RATIONALIZING THE PUBLIC HEALTH SYSTEM THROUGH A COST-EFFECTIVE PREVENTION PROGRAM
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EXECUTIVE SUMMARY

In order to achieve the continuous improvement of the health status of the population and improvement of the conditions that influence health, the Minister of Health and Social Welfare adopted, in May 2003, the Program of Prevention and Control of Non-Communicable Diseases. The program covers cardiovascular, malignant (cancer), and diabetic diseases as well as their common risk factors of smoking, unhealthy eating habits and insufficient physical activity.

Three questions were researched:

- Is the program’s scope too wide, considering limited resources for delivering required prevention and control services?
- Is awareness of RS citizens about the importance and usefulness of the prevention and control of non-communicable diseases low?
- Is the program implementation difficult because of an inappropriate, unrealistic implementation and financial model?

Beside the introductory part and background, the study contains seven more parts referencing the following: The program description, subject and structure of the research, economic analysis of prevention effectiveness – review of the analytic methods, literature review on prevention-programs cost-effectiveness in other countries, the problems identified in the program implementation and proposals for addressing them. Such content of the study has provided appropriate basis for identification of critical issues encountered in the program implementation and a proposal for certain policies for addressing them, considering relevant experiences of other countries in addressing similar issues.

The research has shown that the implementation of the program has not been going at a satisfactory pace, with a lot of problems which, if not remedied soon, could seriously jeopardize the realization of the set program goals. The most important issues can be summarized through the following highlights:

- The review of cost-effectiveness studies from other countries suggests that the list of services being covered by the program scope should be modified to some extent, in order to target the most cost-effective services. Downsizing the scope by excluding early detection of prostate cancer and digitorectal examination as a preventive checkup for early detection of rectum and colon cancer is recommended;
Most of the Dom zdravljas (DZs) are not well-prepared to implement the program as designed, in terms of having enough personnel and equipment and organizational capability in general to do so. For example, most often they cannot do mammograms;

- 68% of adults are not registered with a family doctor, and over half of those did not know they were supposed to do so;

- As a result of the survey, it also appears that many doctors either do not know about the program, or are not informing their patients about the program. As a result, a large majority of citizens are unaware of the program;

- On the other hand, a positive finding is that most people are very aware of preventive care concepts, and so will be ready to learn more about the availability of those services to them;

- The financial incentives do not appear to be in place for the program to work well, especially for uninsured people. The insurance funds only collect money from the insured population, who comprise 70-80% of the total estimated population of the Republic of Srpska. Through this, they must cover all curative health care, as well as try to fund preventive care too. DZs only receive money for their insured patients, and are mandated to provide preventive care to all. From the point of view of the patients, they may be asked to pay for preventive services, especially if they are uninsured, so even if they knew about the program, it is not surprising that they do not go for care when they have no urgent problem;

- Finally, in order to get the program moving, the survey shows that people are very receptive to information in various forms, especially from the television. This provides a very broad way to reach many people, as the program moves forward, although other strategies may be needed too, since some experiences show that direct phone call for scheduling a preventive checkup is the most efficient method;

- An absence of cooperation of primary and secondary health care in providing services for in the program, is coupled with very low awareness of the doctors from secondary health care level about the Program itself;

- The prevention care services provided for in the program are much more demanding than acute care considering the time required for calling citizens for a checkup, administrative evidencing in accordance with requirements of the Guidelines, and the fact that complete administration is manual.
Regarding the program financing, we recommend combining three sources of financing: reallocation of the sources collected by the Fund in favor of the program, a tax of 5KM with the registration of motor vehicles, and an excise tax on tobacco products, alcohol and alcoholic beverages. The financial resources needed for implementation of the proposed program scope amount to KM 12,832,446 in 2006, that is KM 11,824,446 in 2010. If an evaluation in 2010 shows that the program has produced significant savings in treatment costs at primary, secondary and tertiary levels of health care, then the charges would be suspended, and further financing would be an exclusive obligation of the Fund. Besides, it is realistic to expect that the health insurance reform would be ended by 2010, which would make the situation regarding the uninsured much better.

Regarding the program promotion, a strong implementation of the Population Strategy is recommended at the RS level, that is its promotion, but not before providing key assumptions needed for successful implementation of the program, i.e. organizational capability of DZs to provide prevention services provided for in the program and providing a good financial incentives. In the meantime, the Population Strategy should be intended toward education of the citizens about importance and efficiency of prevention and the importance of their behaviour regarding prevention and reduction effects of a risk factors to their health.

Apart from that, for the promotion of the program and its good realization it is important to complete citizens’ registration in DZs, in order to create conditions for direct communication.

Recommended authorities in charge of realization of the policies are the Republic of Srpska institutions such as the Ministry of Health and Social Welfare, Health Insurance Fund, Ministry of Finance, Ministry of Transport and Communications, Public Health Institute and DZs, in cooperation with the BH Council of Ministers. It is recommended in the program promotion activities to include other stakeholders such as: local authorities, NGOs, companies and institutions.
1 INTRODUCTION

At the end of the 20th century, the World Health Organization (WHO) adopted a global policy "Health for All in the 21st Century" with the final and permanent target of the document to achieve: "A full health potential for all". There are two directions leading toward achieving the above target:

- Health promotion and care for human health throughout a life cycle and
- Reduction of leading disease incidence and injuries.

Through the policy, the WHO employed mechanisms directed toward accepting health as the most significant factor of the overall society development, and suggested the following general principles of the Policy:

- Equality in availability health care rights;
- Accessibility of adequate and good quality health care for all;
- Emphasized role of health promotion and illness prevention;
- Multisectoral cooperation;
- Health development process including relevant partners for health at all levels: family, school, enterprise, local community and the whole society in joint decision making;
- Decentralization;
- Integrated health programs, and
- Coordination of all health care levels and activities.

Particularly in the transition countries, there have been changes of ideology systems, significant decrease of GDP and all types of consumption, declining competitiveness, socio-economic degradation, political instability, regional conflicts, ethnical and religion conflicts, and population dispersion as people fled their homes. Such changes have worsened the health status of a population.

The burden of disease in the Republic of Srpska as well as in Bosnia and Herzegovina (BH) is high. With a rapidly ageing population, increasing mental health issues and levels of tobacco and alcohol consumption, pollution, and road accidents the burden of disease will continue to increase.
Although action is needed to better control communicable diseases (in particular HIV/AIDS, sexually transmitted diseases and tuberculosis), in the RS and in BH, the main public health challenge is to control major non-communicable diseases (NCD) – the “NCD epidemic”. The importance of NCD control is clearly seen in data presented in Table 1, where out of the total of 9 deaths per 1,000 people in the RS in 2001, 6.3 deaths were caused by diabetes mellitus, malignant diseases, high blood pressure and heart diseases and only 2.7 deaths were caused by all other non-communicable and all communicable diseases. In 2004, the number of deaths per 1,000 people increased to 9.2, and the increase was caused by NCD which increased to 6.5 deaths.

Table 1 Trends of diseases as mortality causes in the Republic of Srpska in 2001 and 2004

<table>
<thead>
<tr>
<th>DISEASE</th>
<th>2001</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deaths</td>
<td>Population (estimated)</td>
</tr>
<tr>
<td>Deaths caused by leading NCDs</td>
<td>9,349</td>
<td>69.59</td>
</tr>
<tr>
<td>Hypertension and other heart diseases</td>
<td>7,194</td>
<td>53.55</td>
</tr>
<tr>
<td>Malignant diseases</td>
<td>1,994</td>
<td>14.84</td>
</tr>
<tr>
<td>Diabetes</td>
<td>161</td>
<td>1.20</td>
</tr>
<tr>
<td>Other NCDs and CDs</td>
<td>4,085</td>
<td>30.41</td>
</tr>
<tr>
<td>TOTAL</td>
<td>13,434</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Data source: Demographic Statistics-Statistical Bulletin Nos. 5, 8 issued by the RS Institute of Statistics.

The current organization and financing of the health sector makes it unable to cope with the additional burden and emerging needs.

Over the past several years, both Entities of BH have initiated wide-ranging reforms in the health sector aimed at increasing the sector’s efficiency, strengthening financial sustainability, and improving quality of care. However, weaknesses remain in efficiency, equity, and quality of health services, calling for deeper reforms.

The major sector issues are summarized below.

**Financial Sustainability.** Public sector expenditures for health amount to about 8 percent of the BH GDP. In addition, it is estimated that out-of-pocket expenditures amount to another 5 percent of the BH GDP, though private expenditures are not captured effectively, as much of
it is in the form of informal payments, rather than co-payments. Public sector expenditures for health amounted to 5.31% of the Republic of Srpska GDP in 2003 year.

The high cost of the health care system is a reflection of inefficient resource allocation driven by an over extended and highly fragmented provider network and a provider payment system which fails to instill incentives for efficiency improvements and consolidation at the provider level, as well as by very low GDP in BH and the RS. In 2003, the BH GDP amounted to KM 12,303 million, out of which the RS GDP was KM 3,717 million (UNDP BH, 2004).

Inefficient Service Delivery. Technical assessments of both Entities’ health care systems point to an imbalanced mix of primary, secondary and tertiary levels of care and facilities, shortages of materials and equipment, an uneven knowledge of evidence-based medical protocols, and specialist physicians dominated health care system that does not utilize the potential of other health professionals to enhance quality and promote cost effectiveness.

Unequal access to health care. Although the health insurance schemes are meant to provide universal coverage and access to health services, high unemployment, a large informal sector, and tax evasion result in a high contribution burden to the formal sector while a significant share of the population remains uncovered.

2 BACKGROUND

On July 26, 2002, the National Assembly of the Republic of Srpska adopted the Program of Health Policy and Strategies for Health in the Republic of Srpska by the year 2010. The most important enduring goal of that document is the “continuous improvement of the health status of the population and improvement of conditions that influence health”.

Four main objectives of the health policy are:

- Decreasing inequalities in health status and improvement of accessibility to health care, with regards to geographic areas and socio-economic groups
- Improvement of health status and increasing accessibility of health services for vulnerable groups of the population
- Reorientation of the overall health services towards improvement of health and disease prevention
- Increasing the efficiency and quality of health care.
In April 2003, for the realization of its health policy goals, the Government of the Republic of Srpska, along with other strategies, adopted the Strategy for Prevention and Control of Non-Communicable Diseases. After the strategy adoption, the Minister of Health and Social Welfare adopted, as an operational document, in May 2003, the Program of Prevention and Control of Non-Communicable Diseases.

The strategy of prevention and control of non-communicable diseases includes individuals as well as families and covers:

- health-promotion measures aimed at reducing risk;
- detection of risks and early-diagnosis, and mitigation of risk factors;

Prevention and control of non-communicable diseases (NCD) in the RS by 2010 includes cardiovascular, malignant (cancer) and diabetic diseases as well as their common risks factors of smoking, unhealthy eating habits and insufficient physical activity.

The general objective presented in the strategy is:

- By 2010, to stop the increase in mortality and morbidity caused by non-communicable diseases identified in the strategy and to set a trend of their gradual decline in order to reduce deaths and disability caused by these diseases by 5%.

As its overall aim, the strategy defines the following specific objectives:

- Mortality caused by cardio-vascular diseases will decrease by 10% in people under 65;
- Mortality caused by malignant diseases (cancer) will decrease by 5% in people under 65;
- Diabetes-related complications (blindness, amputations, renal failures) will decrease by 20%;
- The number of adult smokers will decrease by 50%, the number of young people smoking will decrease by 80%, and smoking in the workplace, public places and in public transportation vehicles will be prohibited;
- The number of adults regularly drinking alcohol will decrease by 50% and the number of young people by 80%.
In order to realize the objectives, the strategy provided a set of measures directed at the whole population (named the Population Policy) and at individuals and families exposed to increased risk (the High Risk Strategy).

The objectives of the strategy, and the non-communicable diseases and their common risk factors covered by the strategy, were based on the results of a survey of risk factors, health status, health needs and utilization of health services of the RS population. This survey provided insight into the frequency and levels of risk factors of leading non-communicable diseases for the entire population of the RS as well as by gender, age, location, geographical regions, and education level of the population (Health Insurance Fund of the RS and Public Health Institute of the RS, 2003). The survey of the RS demonstrated the great burden of diseases they are exposed to, and the urgent need for control and prevention of non-communicable diseases.

Apart from the results of the survey of risk factors, health status and health needs, the Program was also based upon the idea that cardiovascular and diabetes mellitus diseases could be avoided completely or partially through prevention and health promotion measures, or could be limited in their progression and effects if they have already started. At the same time, partnership is recognized as a key aspect of the efforts to prevent disease and promote health.

Furthermore, the number of cancer cases should be reduced by reducing the exposure of the population to risk factors known to be associated with the development of cancer. Primary prevention targets the known risk factors for certain types of cancer, and aims at eliminating or reducing the exposure of the population or individuals to these risk factors. Nevertheless, prevention through screening requires effective treatment at the preliminary stages of each type of cancer. Screening does not reduce the number of people with cancer but can reduce mortality.

Today, two years after the adoption of the documents, the program is in the stage of implementation, when it is desirable to evaluate what has been done and to what extent. The main objective of our study, after performing a progress analysis of the Program, is to define policies that will enable a realistic, quick, effective and consistent implementation of the Program, taking into consideration economic aspects of the Strategy objectives and the activities covered by the Program.
3 PROGRAM OF PREVENTION AND CONTROL OF NON-COMMUNICABLE DISEASES IN THE REPUBLIC OF SRPSKA

3.1 Description of the Program

Program of Prevention and Control of Non-Communicable Diseases (Program) is meant to facilitate the realization of the objectives set in the Strategy for Prevention and Control of Non-Communicable Diseases in the RS, observing the goals set in the Global Strategy for Prevention and Control of Non-Communicable diseases adopted by the World Health Organization. The need to have the strategy and the program ensued from the fact that non-communicable diseases cause 70% of mortality cases (Figure 1), which proves that there is a high proportion of the RS population susceptible to non-communicable diseases.

Figure 1. Mortality caused by the NCD and the CD diseases in Republic of Srpska in period 2001 to 2004

Data source: Demographic Statistics-Statistical Bulletin No. 5, 6, 7 and 8 of the RS Institute of Statistics.

There is a trend of increase in non-communicable diseases in the countries of central and eastern Europe as well as in our country, unlike the countries of west Europe, where these diseases have been declining gradually owing to preventative reduction of risk factors and early diagnosis of illness. All these engender a need to have the program and its efficient and transparent implementation in order to achieve the wider goal of public health – improved health of the population.

The program covers the entire population of the RS over 18 years of age, given that the Population Policy and the High Risk Strategy are deployed in parallel as measures for achieving the set objectives.

The program covers:
- health-promotion measures aimed at reducing risk;
- detection of risks and early-diagnosis, and mitigations of risk factors;

The Program of Prevention and Control of the Non-Communicable Diseases commenced in health care institutions of the RS in January 1, 2004. Implementation was interrupted by numerous problems, from inadequate infrastructure, organizational structure, number of specialized medical employees at the primary level, to insufficient financial resources necessary for implementation.

Implementation of the health-promotion measures aimed at reducing risk and measures of detection of risks and early-diagnosis and mitigation of risk factors is the responsibility of the primary health care institutions called DZs, that is, of the family medicine ambulantas (general practitioner) and consultative services of the DZs.

The measures of early diagnosis of malignant diseases (cancers) are organized and implemented by consultative services of the DZs in close cooperation with the family medicine ambulanta and specialized services of general hospitals.

The program covers nine initiatives:

1. Prevention and reduction of high systolic/diastolic blood pressure
2. Prevention and reduction of obesity
3. Prevention and reduction of high total blood cholesterol
4. Prevention and reduction of high blood sugar
5. Reducing smoking/tobacco addiction
6. Early detection of prostate cancer
7. Early detection of cervical cancer
8. Early detection of breast cancer

The program sets out in detail the implementation steps for each of the nine activities. It defines the frequency of prevention checkups, the criteria for identification of the target population for a preventive checkup, the procedures for identification of the existence of risk factors, and the stakeholders in charge of implementation.

From the financial point of view, the strategy states that the Health Insurance Fund of the RS is obliged to prepare its own program for implementation activities adopted in the strategy and the program. Annual financial plans of the Fund should include the program activities and financial sources available for the program implementation. Planned activities in accordance
with available sources are contracted between the Fund and primary health institutions. The strategy also states that no additional sources will be necessary for the accomplishment of the goals (except additional investments), and the necessary sources will be provided through reallocation of the available funds the Health Insurance Fund collects from contributions.

According to the available data and information collected from meetings with stakeholders, no economic-quantitative study had been prepared prior to defining objectives set in the strategy and in the program in the RS nor even afterward, during the implementation of the program. The RS Public Health Institute performs quarterly monitoring and evaluation of the program realization but strictly from a medical, and not financial, point of view.

The aim of monitoring and evaluation is to:
- introduce the monitoring system of health-related relevant risk factors,
- assess the effect of the implementation of the program,
- create a database for tracking changes during the implementation period and
- identify the number of people with potential risk factors for non-communicable disease for each following year.

Based on these data, The RS Public Health Institute defines the number and type of preventive services and delivers them to the Fund. This activity is very important for the Institute, since once an illness – risk factor is identified, it must be treated through curative health care. The Fund request this information based on the Reporting of individual services for each citizen. Interviewed representatives of health care institutions pointed out the dilemma that they were not sure when a certain service is considered a program service and when it is curative.

3.2 Stakeholders Involved in the Program Implementation

The following three principal groups of stakeholders are critical:

**Those Involved in Program Operations.** This stakeholder group involves organizations with certain authorities and responsibilities in the Program implementation process, as is clearly seen in Figure 2 below. All these organizations work together in the program and they should operate as a single interest group devoted to improving health status of the RS population through implementation prevention and control of non-communicable diseases.

**Those Served by the Program.** The population of the Republic of Srpska 18 years of age and older are direct users of the services provided for in the Program. They have been involved in
the research through a survey of their attitudes about the importance of illness prevention and control, their familiarity with the program itself, and their interest in participating in the activities included in the program of prevention and control of non-communicable diseases.

**Primary Users of the Study.** The primary users of the Study are individuals who are in a position to organize activities or make decisions observing the program. In this research, those are the Assistant to the Minister of Health and Social Welfare for Health Care, the director of the RS Health Insurance Fund and the Director of the Public Health Institute of the RS. In practice, they are a subset of all stakeholders identified.

**Figure 2 Relations among Organizations involved as Stakeholders in the Program Implementation and their Tasks**

![Logic model](image)

**Logic model.** The logic model (Figure 3) describes the sequence of events and the main program elements that provide a picture of how the program is supposed to work. Besides, the model linked the Program activities with the three levels of results ranging from immediate (identification of individuals exposed to a risk, an early detection of a non-communicable disease) through the intermediate (reduction in non-communicable diseases rate) to long-term effects (cost-effective health care system, improvement of population health status).
Figure 3  Logic Model of the Program of Prevention and Control of Non-Communicable Diseases

- Adult population (18 years of age and older)
- Preventive checks in accordance with the Program activities
- Risk identified
- Early detection of disease
- Medical treatment of the disease in lower development stage
- Decreased expenditures for higher stages of diseases development
- An individual still included in the Program in accordance with the regular schedule
- No identified risk
- Regular monitoring / changing unhealthy habits or medical treatment
- Decreased number of non-communicable diseases cases
- Decreased expenditures of higher/more expensive levels of health care
- Cost-effective health care system
- Improved health status of the population

- Regular monitoring / changing unhealthy habits or medical treatment
- Registering in the evidence
- Decreased expenditures for higher stages of diseases development
- Decreased number of non-communicable diseases cases
- Cost-effective health care system
- Improved health status of the population
4 SUBJECT AND STRUCTURE OF THE RESEARCH

This discussion first outlines the questions to be researched and then the structure of the research.

4.1 Subject of the Study – Questions to be Researched

The study addresses the three following questions:

- Is the program’s scope too wide, considering limited resources for delivering required prevention and control services?
- Is awareness of the RS citizens about the importance and usefulness of the prevention and control of non-communicable diseases too low?
- Is the Program implementation difficult because of an inappropriate, unrealistic implementation and financial model?

1. Is the program’s scope too wide, considering limited resources for delivering required prevention and control services?

The program’s scope is the basis and the blueprint for all required material, financial and human resources.

The program covers 9 fields of prevention which, according to the existing mode of organization, should be implemented by family doctor teams within regular working hours. Within the same time one team should provide services to sick people and perform prevention activities on a daily basis (e.g. from one municipality’s primary health institution “Dom Zdravlja” - in one shift, a team should provide services for 30 ill people and 15 prevention cases). Initial conversations with stakeholders indicated that, practically, it is very difficult for a team to provide so many services each day. The main problem in achieving the required level of prevention in the DZs is their limited financial resources.

The results of researching the first problems should provide a basis to decide whether is it more efficient to redefine the scope of the program or to keep the existing one. Final recommendations will depend on the possibilities for problems to be resolved, as identified in the research.
2. Is the awareness of the RS citizens about the importance and usefulness of prevention and control of non-communicable diseases too low?

The general social situation in the RS and many unsolved problems in the health sector have caused a low level of awareness of the RS citizens about the non-communicable diseases prevention and control importance. Citizens look for health services when they become ill, and very rarely for preventative checkups. A survey conducted as part of this research will suggest an outline for a communications strategy for the program.

3. Is the Program implementation difficult because of an inappropriate, unrealistic implementation and financial model?

According to the Law on Health Insurance, all citizens of the RS should be covered by compulsory health insurance. Considering that certain employers do not pay social and health contributions for their employees, that most farmers do not pay health insurance, and the influence of informal economy and other reasons, it is estimated that about 30% of the RS population are uninsured. On the other hand, even the insured have additional expenditures when they seek secondary and tertiary health services.

