A SYSTEMS APPROACH TO HEALTH INSURANCE POLICY INFORMATION

A PRELIMINARY TAXONOMY OF HEALTH INSURANCE ISSUES, PROGRAM OPTIONS, PROBLEMS AND SOLUTIONS

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Abstract—A methodology is proposed for assisting health insurance policy analysts by developing a systems approach to health insurance information and literature. The general approach is to supply a link between the quantitative and qualitative information available, and the analytic needs of policy analysts. There is a great deal of information available, but traditional cataloging and indexing techniques do not adequately meet the policy researcher's and analyst's information needs. The most important of these once goals and limitations are identified, is knowledge of the interrelationships between program options in terms of expected results (problems, solutions) in a wide range of settings.

The key element of the approach used is the concept of an information frame, based on considering health insurance as systems of issues, program options, problems, and solutions with interrelationships explicitly defined. This approach would provide initially qualitative identification of these interrelationships and make them available via a machine readable taxonomy of the components. With substantiating literature references, preliminary work on the building of the taxonomy is based on seven major health insurance issues, and over 70 program options, 325 problems, and 350 solutions so far identified for 170 of the problems. The implementation of this methodology would provide analytically structured information for policy analysts in a format not presently available.

The multi-country information to be included would allow consideration of alternatives which might otherwise be neglected. The result would improve an important element of the analytic process, and reduce the lead time required for inquiries by health insurance policy analysts, legislators, health planners and administrators.

I. INTRODUCTION

In a rational model, policy analysis, as a search for ways of determining preferred policies, should be able to consider as many options as possible. Recognition of the desirability of expanding the range of policy options as a means to more rational policy outcomes has led to an increasing interest in cross national studies. The number of such studies has greatly increased in the past decade and shows every indication of continuing to do so[1]. A recent publication by HEW and NSF indexes some 4000 selected books and articles on the effectiveness and efficiency of alternative programs in health and social welfare[2]. The growing amount of information available in health insurance and health system programs is, however, inadequately structured for easy access particularly with regard to actual experience with various program options.

Thus, the policy analyst is still faced with the task of having to make decisions based on whatever information he is able to assimilate. To the extent that the information can be systematically structured his burden can be lightened. Jay Forrester has maintained that without an integrating structure, information remains a hodge podge of fragments. "When a structure and governing principles for systems have been accepted, they should go far to explain the contradictions, clarify the ambiguities and resolve the controversies in the social sciences"[3].

Faced with the challenge to review health insurance in an extremely concise manner, one of the writers developed for teaching purposes a conceptual listing of health insurance issues, problems and solutions in early 1975. Subsequently this approach was encouraged as well as assisted by the academic environment of the authors and expanded into a project to establish a systematic information frame for eventual indexing of literature and other reports relevant to health insurance. The usefulness of the information frame was tested by collecting a set of references for application of program options and solutions in several European countries and linking them to the information frame. Eighty-five of these earlier generated solutions were thus verified in practice in various European countries. This trial run proved encouraging as a potentially useful method for structuring information about alternative approaches in health insurance policy in the countries examined. This paper describes an attempt to apply this basic concept of a systematic structure to the organizing of information on comparative health insurance policies. While specific to a particular substantive area, the framework should also be generally applicable to comparative policy analysis.

Comparative policy analysis provides material for evaluating alternatives among possible choices by looking at their recorded or probable effects. Comparative research many times will reveal what is possible under certain conditions rather than what is explicitly desirable.

†Special thanks are due to Dean Wilbur J. Cohen and Prof. R. N. Grosse for major contributions to the conceptual development.
or transportable directly to another social setting. The overall goal of the present activity is to improve the decision making process by improving on one important input to the analytic process—comparative information on alternative solutions and problems in health insurance policy. The detailed objectives of the project are as follows:

1. To establish a computer stored taxonomy of major issues, program options, problems, and potential solutions involved in health insurance policy decisions.
2. To establish a capacity to identify for health insurance policy analysts qualitative interdependencies among issues, program options, problems and solutions.
3. To establish a comprehensive identification of actual applications of program options and potential solutions by health insurance systems, within the U.S. and abroad.
4. To establish a selective listing of references from published literature and annual and other reports of health insurance systems linked to a taxonomy created and coded to indicate the type of information contained therein (e.g. resource requirements, program outcomes, theoretical references, etc.).

