RAND

Model of Basic Benefits Package and Options With Actuarial Analysis

Donna O. Farley, Ninez A. Ponce, and John W. Peabody

DRU-1707-WB

October 1997

The RAND unrestricted draft series is intended to transmit preliminary results of RAND research. Unrestricted drafts have not been formally reviewed or edited. The views and conclusions expressed are tentative. A draft should not be cited or quoted without permission of the author, unless the preface grants such permission.

RAND is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND's publications and drafts do not necessarily reflect the opinions or policies of its research sponsors.

Table of Contents

OVERVIEW 1

REVIEW OF HEALTH INSURANCE PRINCIPLES 1

RAND'S BENEFITS PACKAGE PROPOSAL 2

SOURCES OF DATA 3

GUIDELINES FOR USE OF THE MODEL 4

Worksheet 1: Assumptions and Policy Options: 5

Population Distribution 5

Master Flag 6

Copayments and Coinsurance 7

Inpatient Deductible 8

Inpatient Length-of-Stay Limit 9

Annual Protection Limits 9

Pre-approvals for Treatment Abroad 10

Elasticities: Own-Price and Cross-Price 10

Worksheet 2: Policy Impact 11

Supporting Worksheets 12

ESTIMATED EFFECTS OF HEALTH CARE BENEFIT OPTIONS 12

SUMMARY AND NEXT STEPS 16

OVERVIEW

This report presents the key findings of an accompanying benefits package cost model that RAND has developed. The purpose of the model is to help the Republic of Macedonia in assessing the cost effects of health insurance policies it is considering. For comparison, the cost model presents RAND's recommendations along with 3 other options for basic benefits packages of health care financed through the compulsory Health Insurance Fund This product is the last in a series of products that RAND consultants have developed to assist government policy makers in establishing a new basic benefits package for Macedonia. Input data for the cost model are derived from previous RAND reports for Macedonia. The work RAND has performed consists of the following components:

- Assessment of the burden of disease and costs of treatment for the Macedonian population to identify priorities for health insurance coverage policy that assist in improving health status of the population. DRU-1638-WB;
- Examination of design issues and options for health care benefits and cost sharing policies to achieve financial viability for the Macedonian health insurance program. DRU-1639-WB;
- Preliminary actuarial analysis of health care benefits options for insurance reforms. DRU-1616-WB;
- Development of a suggested coordinated health care benefits policy including services covered, cost sharing, and service limits DRU-1640-WB; and
- Development of an actuarial model that can be used by the government and RAND consultants to estimate potential effects of alternative health care coverage policies on service use and costs of care. DRU-1707-WB

The report begins with a brief discussion of the principles which guided the development of the basic benefits package proposed by RAND. The principles reflect the Macedonian Ministry of Health's philosophy and goals merged with the basic theory of health insurance. The report then discusses the sources of data and guidelines for use of the model. The last sections contain the analysis of the different policies and concludes with recommendation for the next steps. This report is intended to help the MOH decision makers finalize the basic benefits package options that will be proposed in the Health Care Law.

REVIEW OF HEALTH INSURANCE PRINCIPLES

As the Macedonian government considers changes to its health insurance, it will have to address which policy issues it wishes to emphasize and make decisions on tradeoffs among its priorities. Such issues may include making the most efficient use of resources to ensure the health of the population, ensuring equitable access to primary health care services, or achieving the greatest social welfare by protecting people against catastrophic illnesses. These considerations are reflected in the health care benefits policy suggested by RAND in its May 1997 report (Farley and Peabody, DRU-1640-WB). Although the current debate has not yet specified such goals, the current discussion already has addressed two subsidiary questions:

1. *How much insurance coverage should be provided by the government?*
2. *How should the participation (cost sharing) by individuals be structured to ensure that health protection is achieved within the constraints of a limited budget?*

A coordinated package of health care benefits involves three components that work together to change patterns of health care services and associated costs. The first is the set of services covered by insurance. The second is the financial participation by the insured individuals, which creates financial incentives to use fewer services or services in more appropriate settings. The third component is regulatory limits that restrict the service quantities or settings that insurance will cover, using limits or preapprovals for certain types of services. Differing combinations of these policies will yield varying effects on utilization of services and health care costs for both the Health Insurance Fund (HIF) and insured individuals, which are important to consider in evaluating options and selecting health benefits policies that best meet the goals of the Republic of Macedonian in its health sector reform.

RAND'S BENEFITS PACKAGE PROPOSAL

RAND's benefits package proposal is based on strategies that pull together the general policies, goals and objectives mentioned above, established health principles of prevention and treatment, economic theory of payment incentives, and the availability of regulatory interventions. These strategies are further based on an understanding of health insurance theory and practice[1]. The main strategies are to:

1. Create four benefit categories for the list of all covered services:
    - primary care
    - outpatient specialty care
    - inpatient medical, surgery and other specialty care
    - long term inpatient and special procedures
2. Within each category, define a default package of services. A shorter list of *selected* services, which do not fit into the default categories, is also specified.
3. Allows shifts *from* outpatient to inpatient care or shifts *out* of special procedures and exclusions to be done by an expert committees operating under a fixed budget constraint
4. Requires preapproval for certain expensive procedures performed in inpatient settings as well as for shifts from the outpatient setting to the inpatient setting. This will apply to selected medical treatments, inpatient stays that exceed 15 days[2], a list of high cost treatments or procedures, and all long-term (chronic care) inpatient stays.

