vaccine recipients among those over age 65. Payment might simply transfer the cost of vaccination to Medicare from those who would pay for the vaccine on their own. Second, the net cost of vaccination in publicly financed immunization programs may be lower than the cost in the private sector. Therefore, Congress may be able to encourage vaccine use more efficiently by increasing its reliance on public immunization programs, rather than expanding Medicare coverage.

CEA Methodology and Data

The methodology of cost-effectiveness analysis is still evolving and exhibits certain shortcomings. (See chapter 6.) Standardization of certain aspects of CEA methodology and research aimed at reducing methodological shortcomings might strengthen CEA as an analytical technique. Similarly, efforts to identify and collect data necessary or desirable for CEAs—many of which are currently not available or not in usable form-might enhance CEA's potential utility in improving the economic efficiency of resource al1 oca t i ons.

Selection OF the option below could facilitate the evaluation CEA as an analytical tool and might enhance the utility of this technique to the Federal Government.

OPTION E-1:

Federal agencies, including HEW, could begin to develop standardized and refined CEA methodology and basic data sets for CEAs.

The legislation creating the National Center for Health Care Technology (NCHCT) permits that agency not only to conduct CEAs, but also to develop general methodology and data for such assessments. NCHCT could conduct pilot evaluations of certain technologies that would force analysts to confront some of the methodological weaknesses (e.g., developing acceptable health status indexes) or areas of disagreement (e.g., how to account for multiple outcomes or effects).

CEA methodology and data problems could be addressed jointly by NCHCT, the National Center for Health Services Research (NCHSR), and the National Center for Health Statistics (NCHS). These three Centers are all under the authority of HEW's Deputy Assistant Secretary for Health Research, Statistics, and Technology. Thus, coordination among the three Centers and the Deputy Assistant Secretary's offices could greatly improve the feasibility of implementing this option.

Resolution of some CEA methodological shortcomings will likely require efforts by Federal agencies in addition to HEW. For example, the Office of Management and Budget (OMB) is a major force in decisions about what discount rate should be used. Some type of cooperative agreement or study would be needed to standardize such aspects of methodology .

One potential advantage of this option is that it could accelerate certain data-related activities within the three Centers mentioned above. Two examples are: 1) the development of population-based data sets regarding the incidence, prevalence, morbidity, and mortality of chronic conditions; and 2) the development of methods to reflect multiple causes of death and the interactive effects of multiple diseases.

A related advantage is that methodological and data improvements which increased CEA researchers' ability to characterize populations or medical conditions would also benefit health services research in general. Work on health status indexes, for example, might benefit the identification of medically needy, the comparison of different settings for health care, and the comparison of different delivery systems.

Standardized CEA methodologies, once developed and put into use by HEW or other health agencies, could greatly facilitate comparisons of different types of medical technologies. In general terms, agreement on methodological elements, such as types of effects to be measured and the discount rate, along with better health status data on effects could improve comparisons between technologies or programs designed to improve health but not targeted at the same disease. The economic and medical aspects of a cancer prevention technology, for example, might be compared to those of hypertension treatment. Standardized methodologies also might permit comparisons of the cost-effectiveness of various types of vaccinations at selected ages throughout life.

Potential disadvantages are associated with this option. Improvements and standardization of methodology and data sets would be expensive. Both research and administrative programs would be necessary. An intangible disadvantage might be the inconvenience to providers—and consumers—who may have to provide data at a time when there is an expressed effort to reduce burdensome Federal paperwork and regulation.

One possible weakness of this option is the difficulty that would be encountered in attempting at the same time both to improve the methodology (i.e., hasten the evolution of the technique) and to standardize major aspects of it. This is probably not a significant

enough disadvantage to counter the advantages of the option, but it is one that will have to be seriously taken into account. Overcoming this difficulty may require flexibility in setting—and revising—methodological standards. Since such flexibility is not a hallmark of bureaucracy, some form of oversight mechanism may be a desirable addition to the option.