Bearing in mind the fact that the program is financed from the funds that the Health Insurance Fund collects from contributions from insured citizens, we came to the conclusion that preventive control care is not available to all citizens. The result is that uninsured people are not included in the program and even the insured are included only partly because of the limited resources available in the Health Insurance Fund and limited public awareness. Limited available funds discourage immediate program implementers and service providers and slow down the program’s implementation. In these circumstances there is little possibility for a successful implementation of the program, without some changes to its scope and a reprogramming of its financial model.

4.2 Structure of the Research

To address questions 1 and 3 in-depth interviews were organized with stakeholders involved in the strategy and program adoption, financing, implementation, monitoring, and evaluation (A list of the persons with whom the in-depth interviews were conducted can be seen in Appendix 1). The research included stakeholders immediately involved in the program implementation as well as those involved in its creation. The basic objective of the interviews was to compare
opinions of different stakeholders in order to identify the main problems encountered in program implementation, from the required resources point of view (human resources, financial funds, investment requirements). For that reason, a direct un-structured interview questionnaire was prepared. The Economics Institute staff interviewed stakeholders who answered questions about the program scope and problems encountered in the program implementation. The interviews were focused on:

- problems encountered in the financing of the program implementation;
- organizational capability of DZs and
- availability of the equipment required for certain preventive examinations.

To address questions 1 and 3, besides the results of the interviews, information from administrative evidence – monitoring and evaluation reports, annual financial plans of the RS Health Insurance Fund regarding prevention and control of non-communicable diseases, and annual contracts between the RS Fund and DZs – were used as well as other available sources. Because the resources were limited, we thought it useful to provide insights from the experiences of other countries relevant to the health conditions mentioned above, more exactly, programs and activities that provided the greatest benefits for the population targeted for similar interventions. For that purpose, the research included a literature review on cost-effectiveness for similar preventive services being implemented in other countries.

Research to answer question 2 was carried out using a face-to-face survey of citizens’ attitudes. The survey was conducted by the PARTNER MARKETING Lim agency from Banja Luka (References the Agency Partner see in Appendix 2). A structured questionnaire – containing precisely defined, direct questions - was used (Appendix 3). All the questions were answered by all respondents and in the same order.

The final objective of the study, bearing in mind the RS citizens, was to educate them about the importance of prevention and control of non-communicable diseases and make them aware of their rights and obligations provided for in the Program. The study should contribute to achieving this goal through provision of recommendation in the outline of the program communication strategy, which would be the most appropriate manner for RS citizens to receive information.

The survey of the RS citizens attitudes enabled us to test the hypothesis that citizens were not sufficiently aware of the importance of disease prevention and control, and that they were not well informed and interested in participating in the activities included in the program of prevention and control of non-communicable diseases.
Bearing in mind the aforementioned, the questionnaire contained the following three sections:

- background information – gender, ages, level of education, working status, and type of living place (urban or rural);
- existing level of the citizens familiarity with importance of non-communicable diseases prevention and control and the program itself;
- the citizens attitudes about most appropriate platform of the program promotion.

In designing questions we had three principles in mind:

- respondents’ answers should provide us with information related to the study goal
- questions need to be understandable and unambiguous and
- the number of questions needs to be parsimonious.

The targeted population includes an estimated number of 788,004 inhabitants ages 18-64 and 167,742 citizens ages over 64 (955,746 total).

Size of the Sample. Considering available financial sources for the research we interviewed 1,004 respondents (table 2) from the entire territory of the Republic of Srpska.

The sample selection procedure. The sampling was carried out by means of combination of purposive and random sampling that has been used for many other surveys in Bosnia, including for the UN. Keeping in mind that a census has not been done in BH since 1991, low population density in certain areas and some other circumstances, we chose local communities as sampling points (Serbian: mjesne zajednice,) respecting their urban/rural split (downtown or suburb). After that, the selection of individual respondents (1 per household) in the household used a random selection key (next birthday). A next birthday selection key means that the adult member of the household who had a birthday the first in next period will be interviewed. This rule was applied to approximately 80% of questionnaires completed and then the interviewer checked the sex distribution of the respondents interviewed. If more male than female were interviewed, then a modified the first next birthday key was applied, so that only the missing sex persons with the first next birthday were interviewed.

For the purpose of this survey, the Republic of Srpska was divided into eight regions according to the location of the Health Insurance Fund branches: Prijedor, Banja Luka, Doboj, Bijeljina, Zvornik, Foca, Istocno Sarajevo i Trebinje.

It was important to do this, because of the structure of the DZs. The RS Public Health Institute conducts quarterly monitoring and evaluation of the Program implementation by
branches of the RS Health Insurance Fund, and the branches sign annual service provision contracts with DZs as implementers of the primary health care and the program itself. Also, according to the strategy, DZs also adopt and submit to the Public Health Institute for approval quantitatively expressed annual programs of disease prevention and control for the entire territory of the municipality they serve and in which they organize promotion of the Program.

To determine how many households to sample in each region, we used multi-staged stratified random sampling, with possibilities proportional to size of the stratum.

1. the number of sampling points within each region was proportional to the distribution of the population –municipalities having a DZ in its territory represents units of the first circle and citizens from urban and rural territory of the municipalities are units of the second circle;
2. random selection of starting points within each sampling point;
3. selection of households using the "random route" technique;
4. selection of individual respondents (1 per household) using a random selection key (next birthday). Usually, there are two callbacks before a selected respondent is replaced (from another randomly selected household in the same sampling point).

The sampling is carried out based on the contracted survey agency’s data base, created during 10 years of work experience on public opinion surveys. This data base relies on assessments of the Statistical Bureau of the Republic of Srpska and the Statistical Bureau of Bosnia and Herzegovina concerning the populations in the entity and specific regions, and the World Bank assessments of BH population and Election Commission voter registration lists.

Table 2  Sample selection

<table>
<thead>
<tr>
<th>Branches</th>
<th>Urban population</th>
<th>Rural population</th>
<th>Total population</th>
<th>Structure Urban</th>
<th>Structure Rural</th>
<th>Structure Total</th>
<th>Size of the sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Banja Luka</td>
<td>204,686</td>
<td>276,607</td>
<td>481,293</td>
<td>13.09%</td>
<td>17.69%</td>
<td>30.78%</td>
<td>308</td>
</tr>
<tr>
<td>Prijedor</td>
<td>66,762</td>
<td>128,204</td>
<td>194,966</td>
<td>4.27%</td>
<td>8.20%</td>
<td>12.47%</td>
<td>126</td>
</tr>
<tr>
<td>Bijeljina</td>
<td>40,886</td>
<td>95,537</td>
<td>136,423</td>
<td>2.61%</td>
<td>6.11%</td>
<td>8.72%</td>
<td>87</td>
</tr>
<tr>
<td>Žvornik</td>
<td>40,074</td>
<td>148,980</td>
<td>189,054</td>
<td>2.56%</td>
<td>9.53%</td>
<td>12.09%</td>
<td>121</td>
</tr>
<tr>
<td>Doboj</td>
<td>84,777</td>
<td>246,095</td>
<td>330,872</td>
<td>5.42%</td>
<td>15.74%</td>
<td>21.16%</td>
<td>214</td>
</tr>
<tr>
<td>I. Sarajevo</td>
<td>32,583</td>
<td>35,217</td>
<td>67,800</td>
<td>2.08%</td>
<td>2.25%</td>
<td>4.34%</td>
<td>44</td>
</tr>
<tr>
<td>Foča</td>
<td>27,854</td>
<td>58,978</td>
<td>86,832</td>
<td>1.78%</td>
<td>3.77%</td>
<td>5.55%</td>
<td>55</td>
</tr>
<tr>
<td>Trebinje</td>
<td>40,405</td>
<td>36,086</td>
<td>76,491</td>
<td>2.58%</td>
<td>2.31%</td>
<td>4.89%</td>
<td>49</td>
</tr>
<tr>
<td>Total</td>
<td>538,027</td>
<td>1,025,704</td>
<td>1,563,731</td>
<td>34.41%</td>
<td>65.59%</td>
<td>100.00%</td>
<td>1,004</td>
</tr>
</tbody>
</table>
The Program of Prevention and Control of Non-Communicable Diseases in the RS started in 2004, but it has not been agreed yet how to measure the effects of its implementation. As public health resources have become scarcer, and amounts provided for prevention are limited, they should be used in the most effective way and also demonstrate whether the effects they produce justify the costs they impose.

Prevention effectiveness analyses involve a systematic assessment of the impact of public health policies, programs and practices on health outcomes. Information on prevention effectiveness provides a basis for recommendations regarding public health programs, guidelines for prevention and control, and decision making about resource allocation.

“The effectiveness of the intervention is the product of its efficacy, compliance and penetration. Efficacy relates to the impact of an intervention in ideal populations under ideal circumstances. Thus, this level of success can rarely be achieved in routine community settings. Data on compliance provide information about the extent to which patients obey doctors’ recommendations, and penetration means the reach of an intervention to all subjects that might benefit” (Steven M. Teutsch, Anne C. Haddix, 1996, p 52).

The assessment of costs and effectiveness of preventive interventions is an essential component of public health programs. The comparison of different preventive strategies and decisions concerning an allocation of finite health resources both depend on obtaining reliable and consistent costs and effectiveness data, with an aim to indicate which programs and activities provide greatest benefits for the funds expended. All stakeholders, whether directly or indirectly involved in prevention programs, need to know the costs of such programs and the effects on the health of the population targeted for the intervention. To decrease the burden of the illness and improve the health condition of the population, resources should be allocated to the scientifically determined priorities.

We here present three methods whose aim is to identify, measure, value and compare the costs and consequences of alternate prevention strategies: cost-benefit, cost-effectiveness and cost-utility analysis (For more details see Appendix 4). The selection of an appropriate method will depend on the target audience of the study, the study questions, and the availability of data needed to utilize the chosen method. We provide citations from existing research reports on these topics with more detail in the appendix.
5.1 **Cost-benefit Analysis (CBA)** (Beth Clemmer, Anne C. Haddix 1996, p. 85-101)

*Definition:* Cost-benefit analysis is a technique that attempts to value the consequences or benefits of an intervention program in monetary terms. Unlike cost-effectiveness and cost-utility analysis, which analyze outcomes measured in terms of cost-per-unit-of-health-outcome, CBA attempts to place monetary value on program outcomes.

In its simplest form, CBA attempts to weigh all the impacts of a program to assess whether it is worthwhile, i.e. whether its benefits exceed its costs. The results of CBA are reported as either the net present value (NPV), or net benefits of a project, or as the benefit-cost ratio. CBA takes a societal perspective, valuing all costs and all benefits of an prevention program to identify programs that produce the largest social good.

*When should cost-benefit analysis be used?* Generally, the CBA is used before a public health program is implemented to evaluate whether the program produces net savings, but it can also be used to evaluate what has been accomplished by existing programs. Because CBA converts all costs and benefits into common metric unit, it is also useful when an intervention program produces multiple health outcomes. CBA allows comparison of alternate strategies that have different outcomes, and the result indicate whether a specific strategy results in net savings or net loss, which can help decision makers to select among various programs or among different strategies within a program (Beth Clemmer, Anne C. Haddix, 1996, page 86).

Caution is warranted when using a cost-benefit analysis to inform a health policy decision when the study compares the cost of prevention to a dollar value of life. There is no accepted method to assign a dollar value to a life. Some cost-benefit analyses of health policies avoid this concern by comparing the cost of the policy to how much individuals would be willing to pay for the policy. However, because willingness-to-pay studies ask people to respond to hypothetical situations, these estimates may overstate individuals’ true willingness to pay if faced with the actual task of choosing between the policy and their money (Partnership for Prevention, 2001, page 3).

Because of the difficulty of measuring and valuing qualitative benefits, prevention effectiveness practitioners more commonly use cost-effectiveness and cost-utility analysis.
5.2 Cost-effectiveness Analysis (CEA) (Anne C. Haddix, Phaedra A. Shaffer 1996, p. 103-127)

Definition. Cost-effectiveness analysis is commonly used to conduct economic analysis of health programs. In CEA results are presented in the form of cost per health outcome, such as “cost per case prevented” or “cost per life saved”. The decision maker is left to make value judgments about intrinsic value of the health outcomes.

Cost-effectiveness analysis is most useful when the goal of the analysis is to identify the most cost-effective prevention strategy from the set of options that produce a common effect. Because CEA does not use a common outcome measure such as dollars or quality-adjusted life years (QALYs) it does not provide a convenient way to compare the cost-effectiveness of interventions for different health conditions. Another disadvantage is that judgments about the value and quality of lives must be implicitly made by user of the study results because they are not included explicitly in a CEA.

When should a CEA be conducted? CEA compares the cost of optional interventions or treatments per health outcome achieved. CEA is most useful when the interventions being compared have one clear and specific outcome. CEA is most suited for the following scenarios: (a) comparing alternative strategies for an identical goal, (b) identifying which intervention method is best for a specific population, (c) providing empirical support for the adoption of previously under-funded programs with low cost-effectiveness ratios (d) identifying practices that are not worth their cost (Anne C. Haddix, Phaedra A. Shaffer, 1996, pages 103-104).

5.3 Cost-Utility Analysis (CUA) (Erik Dasbach, Steven M. Teutsch 1996, p. 130-140)

Definition: CUA is a type of cost-effectiveness analysis in which benefits are expressed as the number of life years saved adjusted to account for loss of quality from morbidity of the health outcome or side effects from the intervention.

When should CUA be used? Cost-utility analysis (CUA) is appropriate when

- Quality of life is the important outcome;
- Quality of life is an important outcome;
- The program being evaluated affects both morbidity and mortality;
- The program being compared have a wide range of different outcomes;
The program being evaluated is being compared with a program that has already been evaluated using CUA.

CUA is similar to other methods of economic analysis because it examines the number of health outcomes. It also includes measures of the length of life and quality of life, rather than just the number of individuals affected by a program. Because length of life is a factor, CUA tends to favor interventions aimed at conditions affecting younger persons. It differs from CEA and CBA by including measures of the quality of life. CUA can provide useful information in the overall process of decision making and policy development.

6 LITERATURE REVIEW ON PREVENTION-PROGRAMS COST-EFFECTIVENESS

6.1 Risk Factors and Non-communicable Diseases

In a situation where the human and financial resources provided for prevention of non-communicable diseases are limited, public health improvement activities necessarily need to have an economic dimension. Public health efforts must be directed at preventive strategies that provide the most benefits for resources expended. A literature review of prevention activities cost-effectiveness is a good way to reinforce the evidence of the necessity and effectiveness of prevention services that are incorporated into the Program of Prevention and Control of Non-communicable Diseases.

Hypertension. In 2003, hypertension affected 42.1% of the RS population (EPOS, 2003). It poses a major burden on societies, since it is estimated that hypertension affects 50 million individuals in the USA and approximately one billion worldwide (National Institutes of Health, National Heart, Lung, and Blood Institute, 2003). In the next 20 years cardiovascular diseases will be the leading cause of morbidity and mortality; therefore resources that need to be invested in prevention justify increased interest in assessment of cost-effectiveness of preventive interventions.

There is good evidence that blood pressure measurement can identify adults at increased risk for cardiovascular diseases due to high blood pressure, and good evidence that treatment of high blood pressure substantially reduces the incidence of cardiovascular diseases. The benefits of screening for and treating high blood pressure in adults substantially outweigh the harms (The U.S. Preventive Services Task Force, 2003).
Recent studies demonstrated that hypertension could be prevented by population-based strategies and strategies targeted at the individuals and groups who are at higher risk to develop hypertension. Lifestyle modifications can be successful and the absolute reduction in risk of hypertension is likely to be greater when targeted in persons who are older or those who are at higher risk for high blood pressure. The potential benefits refer to decreased morbidity and mortality associated with hypertension: an analysis based on the Framingham Heart Study showed that a 2 mmHg reduction in the population average of diastolic blood pressure for U.S. residents 35 to 64 years of age would result in a 17 percent decrease in the prevalence of hypertension, a 14 percent reduction in the risk of stroke, and a 6 percent reduction in the risk of cardiovascular diseases (National Guideline Clearinghouse, 2002).

A literature provides another interesting consideration regarding the cost-effectiveness of prevention strategies: the Swedish Trial in Old Patients with Hypertension (STOP) compared the costs and outcomes of the cardiovascular multiple-risk-factor intervention program with those of conventional drug treatment alone. Average cost per life-year gained was estimated to be $667, which was lower than that for drug treatment alone ($833 for men and $2,500 for women). In most studies, treatments with cost-effectiveness ratios below $16,667 are considered highly cost-effective. Cost for provision of basic nutrition information and educational materials per patient would be minimal and would require only 1 to 2 minutes of the primary health care provider’s time, which proves to be an adequate effort to improve health outcomes of the patient. Treatment of hypertension decreases overall mortality by 20%, cardiovascular mortality by 33% and the incidence of fatal and non-fatal cerebrovascular accidents by 40% and the complications of coronary heart disease by 15% (The National Guideline Clearinghouse, 2002).

**Body mass index (BMI).** Primary prevention of obesity and overweight provides an opportunity to restrain the onset of serious diet-related chronic diseases, including type 2 diabetes, cardiovascular disease, hypertension and stroke, and certain forms of cancer. Approximately 58% cases of diabetes, 21% of ischaemic heart disease and 8-42% of certain cancers globally were attributable to a BMI above 21 kg/m² (World Health Organization, Global Strategy on Diet, Physical Activity and Health, 2003). According to results of the research 19.6% of the RS population have a BMI>30 (EPOS, 2003). Recent analyses estimated that direct costs of obesity (prevention, diagnosis and treatment) make 5.7% of total US health expenditures and 2.4% of the total health care budget in Canada. A study researching the impact of obesity on the cost of expected lifetime medical care on 5 diseases (hypertension, elevated serum cholesterol, diabetes mellitus, cardiovascular diseases, stroke), found that costs increase by 20% with mild obesity, by 50% with moderate
obesity and nearly 200% with severe obesity (Screening and Interventions for Overweight and Obesity in Adults, 2003).

A literature provides interesting statistics about how physical activity and weight loss save money and additionally augments the importance of effective weight management for individuals and groups at risk (Preventing Obesity and Chronic Diseases Fact Sheet, 2005):

- If 10 percent of adults in USA began a regular walking program, $5.6 billion in heart diseases costs could be saved,
- A sustained 10 percent weight loss will reduce an overweight person’s lifetime medical costs by $2,200-5,300, by lowering costs associated with hypertension, type 2 diabetes, heart disease, stroke and high cholesterol, and increase life expectancy by 2-7 months.

**Cholesterol.** The relevant literature provides fairly reliable scientific evidences of the relationship between high cholesterol and cardiovascular diseases and stroke. Raising public awareness and knowledge about the importance of lowering blood cholesterol levels is fundamental in reducing the health and economic burden of these events. Current guidelines in the USA recommend that all adults have their blood cholesterol level checked every 5 years. It is estimated that (The Burden of Chronic Diseases and Their Risk Factors, National and State Perspective, 2004):

- Over 80% of individuals with high blood cholesterol do not have it under control,
- A 10% decrease in total cholesterol levels may reduce the incidence of coronary heart disease by an estimated 30%.

Effectiveness of early detection is supported by four large primary prevention trials demonstrated that cholesterol-lowering drug treatment for 5 to 7 years decreased cardiovascular disease risk approximately 30% in people with high total cholesterol and low HDL cholesterol. Changing dietary habits can lower total cholesterol and LDL cholesterol approximately 10-20% in some individuals, but the average effect of diet interventions in outpatients is relatively modest (2% to 6% reduction in total cholesterol) (U.S. Preventive Service Task Force, 2001).

**Diabetes Mellitus.** Based on the World Health Organization estimates, diabetes is projected to become one of the world’s main disablers and killers within the next twenty-five years. In 2000, 177 million people worldwide suffered from diabetes. The number of deaths attributed to diabetes was estimated at 4 million per year, mainly from cardiovascular complications (World Health Organization, 2005). The problem is even greater knowing that most of the
premature deaths are happening to people when they are economically contributing to society. In the RS, increased blood sugar level is recorded in 13.7% of population (EPOS, 2003).

Direct costs attributable to diabetes are estimated at $92 billion, and indirect costs (disability, work loss, premature death) are estimated at $40 billion. Average health care costs per year for person with diabetes are estimated at $13,243 vs. $2,560 for a person without diabetes (National Center for Chronic Disease Prevention and Health Promotion, 2005).

Reliable examples of effective prevention come from the studies undertaken in China, where lifestyle modifications (appropriate diet, physical activity and a consequent reduction of weight), supported by a continuous education program, were used to achieve a reduction of almost two-third in the progression to diabetes over a six-year period. This type of measure is not easy, but is likely to be cost-effective if it can be implemented on a population scale. It should be considered particularly in the poorest regions of the world where resources are severely limited, since researches conducted, besides in China, also in Finland and the USA demonstrated that intensive programs of lifestyle modifications can reduce incidence of diabetes by up to 58% in these patients. It is found that improvements in diet and everyday physical activity would reduce obesity, cardiovascular disease and some cancer. If taken at the right time, these activities are beneficial in terms of quality of life, and are cost-effective, especially if it can prevent hospital admission (World Health Organization, 2002).