These strategies are illustrated in Figure 1 below.

---

[1] A solid understanding of health insurance is important to estimate the tradeoffs in any policy choice. (For those that are not familiar with health insurance, these are presented in Appendix A).

[2] RAND's report on Burden of Disease and Cost Effectiveness describes the average length of stay to be 15 days ranging from 3.3 days to 73.5 days.

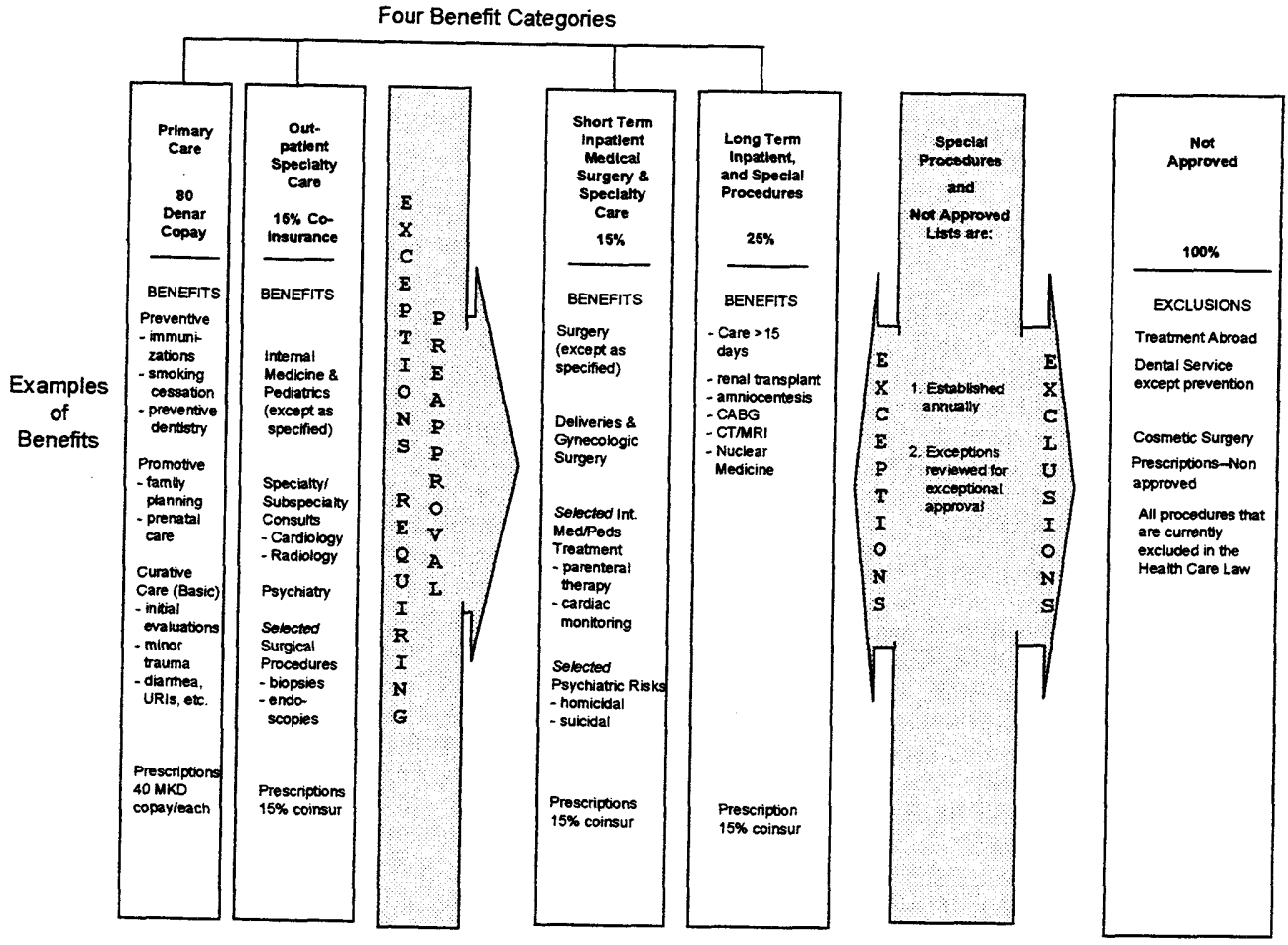

Figure 1. The four basic benefits categories, default services, and corresponding copayment/coinsurance rates with selected examples

SOURCES OF DATA

To construct our model, we used baseline data on utilization and cost under the current policies on health insurance. For utilization, the Republic Institute for Health Protection provided us with 1995 tabulations on outpatient visits and 1994 data for hospital stays. For costs, the information on actual cost of treatment is currently not available. Because of the paucity of data, we took a random sample of inpatient invoices from Ohrid, Prilep and Skopje to estimate the cost of treatment by diagnostic category. Daily average costs of treatment for outpatient stays were calculated from the health organization's expenses, divided by number of days. The health organization's expenses are derived from the Health Insurance Fund's 1994 and 1995 financial statements, submitted to the Macedonian Institute of Payment Operations. For details, please refer to RAND Report DRU-1683-WB, Peabody et al., Disease Burden and Costs of Treatment: Establishing Policy Priorities for Health Care Reform in Macedonia.