2. BACKGROUND

One of the most important health and social policy questions today in many countries is that of the choice of the preferred mode of financing and delivering health care to the population. In the broadest view a country's health insurance scheme is a projection of its overt and covert social goals in all the modes of financing and delivering health and medical care and health related activities, as contributions to overall social welfare. A range of societal goals is involved which often conflict (e.g. resource requirements, program outcomes, theoretical references, etc.).

The issues, encompassing a complex range of concerns, vary among countries and often within one country. Major obstacles in implementing or managing a health insurance program can arise from neglected differences in socio-political values among sub-groups in a particular society. It is often overlooked that while it is technically possible to impose a uniform health insurance program on a society in which diverse social values are held, value conflicts among competing interest groups may remain unresolved. These latent conflicts are likely later to lead to unplanned consequences of implemented programs (e.g. Medicaid's excessive cost-escalation[7], Canada's growth of hospital beds and their costs over the past two decades[8]). Unanticipated consequences of the sort experienced in the U.S. and Canada are less likely to occur when a very strong, centralised governmental authority imposes a set of values on all. (China[9], U.S.S.R.[10]).

If the need of the policy analyst is correctly postulated as particularly directed to the interrelatedness of program options and their effects, then the scope of much of the available literature does not address itself to that specific need. There are many comprehensive studies of a descriptive nature (Roemer[11], Simanus[12], Fry and Farndale[13], Fulcher[14], Van Langendonck[15], U.S. Congressional Studies[16], K. Davis[17]), while others endeavor to explore interrelationships of a range of issues and program options Donabedian[18], Berk[19], M. Feldstein[20], Somers[21]). However, the problem of the interdependence of health insurance activities has not been adequately addressed from a comprehensive systems point of view. The complexity of health insurance problems per se and the considerable interrelationships among health insurance options and other social programs and systems make health insurance systems well beyond individual investigation[22].

Thus, health care system analysis requires a considerable amount of manpower time to explore sources of information for each policy issue at the varying levels of decision making—federal or central, state, county and city. Many approaches to analysis are used. In health and social planning, it has been common to look extensively at data collected from within one's own country and, by modifying or adjusting for different assumptions about such variables as population mix, incomes, age distributions, use rates, etc. to make rational decisions about the preferred course action[23].

A recent approach, proposed by some as an improvement over merely attempting to extrapolate from existing data to reach rational conclusions, is the controlled field experiment or special study. The experimental model approach has been used in the United States in attempts to estimate the probable effects of income maintenance programs[24], and of housing allowances[25]. The experimental model has even been proposed as a useful tool for evaluating national health insurance proposals[26]. However, the use of controlled experiments as tools for social planning has been criticized since so many of the necessary criteria and assumptions of controlled experiments are violated in complicated social action and health related programs[27]. In fact, some maintain that the modern techniques in policy analysis which have been pursued with such great optimism in the areas of public housing, manpower training, etc. have had few if any striking successes, partially due to a failure of the analysts to appreciate the complexity of the tasks they were facing[28]. The complexity arises because, inevitably, goals, the resultant programs and their results are all highly interrelated and interdependent. Levin, Roberts
and Hirsch in a more recent approach to policy analysis, applied the theory of systems dynamics to complex social problems, in particular to the specification of the U.S. heroin problem in terms of a closed, or feedback, dynamic system[29]. Useful information has come from the above approaches in some settings, however, they primarily focus on activities and observations within a single society or section of the country. Improved generation of alternatives could result from the consideration of a wider range of possible alternatives, particularly those which tap cross-national experience. The proposed methodology not only would offer more observations than are currently available to the above approaches, but would include qualitative and descriptive evaluative data collected for a wide range of alternative activities. This, along with qualitatively determined interrelationships between the alternatives will serve to complement and assist the above and other approaches, adding alternatives and relationships for testing and scrutiny.

A central component for this process is the development of a systems framework for health insurance issues, program options, problems and solutions on which to build an information base containing structured data elements on a broad range of alternative activities, derived from literature searches and other sources.