The recent findings concluded that there was no sufficient evidence that routine screening of asymptomatic adults for type 2 diabetes mellitus could prevent the onset of diabetes. Patients at increased risk for cardiovascular disease may benefit most from screening for type 2 diabetes, since there was a good evidence that in adults who had hypertension and clinically detected diabetes, lowering blood pressure could reduce the incidence of cardiovascular events and cardiovascular mortality (The U.S. Preventive Service Task Force, 2003). In other words, screening persons with hypertension for diabetes is more cost-effective than screening all patients for diabetes. The cost-effectiveness is additionally supported by the calculation of investigators at the Research Triangle Institute/University of North Carolina, Chapel Hill Evidence-based Practice Center that diabetes screening for 55-year-old people with hypertension would cost the U.S. health care system $34,375 per QALI, but expanding screening to all adults would cost an additional $360,966 per QALI, which is a far more costly approach (Agency for Healthcare Research and Quality, 2004).

The new study finds that for those who are exposed to the risk of diabetes, prevention efforts are worth every penny. A lifestyle modification program could delay the inception of diabetes by an average of 11 years and reduce the risk of developing diabetes by 20 percent, when compared with no intervention. Also, intensive lifestyle modifications for people with pre-
diabetes would cost society $8,800 for every QALI saved, indicating the strong evidence of cost-effectiveness (University of Michigan Health System, 2005)

**Smoking.** Tobacco use is the leading preventable cause of premature mortality worldwide. It has been attributed to 4 million deaths annually, and it is estimated that the burden will increase to 10 million by 2030. Finland was a good example of cooperation between health authorities and non-governmental organizations associated with health promotion that led to the restriction of smoking in public places in ‘70s, and decline in number of smokers, the incidence of lung cancer and cardiovascular diseases (Cancer Society of Finland, 2003). In 2003, 33.6% of the RS population was every day smokers (EPOS, 2003).

There is good evidence that even brief tobacco cessation counseling interventions, such as screening and behavioral counseling (3 minutes or less), are effective in increasing the number of people who successfully quit smoking and remain abstinent after 1 year. Also, there is a good evidence that smoking cessation prevents the risk of heart disease, stroke, and lung cancer, and even a small increase in the quit rates from cessation counseling would produce important health benefits (The U.S. Preventive Service Task Force, 2003).

The evidence of tobacco-cessation counseling effectiveness was demonstrated in over 100 randomized controlled clinical trials. Even brief behavioral counseling (3 minutes or less) results in 10.7% cessation rates, which improves as the period of counseling increase (12.1% for 3-10 minutes of counseling, and 18.7% for over 10 minutes of counseling) (Tobacco-cessation Patient Counseling, Practice Policy Statement, 1998).

The smoking cessation counseling is known as the gold standard of cost-effectiveness interventions, since the costs it imposes range from $1,108-$4,542 and 1 year of life can be saved (The U.S. National Center for Chronic Disease Prevention and Health Promotion, 2005).

**Cervical Cancer.** Cervical cancer is the second most common cancer among women worldwide. Approximately 85% of all cases of cervical cases worldwide occur in less-developed countries, because prevention programs are either nonexistent or poorly executed. At the same time, cervical cancer could be successfully prevented through well-managed and coordinated screening programs. It is recommended that prevention efforts in low-resource settings should focus on three critical factors: achieving high screening coverage, offering an effective and acceptable test, and ensuring appropriate treatment of test-positive women. Detection and treatment of cervical cancer in its earliest stages is lifesaving, since it provides ten years or more to prevent the progression to invasive stage of disease (Alliance for Cervical Cancer Prevention, 2004).
The effectiveness of early detection of cervical cancer is undoubted: screening programs reduces cervical cancer rates by 60-90% within 3 years of implementation. A different screening intervals produce different outcomes: screening at intervals of 5, 3, 2 years or 1 year was estimated to reduce the incidence of cervical cancer by 84 percent, 91 percent, 93 percent, and 94 percent, respectively, among women aged 35-64, assuming perfect compliance. A longer interval between Pap tests is not associated with a higher risk for developing high-grade lesions (The US Preventive Service Task Force, 2003).

Recent study conducted in the RS in 2003 found that only 25.8% women had a Pap test within last two years (EPOS, 2003). About 87% of U.S. women reported in 2002 that they had a Pap test within the last 3 years. Financial costs of cervical cancer treatment amount to $2 billion each year. That is the reason for insisting on early detection of cancer, because it is a "good investment". Health economists generally agree that if an intervention can save 1 year of life for less than $50,000, it is cost-effective. Therefore, in economic terms, screening for cervical cancer is cost-effective: screening every three years extends life at a cost of about $5,392 per year of a life saved (National Center for Chronic Disease Prevention and Health Promotion, 2005).

Evidence from trials conducted in Australia suggests that screening every two years can prevent up to 90 percent of cervical cancer cases. Data from Victoria show the death rate from cervical cancer was more than halved from 6.3 per 100,000 in 1963 to 2.4 per 100,000 in 1993, indicating a clear benefit from cervical screening (An Australian Government Initiative, The National Cervical Screening Program, 2005.).

**Breast Cancer.** Breast cancer is the most frequently diagnosed cancer among women in most countries, with estimated 999,000 new cases and 375,000 deaths in 2000 worldwide (International Agency for Research on Cancer, 2005). The incidence of breast cancer increased by 0.3% per year between 1987 and 2002 (American Cancer Society, 2005). At the same time, public awareness about importance of breast screening is increasing; approximately 80% of U.S. women aged 50 or older reported in 2002 that they had mammogram in the previous 2 years, compared with 64% in 1992 (National Center for Chronic Disease Prevention and Health Promotion, 2005).

There is a fair evidence that mammography every 12-33 months significantly reduces mortality rates from breast cancer. The evidence of effectiveness is strongest for older women (aged 50-69), since the incidence of breast cancer increases with age. For younger women (aged 40-49), the absolute benefit of mammography is weaker (The US Preventive Service Task Force, 2002).
Breast cancer places a significant financial burden on the society. The financial costs of breast cancer treatment in 2005 were nearly $7 billion. Therefore, early detection supported with appropriate treatment is the most cost-effective strategy in breast cancer deaths reduction. A mammography screening every 1-2 years can reduce mortality rates by approximately 20-25% every 10 years for women aged 40 or older. Mammography every 2 years extends life for women aged 65 or older at a cost of about $36,924 per year of life saved, which suggests that screening for breast cancer is cost-effective (National Center for Chronic Disease Prevention and Health Promotion, 2005).

**Prostate Cancer.** Prostate cancer is one of the most commonly diagnosed cancers among men worldwide. In 2005, about 232,000 men were diagnosed with prostate cancer, and over 30,000 men died from it in the USA (Prostate Cancer Foundation, 2005). The relationship between potential benefits and harms of prostate cancer screening is considered a controversial question, since it is difficult to answer whether the health gains are significant enough to justify the cost of screening.

A recent study has demonstrated that screening could detect prostate cancer in its early stage of development but the evidence of effectiveness was limited and uncertain. Since the screening is associated with important harms, such as possible false-positive results or complications of treatment of some cancers that may never have affected a patient’s health, it is recommended that the patient’s decision whether to be screened should be personal and largely depends on his perception of potential health gains (The US Preventive Service Task Force, 2002).

The prostate cancer survival rate decreases with the continuum of time; the five-year survival rate is 98%, the ten-year survival rate is 84% and the 15-year survival rate is 56% (Prostate Cancer Foundation, 2005).

**Colorectal Cancer.** Colorectal cancer is one of the most commonly diagnosed cancers in the USA. It is estimated that 104,950 new cases of colon cancer and 40,340 new cases of rectal cancer will be diagnosed in the USA in 2005. Screening has potential to reduce morbidity and mortality from colorectal cancer through its early detection which is supported with the fact that mortality rates has been decreasing for the last 15 years. However, only 39% of colorectal cancers are found at that early stage (The American Cancer Society, 2005).

The importance of colorectal cancer early detection has been documented in several studies; a US clinical trial reported a 33% reduction in colorectal cancer related deaths and 20% reduction in colorectal cancer incidence among people who had an annual fecal occult blood test. European population-based trials have demonstrated that screening every other year
reduced colorectal cancer deaths by 15% to 18%. Case-control studies found that sigmoidoscopy as a screening method could reduce deaths from colorectal cancers by 59% to 79% among people who had a sigmoidoscopy than among those who had not. At the same time, CDC does not recommend digitorectal exam because it can inspect only limited area. (The National Center for Chronic Disease Prevention and Health Promotion, 2005).

Analyzing the benefits and harms of colorectal cancer screening tests, that cost-effectiveness ratios for all screening methods were less then $30,000 per life-year saved, supporting the idea that compared to no screening, any reasonable strategy appears to be cost-effective. Still, current data are insufficient to define which strategy is the most cost effective. Therefore, it is recommended that the decision which screening method to employ should take into account individual preferences of a patient (Screening for Colorectal Cancer in Adults, 2002).

6.2 Examples of Prevention Programs in Other Countries

Non-communicable diseases represent a major health burden in the industrialized countries and a rapidly growing problem in the developing countries. At the same time, they are an area where major health gains can be achieved due to prevention and early disease detection. Although much will certainly be learnt in the future, a lot is known already to serve prevention. Today, the main question for non-communicable disease is not "what should be done", but "how it should be done", or, in other words, how can the existing knowledge be applied for effective prevention in real life?

The experience of Scandinavian countries, primarily Finland, represents very successful solutions, which effectively justify the existence of prevention program. The Finnish experience is useful since it provides enough evidence that targeting selected risk factors produces positive effects by reducing the non-communicable diseases. The Danish experience is presented in order to make possible the comparison regarding target groups, risk factors and the scope of the program.

Finland

The North Karelia Project was launched in 1972, as a community-based pilot-project, whose aim was to show whether a comprehensive intervention on the local level, from media campaigns and cooperation with food industry, would lead to significant changes in dietary habits, in population cholesterol level, and ultimately, in coronary heart disease rates. An important part of the project was a comprehensive evaluation system designed to assess
changes in different indicators of the project objectives. The North Karelia Project has acted as a major demonstration project for national and international application, whose scope was enlarged over the years to include broader objectives of integrated prevention of major non-communicable diseases and health promotion, as well as prevention of risk related lifestyles in childhood and youth.

Since 1977, efforts have been carried out nationwide, building on the remarkable results and intersectoral collaboration, long-term nutrition education programs, collaboration with voluntary organizations and the food industry, food labeling policies, price policies, research and international collaboration.

A key aspect of the Project was cooperation between local organizations and active role of the inhabitants. The Project and broader national efforts focused on reducing levels of the main risk factors – smoking, elevated serum (LDL) cholesterol, and elevated blood pressure – and on promoting secondary prevention. The emphasis was on general lifestyle changes, particularly dietary habits and smoking. Therefore, a variety of activities and innovative programs were set up over the years in order to increase the public awareness and take actions against risk factors:

- Programs at workplaces to lose weight, quit smoking or to increase the availability of vegetables at work place canteens,
- Several nationwide TV series were broadcast where a group of people would volunteer to make healthy changes in their lifestyles with the help of experts,
- Cholesterol-lowering competitions were organized between villages in North Karelia,
- The leaders of the program educated activists in the community to pay attention to health related issues, for example by discussing smoking and diet with people they met, promoting smoke-free meeting facilities or urging local grocery stores to improve the variety of fruits and vegetables on sale,
- Anti-smoking legislation was passed in the 1970s. Finland eliminated all tobacco advertising and prohibited smoking in most public places indoors. Tobacco taxes were earmarked to anti-smoking programs,
- The Project operated together with food manufacturers and supermarkets to facilitate dietary changes. The industry focused on development of low fat dairy and meat products and reduction of salt in a number of food items. There was also collaboration between the Project and vegetable oil product manufacturers to produce healthier spreads.
Another innovative initiative involved a project that encouraged people to grow berries, which are known to have a valuable nutritional content.

The published results of the North Karelia Project show how over a 25 year period major changes had taken place in the levels of the target risk factors (Table 3). Among the male population in North Karelia, smoking was greatly reduced and dietary habits changed markedly. In 1972, 52% of middle-aged men in North Karelia smoked, and by 1997 that percentage had fallen to 31%.

In the early 70’s, the use of vegetables or vegetable oil products was very rare; now it is very common. The dietary changes have led to about 17% reduction in the mean serum cholesterol level of the population. Elevated blood pressure has been brought well under control and leisure time physical activity has been increased. It has been estimated that as a result of the North Karelia Project around 3,800 premature deaths have been prevented in North Karelia and 50,000 in the whole of Finland.

Table 3  Risk factor changes in North Karelia 1972-1997 (target population aged 30-59)

<table>
<thead>
<tr>
<th>Year</th>
<th>Men</th>
<th></th>
<th></th>
<th></th>
<th>Women</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Smoking</td>
<td>S-Cholesterol</td>
<td>Blood pressure</td>
<td>Smoking</td>
<td>S-Cholesterol</td>
<td>Blood pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>mmol/l</td>
<td>mmHg</td>
<td>%</td>
<td>mmol/l</td>
<td>mmHg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>52</td>
<td>6.9</td>
<td>149/92</td>
<td>10</td>
<td>6.8</td>
<td>153/92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>44</td>
<td>6.5</td>
<td>143/89</td>
<td>10</td>
<td>6.4</td>
<td>141/86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>36</td>
<td>6.3</td>
<td>145/87</td>
<td>15</td>
<td>6.1</td>
<td>141/85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>36</td>
<td>6.3</td>
<td>144/88</td>
<td>16</td>
<td>6.0</td>
<td>139/83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>32</td>
<td>5.9</td>
<td>142/85</td>
<td>17</td>
<td>5.6</td>
<td>135/80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>31</td>
<td>5.7</td>
<td>140/88</td>
<td>16</td>
<td>5.6</td>
<td>133/80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

By 1995, annual mortality rate of coronary heart disease in the middle-aged (below 65 years) male population in North Karelia reduced by about 73% from the pre-program years (1967-1971). This reduction was especially rapid in North Karelia in the 70’s and again after the mid 80’s. During the last ten years the decline in cardiovascular disease (CHD) mortality in North Karelia has been approximately 8% per year.

Since the 80’s, favorable changes began to develop throughout Finland. By 1997, the annual CHD mortality among men in all Finland had reduced by about 65%, and that trend continued in the following years (Figure 4). At the same time, the lung cancer mortality has also been reduced, by more than 70% in North Karelia and nearly 60% in all Finland.
With greatly reduced cardiovascular and cancer mortality, mortality caused by all diseases has been reduced by about 49%, leading also to greater life expectancy, approximately 7 years for men and 6 years for women (Table 4). Associated with favorable risk factors and lifestyle changes, the general health status of the people has greatly improved.

Table 4  Mortality changes in North Karelia in 1972-1995. (per 100,000, 35-64 years, men, age-adjusted)

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All causes</td>
<td>1509</td>
</tr>
<tr>
<td>All cardiovascular</td>
<td>855</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>672</td>
</tr>
<tr>
<td>All cancers</td>
<td>271</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>147</td>
</tr>
</tbody>
</table>

The experience and results of the North Karelia Project in Finland support the idea that well-structured and determined community-based programs can have a major impact on lifestyle and...
risk factors, and that such a development really leads quite rapidly to reduced non-communicable diseases in the community.

The Finnish model of prevention has shown the following:

- Prevention is possible and pays off,
- Population based prevention is the only cost effective and sustainable public health approach to chronic disease control,
- Prevention calls for some simple lifestyle modifications (individual, family, community, and national and global level action),
- Influencing national diets and other lifestyles is a key issue
- Many results of prevention occur surprisingly quickly (CVD, diabetes) and also at relatively late age,
- Comprehensive action assumes broad collaboration with dedicated leadership and strong government policy support.

The real advantage of this approach is that it is highly cost-effective and does not require high-tech medicine and significant financial resources to achieve visible effects.

**Denmark**

The Health Promotion Program of the Government of Denmark was initiated in 1989 as the first comprehensive activity which gave high priority to health promotion. The Program focused on preventing accidents, cancer, cardiovascular diseases, musculoskeletal and mental disorders, and recommendations related to nutrition, tobacco and alcohol consumption. With this Program, health promotion moved from ad hoc to coherent, systematic long-term efforts. This Program was followed by Government Program on Public Health and Promotion, 1999-2008, which had a broader perspective and included overall targets of increasing life expectancy, improving the quality of life and reducing social inequality in health, targeting several risk factors, with target groups and efforts to promote health in child-care centers, schools, workplaces and the health care system.

The program Healthy throughout Life – Targets and Strategies for Public Health Policy of the Government of Denmark 2002-2010, was initiated based on the experience with programs mentioned above and retained their principles and targets, but its primary focus is moved toward major preventable diseases and disorders.
Healthy Throughout Life is a comprehensive health policy, where target groups are clearly identified, risk factors are recognized, major non-communicable diseases and disorders are identified as well as responsibilities and tasks on three levels: individuals, the local community and public sector.

<table>
<thead>
<tr>
<th>Target groups</th>
<th>Risk factors</th>
<th>Preventable diseases and disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women</td>
<td>Tobacco smoking</td>
<td>Type 2 diabetes mellitus</td>
</tr>
<tr>
<td>Children (0-14 years)</td>
<td>Alcohol consumption</td>
<td>Preventable cancers</td>
</tr>
<tr>
<td>Young people (15-24 years)</td>
<td>Diet</td>
<td>Cardiovascular diseases</td>
</tr>
<tr>
<td>Vulnerable and distressed</td>
<td>Physical activity</td>
<td>Osteoporosis</td>
</tr>
<tr>
<td>people</td>
<td>Obesity</td>
<td>Musculoskeletal disorders</td>
</tr>
<tr>
<td>Elderly people (65 years or</td>
<td>Accident</td>
<td>Hypersensitivity disorders (asthma and allergy)</td>
</tr>
<tr>
<td>older)</td>
<td>Working environment</td>
<td>Mental disorders</td>
</tr>
<tr>
<td>Chronically ill people</td>
<td>Environmental factors</td>
<td>Chronic obstructive pulmonary disease (COPD)</td>
</tr>
</tbody>
</table>

The Program was based on the idea that nearly all these diseases and disorders could be avoided completely or in part through prevention and health promotion measures, or limited in their progression and effects if they have already started. At the same time, partnership is recognized as a key aspect of the efforts to prevent disease and promote health. Improving health is a common responsibility of: individuals, families, local social networks, voluntary sector, child-care centers, educational institutions, the health care system, workplaces, private and public companies, municipalities, counties and state.

Having in mind the fact that prevention program in Denmark has a broader scope, in further analyses we will focus only on those preventable diseases that are also incorporated in the Program of Prevention and Control of Non-communicable Diseases in the Republic of Srpska.

**Diabetes mellitus**

The National Board for Health of Denmark published a report in 1994 on the future organization of diabetes treatment in Denmark. The report contains several recommendations relevant to non-insulin dependent diabetes on the following topics:

- Establishing county diabetes committees and a national follow-up group on diabetes,
- The organization of treatment and care,
- The division of tasks between general practitioners and hospitals,
- Diabetes clinics with adequate professional support,
Instruction and communication – helping people to help themselves,

Preventing late complications through systematic case detection,

Evaluation, monitoring and quality development,

Economic consideration across sectors, and

Quality development.

**Preventable cancer**

The National Board of Health of Denmark, the former Danish Council on Tobacco and Health, the Danish Cancer Society and others have prepared a campaign and instructional material on smoking for several years targeting the general population and especially schoolchildren and young people. In addition, many national and international initiatives have been taken on the labeling of tobacco products and restrictions on their marketing. Mass screening programs for cervical cancer have now been implemented in all counties. Screening for breast cancer has been carried out in approximately 20% of Finland, and screening for cancer of the colon has been introduced as a pilot project so far.

**Cardiovascular diseases**

The National Board of Health presented a national strategy for the prevention of ischaemic heart disease in 1994. The recommendations have been followed-up by many national and local activities on diet and physical activity. The Danish Heart Foundation has provided general preventive measures by supporting initiatives targeting the general population in the past 15-20 years. One initiative has been follow-up programs for patients with heart disease after they are discharged at cardiac treatment centers.
7 IMPLEMENTATION OF THE PROGRAM OF PREVENTION AND CONTROL OF NON-COMMUNICABLE DISEASES IN THE REPUBLIC OF SRPSKA

7.1 Analysis of Compliance of the Program Scope with Resources Available for the Implementation

In-depth interviews with stakeholders were conducted (as explained in chapter 4.2), and a few of the highlights learned from the interviews conducted are presented here:

- All interviewed stakeholders agreed that the existing program scope is overly-ambitious. At the same time a program is needed, considering the health state of the population and the objectives set in the strategy of prevention and control of non-communicable diseases. For example, in the opinion of one stakeholder, program implementation is a legal obligation of the DZ, is a profitable investment in the future, and is a way to employ the staff more productively. However, there were many problems encountered in implementing the program;

- Most of the DZs are incapable of implementing the program. Namely, as of April 2005, out of 54 DZs in the RS, only 30 of them had educated family doctors. Only 16 provided family medicine to 25% or more of the population in the service area registered at the DZs (PCU – Project Coordination Unit for the World Bank's Projects within Ministry of Health and Social Welfare, 2005)

- Only DZ Laktasi operates almost completely within family medicine model and has 98% of the population registered;

- Most of the interviewed stakeholders agreed that registering the population into family medicine in the DZs is a basic precondition of success. In addition, increasing program financing is needed for successful implementation and securing continuity. The DZs still operate according to the classic model, without a registered population provide preventive services along with curative ones, but limited to patients who comes to the DZs because of a health problem. People who are at risk are not in the program unless they are sick. The penetration rate of 80% of the population covered by the Program, has not been achieved;

- Medical staff in the DZs are already overworked providing curative services to patients;
The existing mode of manually entering data for purpose of the program monitoring and evaluation is an additional burden for the DZs staff;

Most of the DZs are not well-prepared to implement the program as designed, in terms of having enough personnel and equipment to do so. While, all DZs own the equipment necessary for the prevention and reduction of the risks factors common for the leading non-communicable diseases, the quality of the equipment in different DZs is different which gives rise to doubts about the quality and comparibility of care. To that end, the Health Insurance Fund prepared a plan for equipping all DZs with equipment of equal technical characteristics, although it was an obligation of the Fund at the time the program was adopted. Out of 8 interviewed DZs, only DZs in Banja Luka and Laktasi own the apparatus necessary for mammography screening, and all others are dependent for services on secondary health care facilities;

The absence of cooperation between primary and secondary health care in providing services provided for in the program, is coupled with very low awareness of the doctors from secondary health care level about the program itself;

The population is unwilling to accept the digit-rectal checkups. Besides, even the doctors interviewed consider this kind of checkup as inefficient for early detection of relevant malignant diseases.