GUIDELINES FOR USE OF THE MODEL

The entire model uses an Excel for Windows spreadsheet file containing 7 worksheets. The worksheets are:

1. Assumptions and Policy Options
2. Policy Impact
3. Outpatient Models
4. Inpatient Models
5. Inpatient Cost Share
6. Inpatient Service Limits
7. Annual Protection Limits

Of most interest to policy makers are the first 2 worksheets--Assumptions and Policy Options and Policy Impact. The first two worksheets show the inputs and outputs of changing assumptions and policy levers. They are linked to one or several of the other worksheets that contain the mathematical modeling for the actuarial analysis. The interactions between the worksheets are illustrated in Figure 2.

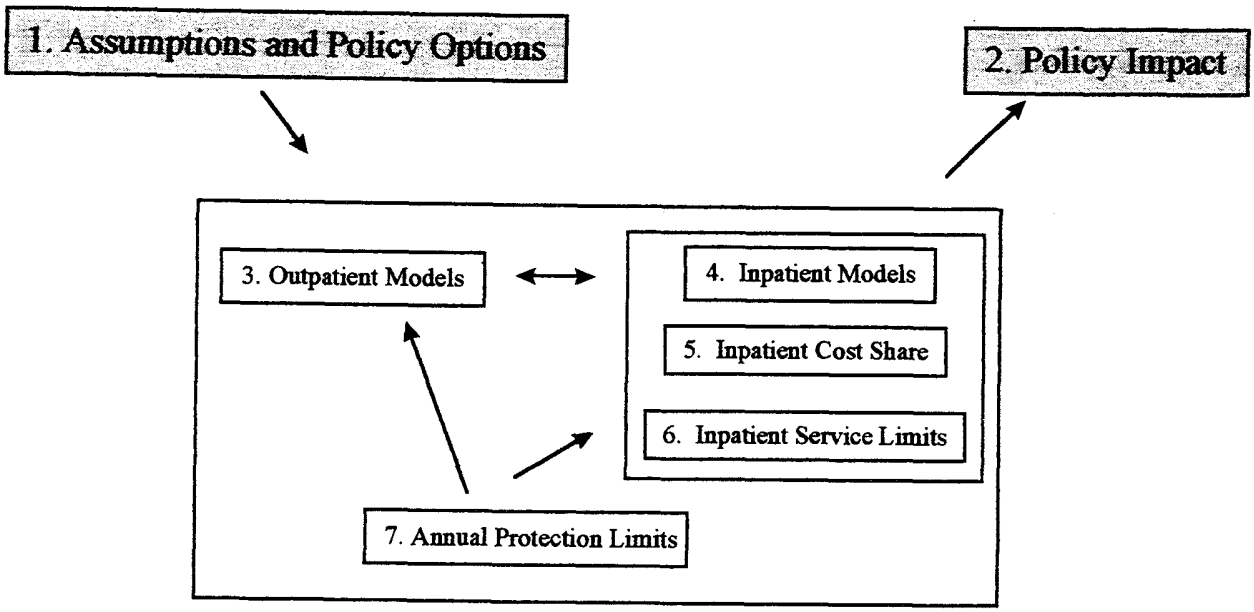

Figure 2.

Worksheet 1: Assumptions and Policy Options:

The first worksheet contains assumptions and policy options for alternative benefit packages and financial participation by individuals. Up to four (4) models can be estimated. The user can enter each assumption for the model in the spaces highlighted in yellow. These assumptions pertain to the population distribution, copayments and coinsurance, exemptions from participation and the switchover (induction) effects between categories of services due to changes in the insurance policies. These assumptions also define the deductibles, length of stay limits, and annual limits on out-of-pocket costs. In line with the principle of protecting the poor, the out-of-pocket limits are differentiated for the general population and for those below the poverty level.

Population Distribution

Rows 17 to 22 contain 1994 Census data from the National Statistical Office, Republic of Macedonia. Because the distribution of diseases and propensity to use services differs across age groups, we stratify the population into 4 different age categories (old, regular, young, youth). Also, since the government's major role in health insurance is to protect the poor, we define a separate category for the segment of the population that falls below the poverty level. Assumptions are made on the proportion of the population that are deemed poor. For example, we assume that 15% of the elderly (66 years and older) are poor. As living standards data from the National Statistics Office become available, these percentages can be changed accordingly.

	A	B	C	D	E	F	G
13	*POPULATION DISTRIBUTION*						
14		1994	Pop.	Prop.	Number	Net	Net
15		Counts	Prop.	Poor	Poor	Counts	Prop.
16							
17	Total population	1,945,932					
18	Old (66 years & older)	189,553	10%	15%	28,433	161,120	8%
19	Regular (19-65 yrs)	1,142,792	59%	10%	114,279	1,028,513	53%
20	Young (0-13 yrs)	451,037	23%	15%	67,656	383,381	20%
21	Youth (14-18 yrs)	162,550	8%	12%	19,506	143,044	7%
22	Below poverty level					229,874	12%

The worksheet rows 17 to 21 also includes a section called Unit Price Adjustment Factor. This factor is a multiplier of the 1995 expenses. By default, these are set to 1. If , for example, there is a policy decision to increase the budget for outpatient visits by 5%, then the unit adjustment factor for outpatient visits can be increased to 1.05.