3. A SYSTEMS CONCEPT FOR A HEALTH INSURANCE POLICY INFORMATION FRAME

The essence of the presented activity lies in the recognition of two important factors: (1) the need to recognize the interactions that characterize health insurance as a system, and (2) the need for analysts and decision makers to try to consider as many reasonable alternative activities as possible. A principle rationale behind the present attempt at defining health insurance as a system relates to the importance which Forrester gives to systems as the building blocks for understanding complex dynamic behavior by way of the theory of system dynamics[3].

In this view of health insurance the dynamics of the system are initially set in motion by the broad health insurance goals determined by the social values and political will of a society. A health insurance goal here is a category of concerns less specific than the term objectives as used in the usual planning and evaluation context, but yet more operational than a mere statement of societal values. Seven areas or issues have been used to define goals within the current project and are intended to be the basic categories for the major grouping of alternative activities which aim toward the ultimate goal of a healthy society. These goals are listed in Table 1.

The primary means by which attainment of a society's health insurance goals is attempted is by implementation of various program options. The health insurance goals can be thought of as requiring program options aiming at their fulfillment. On the other hand, the very existence of certain programs may serve as a controlling or guiding factor in terms of which broad goals are pursued and with what degree of intensity. In this way there is a kind of synerism between program options and goals so that in most cases neither can be looked at separately, and it may become very difficult to separate out which force has brought a certain set of program options into being. The program options are broad sets of activities, and in the context of this project, may also include many activities not necessarily already in existence.

From the program options, we can project subsequent outcomes either empirically or hypothetically. Some of the outcomes will, it is hoped, be positive and to that extent some attainment of the major goal is achieved. Because all social programs have a variety of impacts, however, the results of any one of them may be felt in areas other than the specific one initially intended. The consequences of a program may be beneficial and expected, but with most activities, because it is inherently impossible for one activity to be all things for all things, they may become very difficult to separate out which force has brought a certain set of program options into being. The program options are broad sets of activities, and in the context of this project, may also include many activities not necessarily already in existence.

There are many different kinds of problems that arise when implementing programs for health insurance goals. A restricted categorization of them would be deficiencies, negative results and constraints. A deficiency would be a structural inadequacy resulting in failure to obtain fulfillment of an objective because of neglect or exclud-

Table 1. Seven major goals of health insurance

| 1 | Promote access to medical care. |
| 2 | Contain indirect financial burden of illness on the individual consumer. |
| 3 | Contain direct financial burden of illness on the individual consumer. |
| 4 | Promote efficient remuneration of providers. |
| 5 | Containment of overall cost of medical care. |
| 6 | Secure appropriate medical care. |
| 7 | Promote preventive health care. |
ing a segment of the population or area of concern. For example, lack of coverage of the unemployed is a

4. PROPOSED DEVELOPMENT OF A HEALTH INSURANCE
INFORMATION FRAME SCOPE

Current state of the art work in library science has
developed several comprehensive multi-coordinate word
indexes for many fields of study. The most elaborate of
these have been prepared for the areas of medicine and
biological sciences (MEDLARS, Science Citation Index).

Word indexes also exist for the social sciences but to
date are not as comprehensive as those for the exact
sciences[32]. These extensive data collections may be
based on multiple keywords from previously written
abstracts, title keywords, or subject content of the cur-
rent literature. Such abstracting and indexing, while
immensely worthwhile and essential in medical and
scientific fields for many purposes, is not what the cur-
rent activity proposes to do. Rather, it is the creation
and use of a taxonomy of health insurance issues, options,
problems, and solutions that forms a key element of the
proposed information frame.

It is clear that the development of consistent typolo-
gies in the social and political sciences lags far behind
such development in the natural sciences. This is no
doubt related to the difficulty of trying to relate complex
social problems and solutions to a clearly categorized
indexing scheme. Also, the time frames for problem
solving, policy analysis, and decision making in the
highly politicized social structures is considerably short-
ter than in such academic disciplines as mathematics,
statistics, or biology, discouraging the considerably time-
demanding efforts in this direction.

Establishing a taxonomy of categories of knowledge is
a laborious endeavor in any field, and for health in-
surance problems as a part of the social sciences pos-
sibly more so than in some other sciences. On the other
hand the first application of a discipline to a field so far
touched usually appears more complex than already
existing applications, without necessarily being so, since
the earlier applications have partly lost their image of
complexity and laboriousness as a result of work already
accomplished.