From the above highlights two points could be considered as main causes of the very low level of achievements in the up to date program implementation:

- DZs are not well-prepared to implement the program as designed, and
- In particular, the equipment necessary for preventive examinations provided for early detection of malignant diseases is unavailable.

Table No.5 based on the data from Evaluation Report of the program implementation in DZs in 2004 year (The RS Public Health Institute, 2005), presents the percentage of planned preventive examinations occurred in 8 interviewed DZs. Based on the results presented, excluding the case of DZ Laktasi, there is no strong correlation between the rate of population covered by family medicine and realized rates of planned preventive examinations. The unambiguous conclusion is reinforced by the fact that we could not find out, nor is it clear in the Evaluation Report, if the realized rates of planned examinations represent just preventive care or include both curative and preventive care.

Regardless of significant differences in the level of realized preventive checkups among DZs, most of them have had weak results with checkups associated with early detection of
malignant diseases, which is more clearly seen if compared with the realized rates of preventive checkups at the level of the entire Republic of Srpska (Figures 5, 6).

**Figure 5** Percentage of planned preventive checkups of the risk factors occurred at the RS level in 2004.

**Figure 6** Percentage of the planned preventive checkups for early detection of malignant diseases taking place at the RS level in 2004 year.
<table>
<thead>
<tr>
<th>Condition</th>
<th>Checkup</th>
<th>Target population (population)</th>
<th>Banja Luka</th>
<th>Laktaši</th>
<th>Prijedor</th>
<th>Istočno Sarajevo</th>
<th>Doboj</th>
<th>Trebinje</th>
<th>Bijeljina</th>
<th>Zvornik</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention and reduction of blood pressure</td>
<td>Blood pressure measurement</td>
<td>18-64 years old</td>
<td>20,18</td>
<td>102,04</td>
<td>2,89</td>
<td>12.78</td>
<td>5.5</td>
<td>109.2</td>
<td>13.7</td>
<td>36.1</td>
</tr>
<tr>
<td></td>
<td>Blood pressure measurement</td>
<td>≥ 65 years old</td>
<td>16,36</td>
<td>76,96</td>
<td>0</td>
<td>60.22</td>
<td>8.2</td>
<td>117</td>
<td>26</td>
<td>40.4</td>
</tr>
<tr>
<td>Prevention and reduction of high blood sugar</td>
<td>Blood sugar measurement</td>
<td>With BMI&gt;30</td>
<td>10,05</td>
<td>102,44</td>
<td>2,16</td>
<td>39.13</td>
<td>5.6</td>
<td>15.8</td>
<td>40.6</td>
<td>15.7</td>
</tr>
<tr>
<td>Prevention and reduction of total blood cholesterol</td>
<td>Blood cholesterol measurement</td>
<td>With BMI&gt;30</td>
<td>8,77</td>
<td>97,42</td>
<td>2,75</td>
<td>28.25</td>
<td>6.1</td>
<td>11.6</td>
<td>40.6</td>
<td>14.2</td>
</tr>
<tr>
<td>Prevention and reduction of obesity</td>
<td>Body index mass measurement</td>
<td>18-64 years of age</td>
<td>6,78</td>
<td>84,98</td>
<td>1,30</td>
<td>17.08</td>
<td>12</td>
<td>41</td>
<td>9</td>
<td>52.8</td>
</tr>
<tr>
<td>Fight against smoking/tobacco addiction</td>
<td>Each patient in the Program was asked: Do you smoke every day, for how long and how many cigarettes a day?</td>
<td>People smoking every day are registered in the in reference register (RR)</td>
<td>6,79 % people in RR</td>
<td>61,7% people in RR</td>
<td>1,04 % people in RR</td>
<td>6,38% people in RR</td>
<td>6,5% people in RR</td>
<td>58,9% people in RR</td>
<td>29,6% people in RR</td>
<td>15,9% people in RR</td>
</tr>
<tr>
<td>Early detection of cervical cancer</td>
<td>Papanicolau test</td>
<td>women 25-60 years of age</td>
<td>7,08</td>
<td>97,82</td>
<td>1,55</td>
<td>23.46</td>
<td>0,8</td>
<td>53.5</td>
<td>12.6</td>
<td>25.4</td>
</tr>
<tr>
<td>Early detection of breast cancer</td>
<td>Breast palpation</td>
<td>women &gt; 40 years of age</td>
<td>5,04</td>
<td>84,36</td>
<td>1,51</td>
<td>22.05</td>
<td>1,5</td>
<td>54.1</td>
<td>8.5</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td>Mammography</td>
<td>women &gt; 50-70 years of age</td>
<td>3,34</td>
<td>68,61</td>
<td>0,53</td>
<td>5.26</td>
<td>0,3</td>
<td>0</td>
<td>11.1</td>
<td>14.9</td>
</tr>
<tr>
<td>Early detection of prostate cancer</td>
<td>Digit-rectal exam</td>
<td>Men 50-70 years of age</td>
<td>6,93</td>
<td>88,30</td>
<td>1,38</td>
<td>19.95</td>
<td>0,3</td>
<td>14.5</td>
<td>9.1</td>
<td>18</td>
</tr>
<tr>
<td>Early detection of colon and rectal cancer</td>
<td>Digit-rectal exam</td>
<td>All ages &gt; 50 years of age</td>
<td>3,30</td>
<td>95,30</td>
<td>2,35</td>
<td>0</td>
<td>0,4</td>
<td>8,3</td>
<td>15.5</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Fecal occult blood test</td>
<td>All ages &gt; 50 years of age</td>
<td>0,36</td>
<td>111,56</td>
<td>0,08</td>
<td>0</td>
<td>0,1</td>
<td>0</td>
<td>2,6</td>
<td>0</td>
</tr>
</tbody>
</table>
7.2 Existing Model of Financing

The Strategy of Prevention and Control of Non-Communicable Diseases, adopted by the Government of the Republic of Srpska, and the Program of Prevention and Control of Non-Communicable Diseases, adopted by the Ministry of Health and Social Affairs, are priorities in financing for the Health Insurance Fund of the Republic of Srpska. It is obligatory for all health care institutions to implement the measures necessary to achieve objectives stated in the adopted documents through their regular activities.

In order to achieve stated objectives and receive financial resources from the Health Insurance Fund of the RS, all primary health care institutions are obliged to adopt, for their municipality, precise, quantitatively expressed programs of prevention and control of non-communicable diseases, based on the existing Program of Prevention and Control of Non-Communicable Diseases, and approved by the RS Public Health Institute.

Based on the approved programs for every health care institution in the RS a price list of preventive services is included in the program. Depending on totally available resources for preventive health care, one part of these funds is provided for Program of Prevention and Control of Non-Communicable Diseases.

In order to answer the question whether resources provided in such way are sufficient, i.e. whether the implementation of the program has undergone difficulties due to inadequate and unrealistic model of financing and what other possible financial problems in implementation of the program are, we used two approaches:

- An analysis of data provided by the Health Insurance Fund of the RS (Financial Report for 2004, Financial Plan for 2005), including, the price list of health services for 2004 and 2005;
- In-depth interview with stakeholders.

The financial resources requested for implementation of the adopted program scope, the amount of 14,377,684 KM, are based on the type of preventive checkups, estimated number of population older than 18 (955,476), frequency of checkups and health care services price list adopted by the Fund (Table 6 and for more details see Appendix 5).

<table>
<thead>
<tr>
<th>Table 6</th>
<th>Financial resources required for implementation of the adopted scope of the Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM</td>
<td></td>
</tr>
</tbody>
</table>

44
<table>
<thead>
<tr>
<th>Type of checkup</th>
<th>Target group – citizens of a certain age or certain type of risk</th>
<th>Number of checkups annually</th>
<th>Frequency of checkups</th>
<th>Financial resources needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Measurement of blood pressure</td>
<td>aged 18 – 64</td>
<td>394,002</td>
<td>Once in 2 years</td>
<td>1,182,006</td>
</tr>
<tr>
<td>2. Measurement of blood pressure</td>
<td>older then 64</td>
<td>167,472</td>
<td>Once per year</td>
<td>502,416</td>
</tr>
<tr>
<td>3. Measurement of BMI</td>
<td>aged 18-64</td>
<td>138,619</td>
<td>Once, during first preventive examination</td>
<td>554,476</td>
</tr>
<tr>
<td>4. Lab analysis of blood sugar level</td>
<td>BMI ≥ 30, high blood pressure</td>
<td>267,218</td>
<td>Once per year</td>
<td>614,601</td>
</tr>
<tr>
<td>5. Lab analysis of blood cholesterol level</td>
<td>BMI ≥ 30 or high blood pressure</td>
<td>267,218</td>
<td>Once per year</td>
<td>1,015,428</td>
</tr>
<tr>
<td>6. Identification of smokers</td>
<td>aged 18-64</td>
<td>420,000</td>
<td>Once per year</td>
<td>2,520,000</td>
</tr>
<tr>
<td>7. Mammography</td>
<td>women aged 50 – 70</td>
<td>76,659</td>
<td>Once in two years</td>
<td>2,913,023</td>
</tr>
<tr>
<td>8. Physical breast examination</td>
<td>women older than 40</td>
<td>305,929</td>
<td>Once per year</td>
<td>1,835,574</td>
</tr>
<tr>
<td>9. Pap test</td>
<td>women aged 25 - 60</td>
<td>105,354</td>
<td>Once in three years</td>
<td>632,126</td>
</tr>
<tr>
<td>10. Early detection of prostate cancer - DRP</td>
<td>male aged 50 - 70</td>
<td>69,452</td>
<td>Once in two years</td>
<td>416,709</td>
</tr>
<tr>
<td>11. Fecal occult blood test</td>
<td>older than 50</td>
<td>219,133</td>
<td>Once in two years</td>
<td>1,314,795</td>
</tr>
<tr>
<td>12. DRP – colorectal cancer</td>
<td>older than 50</td>
<td>146,088</td>
<td>DRP in three years</td>
<td>876,530</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>2,577,144</strong></td>
<td></td>
<td><strong>14,377,684</strong></td>
</tr>
</tbody>
</table>

**Source:** Data on the type of checkups, the target groups – citizens of a certain ages or with a certain risk factor, number of citizens in the target group and frequency of checkups taken over from the Guidelines (The RS Public Health Institute, 2003)

The Fund provides only a part of funds necessary for financing the services included in the program. Based on the contract for providing, realizing and financing of primary health care services for the health insured people in 2004, from the total amount provided for preventive health care services, the Fund provided health care institutions 6,223,034.05 KM for financing the services provided for in the program. After the Health Care Institute evaluated accomplishing of contracted services, health care institutions were paid 3,657,628.77 KM.

In 2005 the amount contracted for preventive services was 45% less than in the previous year and amounted to KM 3,422,831.20 (which represents 1.78% of the Fund’s projected income), while in the first six months of the year according to the contract KM 978,993.18 was realized.

According to the projection of the scope and value of the preventive services until 2008 (see Appendix 6), the Fund does not plan to increase the resources provided for the program, and in addition to that, mammography and digitorectal exams have been excluded in the projection,
while our projections consist of all checkups included in the program. Resources the Fund earmarked for program implementation in the period 2004-2008 year provide 21.74 - 31.18% of the funds needed.

The reason for such a low projection for financial support for program implementation for the stated period is the way that the Fund collects limited resources for financing health care needs of the RS population. The Fund’s financial plan for next year is based on the following assumptions:

- By the law prescribed health insurance contribution rate and basis for calculating health insurance contribution for certain categories of insured people;
- The RS Government’s budget proposal for the next year,
- The number of insured people who applied for health insurance which is paid by the employer or by the insured people themselves,
- The realization of income and expenses in the current year serves as a basis for projection of income and expenses in the next year.

Only insured people’s health needs are financed through this mechanism. From the Fund’s perspective, services for uninsured people should be covered by financing schemes other than the Fund. In addition, there is insufficient financing of insured people’s health needs. Preventive care is not a separate item in financial plans, a 15-year old problem in health care financing in which curative services are given priority in resource reallocation of prevention services at all health care levels.

Having in mind the mentioned financial limitations, in 2004 the Fund eliminated the measurement of blood cholesterol and blood sugar level from the compulsory preventive services price list. This structure of the program’s services has been changed without complete and timely notice to health care institutions, and therefore confused them about which activities to implement, and what they would eventually be paid for (Table 7). In the opinion of most of those interviewed, that is one among the major causes of unsatisfactory implementation of the program.

<table>
<thead>
<tr>
<th>Preventive services planned in the Funds’ price list for 2004</th>
<th>Preventive services planned in the Funds’ price list for 2005</th>
<th>Preventive services projected in 2005 - 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male preventive examination</td>
<td>Male preventive examination</td>
<td></td>
</tr>
</tbody>
</table>

Table 7 Comparative review of services listed in the Program of Prevention and Control of Non-communicable Diseases
More detailed data about the financing model of the program and other health services in the RS are provided in Appendix 7 of the Study.
7.3 Citizens’ Awareness of the Program

An analysis of citizens’ attitudes enabled us to test the hypothesis that citizens are not aware enough of the importance of illness control and prevention, and that they are not interested enough in participating in the prevention activities of the Program of Non-Communicable Diseases Control and Prevention. We provide a summary of results here. Complete research results are available from the Economic Institute of Banja Luka.

Most of the questioned people, 78.4%, confirmed that they had health insurance with the Health Insurance Fund. However, even though the implementation of the Family Medicine Project is ongoing in the RS territory, most of the questioned people are not registered with a family doctor. Only 32% of them, a little less than one third, said that they have completed the registration process with the DZs.

As expected, results show that insured citizens are more familiar with the prevention concept. However, there is a significant number of people who know the concept, but are not insured,
which can be a result of population literacy levels. Differences are statistically significant at the 0.01 level.

![Graph showing familiarity with the term "disease prevention" among insured and non-insured citizens.](figure1.png)

**Figure 9**  Familiarity with the term "disease prevention" among insured and non-insured citizens

The next step in our analysis was an analysis of answers to questions regarding familiarity with the program and health insurance. Results unambiguously show that health insured citizens are far more familiar with the existence of the Program of Non-communicable Diseases Prevention and Control, which implies that the next step should include flyers, panels or brochures on the windows of the Health Insurance Fund as a means of program promotion and popularization. Differences are statistically significant at the 0.01 level.

![Graph showing familiarity with the Program within insured and non-insured citizens.](figure2.png)

**Figure 10**  Familiarity with the Program within insured and non-insured citizens

In order to test the citizens’ familiarity with the program, we analyzed cross-tabulation from answers to questions referring to the familiarity with the program and citizens registering with family doctors. Graphically, the data can be shown as follows:
Do you know that there is the Program of prevention and control of non-communicable diseases in RS since 2003?

![Bar chart showing familiarity with the Program within registered and non-registered citizens]

**Figure 11  Familiarity with the Program within registered and non-registered citizens**

The research results show that registration of citizens with family doctors means that those citizens are better informed about existence of the program, but the discrepancy is not large enough to be able to say that citizens registration on its own has significant influence.

In order to test the citizens' readiness to respond to a call for preventive examinations, we analyzed answers to questions referring to the readiness mentioned and citizens registration with family doctors. As a result, it can be concluded that registering at a family doctor does not influence their readiness to respond to a call for preventive examination. The reason for this result can be found in the fact that many registered citizens have already done some preventive examinations.

![Bar chart showing preventive examination readiness among registered and non-registered citizens]

**Figure 12  Preventive examination readiness among registered and non-registered citizens**

We next analyzed answers to questions about citizens’ readiness to respond to preventive examinations and their health insurance in the Health Insurance Fund. The insured citizens are much more willing to respond to preventive examinations.
Are you willing to respond to the call for preventive examinations?

Insured | Non-insured
---|---
85.4% | 75.3%
14.6% | 24.7%

Figure 13  Preventive examination readiness among insured and non-insured citizens

Responses to the questions “Have you obtained a health checkup from a doctor, although you were healthy, in the past year”, and “Have you registered with a family doctor”, led us to conclude that registered citizens more often asked for check-ups for health conditions on their own initiative. Statistical significance appears at the 0.01 level. We confirm the hypothesis that the registered citizens are much more aware of the importance of diseases prevention and control. Differences are statistically significant at the 0.01 level.

Have you obtained a health checkup from a doctor, although you were healthy, in the past year?

Registered | Non-registered
---|---
70.9% | 83.4%
29.1% | 16.6%

Figure 14  Self-initiative health checkups within registered and non-registered citizens

Searching for the answer to the question about whether there are significant differences in the perception of disease prevention importance between insured and non-insured persons, we noticed that insured citizens took more initiative going to check their health than non-insured people, which leads to our conclusion that insured people are more aware of disease prevention importance. An alternative explanation is that non-insured people may be asked to
pay for preventive care and so cannot afford to go. Differences are statistically significant at the 0.01 level.

Figure 15  Self-initiated health checkups among insured and non-insured citizens

In addition, it is necessary to analyze how many citizens, by different criteria, are familiar with the term *prevention*. The research shows that more than 20% of the population does not know what this word means. Most of them are from rural areas, with a lower educational level, lower income, are unemployed and housewives, or are citizens whose only source of income is the social fund. There are also certain regional discrepancies. The citizens of Višegrad are the most, and the citizens of Trebinje are the least, familiar with the term. Appendix 8 provides graphs to illustrate the more detail about familiarity with the term *Prevention*.

Figure 16 gives a clear picture of differences in familiarity with the term *prevention* between persons registered and not registered with the family doctor. Differences are not statistically significant, which leads us to the conclusion that being familiar with the term *prevention* does not depend on registration with a family doctor.
Are you familiar with term «Disease prevention»?

<table>
<thead>
<tr>
<th></th>
<th>Registered</th>
<th>Non-registered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>72</td>
<td>71</td>
</tr>
<tr>
<td>No</td>
<td>23</td>
<td>24</td>
</tr>
</tbody>
</table>

![Graph showing familiarity with term «Disease prevention»](image)

**Figure 16**  Familiarity with the term among registered and non-registered citizens

When discussing citizens’ familiarity with the program, the picture is different. Over 70% of the population is not aware of the program, and almost the same percentage refers to men and women. Furthermore, if we analyze the age groups of population who do not know that the program exists, a higher proportion in the age group over 60 did not know about the program, which is shown in the next figure.

Do you know that there is the Program of prevention and control of NCDs...?

<table>
<thead>
<tr>
<th></th>
<th>18 - 29</th>
<th>30 - 44</th>
<th>45 - 59</th>
<th>Over 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>25</td>
<td>30</td>
<td>33</td>
<td>20</td>
</tr>
<tr>
<td>No</td>
<td>75</td>
<td>70</td>
<td>67</td>
<td>80</td>
</tr>
</tbody>
</table>

![Graph showing familiarity with Program by age groups](image)

**Figure 17**  Familiarity with the Program by age groups

As in the case of familiarity with the term *prevention*, it can be concluded that the most people who are unaware of the existence of the program existence, are citizens of lower educational level, lower income and students. When considering regional analysis, it can be concluded that citizens of Višegrad and Doboj are the least familiar with the program, and they are followed by regions of Trebinje, Pale, Zvornik etc.

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In Appendix 9 graphs are given to illustrate the research on citizens’ familiarity with the program.

In order to give some recommendations for program promotion, it is necessary to analyze questionnaire results, primarily those related to the citizens who are aware of the existence of the program.

Analyzing the answers to the question “How did you find out that the program is implemented”, we show that most of the questioned people, by all criteria (sex, age, occupation, income etc.), answered that they heard for the program from the media, and at the second place is the answer “from acquaintances”.

![Figure 18 Source of information about the Program]

Regarding the fact that most answers relate to media, it is easy to conclude that most of the acquaintances also heard about the program from the media. Therefore, a stronger media campaign for the program promotion is recommended. Recognizing that media can be printed (newspapers, magazines, brochures) or electronic (radio, TV, internet), citizens’ preferences regarding different media, as well as their attitudes towards the program promotion will be additionally analyzed.
Most of the citizens who have heard about the program are informed about its content and what it does, but few of them have used its services in the past 12 months.

Analyzing the frequency of radio listening, we can conclude that more than a half of the population, regardless of their sex, age and education, are everyday listeners. There are some exceptions, especially with housewives, the self-employed, farmers and people receiving social care, but differences appear between regions as well (for example, in Bijeljina only 24%).

It is evident that watching TV is much more frequent with no exceptions, and this fact suggests that TV media will be excellent for the program promotion in order to achieve best promotion and popularization results.

Newspapers are read by the urban population, male, younger age groups, and more educated people, whereas the Internet, as expected, is used by a very small part of the population. Therefore, in our opinion, promoting the program through these media would not contribute much to its promotion and popularization.

The answer to the question “Which of the below stated media would make you informed about activities in the health sector in the fastest and most reliable way”, shows expected results. Namely, a majority of the population considers TV as the media that would enable best informing about the program. According to preferences of the questioned people, TV is followed by radio, newspapers, flyers etc. and this is shown on the graphs in Appendix 10, where only answers related to age groups are presented.