LEGAL LIABILITY AND COMPENSATION FOR VACCINE-RELATED INJURIES

Unless Congress takes some definitive action, decisions concerning liability and compensation for vaccine-related injury will continue to be made on a case-by-case basis by the courts. (See chapter 5.) By maintaining the status quo, the Federal Government may be perpetuating a degree of uncertainty that is, or could be, leading to a reduced commitment of vaccine manufacturers, as well as State and local health agencies, to public immunization programs. Until vaccine liability issues are resolved, all participants in federally financed immunization programs proceed with caution. Manufacturers and Congress scrutinize their commitments to public immunization programs at least yearly, State and local health agencies are concerned about the malpractice risks of their employees, and the public's enthusiasm for vaccines may be waning. (See chapter 6.)

Current case law has placed ultimate liability for the "duty to warn" potential vaccinees about the statistically remote risks of serious vaccine-induced injury on the vaccine manufacturer. In its recent vaccine purchase contracts with manufacturers, however, the Department of Health, Education, and Welfare (HEW) has assumed responsibility for developing an adequate informed consent statement to be used to discharge the legal duty to warn; HEW is requiring participating State and local health agencies to use this statement and HEW guidelines before administering vaccines in federally financed public immunization programs. HEW and vaccine manufacturers disagree on who now has legal responsibility to inform potential vaccinees of the risks of vaccination.

There is no definite way to predict whether a court in any given instance will find HEW's informed consent statements, and the way in which they are used, to be adequate. If a court finds that the duty to warn has been successfully discharged, then injured vaccinees would not be legally entitled to compensation. Even if a court finds in a particular case that the duty has not been discharged, whom the court will hold 1iable is not predictable. The duty to warn may be contractually transferred from the vaccine manufacturer to other participants further down the vaccination distribution and administration chain. It is not clear, however, how this transfer may be accomplished to the satisfaction of a court.

If the Federal Government takes the position that liability for vaccine-related injury should be determined by the courts, it is doing its best to avoid assuming the responsibility for compensating the injured. If HEW successfully defends its current position that underlying responsibility for the duty to warn still rests with the manufacturers, however, vaccine manufacturers may become even more reticent than ever to continue developing and producing vaccines. If manufacturers are able to obtain liability insurance, then it is likely that they will pass the costs of such insurance on to the Federal Government and other vaccine purchasers in the form of higher vaccine prices.

Alternatively, however, if vaccine manufacturers are not able to obtain liability insurance, they may ask the Federal Government to indemnify them from all duty to warn

liability before they will produce vaccines for future federally financed public immunization programs. This is what happened under the 1976 swine flu program. Failure to meet the manufacturers' requirement(s) could lead to a further decline in, and possible termination of, vaccine production in the private sector. In this case, if the Federal Government chose to retain its commitment to public immunization programs, it might have to establish Government vaccine production programs.

By allowing vaccine liability cases to be decided by the courts, the Federal Government minimizes its administrative and legal expenses for settling liability lawsuits arising from public immunization programs. The current system also may keep the number of lawsuits for claims without merit to a minimum. Because of the expenses associated with large court cases, though, some persons truly injured in public immunization programs may never seek compensation.

The Federal Government's involvement in all phases of vaccine development, quality assurance, promotion, and use might justify the Federal Government's developing an approach to mitigate liability problems that would improve injured vaccinees' access to compensation. If Congress believes that such an approach is warranted, then it might consider adopting one of the two options presented below. A central element of each of the options below is easier access to compensation for vaccinees injured in federally sponsored public immunization programs.

OPTION F-1:

Assume responsibility for defending all claims of vaccine-induced injury incurred in public immunization programs and maintain authority to sue negligent parties.

This model is analogous to that used in the swine flu program. (See chapter 5.) Under this option, the Federal Government would become the primary defendant in all legal actions involving claims of injury sustained as a result of vaccination in a public program. The Federal Government would assume liability for the duty to warn, but would retain the right to sue other parties for negligently caused injury. Vaccine manufacturers would incur costs in assisting the Government in the preparation and defense of lawsuits under this option, but would be somewhat insulated from the expense of defending lawsuits.