	I	J	K
14	Unit Price Adjustment Factor		
15	(adjust from 1995 expenses)		
16			
17	Outpatient visits		1
18	Inpatient services		1
19	Dental care		1
20	Prescription drugs		1
21	Other health services		1
22	Treatment abroad		1

Master Flag

This section of the worksheet, row 24 to 26, simply turns on or off the display of the model(s) being estimated. The default model turns on all 4 cases, thus each case has a "1".

	A	B	C	D	E	F	G
24	MASTER FLAG:						
25	Turn on or off each case model		RAND	MOH 1	MOH 2	No Exempt	
26	1 = use case 0 = zero out case summary		1	1	1	1	

The 4 specific cases estimated in the default model are:

1. **RAND**

   This model was presented by RAND to the Ministry of Health in April-May 1997. The specifics of the model are contained in the report by Farley and Peabody, DRU-1640-WB.

2. **MOH 1**

   This model was proposed by the Ministry of Health after follow-up discussions on the Basic Benefits Package in Ohrid in June 1997.

3. **MOH 2**

   This model was proposed by the Ministry of Health in a conference on amending the Health Care Law in Bitola in September 1997.

4. **Baseline Model with No Exemptions**

   This model presents a policy scenario of the current health care benefits package—where participation policies and benefits packages are the same—but all exemptions are eliminated.

These models are sample models based on policy scenarios that have been discussed. As policy priorities and mandates change, the Macedonian government can propose new alternative policies by changing the entries for the spreadsheet cells that are highlighted in yellow.

Copayments and Coinsurance

Copayments and co-insurance are core policy levers for health insurance. The user of the model will enter the copayment (a fixed denar amount) or coinsurance (a percentage of the total health service invoice) in the highlighted cells in rows 33 through 36. The default model displays the outpatient participation policies for RAND, MOH1, MOH2 and No Exemptions.

	A	B	C	D	E	F	G	H	I	J
28	COPAYMENTS AND COINSURANCE:									
29		Baseline	RAND		MOH 1		MOH 2		No Exempt	
30		Coins	Copay	Coins	Copay	Coins	Copay	Coins	Copay	Coins
31	Outpatient Services		(denars)	(prop)	(denars)	(prop)	(denars)	(prop)	(denars)	(prop)
32										
33	Primary care	20%	80	0%	80	0%	80	0%	0	20%
34	Specialty care	20%		15%		20%	80	0%		20%
35	Dental care **	20%		40%		20%		20%		20%
36	Prescription drugs**	20%	–	15%	–	15%	–	10%	–	20%

Rows 43 through 47 contain the outpatient exemptions for participation by age category. The user will enter 1 for exemption, and if otherwise, will leave the cells blank. For example, in the case for No Exemptions, rows 43 through 47 are left blank. For RAND's proposal, full exemption is only allowed for those qualifying for social welfare. Individuals that need social welfare should qualify on the basis of the national definition of poverty.

	A	B	C	D	E	F
38	Exemption from participation					
39	Outpatient exemptions:					
40	(Enter 1 for exemption;	Baseline	RAND	MOH 1	MOH 2	No Exempt
41	otherwise leave blank)					
42						
43	Old (66 years & older)	1			1	
44	Regular (19-65 yrs)					
45	Young (0-13 yrs)	1			1	
46	Youth (14-18 yrs)					
47	Below poverty level		1	1		

Rows 55 through 62 contain the cells for entering participation policies from short-term to long-term inpatient coinsurance. The possible categories for exemption are the 4 age categories (old, regular, young, youth), below poverty level and an additional category for diseases that are currently exempt.[3] These cells

[3] Per the Health Care Law, article 76-a, item 5): "Health services related with treatment of malignant disease, progressive nerve and muscular disease, cerebral paralysis, multiplex sclerosis, cystic fibrosis, hemophilia, epilepsy, infectious diseases, rheumatic fever and its complications, diabetes, kidney insufficiency treated by chronic dialysis, neonatal disease, alcoholism and drug addiction, thalassemia and

simultaneously take into account coinsurance rates and exemptions. For example, for the MOH2 proposal, certain diseases are exempt, therefore the user would enter a coinsurance rate of 0%. Under the proposal of "No Exemptions," the user would enter the proposed coinsurance rate for inpatient services (10%) for all of the categories of patients.