It is interesting to mention the experiences of Dom Zdravlja Laktaši, which carried out a research on effects of certain ways of communication with citizens. To this end, citizens of municipality Laktaši had been invited to do preventive and control checks in the following three ways:

1. By media – radio and TV;
2. By directly addressed written invitation, and
3. By direct phone call.

Citizens’ response was different depending on the form of communication. In the first case about 46% of invited citizens responded, in the second case 54% and in the third case 98%. The data show that personal phone call is the most efficient way to summon citizens for a preventive checkup and likewise for the program promotion and implementation. It is important to mention that Dom Zdravlja Laktaši has completely implemented the family medicine project, which enables direct communication with citizens.
7.4 Program Monitoring and Evaluation

The electronic medical record that is used in the RS health sector consists of nonstructural text useful only in certain aspects of health care. There is no possibility of extracting relevant information about clinical decision making in a quick and effective way. Most DZs do not have an adequate, computer supported information system, and it is a serious problem to manually monitor the health status of health service users. This bring us to the conclusion that there is little chance for objective measurement of program effects based on available automated data.

Certain adjustments are necessary in the existing way of monitoring the program implementation, in order to provide data relevant for applying a cost-benefit and cost-effectiveness analysis. In that respect, it is very important to analyze the currently used software program in the family medicine teams, and to equip all DZs in the RS with computers and networked information systems.

The basic features that the electronic medical record should contain are:

- identification of all patients according to name and surname, ID number, date of birth, gender, address, risk factors etc;

- creation of patients data base with similar features, for example all patients with self-reported diabetes, all patents with diabetic complications, all patients with hypertension and diabetes, all patients that use statins, all patients that cost more than KM 30 monthly, etc;

- allows users to share data with affiliates or consultants, possibly via the Internet with maximal data security.

The final solution to program monitoring should be the result of close cooperation between the RS Public Health Institute, a relevant consultant company, and health experts in finding complex software for collecting relevant data and appropriate data for program evaluation.
8 SUMMARY OF THE PROBLEMS IDENTIFIED IN THE PROGRAM IMPLEMENTATION AND PROPOSALS TO RESOLVE THEM

The most frequently mentioned problems that have caused the unsatisfactory implementation of the program are:

- Insufficient financial resources available for financing program implementation, by comparing the financial sources needed and the sources the Health Insurance Fund contracted with DZs in 2005 year;

- The RS citizens are not familiar enough with the program because of total absence a Population Strategy and the problems that occurred in realization of the High Risk Strategy;

- Family medicine is not implemented in most of DZs, because there are many citizens who have not registered with a family doctor, which makes further barriers in scheduling preventive checkups;

- About 30% of the RS population has no health insurance, and the Fund’s policy is to provide health care just for the insured citizens. It is still unclear who should finance checkups for the uninsured.

- Doctors in the DZs are of the opinion that their counseling services are not paid at all. The Fund however, says that these services are already included in the price of preventive checkups;

- There is little cooperation between the primary and secondary health care sectors in providing services for the program. There is very low awareness of the doctors from secondary health care level about the program itself;

- Inconsistency in the list of preventive services paid by the Health Insurance Fund make it difficult to monitor the program’s effects and brings its efficiency in question;

- Doctors in DZs are not motivated and they are unwilling to implement preventive checkups from the program. Preventive care is sometimes harder to provide than acute care, considering the time required for calling citizens to come in for a checkup, administrative tracking in accordance with requirements of the guidelines. Because preventive checkup prices are the same as those of acute care, medical staff have no incentive to implement the program;
- Evaluation of the program is very difficult, because it is based on manual review of randomly selected medical files;
- Users of preventive checkups have been charged for services from the program in certain DZs although those should be free of charge.

In searching for effective recommendations to address the problems identified, we asked the following questions:

- Should the program scope be kept as is or redefined in accordance with financial sources available in the Health Insurance Fund?
- Should this compliance be performed by means of obligatory earmarking sources from sources already earmarked for primary health care?
- Should the government provide additional financial resources for the program, at least for the uninsured RS citizens?
- In what way to associate prevention and control of non-communicable diseases with certain economic measures, which would, on the one hand destimulate consumption of health harmful goods (cigarettes, alcohol, oil and oil derivatives), and, on the other hand, provide additional sources for the program financing?
- How should the program be promoted? Is it better first to provide the required material, organizational and human resources, and then launch program promotion or immediately launch program promotion in certain segments of the population?

In order to answer the questions and dilemmas identified, we propose certain variants of policies for addressing the problems in program implementation.

### 8.1 The Program Scope

Based on the results of analysis made in chapter 7.1, and respecting opinions of most of the stakeholders interviewed and the other results of this study, we come to three variants of the program scope.

*The first variant* proposes keeping the program scope as is, but with providing organizational, material and human resources preconditions required for program implementation.

*The second variant* supports a program scope limited to the control and prevention of five risks factors common for leading non-communicable diseases.

*The third variant of the program scope*, based on the results of our study, covers the following conditions:
- Five risk factors common for leading NCD;
- Early detection of cervix cancer, retaining the Papanicolaou test;
- Early detection of breast cancer, including breast palpation and mammography examination and
- Early detection of colon and rectum cancer, retaining the fecal occult blood test.

Table 8  Frequency of malignant diseases included in the Program in total number of deaths caused by all malignant diseases

<table>
<thead>
<tr>
<th>DISEASE</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Deaths</td>
<td>%</td>
<td>No. of Deaths</td>
<td>%</td>
</tr>
<tr>
<td>Malignant diseases - total</td>
<td>1,994</td>
<td>100%</td>
<td>1,772</td>
<td>100%</td>
</tr>
<tr>
<td>Malignant diseases involved in the Program - total</td>
<td>1,109</td>
<td>55.62%</td>
<td>891</td>
<td>50.28%</td>
</tr>
<tr>
<td>Malignant neoplasm of colon and rectum</td>
<td>203</td>
<td>10.18%</td>
<td>201</td>
<td>11.34%</td>
</tr>
<tr>
<td>Malignant neoplasms of trachea, bronchus and lung</td>
<td>645</td>
<td>32.35%</td>
<td>509</td>
<td>28.72%</td>
</tr>
<tr>
<td>Malignant neoplasm of breast</td>
<td>130</td>
<td>6.52%</td>
<td>43</td>
<td>2.43%</td>
</tr>
<tr>
<td>Malignant neoplasm of cervix and ovaries</td>
<td>20</td>
<td>1.00%</td>
<td>43</td>
<td>2.43%</td>
</tr>
<tr>
<td>Malignant neoplasm of prostate</td>
<td>111</td>
<td>5.57%</td>
<td>95</td>
<td>5.36%</td>
</tr>
</tbody>
</table>

Source: The RS Institute of Statistics, 2001-2004
8.2 Proposals for the Financial Model of the Program

The financial model of the program is obviously one of the major reasons for unsatisfactory results and current situation in its implementation. Two options are identified for solving the problem.

Option No. I – Reallocation of health care resources in favor of the program

This variant has been talked about since the beginning of program implementation, because the Strategy of Prevention and Control of Non-Communicable Diseases presupposes that the Fund should provide necessary financial resources by reallocation of available funds that the Fund collect from the contributions.

The analysis of the existing financial model showed that this way of financing did not provide enough funds, because of the number of uninsured people and irregular payments by the companies and other legal entities.

Special attention is focused on the situation where many private entities do not register their employees, and even if they do, then report only a minimal amount of wages in their financial reports, which means that health care contributions are calculated on that minimal basis and paid for health insurance. It has negative consequences for financing health care, knowing that 80 percent of the Fund’s income is made of contributions paid by the employees. This problem should be solved by responsible authorities of the RS, and therefore, we will not define a special policy in this study, since the efficiency of the courts and the executive authorities in the RS are being reexamined and concrete measures for their have already been initiated.

The criteria for reallocation the total Fund’s expenses, particularly those for financing primary, secondary and tertiary health care (Appendix 11), did not include preventive services as a separate item, although it could be introduced as an obligatory practice to reallocate at least 20 percent of funds for primary health care for financing the program.

The analysis of financing health care by contributions (Appendix 7) indicates the existence of internal reserves in the Fund that could be reallocated in favor of the program, but even that amount is still not sufficient to satisfy the financial needs of the program.

A proposal for a new scheme for reallocation the Fund’s income is provided in Appendix 12.
Option No. II – Providing additional financial resources

The second option was introduced with the Strategy of Prevention and Control of Non-Communicable Diseases in terms of measures for providing additional financial resources through the price policy of:

- Tobacco products. In order to reduce smoking, additional resources collected from sales taxes on these products would be redirected into prevention, smoking cessation, and treatment of diseases attributed to smoking;

- Reducing the alcohol consumption, where certain amount of resources collected from sales taxes on these products would be redirected into prevention, alcohol consumption cessation, and treatment of diseases attributed to alcoholism.

So far, this option was not implemented, even though the Ministry of Health and Social Affairs, together with the Ministries of Industry, Agriculture, Ecology, Trade, Education, and other interested authorities, were expected to establish a permanent inter-sector cooperation in implementation of measures proposed by the program.

Meanwhile, with the introduction of the VAT, taxation conditions for some products have changed, and proposed solutions of providing additional resources are no longer applicable.

Therefore, we propose here some other solutions that are similar to those stated in the strategy, with the only difference in the decision procedure being changes in laws. Thus, the second variant of collecting additional funds in order to increase the Fund’s income would be carried out through:

- Introducing a special charge on vehicles usage under codes 714911, 714913 and 714914, paid at registration, extension of registration and replacement of registration plates in compliance with regulations.

(Regulated by the Tax Act of Use, Possession and carrying the goods – The Official Gazette of the RS, No. 37, August 3, 2001)

**Authority in charge:** The RS Ministry of Health and Social Affairs together with the Ministry of Transport and the Ministry of Internal Affairs should increase the excise tax rate for the products such as:

- Tobacco products
- Alcohol and alcoholic beverages.

The Fund would be responsible for collected incomes under a special code, and the resources would be used only for financing preventive services included in the program.

By introducing charges on excisable and motor vehicles, multiple effects could be achieved:

- Missing funds for financing the program would be provided;
- The consumption of unhealthy products would be discouraged (tobacco, alcohol);
- The balance of payments deficit would decrease, since the imported products are in focus;
- The charges would not affect the living standard; on the contrary, it would contribute to a better living and working environment.

The program has not yielded reasonable effects that would allow the Fund to determine the exact saving in costs of treatment at primary, secondary and tertiary levels, which could then be reallocated in favor of the program. This is another argument in seeking additional financial resources.

The second option can be successful only in combination with the first one because it is unrealistic to expect that each one would separately provide sufficient resources for the program financing. Besides, this option presents a compromise between the Fund, which practically finances the health needs for the insured, and the Ministry of Health and Social Welfare, who should provide the missing funds at least for the uninsured, since the program’s services should be free of charge for all citizens.

In the case that combination of the two financing options is accepted as a basic principle for program financing, the total amount of resources needed for program financing will depend on the variant of the program scope that is adopted. Based on the proposed variants of the program scope there are three possible combinations of the financial resources in 2006:

<table>
<thead>
<tr>
<th>The Program scope</th>
<th>Required financial resources in KM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variant I</td>
<td>14,125,684.80</td>
</tr>
<tr>
<td>Variant II</td>
<td>6,136,927.80</td>
</tr>
<tr>
<td>Variant III</td>
<td>12,832,445.80</td>
</tr>
</tbody>
</table>

A detailed calculation of the scope of services and required financial resources for implementation of the program by the Variant I are provided in Appendix 6, and by Variant II and III in Appendixes 13 and 14. Depending on the scope variants, the structure of the financing of the program would be:
### Variant I

<table>
<thead>
<tr>
<th>Source of finance</th>
<th>Amount in KM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Fund</td>
<td>9,887,979.36</td>
</tr>
<tr>
<td>2. Registration of Motor vehicles</td>
<td>1,100,000.00</td>
</tr>
<tr>
<td>3. Excise tax</td>
<td>3,137,705.44</td>
</tr>
<tr>
<td>3.1 Tobacco products</td>
<td>2,329,835.05</td>
</tr>
<tr>
<td>3.2 Alcohol and alcoholic beverages</td>
<td>807,870.39</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>14,125,684.80</strong></td>
</tr>
</tbody>
</table>

### Variant II

<table>
<thead>
<tr>
<th>Source of finance</th>
<th>Amount in KM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Fund</td>
<td>4,295,849.46</td>
</tr>
<tr>
<td>2. Registration of Motor vehicles</td>
<td>1,100,000.00</td>
</tr>
<tr>
<td>3. Excise tax</td>
<td>741,078.34</td>
</tr>
<tr>
<td>3.1 Tobacco products</td>
<td>550,271.63</td>
</tr>
<tr>
<td>3.2 Alcohol and alcoholic beverages</td>
<td>190,806.71</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>6,136,927.80</strong></td>
</tr>
</tbody>
</table>

### Variant III

<table>
<thead>
<tr>
<th>Source of finance</th>
<th>Amount in KM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Fund</td>
<td>8,982,712.06</td>
</tr>
<tr>
<td>2. Registration of Motor vehicles</td>
<td>1,100,000.00</td>
</tr>
<tr>
<td>3. Excise tax</td>
<td>2,749,733.74</td>
</tr>
<tr>
<td>3.1 Tobacco products</td>
<td>2,041,755.09</td>
</tr>
<tr>
<td>3.2 Alcohol and alcoholic beverages</td>
<td>707,978.65</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>12,832,445.80</strong></td>
</tr>
</tbody>
</table>

The proposed measures would be in force by the end of 2010, until the end of the program’s implementation. If evaluation in 2010 shows that the program yielded significant savings in treatment costs at primary, secondary and tertiary levels of health care, then the charges would be suspended, and further financing would be exclusive obligation of the Fund. Besides, it is realistic to expect that the health insurance reform would end by 2010, which would make the situation regarding the uninsured much better.
8.3 Program Promotion

As said in the foreword of the document, at the end of 20th century, WHO developed the “Health for Everyone” strategy with the general goal “to achieve full health potential for everyone.” A realization of this goal is based on health promotion and protection during a whole life, as well as on the reduction of incidence of sickness from leading diseases and injuries.

One of the main principles of the strategy is equality in the availability of health care to all citizens, and accessibility of adequate and good quality health care for all with an emphasis on health promotion and illness prevention;

Having in mind the crisis in the health sector and unequal availability of health services to all citizens, in May 2002, the National Assembly of the Republic of Srpska (NARS) set the goal of reducing inequality in the health sector and improving the population’s health condition.

Even though the Program of Prevention and Control of Non-Communicable Diseases is in its third year of implementation, the participating institutions cannot be praised for the fact that most of the RS population is not familiar with the program. If we take into account all the complications, such as money deficiencies and the Dom Zdravljas’ organizational incapability for program implementation, the reasons for poor familiarity with the program itself are much more evident. However, program implementation has been going on some time and the fact that over 70% of RS population is not familiar with the program is surprising.

Our research showed that the health of RS population is endangered by bad habits regarding nutrition, tobacco consumption, lack of physical activity etc., which, directly or indirectly cause the most common non-communicable diseases like cardiovascular and malignant diseases, and diabetes mellitus.

The goal of this study is to raise the public’s awareness about the importance of non-communicable diseases prevention and control. It will determine the directions of program promotion. Considering the research results, and the experiences of the DZs, as well as the general condition of the RS health sector, it is necessary to approach program promotion with great caution.

Even though the program is equally related to prevention and control, their promotion should be approached separately. Due to all obstacles mentioned-above that the RS health sector is faced with, full and intensive program promotion would produce undesirable results. Focusing on the direct invitations of all citizens, who belong to one of the risky groups to do preventive health examinations could cause problems. Namely, there is a great possibility that
doctors, notwithstanding their specialties and great will to help people, might not complete their tasks well because of all the obstacles mentioned above. In this case, achieving the long term goals set by WHO and NARS would be questionable.

Consequently, in our opinion, promotion should be “dosed”. That means the prevention should be put in place first in order to make citizens more aware of its importance and help them change their own behavior and habits to improve their health condition. Control should be, at least at the beginning, a second priority and should be directed only towards those people who belong to one of the risky groups, i.e. to those people who believe that because of their habits or condition they might get one of the non-communicable diseases. This is a combination of the population and high-risk strategy. The population strategy by itself should be focused on education related to prevention importance and effectiveness in order to elicit in citizens a change in their life, as well as on strengthening citizens awareness of preventive checkups importance.

Later, when it becomes obvious that DZs and family medicine teams are ready to accept larger number of patients for preventive checkups, it will be possible to promote the program to the entire RS population.

If observing local community, informing about the program and its existence, as well as inviting citizens to do preventive checks can be left to local media (TV, radio) and to DZs, since they are the best informed about their capacities and capabilities for preventive checks.

Considering the research results, it is clear that the best media for program promotion would be TV and brochures given to citizens on Health Insurance Fund facilities. On the other hand, the experience of the Dom Zdravlja Laktaši shows that, in local communities that have already implemented the Family Medicine Project, direct phone calls to citizens are a good way to succeed in promotion, as well as in program realization itself.

Based on great differences in rates of preventive checkups effectuation and interviews with stakeholders involved, our general conclusion is that the existing way of implementation organization, evaluation, financing and coordination has resulted in different behavior of all identified stakeholders according to their own conception of the program and preferences in practicing their activities.
9 POLICY RECOMMENDATIONS FOR MORE EFFICIENT AND COST-EFFECTIVE IMPLEMENTATION OF THE PROGRAM

9.1 The Program Scope

We recommend accepting variant III of the program scope, that is the scope narrowed down by excluding early detection of prostate cancer and digitorectal exam as preventive checkups for early detection of rectum and colon cancer.

The recommended policy is based on the following:

1. Reduction of the program scope, through excluding early detection of prostate cancer and digit-rectal exam as a preventive checkup for early detection of rectum and colon cancer, is acceptable considering that there is no direct evidence in literature which proves their cost-effectiveness.

2. The narrowed scope of the program reduces the financial resources required for its implementation, which is important in a situation of limited available resources;

3. Health institutions and citizens should give priority to prevention activities.

9.2 Policy Proposed for Resolving the Financial Problems of the Program

A recommended policy for solving the financial problems of the program is based on the following assumptions:

- A reallocation of the sources collected by the Fund in favor of the program
- A tax of 5KM on the registration of motor vehicles
- An increase of the excise tax on tobacco products, alcohol and alcoholic beverages.

Based on the proposed financing model and narrowed scope of the program, the following structure of the financing for 2006 is proposed:
## Financial source

<table>
<thead>
<tr>
<th>Financial source</th>
<th>Amount in KM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Fund</td>
<td>8,982,712.06</td>
</tr>
<tr>
<td>2. Motor vehicles</td>
<td>1,100,000.00</td>
</tr>
<tr>
<td>3. Excise tax</td>
<td>2,749,733.74</td>
</tr>
<tr>
<td>3.1 Tobacco products</td>
<td>2,041,755.09</td>
</tr>
<tr>
<td>3.2 Alcoholic and non-alcoholic</td>
<td></td>
</tr>
<tr>
<td>beverages</td>
<td>707,978.65</td>
</tr>
<tr>
<td>TOTAL</td>
<td>12,832,445.80</td>
</tr>
</tbody>
</table>

Proposed financing model is based on the following facts:

1. It can hardly be expected that the reallocation of the resources in the Fund alone would provide sufficient amount of resources to finance the program;

2. This variant presents a compromise between the Fund, which practically finances the health needs for the insured, and the Ministry of Health and Social Welfare, which should provide the missing funds for the uninsured, since the program’s services are free of charge for all citizens;

3. The program has not yielded reasonable effects that would allow the Fund to determine the exact savings in the costs of treatment on primary, secondary and tertiary level, which could be then reallocated into the program. This is another argument in seeking additional financial resources;

4. By introducing the charges on excisable and motor vehicles, multiple effects could be achieved:
   - Missing funds for financing the program would be provided;
   - The consumption of unhealthy products would be discouraged (tobacco, alcohol);
   - The balance of payments deficit would decrease, since the imported products would be in focus;
   - The charges would not affect the living standard; on the contrary, it would contribute to a better living and working environment.

If the evaluation in 2010 shows that the program yields significant savings in treatment costs at the primary, secondary and tertiary levels, then the charges should be suspended, and further financing would be exclusively obligation of the Fund. It is realistic to expect that the health insurance reform would end by 2010, which would make the situation regarding the uninsured much better.

In addition, to stimulate the use of preventive care, we recommend that the DZs and doctors be paid a higher price for preventive services, relative to curative exams.
9.3 Policy Recommendation for the Program Promotion

*Effective implementation of the Population Strategy is recommended at the RS level in order to educate citizens about the importance and efficiency of prevention, as well as inform them about the existence of the program. High risk strategy implementation should be realized by DZs, in accordance with their quantitatively expressed program objectives, as approved by the RS Public Health Institute.*

The reasons for recommending this promotion policy are:

- The questionnaire showed low levels of citizens’ awareness of the existence of the program;
- The questionnaire results also show that citizens are very interested (73.4%) in a prevention program;
- By informing citizens about rules and program possibilities, additional pressure would be generated to provide organizational and material prerequisites for its implementation as soon as possible;
- In order to hold citizens’ trust in the program and prevention effects it is not recommended to undertake strong program promotion activities at the local level before solving the program financing problem.