The establishment and maintenance of indexed
reference collections is labor intensive and costly, due to the
tremendous volume of information indexed. However, as emphasized earlier, comprehensiveness in
the mode of indexes such as MEDLARS and Scientific
Citations Index is not envisaged here. Rather only arti-
cles and reports containing information relevant to the
information frame or for expanding this frame would be
selected. As a result it is expected that the information base will be much smaller in size than those currently in
use and maintained for the more conventional library
searchers. In contrast to conventional indexes, the
coding of the information will require more careful
attention and understanding of the contents of the
references found, since the aim is not to create merely a
keyword reference, but to identify the kind of informa-
tion contained in the reference (e.g. type of political
system, resources identified, quantitative results) and
link it logically to the information frame (see Fig. 3).

It is expected that such indexing will require more
specialty trained indexers than normally used for ab-
stracting of articles, etc. and that extra attention will
have to be given to the crucial problems of inter-coder
reliability. Much use will be made of the existing multi-
coordinate indexed systems, but this will by no means be
the only source of input to the information base. Actual
experience with health insurance options is not always
A systems approach to health insurance policy information

Fig. 1. Systems approach to health insurance policy analysis information
Fig. 2. A systems approach to health insurance policies: Delineation of project boundaries within total system of health and disease.
A systems approach to health insurance policy information

**Kind of information contained in this reference**

1) Type of ref.: theoretical applied legislative regulatory

2) Country & system: Britain -- National Health Service

3) Resources: Manpower Investment Cost Operating Cost Facility

4) Results: Health Outcomes Postulated Positive Negative

5) Financing mechanism: NHS financing - general taxation & contributions

6) Additional information:

Fig. 3. Example of coding card for summarizing references.

Methods

(1) Initial exploration. The activity reported now has been pursued by the authors, assisted through occasional review by colleagues at the School of Public Health in Ann Arbor. An information frame was internally generated using only the three categories—issues, problems and solutions. The listings for these three categories were subsequently partly confirmed as well as expanded through literature search. Further development of the concept led to the recognition of the need to identify program options for the selected issues and to clearly specify criteria for identification of problems and solutions. This recognition led to the outline of the information frame as shown in Fig. 1, using as the basis for the taxonomy the hypothesized operational sequence—issues, program options, problems and solutions. Figure 4 shows the format for listing the program
options, problems and solutions based on the proposed
taxonomy. The sixty-seven program options so far
generated for the postulated issues are provided in Table 2.
An example of the worksheets using this format for
one problem, under one program option, under Issue 1,
Promote Access to Medical Care, is shown as Fig. 5. This
example lists the codes for problem class (reference Fig.
1) and for the criteria used for identification of the
individual problem and solution. It is anticipated that this
identification will provide one of the tools to explore
qualitative interrelationships between solutions and
problems and issues. Also an attempt is being made to
determine the program option, problem and solution.
For identification of program options, problems and
solutions occurring more than once, all such solutions
will be listed with an additional four level value made up
of variables l-4. For the first or primary occurrence of a
solution this would be just a duplication of the first four
variables: but where this solution was one repeated from
a previous location, it would contain the issue, program
option, problem and solution number of that solution
(see Fig. 6).

Once such a data frame has been assembled, a variety
of questions and comparisons can be made. A major
element of flexibility arises from being able to cross
reference any of the variables in the data frame. This
can be done very easily without yet having all the variables
defined, by using only those of most immediate concern
(issue number, problem number, solution number, coun-
try and level of care) on an interactive computer system.
Cross referencing would be accomplished by using
packaged software (already available without immediate
production of new or special computer programs), to
perform sorts and/or counts of the various elements. For
example, if identification of solutions applied for various
problems was desired, the computer can perform a sort
operation on the solution identification field which would
group all occurrences of each solution, and show the
different problems to which it has been applied.
Similarly, counts or cross references by country, or any
of the other variables, could also be obtained rapidly and
inexpensively by a simple computer command. However,
as additional descriptive variables (as well as other con-
straints) are examined special programs can then be
written.