	A	B	C	D	E	F	G	H	I	J	K
50			*Short-Term Inpatient Services*					*Long-Term Inpatient Services*			
51	Short-Term Inpatient Services--Coinsurance										
52	(Enter as a proportion, e.g. 0.15 for 15%)		RAND	MOH 1	MOH 2	No Exempt		RAND	MOH 1	MOH 2	No Exempt
53	*NOTE: Use 0 for full exemption*										
54											
55	Old (66 years & older)		15%	15%	0%	10%		25%	25%	0%	10%
56	Regular (19-65 yrs)		15%	15%	10%	10%		25%	25%	10%	10%
57	Young (0-13 yrs)		15%	15%	0%	10%		25%	25%	0%	10%
58	Youth (14-18 yrs)		15%	15%	10%	10%		25%	25%	10%	10%
59	Exempted Diseases		15%	15%	0%	10%		25%	25%	10%	10%
60	Below poverty level		5%	5%	10%	10%		5%	5%	10%	10%
61											
62	Average for long-term services							23%	23%	7%	10%

Inpatient Deductible

Rows 68 through 73 contain the cells for inpatient deductible. An inpatient deductible is the amount that the Macedonian insuree must pay, each year, for inpatient services received, before the Health Insurance Fund (HIF) would be required to pay for the services. An insuree is responsible for paying from their own resources the full cost of health services received until they have paid an amount equal to the annual deductible amount (e.g. 3200 denars). The HIF would be paying for services after the deductible is met. RAND proposes a modest 3200 denar deductible that intends to discourage overutilization of hospital services. The government proposals do not include a deductible for several reasons, but mostly because a deductible would be difficult to administer under the current information system. As an electronic, integrated medical and financial information system is developed in Macedonia (one of the major reform components), then the government will consider using a deductible in addition to the coinsurance policies.

	A	B	C	D	E	F
64	**Inpatient Deductible**					
65		Baseline	RAND	MOH 1	MOH 2	No Exempt
66		(denars)				
67						
68	Old (66 years & older)	0	3200	0	0	0
69	Regular (19-65 yrs)	0	3200	0	0	0
70	Young (0-13 yrs)	0	3200	0	0	0
71	Youth (14-18 yrs)	0	3200	0	0	0
72	Below poverty level	0	3200	0	0	0
73	Average deductible		3200	0	0	0

---

similar sickness, infarct of the myocarditis, post-operative condition after surgical treatment of coronary arteria, heart discompensation, heart block, installed pacemaker, post-kidney transplantation treatment, penfigus and lupus eritematodes.

Inpatient Length-of-Stay Limit

Rows 80 through 84 contain the cells for administering an inpatient length-of-stay limit. RAND proposes a 15 day limit for short-term inpatient stays. MOH1 proposes a 10 day short-term stay limit. MOH2 and the No Exemption case do not propose to administer length-of-stay limits. This administrative mechanism is expected to encourage shortening of unnecessary length of stays. In Macedonia, there are lengths of stays of more than a calendar year, thus prompting categorization of not only short and long term inpatient stays, but of hospice care. MOH1's proposal of a 10 day limit is more stringent than RAND's proposal of a 15 day limit, and thus may have bigger service volume and cost effects on inpatient services.

	A	B	C	D	E	F
75	*INPATIENT LENGTH OF STAY LIMIT*					
76						
77		Baseline	RAND	MOH 1	MOH 2	No Exempt
78	Enter 1=yes; 0=no					
79						
80	Medium stay limit (>30 days)	0	0	0	0	0
81	Short stay limit					
82	10 days	0	0	1	0	0
83	15 days	0	1	0	0	0
84	Proportion long days allowed	0	0.5	0.25	1	1
85	after short stay limit applied					

Annual Protection Limits

Rows 92 through 94 contain the cells for the denar amount for annual protection limits. The concept of this out-of-pocket limit is to protect individuals from the risk of unusually high costs of care during any given year and to mitigate the economic impact on households suffering from catastrophic illness. This limit should be set at a high enough level that it equals a substantial fraction of the national average family income. RAND proposes 15,000 denar limit for the general population, but a 2000 denar limit for social case. MOH2 and No Exemption proposals do not include establishing an annual protection limit. Since there is no limit for the amount the patient pays for health services, the user enters a very high amount. We use 1,000,000 denars for the model.

	A	B	C	D	E	F
87	*ANNUAL PROTECTION LIMIT*					
88						
89	Enter 1000000 if no limit		RAND	MOH 1	MOH 2	No Exempt
90						
91						
92	General population		15000	10000	1000000	1000000
93	Below poverty level		2000	2000	1000000	1000000
94	Treatment Abroad		15000	1000000	1000000	1000000

Pre-approvals for Treatment Abroad

Pre-approval is another administrative mechanism to limit overuse of unnecessary treatments, particularly high cost ones. Treatment abroad is a prime example of expensive treatments. The HIF spends around $4 million per year for about 400 beneficiaries for treatment abroad. Because Macedonia's health care system was part of the Former Yugoslavia's system prior to independence, some health services such as cardiac surgery and kidney transplants are not available in the country. Individuals who need these services must travel outside of Macedonia to get care. RAND's proposal is to exclude treatment abroad in the benefits package, with the exception of cases that are approved by an expert committee. The other proposals do not exclude treatment abroad.

In row 99, the user enters the expected percentage of cases that are pre-approved for treatment abroad. Because RAND's policies exclude treatment abroad, the percentage of preapprovals (estimated at 40%) is much less than the pre-approval rate of the other proposals (90%). In row 100, the estimated coinsurance rate is the same rate for long-term inpatient care and high cost services (RAND= 25%. MOH1 = 25%, MOH2 = 20%, No Exempt = 20%). In the long run, the importance of issue of HIF expenditures for treatment abroad may diminish as the country develops and adopts new technology and procedures (for instance cardiac surgery may soon be available).