Another point is that, for the program’s promotion and its good realization it is important to complete citizens’ registration in DZs, in order to create conditions for direct communication. It is possible to accomplish this with a proper campaign, without waiting for completion of family medicine teams. The effect achieved would be useful not only for the prevention program, but also for family medicine teams, because non-registered citizens would be designated to family medicine teams.
9.4 Recommendations for the Program Monitoring and Evaluation

The annual number of preventive checkups is planned on the basis of results of research on the health state of the RS population done by consulting company EPOS and RS Public Health Institute in 2002. In order to identify the health state of the population in preparing the basis for measuring the program’s cost-effectiveness, it would be useful in the next evaluation report to include precise data about number of citizens with risk factors identified for each condition included in the program. Practically, it means that the table presenting the percentage of planned preventive exams needs to be expanded by a column named “No. of persons included in a preventive exam (absolute number)” and another column entitled “No. of persons with a risk factor identified (absolute number)”. These data would enable the identification of the actual incidence of risk factors among the RS population, and also a control for whether the preventive exams have really been performed, based the existence of certain risk factors. (For example, cholesterol blood test is done with people having higher blood pressure or Body mass index > 30.)

Separate monitoring of the register of individuals with risk factors identified is also recommended. Evaluation tables should include data on people whose risk factors that are kept within allowed limits, which would further provide data on the number of cases of cardiovascular, malignant and diabetes diseases averted. Those data would further present one of the inputs required for measuring the cost-effectiveness of each condition included in the program. Since, cost-effectiveness and other analytic methods have not been used in our country, through collecting those data we would design a basis for implementing such methods in our circumstances. Besides, we would acquire important experience that would prepare us for similar research to be used before making decisions and adopting any strategy or a program in the health sector, and similar documents having effects on all citizens as taxpayers and payers for health insurance.
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World Health Organization and International Diabetes Federation meeting. Recommendations and Rationale, Screening for Type 2 Diabetes Mellitus.


APPENDICES

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APPENDIX 12  ALLOCATION OF THE SOURCES COLLECTED BY THE FUND BASED ON THE DECISION ON CRITERIA – ADDITIONAL SOURCES


<table>
<thead>
<tr>
<th>No</th>
<th>Institution</th>
<th>A person interviewed</th>
<th>Date of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ministry of Health and Social Welfare of Republic of Srpska</td>
<td>Dr. Stevan Jovic</td>
<td>Dr. Stevan Jovic</td>
</tr>
<tr>
<td>7</td>
<td>Health Insurance Fund of RS</td>
<td>Sandra Kovacevic</td>
<td>Sandra Kovacevic</td>
</tr>
<tr>
<td>8</td>
<td>Dom zdravlja Banja Luka</td>
<td>Dr. Dragana Rakic</td>
<td>Dr. Dragana Rakic</td>
</tr>
<tr>
<td>9</td>
<td>Dom zdravlja Prijedor</td>
<td>Dr. Spomenka Sekulic-Pavlovic</td>
<td>Dr. Spomenka Sekulic-Pavlovic</td>
</tr>
<tr>
<td>10</td>
<td>Dom zdravlja Laktasi</td>
<td>Dr. Ljubomir Sormaz</td>
<td>Dr. Ljubomir Sormaz</td>
</tr>
<tr>
<td>11</td>
<td>Dom zdravlja Bijeljina</td>
<td>Dr. Mirko Medan</td>
<td>Dr. Mirko Medan</td>
</tr>
<tr>
<td>12</td>
<td>Dom zdravlja Zvornik</td>
<td>Dr. Mara Mitric</td>
<td>Dr. Mara Mitric</td>
</tr>
<tr>
<td>14</td>
<td>Dom zdravlja Zvornik</td>
<td>Dr. Djeri Ljubo</td>
<td>Dr. Djeri Ljubo</td>
</tr>
<tr>
<td>15</td>
<td>Dom zdravlja Zvornik</td>
<td>Dr. Vesna Cvijetic</td>
<td>Dr. Vesna Cvijetic</td>
</tr>
<tr>
<td>16</td>
<td>Dom zdravlja Zvornik</td>
<td>Dr. Glusic Gordana</td>
<td>Dr. Glusic Gordana</td>
</tr>
<tr>
<td>19</td>
<td>Dom zdravlja Trebinje</td>
<td>Dr. Jovan Gadza</td>
<td>Dr. Jovan Gadza</td>
</tr>
<tr>
<td>20</td>
<td>Dom zdravlja Doboj</td>
<td>Boro Pantic</td>
<td>Boro Pantic</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>Dr. Andja Susic</td>
<td>Dr. Andja Susic</td>
</tr>
</tbody>
</table>
PARTNER Marketing Consulting Agency from Banja Luka was founded as an independent company in 1999. Nevertheless, our knowledge and experience about the region dates from early 90’s. Before Partner MCA’s inception, we were present in this part of the region from 1989 to 1992 as PARTNER Agency, based in Belgrade, with its operations throughout the ex-Yugoslavia and from 1996 to 1999 as PARTNER Marketing, Representative Office in Bijeljina.

Since its inception, Partner has been conducting both qualitative and quantitative research projects throughout the Balkans region: Serbia, Montenegro, Bosnia & Herzegovina, Former Yugoslav Republic of Macedonia and recently, Partner has re-established its research activities on the territory of Kosovo and Metohija as well. We are also active on the territory of Albania through our subcontractors.

Nowadays, PARTNER Marketing Consulting Agency is part of larger regional association Partner International South-East Europe, a business-driven association that has domicile research entities in each sub-region or country of the region, which consists of another two institutes as well: Partner Marketing Research Agency and Institute for Applied Marketing, both in Belgrade. Partner International Group has its representative office in Skopje, Former Yugoslav Republic of Macedonia (being currently transformed into new, independent research company), and local representatives/ fieldwork supervisors in Bijeljina (B&H), Podgorica, (Montenegro,), and Pristina, (Kosovo).

PARTNER Marketing Consulting Agency is at present engaged with the 8th year of continuous bi-monthly public opinion polling for D³ Systems, USA, then regular quarterly polling for the Office of the High Representative in Sarajevo and we must stressed out that we have done, so far, two surveys for Transparency International, apart from several research projects in the domain in marketing research (on beer industry and insurance or media researches), while research staff of the Partner International is engaged at the time being with two complex quantitative and qualitative social research projects on behalf of OSCE Mission to the FRY (concerning reform of the parliament and reform of the police), and few regional market research projects (in Serbia, Kosovo and Montenegro, at present, on behalf of Coca-Cola Company, JTI, Unilever, House of Prince, Sinalco, among others). Also, we have done one public opinion poll for USAID, Sarajevo, in which we cover, among other things, the question of corruption in our country and the level of democracy in BH.
Partner’s professional experience encompasses more than 450 research projects in domains of social sector, market research (both consumer and retail), media studies, politics, economics, advertising, government institutions, business environment, information technology, etc. Partner is a full-service research agency, qualified and experienced in both qualitative and quantitative studies. Its expertise includes determination of research goals (in cooperation with the Client), questionnaire design and guide developing, sample design, briefing of all involved staff, fieldwork, data collection, data coding and entry, data processing, advanced statistical analyses, reporting, presenting of results, providing continuous research plans and strategic backup for planned actions, as well as evaluation of achievements, communication with general public and professional bodies.

Partner, as an **ESOMAR** member (The World Association of Research Professionals, originally European Society for Opinion and Marketing Research, the most respectable professional organization in this area of work), follows the **ICC/ESOMAR** International Code of Marketing and Social Research Practices, an international code of best practice for survey companies.

Mr. Sutic, President and CEO of Partner, has been appointed as national representative at ESOMAR, which was officially verified at the 55th annual ESOMAR conference in Barcelona, Spain, September 22-25, 2002, attended by over 1000 delegates from around the world.
Ekonomski institut Banja Luka is conducting survey of the RS citizens attitudes about Program of prevention and control of non-communicable diseases, implementing in the RS since 2003 year. The final objective of the survey and one of the Study objectives is that the RS citizens become better informed and interested considering the importance of prevention and control of non-communicable diseases and to get familiar with their rights and responsibilities within the Program. Your opinions and experiences are extremely important and will help us to improve the Program implementation, what should provide preventive health care of non-communicable diseases to all citizens of the Republika Srpska.

Stakeholders interested for the Study and its users are public, that is citizens of the RS, the Ministry of Health and Social Welfare, Health Insurance Fund and Public Health Institute. The Study and the survey are financed by the USAID with technical assistance of the Urban Institute from Washington.

You were randomly selected in the sample of 1,004 respondents from the territory of the RS. The survey is anonymous, and it is conducted by Marketing Consulting Agency PARTNER from Banja Luka. Your participation in this Study is voluntary. An interview would take you about 10 minutes. If you agree, can we proceed?

M-1. Respondent Identification Number ________ M-2. Local Community:  
2. Rural  

I – EXISTING LEVEL OF THE CITIZENS FAMILIARITY WITH IMPORTANCE OF THE DISEASES PREVENTION AND CONTROL AND THE PROGRAM ITSELF

Q-1. Are you covered by the health insurance through the Health Insurance Fund of the RS?

1. Yes  
2. No  
3. I don't know

Q-2. Have you been registered with the family doctor in Dom zdravlja?

1. Yes (Proceed to Q-4)  
2. No (Proceed to Q-3)

Q-3. Why haven't you been registered with the family doctor? (more answers is possible)

1. I didn't know that I should have
2. I have got used to use private doctor's services
3. I might not since I am uninsured
4. Other (please state)

**Q-4.** During the last year (12 months), have you been diagnosed as having, or been treated for any of the following diseases:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. high blood pressure</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>b. high cholesterol</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>c. high blood glucose (diabetes)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>d. cardio-vascular diseases</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>e. malignant diseases (cancer)</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Q-5.** Which of the following diseases you consider as the noncommunicable or communicable?

<table>
<thead>
<tr>
<th></th>
<th>Non-communicable disease</th>
<th>Communicable disease</th>
<th>I don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Cardio-vascular disease</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>b. Influenza</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>c. Malignant diseases &quot;cancer&quot;</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>d. High blood pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>e. High blood glucose</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>f. Obesity</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>g. AIDS</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Q-6.** Are you familiar with term "diseases prevention"?

1. Yes
2. No
3. I don't know
4. Refuse to answer

**Q-7.** What do you do to prevent occurrence of a disease? (More answers possible)

1. I don't smoke
2. I do take care to eat healthy food
3. I do regularly physical activities
4. I regularly go to checkup with a doctor
5. I do not think about that
6. Other. What?
7. I don't know/Refuse to answer
Q-8. Do you know that there is the Program of prevention and control of non-communicable diseases, implementing in the RS since 2003 year?
1. Yes (Proceed to Q-9)
2. No (Proceed to Q-13)

Q-9. How have you found out that the Program is implemented?
1. At the time of my visit to the doctor because of my illness
2. At the medical staff invitation although I have not been ill
3. From my friends
4. Through media
5. Other

Q-10. Do you know what the Program provides to the citizens?
1. Yes
2. No
3. Refuse to answer

Q-11. During last 12 months, have you been utilised the Program services?
1. Yes (Proceed to Q-13)
2. No (Proceed to Q-12)

Q-12. You have said that you haven't used services provided for in the Program. Why?
1. I think that is not important
2. I don't have time
3. I can't afford it
4. I had no need
5. I don't like to see a doctor, except when I have to because of a ill

Q-13. Have you obtained a health checkup from a doctor, although you were healthy, in the past year?
1. Yes (Proceed to Q-14)
2. No (Proceed to Q-15)

Q-14. Which of the following checkups you have obtained during last 12 months? (please indicate each answer)
II – THE CITIZENS ATTITUDES ABOUT MOST APPROPRIATE PLATFORM OF THE PROGRAM PROMOTION

Q-15. Are you willing to respond to the call for preventive examinations?

1. Yes
2. No
3. I don't know

Q-16. How often do you watch/read following media?

<table>
<thead>
<tr>
<th>Media</th>
<th>Daily</th>
<th>Almost daily</th>
<th>One a month</th>
<th>Less than one a month</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Radio</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. TV</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. Newspapers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. Internet</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Q-17. Which of the below stated media would enable you to get informed, in the fastest and most reliable way, about actions within health sector? (Please indicate more answers)

1. Radio
2. TV
3. Internet
4. Newspapers
5. Printed guidelines to be spread on the Health Insurance Fund windows
6. Informative boards in primary health institutions "DZs" or in the doctor office
7. Other (please list)
III – SOCIO-DEMOGRAPHY

D-1. What is your sex category?
   1. Female
   2. Male

D-2. What is your age? _____ (Indicate age)

D-3. How many years of formal education have you? ______

D-4. What is a total monthly income of your household (of all members and from all sources)
   1. up to 50 KM
   2. 50-149 KM
   3. 150-249 KM
   4. 250 – 499 KM
   5. 500 – 999 KM
   6. 1000 – 1499 KM
   7. over 1500 KM
   8. I don't know
   9. Refuse to answer

D-5. Working status
   1. Employed
   2. Unemployed
   3. Housewife (if a woman doesn't want to work)
   4. Student
   5. Retired

D-6. What is a main monetary income of your household?
   1. Salary in public service
   2. Salary in private company
   3. Self-employment (own business)
4. Agriculture
5. Pension
6. Social welfare support
7. No monetary income
8. I do not want to answer

To be filled by an interviewer:

D-7. Have the questionnaire been subject of supervision?
  1. Yes           2. No

D-8. Method of the supervision:
  1. Direct control along with the interview
  2. Personnel control
  3. Phone control
  4. The questionnaire wasn't subject of the supervision
Cost-benefit analysis (CBA) (Extracted from Prevention Effectiveness – A guide to decision analysis and economic evaluation, Beth Clemmer, Anne C. Haddix 1996, p. 85-101)

Definition. Cost-benefit analysis is a technique that attempts to value the consequences or benefits of an intervention program in monetary terms. Unlike cost-effectiveness and cost-utility analysis, which analyze outcome measure in terms of cost-per-unit-of-health-outcome, CBA attempts to place monetary value on program outcomes.

In its simplest form, CBA attempts to weigh all the impacts of a program to assess whether it is worthwhile, i.e. whether its benefits exceed its costs. The results of CBA are reported as either the net present value (NPV), or net benefits of a project, or as the benefit-cost ratio.

CBA takes societal perspective, valuing all costs and all benefits of a prevention program to identify programs that produce the largest social good.

When to use cost-benefit analysis. CBA is usually used to (1) decide whether to implement specific programs, (2) choose among competing options, or (3) set priorities on options within resource constraints. Generally, the CBA is used before a public health program is implemented to evaluate whether the program produces a net savings. However, CBA can also be used to evaluate what have been accomplished by existing programs. Because CBA converts all costs and benefits into common metric unit, it is also useful when an intervention program produces multiple health outcomes. While CEA and CUA usually compare options to find the least costly method of achieving a similar health outcome, CBA allows comparison of alternate strategies that have different outcomes. The CBA result indicate whether a specific strategy results in a net savings or net loss, what can help decision makers to select among various programs or among different strategies within a program.

Limitations of CBA. Cost-benefit analysis provides important information for decision making, i.e. it is a tool to aid decision making. The advantage of CBA also raises some controversial questions. What is the exact value of saving one life? The assignment of monetary value to health outcomes - especially to human life - is difficult and sensitive issue. From moral perspective, human life is often consider priceless, so attempting to value it in some other way could impose harmful effects. Valuing pain and suffering (classified as intangible items) present similar problem. Because of the difficulty of measuring and valuing qualitative benefits, prevention effectiveness practitioners more commonly use cost-effectiveness and cost-utility analysis. However, as our ability to quantify intangibles improves, cost-benefit is becoming more comprehensive and more complete measure of changes in societal welfare.
Basic steps for a CBA are:

- Frame the problem;
- Identify the program or programs to be analyzed;
- List the effects of the programs for the full range of health and nonhealth outcomes in terms of benefits and costs;
- Assign values (usually monetary) to the intervention and the outcomes;
- Construct the decision tree;
- Identify the probabilities;
- Calculate the NPV of the program;
- Evaluate results with sensitivity analyses;
- Prepare the results for presentation.

Identifying outcomes. In prevention-effectiveness studies outcomes are the results of implementing prevention strategy. Because CBA takes societal perspective, it is important to identify potential effects of on all stakeholders.

Common health-related benefits to be considered are:

- Increased life expectancy;
- Decreased morbidity;
- Reduced disability;
- Improved quality of life;
- Averted medical costs;
- Increased worker productivity.

Nonhealth outcomes. Often, public health programs yield benefits other than improved health. Such benefits might include improvement of environmental quality or increases in property values. The value of these benefits should also be included. When nonhealth benefits are not fully captured in the analysis, the net present value of the project will not reflect its total economic value. This is obvious advantage of this method, because it allows different types of benefits to be measured with common metric. Analyst must be careful not to attempt to achieve a positive net present value based on the inclusion of health benefits alone.

Intangible outcomes. Some intangible outcomes, e.g. pain, suffering, may be critical to the analysis, and even though a perfect estimate cannot be obtained, such outcomes must be
included. The issue of intangible costs and benefits is a difficult analytical problem. Certain outcomes cannot be valued neatly, but they must be evaluated or at least discussed. The *willingness to pay (WTP)* approach is often used to capture this aspect of a health outcome.

**Valuation of Costs and Benefits.** After the outcomes of the program are determined, the monetary values are assigned to the outcomes and the costs. Prevention-effectiveness studies often include (1) the intervention program, (2) any side effects, (3) the illness or injury prevented, and (4) other nonhealth outcomes.

**Valuation of Health Outcomes.** Valuation of costs and benefits for which market prices do not exist presents many problems. Some estimation techniques to deal with this difficulty include:

- Expert opinion: a Delphi or consensus process can be used to determine the "best estimate" of professionals in the field
- Past policy decisions: estimates from previous legislative decisions may imply a certain baseline value
- Court awards: although court awards provide an estimate of some intangibles such as pain and suffering, court awards are often inconsistent, and thus are seldom used
- Cost-of-illness approach: a method for determining the economic cost of disease by summing the medical and nonmedical costs of the disease and the productivity losses from associated morbidity and mortality.
- Willingness-to-pay (WTP) approach: a method for determining how much people are willing to pay to decrease their risk of death or injury.

**Willingness-to-pay approach.** This method attempts to measure the value an individual places on reducing the risk of death or illness by estimating the maximum amount an individual would pay in a given situation. Rather than a value of the health outcome to any particular individual, this method assesses the value of a statistical health outcome (i.e., statistical life) by determining what society as a whole is willing to pay to reduce by a certain amount the risk for each individual. Because there is no market pricing mechanism for reducing the risk of health outcomes, methods have been developed to determine societal WTP: *required compensation or wage-risk studies* (look at the difference in wages for persons in occupations associated with higher risks than in other occupations), *consumer market studies* (the value of nonmarket resources can be imputed from reference to similar commodities for which a market exist), and *contingent market studies* (values are derived from surveys of individuals conducted in the context of a hypothetical market situation).
WTP approach presents some difficulties. For example, wealthy individuals may be willing to pay more than economically disadvantaged persons, people who are sick will be willing to pay more than healthy people, etc. However, the WTP method is constantly improving, and more consistent estimates on the value of lives saved should be achievable.

**Valuation of Benefits.** One of the advantages of cost-benefit analysis is the ability to incorporate multiple outcomes into the analysis. Thus, the method is particularly suitable in the evaluation of public health programs that also provide quantifiable nonhealth outcomes. The answer to the question how far should one go in the valuation of other outcomes, depends on the purpose of the study and the intended user of the study. If a program shows net benefits when only obvious benefits are included, it may not be necessary to continue to seek estimates of all benefits. However, if the time and the cost of gathering information can be justified, an attempt should be made to estimate monetary value for the major outcomes.

**Analyzing the Model and Interpreting the Results.** A program passes the efficiency test and considered worthwhile if the NPV of the program is positive. It is still common within the health literature to see benefit-cost ratio reported as summary measures. If the resulting ratio is greater than 1, the benefits exceed the costs, and the program is acceptable. However, it is recommended that the net present value rather than a benefit-cost ratio should be used as the summary measure in a cost-benefit analysis.

**Incremental Summary Measures.** Cost-benefit analysis most commonly report the NPV or the benefit-cost ratio of the intervention evaluated against the “no program” alternative. It may be useful to report incremental results when evaluating a set of option. An incremental an incremental NPV is the additional benefit of one program over another minus the additional cost of the first program over another. An incremental benefit-cost ratio is the additional benefit of one program over another divided by the additional cost of the first program over the second. Either measure provides information on the impact of an additional investment into the strategy with the next most costly intervention.

**Presentations of Results.** Because many analysts will make considerations based on CBA, it is important to prepare results in a straightforward and useful form for decision makers. The presentation should include the following:

- Clearly defined question answered by the analysis
- Description of the options considered in the analysis
- Concise listing of the relevant outcomes considered for each option
- Explanation of valuation of outcomes with particular attention to estimation of intangible costs and benefits and differences in timing (discounting)
Discussion of the evaluation of results with sensitivity analysis (this is particularly important because it gives decision makers a sense of the robustness of the analysis so they can determine what weight the findings should be given).

Checklist for cost-benefit analysis

- Has the program been clearly identified?
- Have the specific questions to be answered been identified?
- Have all reasonable options been clearly stated?
- Is CBA the appropriate methodology for the study?
- Have all outcomes of the program been identified?
- Have the assumptions been specified?
- Have intangible costs and benefits been appropriately included?
- Have any outcomes been counted more than once?
- How have the outcomes been valued?
- Have calculations for NPV of all options been appropriately performed?
- Have appropriate sensitivity analysis been conducted?
- Have sensitivity analysis been conducted for intangible benefits and costs?
- Have sensitivity analysis been conducted for intangible benefits and costs?
- Does the presentation of results include appropriate information?
  - Are the results presented in terms of NPV and not as cost-benefit ratios?
  - Are techniques used to estimate intangibles clearly identified?
  - Are results presented in a way that clearly outlines to decision makers what options have been evaluated and how robust the CBA can be considered?