Interrelationships among the program options, prob-
lems and solutions will be explored through "signed
descriptors" for the individual problem or solution qual-
atively indicative of the direction of the effect on the
criteria other than the one used for identifying a problem
or solution as well as on the issues other than that in
which the problem or solution occurs. "Signed descrip-
tor" is used to refer to additional variables associated
with each program option and solution to indicate the
effect of this activity on the other issues and the other
criteria. The effect is intended to be shown by giving a
plus or minus sign or a zero to indicate the probable
direction of the effect relative to that issue (positive,
negative, or neutral), as for example in Table 3. The
concept of a signed descriptor as an aid in the grouping
of social science literature has also been observed else-
where though not exactly in the present context[32]. For
example, a program option which promoted access (Issue
1), but increased the indirect financial burden (Issue 2)
and also failed to contain overall costs (Issue 5) might
have three signed descriptors of +-- for these three issues.

Another means for identifying qualitative relationships
is the tabulation of repeated occurrence of options as
problems or solutions and vice versa. Analysis of such
multiple occurrences will give some indication of the
range of possible effects of the different activities. As an
example, co-insurance may constitute both a program
option and a potential solution in attempts to contain
overall costs, but will emerge as a problem violating
equity when considering the issue of promoting access to
medical care. Thus it will be more easily recognized that
selection of solutions to, for instance, co-insurance as a
problem, mitigates negative effects on the accepted goal
of equity. The power of any given solution may in this
<table>
<thead>
<tr>
<th>Program Option</th>
<th>Problem</th>
<th>Problem Class</th>
<th>Problem Criteria</th>
<th>Potential Solutions</th>
<th>System Level</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 Compulsory health insurance for those with an income below a defined level. (also in: 4.7)</td>
<td>1.8.3 Additional charges over agreed fees in fee-for-service systems.</td>
<td>2</td>
<td>2</td>
<td>1.8.3.1 Supplemental insurance for increased charges (not including additional benefits). (also in: 1.9.2.1)</td>
<td>02 Belgium</td>
<td>04 Italy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.8.1.2 Ombudsmen (also in: 1.9.4.1.)</td>
<td>06 Sweden</td>
<td>United Kingdom</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.8.1.3 Press publicity on complaints of overcharging.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.8.1.4 Providers association watch.</td>
<td>07 Sweden</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.8.1.5 Cpititation fee for G.P.'s (also in: 1.7.4.1)</td>
<td>02 Holland</td>
<td>04 Italy</td>
</tr>
</tbody>
</table>

| Codes Used: |
|---|---|---|
| System Level | Problem Class | Problem Criteria |
| 01 Self-care | 1 = negative result | 1 = illness cost-risk sharing |
| 02 Primary | 2 = program constraint | 2 = equity |
| 03 Secondary | 3 = deficiency | 3 = efficiency |
| 04 Tertiary | | |
| 05 Preventive Medical Care | | |
| 06 Social Services | | |
| 07 Administrative | | |