	A	B	C	D	E	F
96	*PRE-APPROVALS FOR TREATMENT ABROAD*					
97			RAND	MOH 1	MOH 2	No Exempt
98	Treatment abroad:					
99	Estimated % preapproved		50%	90%	90%	90%
100	Estimated coinsurance		25%	25%	20%	20%

Elasticities: Own-Price and Cross-Price

The model estimates changes in utilization (outpatient visits, inpatient stays) due to a given percentage change in prices in health services. For example, if the price of specialty care outpatient care decreases from 20% coinsurance rate to a 15% , then we expect that the number of specialty outpatient visits will increase. This is called own-price elasticity. For rows 105 through 108 are our assumptions for own-price elasticities. These elasticities are the same for all policy scenarios.

	A	B	C
104	**Own-price elasticities**		
105	Primary Care		-0.15
106	Specialty Care		-0.2
107	Dental Care		-0.3
108	Prescription Drugs		-0.1

Furthermore, if we assume that there are substitution effects between categories of services, i.e. that some specialty outpatient care can be provided in a primary care setting or some short-term inpatient procedures can be provided in specialty outpatient care, then a change in price in one category of service may induce switchover effects. We refer to this as cross-price elasticities. Intuitively and particularly for Macedonia, switchover effects are lower from inpatient to outpatient care (row 111) than from specialty outpatient to primary care (row 113). While these are also assumptions, the user does not enter any data in these rows. The volume effects from the cross-price elasticities are estimated from the relative coinsurance rates entered earlier in the worksheet.

	A	B	C	D	E	F
110	**Volume effects from Cross-price elasticities**					
111			RAND	MOH 1	MOH 2	No Exempt
112	Change in specialty outpatient services		0.07	0.07	0.04	0.04
113	due to inpatient changes (induction effect)					
114	Change in primary care		0.10	0.13	0.00	0.10
115	due to specialty outpatient changes					

RAND's capitation evaluation program will collect utilization data before and after health reform policies take effect. From this evaluation, we will be able to generate information that can be used to approximate both own-price and cross-price elasticities. For now, the elasticities entered in the default model are merely assumptions based on data from other countries.

Worksheet 2: Policy Impact

This worksheet presents the policy impact of each benefit package model on service utilization and HIF expenditures. It uses estimated expenditures from the "Inpatient Models" and "Outpatient Models" worksheets and assumptions from the "Assumptions" worksheet.

There are 3 effects of health insurance of utmost concern for policy makers. The first is the effect on service utilization. The model allows us to examine the changes in visits for outpatient services and the changes in the number of inpatient days for both short-term and long-term stays. As a general rule, following the principle of allocating services to a lower cost, more appropriate setting, an efficient policy objective should be to switch from short-term inpatient to specialty outpatient care and from long term to short term inpatient care. The model allows us to see these switchover effects due to the health insurance policies.

The Health Insurance Fund (HIF) also needs to adhere to policies with financial sustainability. In order to do this, revenues should equal or exceed expenditures so that the balance is positive (or zero). This is presented in the table "HIF Obligations under Alternative Benefit Packages and Financial Participation." A positive balance assures payment of past obligations and working capital to upgrade working conditions, equipment and facilities.

Policy makers also need to know how much the citizen is participating in the system, if for example, a policy unduly burdens the citizen with a too high coinsurance rate or too high deductible. In the table "Estimated Participation—Copayment, Deductible, Coinsurance" we are able to estimate the level of net participation amounts for the different service settings and more importantly, participation amounts for the poor. The outputs of this worksheet will be discussed in detail in a later section on estimated effects of health care benefit options.

Supporting Worksheets

Worksheets 3 to 7 are supporting worksheets that contain deterministic equations, modeled in the Macedonian health sector context. Generally, Worksheet 3, Outpatient Models calculates the estimated expenditures for outpatient services, dental services, and prescription drugs. Input data for outpatient models are RIHP 1995 tabulations of outpatient visits.

Worksheet 4 contains the Inpatient Models. The tables establish the inpatient activity (from 1994 data) and daily expenses by diagnostic category and total. Inpatient activity is separated into 2 different categories—short term and long term stays. Short term stays can be up to under 30 days; long term stays are over 30 days.

Worksheet 5 contains the inpatient cost share tables. These are schedules of assumptions for inpatient coinsurance by diagnostic category. Data used is 1994 data for hospital stays and inpatient days , along with assumptions for coinsurance rates and exemptions for each of the age categories. The numbers in this worksheet are inputs and thus linked to the Inpatient Model worksheet.

Worksheet 6 contains Inpatient Service limits. User can choose either short or medium days, and fraction reduced, on the assumptions sheet to limit length of stay. These service limits may have a major impact on expenditures for inpatient days.

Worksheet 7 contains the annual protection limits on participation. The worksheet assumes 20% of the population have no health expenditures and that 10% consume 50% and 20% consume 70% of total expenditures. The assumption is a version of a displaced lognormal distribution. This worksheet allows the policy maker to make an informed decision on setting annual limits. The objective is to set the limit high enough to discourage unnecessary use of health services, but not so high that it creates great barriers to access to needed health services.