An example of a CBA using WTP estimation

Suppose you want to conduct a cost-benefit analysis of the use of household water vessels to prevent diarrhea. You decide to use the WTP approach to measure the benefits of the program. You conduct a contingent-valuation survey in a village of 100 households. You explain the use of the vessel in such a way that the villagers are clear that they are being asked to value the trade-off in their resources between either using a water vessel or coping with diarrhea in their household. You find the following:
### Table

<table>
<thead>
<tr>
<th>Number of households</th>
<th>Total value</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 households</td>
<td>5 x 25$ = 125$</td>
<td>5%</td>
</tr>
<tr>
<td>10 households</td>
<td>10 x 20$ = 200$</td>
<td>15%</td>
</tr>
<tr>
<td>50 households</td>
<td>50 x 15$ = 750$</td>
<td>65%</td>
</tr>
<tr>
<td>15 households</td>
<td>15 x 10 = 150$</td>
<td>80%</td>
</tr>
<tr>
<td>15 households</td>
<td>15 x 5$ = 75$</td>
<td>95%</td>
</tr>
<tr>
<td>5 households</td>
<td>5 x 0$ = 0$</td>
<td>100%</td>
</tr>
</tbody>
</table>

From this information, you can calculate that the median willingness-to-pay is $15.

Suppose that the vessel costs $10. You want to achieve an 80% coverage rate with the program so you decide to make the vessel available for $10. The total cost of the program is $800 (80 household x $10). The total benefits of the program are $1,225 (125$ + 200$ + 750$ + 150$). The NPV of the program is $425 (1,225$ - 800$). The concept here is that if household has to pay only $10 for benefits they value at $25 then they get a surplus of $15 from the purchase. In economics, this is called *consumer surplus*. It is what CBA attempts to measure.

Now, you wish to consider increasing coverage to 95% of village households. You decide to lower the price to $5. Since the vessel costs $10, you give a $5 per vessel subsidy to the manufacturer. The program now costs $950. The total benefit is $1,300. The NPV of the program is $350.

The marginal NPV tells a different story. The additional benefit from an increase in coverage from 80% to 95% is $75 (15 x $5). The additional cost is $150 (15 x $10). The marginal NPV is -$75; expanding the program from 80% coverage to 95% generates a net loss.

**Cost-effectiveness analysis (CEA)** (Extracted from *Prevention Effectiveness – A guide to decision analysis and economic evaluation*, Anne C. Haddix, Phaedra A. Shaffer 1996, p. 103-127)

**Definition.** Cost-effectiveness analysis is commonly used to conduct economic analysis of health programs. In CEA results are presented in the form of cost per health outcome, such as “cost per case prevented” or “cost per life saved”. The decision maker is left to make value judgments about intrinsic value of the health outcomes.

Cost-effectiveness analysis is most useful when the goal of the analysis is to identify the most cost-effective prevention strategy from the set of options that produce a common effect. Because CEA does not use a common outcome measure such as dollars or quality-adjusted
life years (QALYs), it does not provide a convenient way to compare the cost-effectiveness of interventions for different health conditions. Another disadvantage is that judgments about the value and quality of lives must be implicitly made by user of the study results because they are not included explicitly in a CEA.

**When to conduct a CEA.** CEA compares the cost of optional interventions or treatments per health outcome achieved. CEA is most useful when the interventions being compared have one clear and specific outcome. Four scenarios for which CEA is most suited include the following:

1. Comparing alternative strategies for an identical goal
2. Identifying which intervention method is best for a specific population
3. Providing empirical support for the adoption of previously under-funded programs with low cost-effectiveness ratios
4. Identifying practices that are not worth their cost

**How to conduct a CEA.** There are nine basic steps to conducting a CEA:

- Frame the problem to be analyzed
- Identify the options to be compared
- Identify the outcome measures
- Identify intervention and outcome costs
- Construct the decision tree
- Identify the probabilities
- Analyze the decision tree
- Perform sensitivity analysis
- Prepare presentation of results

**Framing the problem.** This step actually has several components, all of which need to be carefully considered to assure that the study will be productive and useful. These components are: the study question (Is surgical treatment of patients with prostate cancer cost-effective?), the perspective of the study (all cost-effectiveness studies should have the societal perspective), the time frame (the time frame should extend long enough to ensure that relevant consequences of the intervention are captured), and the analytic horizon (the entire period over which benefits can be realized or costs occurred).
Identification of Interventions. When selecting interventions, all reasonable options should be included. Interventions must be appropriate for the target population and measures of effectiveness must exist. The intervention must be legally and morally acceptable to policymakers and society. Finally, it is important to remember that CEA must compare options that are directed at achieving the same health outcome. The set of options should always include current practice, whether it is ’no-program’ option, which serves as a reference or baseline.

Identify Outcome Measures. The health outcome identified for the study must be relevant to address the study question, and the outcome must be the same for each intervention. A health outcome often used in CEA is life years saved. Other commonly used outcome measures include lives saved, cases prevented, and cases identified. There are two basic categories of health outcomes: intermediate and final. Intermediate outcomes are often those most directly associated with the intervention being evaluated, e.g. cases identified or behavior changed. Final-outcome measures include cases prevented, lives saved, deaths averted, and life years gained. It is recommended that final health-outcome measures be used in CEA, unless the relationship between outcomes and the final health outcome is not known.

Identify Intervention and Outcome Costs. Once the set of relevant intervention strategies and the health outcomes have been identified, the next step is to determine the costs of the components in the net cost equation:

$$\text{Net Cost} = \text{Cost}_{\text{intervention}} - \text{Cost}_{\text{disease Averted}} - \text{Cost}_{\text{Productivity Losses Averted}}$$

Net costs are divided into the total cost for all resources required for the program (Cost_{intervention}), including the cost of side effect and the cost to participants, the cost of diagnosis and treatment associated with cases of the health program averted (Cost_{disease Averted}), and the productivity losses averted as a result of the intervention (Cost_{Productivity Losses Averted}). In CEA, the cost of the disease averted and the productivity losses are assessed using the cost-of-illness-approach, rather then willingness-to-pay approach.

Cost-of-illness (COI) approach defined. The COI method estimates (1) the direct medical costs (e.g. the cost of hospitalization, diagnostic testing, and prescription drugs), (2) the direct nonmedical costs (e.g. the cost of transportation to visit a clinician), and (3) the indirect costs of lost productivity associated with morbidity or premature mortality resulting from the health problem (income lost by family member, forgone leisure time etc.), and intangible costs (e.g. psychosocial costs, pain and suffering etc.).

Prevalence-Based Costs are the total costs associated with the existing cases of a health problem that accrue in a specific period, divided by the total population. Prevalence-based...
costs are more commonly found in the literature and are frequently reported as annual costs of a health problem.

**Incidence-Based Costs** are the total lifetime costs resulting from disease or illness.

**Morbidity Costs** can be defined as the wages lost by people who are unable to work or perform normal housekeeping duties because of a health problem they have or one experienced by another individual for whom they must care, e.g. a child or elderly parent. The total costs of morbidity is determined by the number of days sick or hospitalized, multiplied by the daily wage rate.

**Mortality Costs** are the future productivity lost to society as the result of premature death. This value is derived by estimating the present value of future earnings lost by an individual who dies prematurely.

**Interpreting the Results.** Two types of cost-effectiveness ratios are average and incremental ratios. Each provides insight into the efficiency and the affordability of the intervention. The average CE ratio, evaluated against the baseline or reference option, is the net cost of a strategy divided by the total number of health outcomes averted, e.g. cost per case prevented or year of life saved. The incremental CE ratio examines the efficiency of one strategy relative to another.

**Presentation of Results.** The presentation of a cost-effectiveness analysis should include:

- The study perspective, time frame and the analytic horizon
- The study question
- The assumptions used to build the model
- A description of the interventions
- Evidence of the effectiveness of the interventions
- Identification of all relevant costs
  - Inclusion or exclusion of productivity costs
  - Discount rate
- Results of incremental analysis
- Results of sensitivity analysis
- Discussion of results that addresses all issues of concern and the implications of assumptions used
Cost-utility analysis (CUA) (Extracted from “Prevention Effectiveness – A guide to decision analysis and economic evaluation”, Erik Dasbach, Steven M. Teutsch 1996, p. 130-140)

Definition: A type of cost-effectiveness analysis in which benefits are expressed as the number of life years saved adjusted to account for loss of quality from morbidity of the health outcome or side effects from the intervention.

Cost-utility analysis (CUA) is appropriate when

- Quality of life is the important outcome;
- Quality of life is an important outcome;
- The program being evaluated affects both morbidity and mortality;
- The program being compared have a wide range of different outcomes;
- The program being evaluated is being compared with a program that has already been evaluated using CUA.

Cost-utility analysis allows comparison across health interventions and has been applied in a diverse array of interventions including postpartum use of anti-D gamma globulin, smoking cessation, and phenylketonuria screening.

This chapter presents:

1. A discussion of why and how quality-adjusted life years (QALYs) are measured;
2. Sources of data for measuring QALYs;
3. An example of using QALYs in a CUA.

The chapter focuses on a specific aspect of cost-effectiveness analysis, namely, quality-of-life adjustments, rather than presenting step-by-step information on performing an analysis as we did for CBA and CEA. Except for the added feature of quality-of-life adjustments, the methods for conducting CUA parallel those for CEA.

**Definition of cost-effectiveness analysis and comparison with cost-effectiveness analysis**

CUA differs from CEA in the way the health outcomes are measured. In CUA, the results are usually reported as cost per QALY gained. However, in CUA, if the utility measurement includes the value for lost productivity, productivity losses should not be included in the numerator because this will result in double counting. If the utility measurement does not take into account utility lost as the result of a change in productivity due to an illness, productivity losses should be included in the net cost calculation in the numerator.
**Recommendation:** The numerator in a cost-utility analysis should only include direct medical and nonmedical costs unless the utility measurement in the denominator does not incorporate productivity losses.

Once the quantitative measure of the health outcome has been adjusted for qualitative changes, the CUA is conducted as one would conduct a standard cost-effectiveness analysis.

**Why measure quality of life?**

To compare health programs on the basis of economic value, a standard measure must be used. Sometimes the natural units of measure for different health interventions are similar and programs can be easily compared using CEA. For example, when comparing two interventions designed to reduce neural tube defects, a natural unit of measure might be the number of neural tube defects averted.

For other health interventions, however, natural units of measure may not be similar and a straightforward comparison will therefore not be possible. For example, a program designed to reduce birth defects and a program to reduce lead toxicity among children have very different natural units of outcome measure (e.g. number of birth defects averted compared with IQ levels of children). Although both interventions address the health of children, program results cannot simply be compared. Thus a standard metric must be used to allow comparison. In other cases, interventions may have multiple outcomes, all of which may need to be assessed in a single summary outcome measure.

Suitable measures must address changes in *length of life* as well as in *quality of life*. Several approaches have been developed that include both, prognosis and preferences for health states. Among the specific instruments that have been developed for combining quantity and quality of life into a single, summary index are the Quality of Well-Being (QWB), the Health Utility Index (HUI), and the Years of Healthy Life (YHL). These approaches provide information about health-related quality of life that is expressed in terms of years of healthy life, sometimes also referred to as quality-adjusted life years (QALYs), healthy life years, or disability-adjusted life years (DALYs).

Using QALYs is most appropriate when quality of life is the important outcome in a study, e.g. in a program designed to improve social functioning of persons with mental disabilities. Also, when quality of life is an important outcome, though not necessarily the only important outcome, a CUA using QALYs can provide useful data, because QALYs can combine multiple outcomes in a single measure.
When a program affects both morbidity and mortality, QALYs can be used to assess the overall program outcomes. For example, an exercise program to reduce the mortality from coronary artery disease may also reduce the incidence. Thus the standardized quality-of-life metrics provide a means for comparing health programs on the basis of cost-effectiveness, considering both quality and length of life.

**How QALYs are measured?**

Mathematically, QALYs are calculated as the sum of the product of the number of years of life and the quality of life in each of those years. One life year in optimal health is assigned a value of 1. Death is given a value of 0. The value of a year in less than perfect health is given a value between 0 and 1. Thus the number of QALYs is calculated as:

\[
\text{Number of QALYs} = \text{Sum of the years of life in each health state} \times \text{Quality of life in each health state}
\]

For example, in the case of an individual with cancer, CUA would consider not only the absolute number of years of survival after diagnosis but also how much pain and disability an individual suffered during those years. The utility measure for a cancer patient who has bedridden and in extreme pain might be only 0.3, when quality of life has been taken into consideration.

The QALY formula provides a way to compare health outcomes when both quality and length of life are affected. Measuring duration of life is straightforward. However, measuring the value of the quality of life associated with a particular state of health requires that individuals or groups be studied to determine how a particular state of health is valued by that individual or group. The value assigned to quality of life is referred to as health utility.

QALYs provide a method for comparing outcomes that have widely varying results. To illustrate, consider the health outcomes of two different programs to prevent amputations due to diabetes. The baseline program achieves no improvement but delays the time until the patient must have an amputation, whereas a foot-care program provides improved function and no amputation. The quality of life for an individual who must have a limb amputated would be valued very differently from that for a person enrolled in the foot-care program. If only cost measures were used, an amputation program might appear to be a less expensive option than foot-care education over the life of an individual with diabetes. In this example – as in many public health interventions – quality of life is critical in assessing possible outcomes.

QALYs are also useful in integrating results of interventions that have several outcomes. For example, a smoking-cessation program may result in changes in both length of life and
quality of life, because of such associated health problems as emphysema, coronary artery
disease and cancer. Assessing the changes in morbidity and mortality from each of these
disease conditions individually can be difficult to interpret. Using QALYs allows the overall
quality of life to be assessed, rather than limiting assessment to unidimensional changes in
health status.

The quality weights for use in calculating QALYs should be based on the relative preferences
that individuals have for the various health outcomes. That is, outcomes that are more
preferred should have higher weights. Utility theory provides a well-established approach for
the measurement of preferences. Health state utilities, then, are an expression of health-related
quality of life; and QALYs are an expression of health utility and length of life combined. In
decision analysis of health outcomes, two approaches have been used to assign health utilities:
the direct approach and the indirect approach. Generally, the economic viewpoint of an
analysis dictates the appropriate method for measuring health utilities.

THE DIRECT APPROACH TO MEASURING HEALTH UTILITIES

The direct approach to health utilities measures how an individual values a given health state.
Because of this, the direct approach is most appropriate for clinical decision analysis (i.e.
individual decision making). With the direct approach, health utilities are elicited directly
from an individual by using a standard technique, such as the “standard gamble”, “time trade-
off” or “rating scale”.

The standard gamble (Figure 1) approach is a lottery-based approach. In this technique, an
individual is asked to choose between a less desirable (but certain) chronic health state (State
Bi) and a gamble offering a certain probability of a worse health state (Dead) or having state
of health (Healthy).

For example, a patient might be given the choice of undergoing surgery or progressing to a
certain chronic health state Bi. With surgery, the possible outcomes are a healthy life with a
probability of death with a probability of $1-p$. To construct the standard gamble model,
the patient would be asked, “Would you prefer no surgery if you were certain that this choice
would lead to survival for $N$ years with a chronic health condition, or would you prefer to
undergo surgery if the chances of surviving $Y$ years with full health were 50%, and the
chance of death were 50% (a gamble with a 50% chance of the best possible outcome)?”. An
individual would then choose one of the two treatment options on the basis of the possible
outcomes.

Next, the interviewer would continue to ask the same question but would vary the probability
of the gamble. If the individual in the above example chose surgery, the interviewer might
then ask, “what if your chances of surviving with full health were 25% rather than 50%?” This process would continue until the individual’s response indicated indifference to the options of the certain state of health and the gamble. The utility would measure the point at which the person would be neutral between the two choices.

The standard gamble is considered a standard elicitation method because its theoretical foundations are rooted in the axioms of expected utility theory. If an individual’s responses satisfy the axioms for calculating expected utility, the standard gamble elicitation method results in a measure with interval scale properties.

![Diagram of Standard Gamble](image)

**Figure 1. Standard gamble for eliciting utilities for a chronic health state**

**Time trade-Off**

Because the standard gamble technique may be difficult to administer, the time trade-off technique, which many believe to be easier to administer, was developed. The time trade-off technique is used to determine how many years of life in excellent health are equivalent to life with a less desirable health state. To continue the above example, a patient might be asked to choose between two alternatives:

1. The no surgery option that results in a chronic health condition with a life expectancy of $t$ years, or
2. The surgery option with the chance for full health with a life expectancy of $x$ years, where $x < t$.

*Time* $x$ is varied until the individual is indifferent between the choice of surgery or of no surgery. The time trade-off technique differs from the standard gamble in that the individual
is presented with a choice that does not involve risk. In the example with the standard gamble, probability was stated as a 50% chance for the best outcome. As a result, the time trade-off technique measures preference value and does not, therefore, satisfy the axioms of expected utility theory.

Rating scale

Another method that has been used to elicit health utilities is the rating-scale technique. Like the time trade-off technique, the rating-scale technique does not involve judgments about risky outcomes. The rating-scale technique is, therefore, also a measure of preference.

In the rating-scale technique, an individual directly relates a health state to a linear scale for example from 0 to 100, where 0 corresponds to the least desirable health state (e.g. death), and 100 corresponds to the most desirable state of health (i.e. excellent health). This kind of scale has been called a feeling thermometer. In addition to the feeling thermometer, a card is used to describe a particular state of health. The analyst instructs an individual to place various cards on the scale such that each card’s distance from the end points on the feeling thermometer corresponds to her or his feelings about the relative differences in desirability among the levels. The numerical values from the feeling thermometer are then converted to utility values, e.g. values on a scale of 0 to 1. Thus, if the individual places a card at 50, the utility for the health state is 0.5 on a scale of 0 to 1. The individual creates an interval scale using judgments about the desirability of a particular state of health relative to all the other possible states of health.

INDIRECT APPROACH TO MEASURING HEALTH UTILITIES

In contrast to the direct approach, the indirect approach measures how the general public, rather than an individual, values a given health state. Because it reflects the values of the general public, the indirect approach is more appropriate for CUAs in public health than the direct approach.

Utilities for the general public as a group may also be estimated using data collection methods that combine different dimensions of health to compute a series of health-utility values. Once the utility values and weights are developed for each dimension, they can then be combined mathematically into a single function known as a multiattribute-utility (MAU) model. For example, one model characterized health according to four dimensions: physical function, role function, social-emotional function and other coexisting health problems. With this model, description were developed for each of the four dimensions for a particular health condition. In one study of multiple sclerosis, for example, physical function was described as
“being able to get around the house, yard, neighborhood, or community without help; (needing) mechanical aids to walk or get around.” Descriptions were also developed for each of the other three dimensions. After descriptions of the dimensions were developed, utility values were developed for all of the four dimensions.

In constructing a Health Utility index, one of the direct methods described above can be used to solicit information from individuals. The value of different aspects of state of health can also be weighted according to their relative contributions to the overall utility of a general health state. Like the utility functions, the weights can be derived by using direct-elicitation techniques with individuals and deriving group weights by averaging individual weights.

Another frequently used MAU model is called the *Quality of Well-being Index* (QWB). With an appropriate model, a group-utility index can be constructed for health conditions of interest and used to develop utility values the general public has for a particular disease condition. Group-utility values are expressed in numbers ranging from 0 to 1 so they may be easily inserted into the basic equation for calculating QALYs.

Developing and administering a Health Utility Index is one way to collect data on group-utility values for particular health conditions. Data for measuring QALYs are available from various sources. Some sources of data, their advantages, and their limitations are discussed below.

**SOURCES OF DATA FOR MEASURING QALYs**

**Collection of Primary Data**

To obtain the quality-adjusted health outcomes for the denominator of the CUA it is necessary to measure quality weights for all of the health outcomes or health states in all alternatives in the decision model. Data for measuring QALYs can be obtained through primary data collection. When collecting primary data, one can conduct direct measurement on individuals in the health states of interest. It is necessary to find patients with the various conditions and use a utility measurement instrument (e.g. standard gamble) to measure their utility for their condition.

An alternative is to conduct direct measurement on individuals who have some experience or knowledge of the health states. It is desirable to find patients who have had the disease or condition of interest and have some knowledge about the various health states. Again, a utility measurement instrument (e.g. standard gamble) is used to measure their utility for all the states.
The third alternative is to administer a Health Utility Index to a random sample of the general population. Utilities are measured for the health states of interest as described above.

Primary collection of quality adjustments weights is often not feasible for prevention-effectiveness studies, owing to time and cost constraints. However, a number of instruments are available to facilitate primary data collection. These include the QWB, the HUI, the Rosser and the EuroQol. The most widely used and tested is the Quality of Well-Being Index (QWB). The drawback of using the QWB or other detailed instruments to collect utility data is that substantial resources are required to train interviewers, interview subjects, and process the data.

An approach has been developed that uses the short-form health interview survey (SF-36), quality-of-life instrument developed from measures used in the Health Insurance Experiment as a data-collection medium for QWB. The two instruments have been compared, and a translation function developed that maps the SF-36 into the QWB, which assesses the level of disability. The World Bank has used a different measure, the disability-adjusted life year (DALYs) for comparing health outcomes for various health conditions. DALYs, however, were developed using utilities from an expert panel and lack the rigor of other preference measures.