Fig. 5. Issue 1: Promote access to medical care.
<table>
<thead>
<tr>
<th><strong>Program Options</strong></th>
<th><strong>Program Options</strong></th>
<th><strong>Program Options</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Promote access to medical care.</td>
<td>2. Reduce indirect financial burden of illness on consumer.</td>
<td>3. Reduce direct financial burden of illness on consumer.</td>
</tr>
<tr>
<td>1.1 Employment/occupation/group health insurance. (also in: 3.5, 5.10)</td>
<td>2.1 Social security package including sickness insurance, maternity benefits.</td>
<td>3.1 Private health insurance. (also in: 1.9)</td>
</tr>
<tr>
<td>1.2 Insurance for persons over 65.</td>
<td>2.2 Voluntary sickness insurance for lost income.</td>
<td>3.2 Catastrophic insurance. (also in: 5.7)</td>
</tr>
<tr>
<td>1.3 Insurance for children under 6 years.</td>
<td>2.3 Voluntary insurance for home care.</td>
<td>3.3 Employment/occupation/group health insurance. (also in: 1.1, 5.10)</td>
</tr>
<tr>
<td>1.4 Government sponsored services for pregnancy.</td>
<td>2.4 Voluntary agency providing home care nursing and home aids.</td>
<td>3.4 Prepaid group practice; HMO. (also in: 5.8)</td>
</tr>
<tr>
<td>1.5 Health insurance for entire population — National Health Insurance. (also in: 3.8, 5.15)</td>
<td>2.5 Local or central government funded home care services.</td>
<td>3.5 P.S.H.O. (also in: 5.9, 6.1)</td>
</tr>
<tr>
<td>1.6 Catastrophic health insurance administered by private insurance companies.</td>
<td>2.6 Volunteer home care assistance.</td>
<td>3.6 Medicare health plan (tax credits to families).</td>
</tr>
<tr>
<td>1.7 Fee-for-service for all care levels. (also in: 4.1, 5.14, 6.2)</td>
<td>2.7 Consumer awareness programs.</td>
<td>3.7 Local government provided ambulance and transport service.</td>
</tr>
<tr>
<td>1.8 Compulsory health insurance for those w/income below a defined level. (also in: 4.7)</td>
<td></td>
<td>3.8 Health insurance for entire population — Nat'l Health Insurance. (also in: 1.5, 5.15)</td>
</tr>
<tr>
<td>1.9 Private (individual) h.i. (also in: 3.1, 6.8)</td>
<td></td>
<td>3.9 National health service. (also in: 5.11, 6.5)</td>
</tr>
<tr>
<td>1.10 Care for medically indigent (medicaid).</td>
<td></td>
<td>3.10 Use of co-insurance ($ of cost). (also in: 5.1)</td>
</tr>
<tr>
<td>1.11 National Health Service. (also in: 3.9, 5.11, 6.5)</td>
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<td>Program Options</td>
<td>Program Options</td>
<td>Program Options</td>
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</tr>
<tr>
<td>6.1 Use of co-insurance (% of cost). (also in: 3.10)</td>
<td>6.2 Fee-for-service for all care levels. (also in: 1.7, 4.1, 5.14)</td>
<td>7.1 Health education programs.</td>
</tr>
<tr>
<td>5.2 Rate and fee regulation by state or federal government.</td>
<td>6.3 Health insurance regulatory control of reimbursement for appropriate medical care.</td>
<td>7.2 No charge MCH programs (including immunizations).</td>
</tr>
<tr>
<td>5.3 Capitation fee for primary care providers (including pharmacists) with salaried specialists. (also in: 4.2, 7.5)</td>
<td>6.4 Health insurance for entire population: National Health Insurance. (also in: 1.5, 3.8, 5.15)</td>
<td>7.3 Social programs for environment: food, housing.</td>
</tr>
<tr>
<td>5.4 Capitation fee for primary care providers (including pharmacists) with fee-for-service specialists. (also in: 5.5)</td>
<td>6.5 National health service. (also in: 3.11, 5.11, 3.9)</td>
<td>7.4 Environmental health programs: air, water, transport safety.</td>
</tr>
<tr>
<td>5.5 Capitation fee for primary care providers (including pharmacists) with fee-for-service specialists.</td>
<td>6.6 Episode of illness payment for specialist care (within health insurance schemes). (also in: 4.6, 5.12)</td>
<td>7.5 Capitation fee for primary care providers (including pharmacists) (also in: 4.2, 5.3)</td>
</tr>
<tr>
<td>5.6 All care level providers salaried. (also in: 5.6, 7.7)</td>
<td>5.7 Catastrophic insurance. (also in: 3.2)</td>
<td>7.6 Capitation fee for primary care providers (including pharmacists) with salaried specialists. (also in: 4.3, 5.4)</td>
</tr>
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<td>5.8 Prepaid group practices. HMO. (also in: 3.4)</td>
<td>5.9 P.S.H.O. (also in: 3.5, 6.1)</td>
<td>7.7 All care level providers salaried. (also in: 4.5, 5.6)</td>
</tr>
<tr>
<td>5.10 Employment/occupation/group health insurance. (also in: 1.1, 3.3)</td>
<td>5.11 National Health Service. (also in: 3.9, 6.3)</td>
<td>7.8 Occupational safety regulation programs.</td>
</tr>
<tr>
<td>5.12 Episode of illness payment for specialist care (within health insurance schemes). (also in: 4.6, 5.12)</td>
<td>5.13 Insurance for persons over 65.</td>
<td>7.9 Disease control programs.</td>
</tr>
<tr>
<td>5.14 Fee-for-service for all care levels. (also in: 1.7, 4.1, 6.2)</td>
<td>5.15 Health insurance for the entire population—National Health Insurance. (also in: 1.5, 3.8)</td>
<td></td>
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Program, Problem, or Solution Identification:

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<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue Code Number</td>
<td>Program Option Code Number</td>
<td>Problem Code Number</td>
<td>Solution Code Number</td>
<td>Program, Problem, or Solution I.D.</td>
<td>Text description of solution</td>
<td>Potential system impacts</td>
<td>System Level</td>
<td># of application refs.</td>
<td># of theoretical references</td>
</tr>
</tbody>
</table>

Program, Problem, or Solution References:

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<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>Kind of information</th>
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</thead>
</table>

*to be matched with similar numerically coded list of bibliographic citations.

Fig. 6. Record contents for implementation of a health insurance system database.

Table 3. Signed descriptors for solutions to Problem 1.1.1. (no coverage when unemployed) of program option 1.1. (employment/occupation/group health insurance) of Issue I (promote access to medical care)

<table>
<thead>
<tr>
<th>V1.1.1</th>
<th>Unemployment insurance (social security) includes payment of health insurance.</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>0</th>
<th>-</th>
<th>+</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1.1.2</td>
<td>Unemployed allowed to pay government health insurance (normally considerably lower than voluntary health insurance rates) from own resources.</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>n</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>V1.1.3</td>
<td>Unemployed allowed to choose reduced coverage (catastrophic illness only) at reduced premium rates out of pocket.</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>V1.1.4</td>
<td>Provider levels provide free care to unemployed with commensurate increase of payment to providers (primary, secondary, tertiary) by either city, state, or federal contributions.</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>V1.1.5</td>
<td>Governmental institutions (federal, state, city) provide free care to unemployed.</td>
<td>+</td>
<td>0</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>
way be measured by the frequency with which it addresses different problems.

Quantitative interrelationships are not intended to be produced within the policy information frame itself, but are expected to become available from literature references.

5. PRELIMINARY RESULTS

For the seven selected issues, 78 program options have so far been listed. For these 78 options 325 problems have been identified. Over 359 solutions generated earlier for the more than 75 problems at that time listed have been rearranged for the newly identified problems. So far applications in 8 European health insurance systems have been identified for 85 solutions. To test the feasibility of creating a computerized health insurance information base, the available issues, program options, problems and solutions have been transferred to computer storage according to the design provided in Fig. 6.

The first preparation of the information frame cannot at all be considered complete. Completion will require intensive collaboration from future users, particularly in government, and health insurance specialists, both in this country as well as in other countries with experience in health insurance, so as to complement and adapt the frame accordingly. In addition, the literature search, once started, is expected to provide additions to elements of the information frame, without need to change the design of the frame itself.

6. DISCUSSION

The preliminary character of this report relates to the recognition that the information frame, once worked out for all four categories, needs further testing by health insurance specialists and policy analysts for confirmation or adaptation. A structured survey of policy information needs should form a part of such a testing phase for the project. Contributions must also be obtained from existing health insurance systems outside the U.S.A.

In addition, it is obvious that the authors by themselves can never expect to establish an adequate information frame. A search for additions and corrections and a need-survey would eventually complete a workable information frame for the purposes identified earlier. Apart from adaptation, addition to the frame will be necessary, particularly on the basis of information available through reports, including internal reports from health insurance agencies, both government and private. The information frame as designed allows for expansion within the established four categories, and also for possible expansion of the categories if considered necessary. The establishment of the information base would be a much larger endeavor, requiring considerable and long-term support or might be undertaken in another environment altogether.

7. CONCLUSION

So far the development of the information frame has been conducted in a university setting with assistance from experienced health policy analysts. But even with a relatively limited exposure, the potential usefulness of the approach has been demonstrated. The increasing importance of comparative analysis of health insurance alternatives, plus the increasing interest in international comparisons of experience, and the time saving such a resource could provide policy analysts are the justifications for the present efforts.

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