ESTIMATED EFFECTS OF HEALTH CARE BENEFIT OPTIONS

Four policy options are presented and compared with the baseline (current coverage). The first option is the benefit model suggested by RAND in its May report. The second and third options are the preliminary models being considered by the Macedonian government, and the fourth is a policy option of eliminating all current exemptions. Table 1 displays the assumptions used in each of the models.

Table 1

Assumptions for Estimating Service Use and Costs of Alternative Health Benefit Policies

	A	B	C	D	E	F
122						
123		Baseline	RAND	MOH 1	MOH 2	No Exempt
124						
125	Copay/Coinsurance					
126	Primary care	20%	80	80	80	20%
127	Specialty care	20%	15%	20%	80	20%
128	Short-term inpatient	10%	15%	15%	10%	10%
129	Long-term inpatient	10%	25%	25%	10%	10%
130	Dental care	20%	40%	20%	20%	20%
131	Prescription drugs	20%	15%	15%	10%	20%
132						
133	Exemptions					
134	Old (66 years & older)	1	0	0	1	0
135	Regular (19-65 yrs)	0	0	0	0	0
136	Young (0-13 yrs)	1	0	0	1	0
137	Youth (14-18 yrs)	0	0	0	0	0
138	Below poverty level	0	1	1	0	0
139	Certain Diseases	1	0	0	1	0
140						
141	Deductible (denars)	0	3200	0	0	0
142	Annual Protection Limit (denars)					
143	General Population	1000000	15000	10000	1000000	1000000
144	Poor	1000000	2000	2000	1000000	1000000
145	Treatment abroad	1000000	15000	1000000	1000000	1000000
146	In-patient Service Limits (hospital days)	0	15	10	0	0

Table 2 presents the estimated changes in service utilization under the 4 alternative benefit policies. A rational benefit policies generally follows these broad policy objectives of increasing outpatient visits and decreasing inpatient visits. We suggest stylized decision parameters to help the policy maker evaluate different policies:

- maximize the ratio of Primary Care to Specialty Outpatient Care
- maximize the ratio of Outpatient to Inpatient services
- minimize the number of long-term inpatient care by a target percentage, say 10%

In terms of service utilization, and based on these decision parameters, the alternative proposed by MOH 1 is the best. The outpatient to inpatient days ratio is highest as well as the primary care to specialty care ratio. Long-term inpatient days are also the lowest under the MOH 1 proposal. The key policy levers that distinguish MOH 1's proposal is the imposition of a 10 day short-stay limit, versus RAND's 15 day limit. This limit would minimize the total number of inpatient days. Additionally, MOH 1 proposes a higher coinsurance rate of 20% for specialty outpatient service, as compared to RAND's proposal of 15%. The higher rate for specialty services encourages the substitution of some outpatient specialty services for primary care services. The option of No Exemptions seems to reduce all service activities from the baseline and does not change the structure of utilization.

Table 2

Estimated Service Utilization Under Alternative Health Benefit Policies

TOTAL SERVICE ACTIVITY	Baseline	RAND	MOH 1	MOH 2	No Exempt
Total Outpatient	10,342,981	11,650,435	11,691,339	11,499,475	10,062,787
Primary Care	7,668,746	8,940,609	9,201,103	8,280,119	7,624,475
Outpatient Specialty Care	2,674,235	2,709,827	2,490,236	3,219,355	2,438,312
Total Inpatient days	2,514,062	1,306,148	1,172,409	2,052,289	2,016,442
Short-term Inpatient	2,231,562	1,032,337	913,410	1,781,269	1,746,260
Long-term Inpatient	282,500	273,811	259,000	271,020	270,182

Table 3 estimates the HIF's finances under alternative health benefit policies. The goal is for revenues to be greater or equal than expenditures. Decision parameters are to:

- maximize net income
- maximize the ratio of outpatient expenditures to inpatient expenditures

RAND's proposal scores best under the decision parameters. RAND's proposal generates the highest net income and the highest ratio of Outpatient to Inpatient services (about 4 to 1). RAND's proposal does better financially than MOH 1 because of the inclusion of a deductible for inpatient services. The No Exemption policy option ranks second in net income, but ranks last in terms or restructuring the emphasis of expenditures from inpatient to outpatient services. MOH 1 and MOH 2 proposals improve the structure of expenditures relative to the baseline. However, MOH 2's proposal increases the deficit of the HIF. This is attributed to the 80 denar fixed amount for specialty services. This fixed amount, identical to primary care fees, shifts preferences from primary care to specialty care and creates a sizable government subsidy for the use of specialty outpatient visits, given that the average price of specialty services is 500 to 600 denars.