As the Federal Government would be the primary focus of claims for compensation, it might relax the vigorousness of the kinds of proof that would be needed to obtain compensation. Under the legal liability system, foreseeability is a fundamental concept in assigning liability. (See chapter 5.) In its processing of claims from plaintiffs who allegedly contracted Guillain-Barre Syndrome (GBS) by participating in the 1976 swine flu program however, the Federal Government apparently is relaxing the requirement of proof of foreseeability. GBS injuries were not a foreseeable consequence of immunization at the start of the swine flu program. In order to provide compensation to injured vaccinees, the Government is requiring proof of causation between swine flu inoculation and alleged injury more than proof of foreseeability of injury. This approach is more compensation-oriented than an approach based on strict application of judicial doctrine. If the Federal Government were to decide to use a similar approach in the future, compensation would depend less on whether an adequate warning had been given than on whether significant injury had occurred as a result of immunization.

In terms of increasing injured vaccinees' chances of receiving compensation, this approach might represent an improvement for the class of injured vaccinees as a whole; however, it might not represent an improvement for the rare individual vaccinee who successfully maneuvers the current 1itigation process and receives a large award. Such a tradeoff between high individual awards and more awards of less individual worth is typical of the kinds of tradeoffs that would have to be made in either continuing the current situation or developing a more compensation-oriented system.

Immediate and direct costs to the Federal Government would increase under this option because of the administrative expense of processing, evaluating, and defending claims and because of the costs of compensating successful 1itigants. Long-term and indirect costs to the Coverrnent might or might not increase. Indirect "costs, " such as decreased public participation i n immunization programs, might be less under this option, because the Government would be taking a positive approach, or at least not a passive one, to the problem of injured vaccinees.

OPTION F-2:

Establish a federally operated program to compensate vaccinees injured as a result of being vaccinated in public immunization programs.

A frank compensation approach could take any one of several forms ranging from modifications of the legal 1iability system, to integration into existing social insurance programs, to melding with existing injury compensation approaches that have similar rationales for compensation (e. g., for the injured in medical experimentation). The details of specific Federal compensation approaches that might be developed will have to await further studies. Data currently being collectedly HEW may assist in estimating the costs of a compensation system, determining which injuries should be compensated, and which systems should be used to deliver compensation.

The four major tasks in establishing a Federal compensatic~n system would be the following. First, criteria for- the selection of vaccinees eligible for compensation would have to be established. Compensation could be limited, for example, to persons whose injuries result from vaccinations that the Government promotes to a substantial degree. This would provide compensation to injured recipients of the childhood vaccines and certain influenza vaccines, but not vaccines such as rabies.

Second, the types and severity of injury qualifying a vaccinee for compensation would have to be established. Under present legal approaches, what should be compensated is decided on the basis of individual assessment of causation, foreseeability, and severity of injury. Under a compensation approach, there would have to be some test of causality and cutoff point on the severity of injury for which compensation will be provided.

Third, the amount of compensation to be provided to injured vaccinees would have to be determined. A basic tenet of damage assessment in litigation is that damages are set according to the particular circumstances of the individual. Under the legal liability system, compensation is awarded in lump sums based on a judge's or jury's determination of the projected needs of an injured person. Under a frank compensation system, which is oriented away from the adversary process toward the assumption of societal responsibility for injury, however, compensation could not be based primarily on consideration of individual circumstances. Instead, some general standards of levels of compensation would have to be established. The compensation mechanism could be structured,

however, to pay for injured persons' needs as they occur. Further, payments could be standardized, at least within set ranges, for selected types of injuries. Efforts could be made to ensure that the schedule of payments adopted under the system is not excessively restrictive and to provide for updating the schedule of payments as needed to keep pace with increases in the cost of living.

Fourth, financing mechanisms would have to be created or selected. Prior analysis in this report has shown the difficulty of applying insurance principles to finance such a system. (See chapter 5.) Furthermore, given the limited number of injuries arising out of even mass immunization programs, it would appear that the development of a free-standing compensation system might not be warranted. The issue of how compensation should be given is a generic one in reform of the injury liability field and has been extensively studied. No amount of further analysis here will bring new insight to bear upon the exact contours of the compensation system that might be developed. Any specific approach would need clarification, public debate, and compromise.

The advantages and disadvantages of establishing a federally operated program to compensate vaccinees injured as a result of being vaccinated in public immunization programs are largely speculative at this point, but in some respects parallel those cited in Option F-1. Court costs to the Federal Government probably would be lower under this option than those under Option F-1, but administrative costs probably would be greater. In addition, under this option, injured vaccinees probably would have easier access to compensation.