Table 3

Estimated HIF Finances Under Alternative Health Benefit Policies

	Baseline	RAND	MOH 1	MOH 2	No Exempt
REVENUE	8,412,321	8,412,321	8,412,321	8,412,321	8,412,321
EXPENDITURES					
Outpatient services	3,389,126	4,125,222	4,079,444	4,208,637	3,158,704
Inpatient services	2,870,300	1,005,622	1,161,281	2,267,588	2,087,341
Dental care	422,705	535,889	756,204	800,048	724,846
Prescription drugs	784,000	598,255	598,255	732,104	462,147
Other health care services	114,700	114,700	114,700	114,700	114,700
Treatment abroad	138,500	64,922	116,859	124,650	124,650
Cost of annual participation limit		71,760	-5,328	-33,240	-33,240
Total health care	7,719,331	6,516,371	6,821,415	8,214,488	6,639,148
OTHER HEALTH EXPENDITURES					
Capital for health organizations	16,600	16,600	16,600	16,600	16,600
Health program operations	120,600	120,600	120,600	120,600	120,600
Orthopedic devices	134,800	134,800	134,800	134,800	134,800
Total other expenditures	272,000	272,000	272,000	272,000	272,000
SALARY REIMBURSEMENTS	939,900	939,900	939,900	939,900	939,900
HIF OPERATING EXPENSES	214,400	214,400	214,400	214,400	214,400
TOTAL EXPENDITURES	9,145,631	7,942,671	8,247,715	9,640,788	8,065,448
NET BALANCE	(733,310)	469,650	164,606	(1,228,467)	346,873

Table 4 presents the estimated gross participation of insurees under the alternative benefit packages. The broad goal in participation policies is equity—so that the poor are not priced out of the health care system. The decision parameters are to:

- minimize net participation

- minimize participation for the poor and vulnerable populations.

The model displays some interesting findings. While MOH 2's proposal has the lowest net participation, it collects the greatest participation amount from the poor when compared to the other alternative policies. The Baseline with No Exemptions benefits package collects the most participation and also collects relatively high amount from the poor. RAND's policy collects a high amount of net participation, but collects the lowest amount from the poor.

Table 4

Estimated Cost Sharing by Insured Individuals Under Alternative Health Benefit Policies

(1000's of denars)

Participation	Baseline	RAND	MOH 1	MOH 2	No Exempt
Outpatient services	556,265	412,758	473,588	220,847	789,676
Hospital services	112,511	602,106	223,163	88,569	231,927
Dental care	352,936	292,056	161,936	134,628	181,211
Prescription drugs	41,263	91,202	91,202	56,817	115,537
Treatment abroad	27,700	23,083	41,550	33,240	33,240
Total gross participation	1,090,676	1,421,205	991,438	534,101	1,351,591
Total net participation (with annual limits, if any)	1,090,676	1,349,444	996,766	567,341	1,384,831
Participation from the poor		5,346	6,173	24,108	22,192

SUMMARY AND NEXT STEPS

The model demonstrates that RAND's benefit package proposed in May 1997 is financially sustainable. RAND's proposed benefits package has also met two chief policy priorities: the efficient use of resources, and the assurance of equity through universal access to primary care. The model also makes evident that a coordinated use of policy levers—copayments and coinsurance, pre-approvals, deductibles, annual protection limits, service limits can lead to a desired effect in utilization, financial sustainability and equity.

The Ministry of Health's proposal from Ohrid in June 1997 (MOH 1), is very similar to the RAND proposal, and indeed leads to the best result in service utilization. This proposal wisely integrates the health insurance principles emphasized in RAND's proposal, with the institutional realities in Macedonia's health care sector (i.e. choosing a more stringent service limit for inpatient length of stay of 10 days, but declining the introduction of a deductible because it would be difficult to administer. It is clear that the option of keeping baseline coinsurance levels, but omitting all exemptions, including the exemption for the poor, does not contribute to the incentives and disincentives for more rational care.

The most financially sustainable package is RAND's proposal, followed by the Baseline with No Exemption package. However, the Baseline with No Exemption package, while financially attractive, should not be chosen because it does not change the structure of expenditures. If the MOH chooses this option, then it guarantees to the citizens of Macedonia the status quo of inefficient use of resources. The MOH 2 option also retains the status quo.

Finally, the MOH 2 proposal collects the least amount of participation, but collects the greatest amount from the poor, thus violating the government's principle role of protecting the poor. RAND's proposal collects the greatest amount of net participation, but collects the least amount from the poor.

What are the next steps? The decision makers at the MOH need to familiarize themselves with the different policy options and the consequences and impact they have on the health sector. This model is

one way to better understand the effects of the policy levers we have discussed. We encourage the MOH to create different policy scenarios—i.e. different schedules of coinsurance rates, different exemptions, different annual protection limits and service limits, given their practical experience in the health sector. We encourage the young economists and other technical staff at the MOH, the HIF, RIHP and the IPU to check the behavioral assumptions of this model that are represented in mathematical relationships contained in the supporting worksheets. Finally, this model could benefit from updates of the most recent information from the National Statistical Office, the Health Insurance Fund, and the RIHP.

In making the final decision on which benefits package policy to choose, this accompanying cost model furnishes only supporting information on the impact of the benefits policies on utilization and costs. It is the government's role to weigh the tradeoffs between utilization changes, financial stability, and the participation burden that is tolerable for most Macedonians, especially the poor. Guided by the principles of health insurance, and governed by the philosophies and policy priorities of public service, a rational decision on a coordinated benefits package policy should be within reach for Macedonia.