CONDUCTING A COST-UTILITY ANALYSIS

A simplified, hypothetical example of a CUA, to evaluate a health program designed to prevent chronic disease at birth, is presented. Assuming that the primary difference between a CEA and a CUA is the measure used to evaluate effectiveness, this example focuses only on how QALYs are measured and used in a CUA.

The first step is to identify the options being evaluated. In this example, there are two options. Option A is a program that prevents chronic disease (X) at birth. Option B is a no-program option that would result in the natural progression of chronic disease (X) over an expected lifetime with the disease. The second step is to identify the health states that Option A and Option B will follow. A minimum set of health states should include all those that result in a change in quality of life or a change in expenditures of resources. In this example, two health states are assumed: excellent health and chronic disease X.

Next, life expectancy should be estimated. In this example, two assumptions are made: (1) the life expectancy of an individual for whom chronic disease X has been prevented is 75 years (Option A), and (2) the life expectancy of an individual with chronic disease X from birth is 30 years (Option B).
The utility of living in excellent health is 1.0. In this example, it is assumed that the utility associated with living with chronic disease X (Option B) is similar to living with noninsulin-dependent diabetes. Thus the corresponding utility i.e. 0.70 is used for the calculations.

Figure 2. describes the results of the calculations used to determine the incremental gain in QALYs when Option A is chosen instead of option B. Option A accrues 75 QALYs (75 years x 1 QALY/yr). Option B, in contrast, accrues 21 QALYs (30 years x 0.70 QALY/yr). Thus, Option A gains 54 QALYs over Option B. This substantial gain would decrease if discounting were incorporated.

**Figure 2: Measuring effectiveness with QALYs**

\[
\begin{align*}
\text{QALYs} &= 1.00 \times 75 = 75 \text{ w prevention program} \\
\text{QALYs} &= 0.70 \times 30 = 21 \text{ w/o prevention program} \\
\text{QALYs gained} &= 75 - 21 = 54 \text{ QALYs w/o discounting}
\end{align*}
\]

**CONCLUSION**

CUA is similar to other methods of economic analysis because it examines the number of health outcomes. It also includes measures of the length of life and quality of life, rather than just the number of individuals affected by a program. Because length of life is a factor, CUA tends to favor interventions aimed at conditions affecting younger persons. It differs from
CEA and CBA by including measures of the quality of life. Measuring quality of life is both complex and difficult. The methods presented in this chapter convey some options for consideration, but better techniques are needed. Agreement on standardized methods for collecting, applying, and interpreting quality-of-life data may also make CUA more useful for analysts and decision makers. Adding quality of life to an economic analysis adds another layer of analytic complexity and requires interpretation that may be confusing for persons unfamiliar with CUA methods.

CUA does, however, provide a method for comparing different health interventions in a way that considers both quality of life and length of life. CUA can provide useful information in the overall process of decision making and policy development. As with each method described here, economic analysis and decision analysis do not make decisions. They simply provide information to help decision makers clarify issues, compare options, and evaluate options. Public health decisions require a holistic approach to decision making that includes not only cost information, but consideration of ethical, legal and distributional issues as well.
# APPENDIX 5
## REVIEW OF THE SCOPE AND FINANCIAL RESOURCES REQUIRED FOR COMPLETE IMPLEMENTATION OF THE PROGRAM IN PERIOD 2005-2010 YEAR

### VARIANT I

<table>
<thead>
<tr>
<th>Activities</th>
<th>Checkup</th>
<th>Target population</th>
<th>Prices</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention and reduction of blood pressure</td>
<td>Blood pressure</td>
<td>18-64 years old</td>
<td>3</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
</tr>
<tr>
<td>measurement</td>
<td>Blood cholesterol</td>
<td>With BMI &gt; 30</td>
<td>3.8</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
</tr>
<tr>
<td>measurement</td>
<td>Body index mass</td>
<td>18-64 years old</td>
<td>4</td>
<td>138,619</td>
<td>554,476</td>
<td>138,619</td>
<td>554,476</td>
<td>138,619</td>
<td>554,476</td>
</tr>
<tr>
<td>measurement</td>
<td>Interview</td>
<td>Persons smoke every day</td>
<td>6</td>
<td>420,000</td>
<td>2,520,000</td>
<td>378,000</td>
<td>2,268,000</td>
<td>336,000</td>
<td>2,016,000</td>
</tr>
<tr>
<td>Early detection of cervical cancer</td>
<td>Pap test</td>
<td>Woman ages 25-60</td>
<td>6</td>
<td>105,354</td>
<td>632,126</td>
<td>105,354</td>
<td>632,126</td>
<td>105,354</td>
<td>632,126</td>
</tr>
<tr>
<td>Breast palpation</td>
<td>woman &gt; 40 years</td>
<td>6</td>
<td>305,929</td>
<td>1,835,574</td>
<td>305,929</td>
<td>1,835,574</td>
<td>305,929</td>
<td>1,835,574</td>
<td>305,929</td>
</tr>
<tr>
<td>Mammmography</td>
<td>woman &gt; 50-70 years</td>
<td>38</td>
<td>76,659</td>
<td>2,913,023</td>
<td>76,659</td>
<td>2,913,023</td>
<td>76,659</td>
<td>2,913,023</td>
<td>76,659</td>
</tr>
<tr>
<td>Early detection of prostate cancer</td>
<td>Digit-rectal exam</td>
<td>Man 50-70 years</td>
<td>6</td>
<td>69,452</td>
<td>416,709</td>
<td>69,452</td>
<td>416,709</td>
<td>69,452</td>
<td>416,709</td>
</tr>
<tr>
<td>Early detection of colorectal cancer</td>
<td>Digit-rectal exam</td>
<td>All ages &gt; 50 years</td>
<td>6</td>
<td>146,088</td>
<td>876,530</td>
<td>146,088</td>
<td>876,530</td>
<td>146,088</td>
<td>876,530</td>
</tr>
<tr>
<td>Fecal occult blood test</td>
<td>All ages &gt; 50 years</td>
<td>6</td>
<td>219,133</td>
<td>1,314,795</td>
<td>219,133</td>
<td>1,314,795</td>
<td>219,133</td>
<td>1,314,795</td>
<td>219,133</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td>14,377,685</td>
<td>14,125,684</td>
<td>13,873,684</td>
<td>13,621,684</td>
<td>13,369,684</td>
<td>13,117,684</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 6  REVIEW OF ESTIMATED SCOPE AND VALUE OF SERVICES INCLUDED IN THE PROGRAM FOR PERIOD 2005-2008
PREPARED BY THE HEALTH INSURANCE FUND

<table>
<thead>
<tr>
<th>Description</th>
<th>The price of the service</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Scope</td>
<td>Amount (KM)</td>
<td>Scope</td>
<td>Amount (KM)</td>
</tr>
<tr>
<td>Anthropometric measurements</td>
<td>4</td>
<td>176,560</td>
<td>706,240</td>
<td>194,216</td>
<td>776,864</td>
</tr>
<tr>
<td>Blood pressure measurement</td>
<td>3</td>
<td>176,622</td>
<td>529,866</td>
<td>194,284</td>
<td>582,852</td>
</tr>
<tr>
<td>Total blood cholesterol</td>
<td>3.8</td>
<td>58,727</td>
<td>223,163</td>
<td>64,600</td>
<td>245,480</td>
</tr>
<tr>
<td>Blood sugar measurement</td>
<td>2.3</td>
<td>58,732</td>
<td>135,084</td>
<td>64,605</td>
<td>148,592</td>
</tr>
<tr>
<td>Fight against smoking/tobacco addiction - doctor</td>
<td>6</td>
<td>9,062</td>
<td>54,372</td>
<td>9,968</td>
<td>59,808</td>
</tr>
<tr>
<td>Physical breast examination</td>
<td>6</td>
<td>60,440</td>
<td>362,640</td>
<td>66,484</td>
<td>398,904</td>
</tr>
<tr>
<td>Pap smear</td>
<td>6</td>
<td>37,928</td>
<td>227,568</td>
<td>41,721</td>
<td>250,326</td>
</tr>
<tr>
<td>Fecal occult blood test</td>
<td>6</td>
<td>54,757</td>
<td>328,542</td>
<td>60,233</td>
<td>361,398</td>
</tr>
</tbody>
</table>

2,567,474  2,824,224  3,106,647  3,417,314
### APPENDIX 7  RELOCATION OF THE RS HEALTH INSURANCE FUND RESOURCES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>Reallocation based on the criteria</th>
<th>Reallocation based on additional sources</th>
<th>Reallocation based on shifting resources in the Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL FUND’S EXPENSES</td>
<td>100% 192,000,000</td>
<td>100% 203,810,211</td>
<td>100% 192,000,000</td>
</tr>
<tr>
<td>FUND’S COSTS</td>
<td>5.00% 9,600,000</td>
<td>4.71% 9,600,000</td>
<td>4.71% 9,043,708</td>
</tr>
<tr>
<td>HEALTH CARE</td>
<td>89.49% 171,820,800</td>
<td>90.10% 183,631,011</td>
<td>90.10% 172,990,126</td>
</tr>
<tr>
<td>Health care in health care institutions</td>
<td>75.73% 145,401,600</td>
<td>77.14% 157,211,811</td>
<td>76.46% 148,101,842</td>
</tr>
<tr>
<td>Primary level health care</td>
<td>30.29% 58,160,640</td>
<td>34.33% 69,970,851</td>
<td>34.33% 65,916,243</td>
</tr>
<tr>
<td>PRIMARY AND FAMILY MEDICINE HEALTH CARE *</td>
<td>17.88% 34,326,410</td>
<td>22.64% 46,136,621</td>
<td>28.79% 55,273,348</td>
</tr>
<tr>
<td>CHILDREN STOMATOLOGY</td>
<td>6.75% 12,958,191</td>
<td>6.36% 12,958,191</td>
<td>6.36% 12,207,301</td>
</tr>
<tr>
<td>HYGIENIC-EPIEMIOLOGY CARE</td>
<td>0.02% 40,712</td>
<td>0.02% 40,712</td>
<td>0.02% 38,353</td>
</tr>
<tr>
<td>EMERGENCY</td>
<td>1.44% 2,762,630</td>
<td>1.36% 2,762,630</td>
<td>1.36% 2,602,544</td>
</tr>
<tr>
<td>AMPOULE MEDICATIONS</td>
<td>1.19% 2,285,713</td>
<td>1.12% 2,285,713</td>
<td>1.06% 2,153,263</td>
</tr>
<tr>
<td>LAB DIAGNOSTIFICATION</td>
<td>2.42% 4,652,851</td>
<td>2.28% 4,652,851</td>
<td>2.28% 4,383,232</td>
</tr>
<tr>
<td>RADIOLOGY</td>
<td>0.59% 1,134,132</td>
<td>0.56% 1,134,132</td>
<td>0.56% 1,068,413</td>
</tr>
<tr>
<td>Secondary level health care</td>
<td>33.00% 63,366,017</td>
<td>31.09% 63,366,017</td>
<td>31.09% 59,694,140</td>
</tr>
<tr>
<td>HOSPITAL TREATMENT</td>
<td>23.47% 45,053,238</td>
<td>22.11% 45,053,238</td>
<td>22.11% 42,442,534</td>
</tr>
<tr>
<td>CHEMODIALYSIS</td>
<td>2.94% 5,639,576</td>
<td>2.77% 5,639,576</td>
<td>2.77% 5,312,778</td>
</tr>
<tr>
<td>KSZZ</td>
<td>4.29% 8,237,582</td>
<td>4.04% 8,237,582</td>
<td>3.81% 7,760,238</td>
</tr>
<tr>
<td>ANES.BLOOD AND DERIVATES</td>
<td>2.31% 4,435,621</td>
<td>2.18% 4,435,621</td>
<td>2.05% 4,178,590</td>
</tr>
<tr>
<td>Tertiary level health care</td>
<td>12.43% 23,874,943</td>
<td>11.71% 23,874,943</td>
<td>11.04% 22,491,459</td>
</tr>
<tr>
<td>HOSPITAL TREATMENT</td>
<td>10.32% 19,816,202</td>
<td>9.72% 19,816,202</td>
<td>9.16% 18,667,911</td>
</tr>
<tr>
<td>KSZZ</td>
<td>1.24% 2,387,494</td>
<td>1.17% 2,387,494</td>
<td>1.10% 2,249,146</td>
</tr>
<tr>
<td>ANES.BLOOD AND DERIVATES</td>
<td>0.87% 1,671,246</td>
<td>0.82% 1,671,246</td>
<td>0.77% 1,574,402</td>
</tr>
<tr>
<td>Orthopedic appliances</td>
<td>2.66% 5,107,200</td>
<td>2.51% 5,107,200</td>
<td>2.36% 4,811,253</td>
</tr>
<tr>
<td>Medications</td>
<td>11.10% 21,312,000</td>
<td>10.46% 21,312,000</td>
<td>9.85% 20,077,031</td>
</tr>
<tr>
<td>SICK LEAVE</td>
<td>1.01% 1,939,200</td>
<td>0.95% 1,939,200</td>
<td>0.90% 1,826,829</td>
</tr>
<tr>
<td>IMPROVEMENT OF FUND’S WORK</td>
<td>2.00% 3,840,000</td>
<td>1.88% 3,840,000</td>
<td>1.77% 3,617,483</td>
</tr>
<tr>
<td>RESERVES</td>
<td>2.50% 4,800,000</td>
<td>2.36% 4,800,000</td>
<td>2.22% 4,521,854</td>
</tr>
</tbody>
</table>

* the amount required for complete implementation of the Program included
APPENDIX 8  CITIZENS’ FAMILIARITY WITH “DISEASE PREVENTION” TERM BY DIFFERENT CRITERIA

Are you familiar with the term "disease prevention"?

Registered

Non-registered

Male

Female

Urban

Rural

Refuse to answer
Don’t know
No
Yes
Years of formal education finished:
1. 8 years
2. 11 years
3. 12 years
4. Over 14 years
9. Salary in public service
10. Salary in private company
11. Self-employment (own business)
12. Agriculture
13. Pension
14. Social welfare support
15. No monetary income
16. I do not want to answer
Are you familiar with term "disease prevention"?

Refuse to answer
Don't know
No
Yes

Banja Luka
Prijedor
Doboj
Bijeljina
Pale
Zvornik
Visegrad
Trebinje

- 21% Refuse to answer
- 22% Don't know
- 10% No
- 67% Yes
APPENDIX 9  CITIZENS’ FAMILIARITY WITH PROGRAM IN RS BY DIFFERENT CRITERIA

Do you know that there is the Program of prevention and control of NCDs...?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.3</td>
<td>71.7</td>
</tr>
</tbody>
</table>

0% 20% 40% 60% 80%

---

Do you know that there is the Program of prevention and control of NCDs...?

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>70</td>
</tr>
</tbody>
</table>

- Male: 27 Yes, 46 No
- Female: 30 Yes, 40 No

0% 20% 40% 60% 80% 100%

---

Do you know that there is the Program of prevention and control of NCDs...?

<table>
<thead>
<tr>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>73</td>
</tr>
</tbody>
</table>

- Urban: 30 Yes, 40 No
- Rural: 27 Yes, 44 No

0% 20% 40% 60% 80% 100%
Do you know that there is the Program of prevention and control of NCDs...

Yes

No

Years of formal education finished:

5. 8 years
6. 11 years
7. 12 years
8. Over 14 years
Do you know that there is the Program of prevention and control of NCDs...?

- **Up to 150 KM**: 83% No, 17% Yes
- **150 - 499 KM**: 70% No, 30% Yes
- **500 - 999 KM**: 69% No, 31% Yes
- **Over 1000 KM**: 60% No, 40% Yes
- **Don’t know to answer**: 93% No, 7% Yes

1. Salary in public service
2. Salary in private company
3. Self-employment (own business)
4. Agriculture
5. Pension
6. Social welfare support
7. No monetary income
8. I do not want to answer
Do you know that there is the Program of prevention and control of NCDs...?

- Banja Luka: 67% No, 33% Yes
- Prijedor: 56% No, 44% Yes
- Doboj: 82% No, 18% Yes
- Bijeljina: 87% No, 13% Yes
- Pale: 70% No, 30% Yes
- Zvornik: 62% No, 38% Yes
- Visegrad: 84% No, 16% Yes
- Trebinje: 82% No, 18% Yes
APPENDIX 10  CITIZENS’ PREFERENTIONS TOWARD DIFFERENT MEDIA  
BY THEIR AGE GROUPS

![TV Preference Chart]

![Radio Preference Chart]

![Newspaper Preference Chart]
APPENDIX 11

ALLOCATION OF THE SOURCES COLLECTED BY THE FUND BASED ON THE DECISION ON CRITERIA
APPENDIX 12

ALLOCATION OF THE SOURCES COLLECTED BY THE FUND BASED ON THE DECISION ON CRITERIA – ADDITIONAL SOURCES
## APPENDIX 13

**REVIEW OF THE SCOPE OF SERVICES AND FINANCIAL RESOURCES REQUIRED FOR THE IMPLEMENTATION OF THE PROGRAM FOR PERIOD 2005-2010 YEAR**

### VARIANT II

<table>
<thead>
<tr>
<th>Activities</th>
<th>Checkup</th>
<th>Target population</th>
<th>Prices</th>
<th>2005 Number of services</th>
<th>2005 Amount in KM</th>
<th>2006 Number of services</th>
<th>2006 Amount in KM</th>
<th>2007 Number of services</th>
<th>2007 Amount in KM</th>
<th>2008 Number of services</th>
<th>2008 Amount in KM</th>
<th>2009 Number of services</th>
<th>2009 Amount in KM</th>
<th>2010 Number of services</th>
<th>2010 Amount in KM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention and reduction of blood pressure</td>
<td>Blood pressure measurement</td>
<td>18-64 years old</td>
<td>3</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
</tr>
<tr>
<td>Prevention and reduction of high blood sugar</td>
<td>Lab analysis of blood sugar level</td>
<td>BMI &gt; 30 and elevated blood pressure</td>
<td>2.3</td>
<td>267,218</td>
<td>614,601</td>
<td>267,218</td>
<td>614,601</td>
<td>267,218</td>
<td>614,601</td>
<td>267,218</td>
<td>614,601</td>
<td>267,218</td>
<td>614,601</td>
<td>267,218</td>
<td>614,601</td>
</tr>
<tr>
<td>Prevention and reduction of total blood cholesterol</td>
<td>Lab analysis of total blood cholesterol</td>
<td>BMI &gt; 30 and elevated blood pressure</td>
<td>3.8</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
</tr>
<tr>
<td>Fight against smoking/tobacco addiction</td>
<td>Interview</td>
<td>Persons smoke every day</td>
<td>6</td>
<td>420,000</td>
<td>2,520,000</td>
<td>378,000</td>
<td>2,268,000</td>
<td>336,000</td>
<td>2,016,000</td>
<td>294,000</td>
<td>1,764,000</td>
<td>252,000</td>
<td>1,512,000</td>
<td>210,000</td>
<td>1,260,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6,388,928</td>
<td></td>
<td>6,136,928</td>
<td></td>
<td>5,884,928</td>
<td></td>
<td>5,632,928</td>
<td></td>
<td>5,380,928</td>
<td></td>
<td>5,128,928</td>
</tr>
</tbody>
</table>
## APPENDIX 14

### REVIEW OF THE SCOPE OF SERVICES AND FINANCIAL RESOURCES REQUIRED FOR THE IMPLEMENTATION OF THE PROGRAM FOR PERIOD 2005-2010

### VARIANT III

<table>
<thead>
<tr>
<th>Activities</th>
<th>Checkup</th>
<th>Target population</th>
<th>Prices</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention and reduction of blood pressure</td>
<td>Blood pressure measurement</td>
<td>18-64 years old</td>
<td>3</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
<td>394,002</td>
<td>1,182,006</td>
</tr>
<tr>
<td>Prevention and reduction of high blood sugar</td>
<td>Lab analysis of blood sugar level</td>
<td>BMI &gt; 30 and elevated blood pressure</td>
<td>2.3</td>
<td>267,218</td>
<td>614,601</td>
<td>267,218</td>
<td>614,601</td>
<td>267,218</td>
<td>614,601</td>
</tr>
<tr>
<td>Prevention and reduction of total blood cholesterol</td>
<td>Lab analysis of total blood cholesterol</td>
<td>BMI &gt; 30 and elevated blood pressure</td>
<td>3.8</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
<td>267,218</td>
<td>1,015,428</td>
</tr>
<tr>
<td>Prevention and reduction of obesity</td>
<td>Body index mass measurement</td>
<td>18-64 years old</td>
<td>4</td>
<td>138,619</td>
<td>554,476</td>
<td>138,619</td>
<td>554,476</td>
<td>138,619</td>
<td>554,476</td>
</tr>
<tr>
<td>Fight against smoking/tobacco addiction</td>
<td>Interview</td>
<td>Persons smoke every day</td>
<td>6</td>
<td>420,000</td>
<td>2,520,000</td>
<td>378,000</td>
<td>2,268,000</td>
<td>336,000</td>
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</tr>
<tr>
<td>Early detection of cervical cancer</td>
<td>Pap test</td>
<td>Woman ages 25-40</td>
<td>6</td>
<td>105,354</td>
<td>632,126</td>
<td>105,354</td>
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<td>632,126</td>
</tr>
<tr>
<td>Early detection of breast cancer</td>
<td>Breast palpation</td>
<td>woman &gt; 40 years</td>
<td>6</td>
<td>305,929</td>
<td>1,835,574</td>
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<tr>
<td></td>
<td>Mammmography</td>
<td>woman &gt; 50-70 years</td>
<td>38</td>
<td>76,659</td>
<td>2,913,023</td>
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<tr>
<td>Early detection of colorectal cancer</td>
<td>Fecal occult blood test</td>
<td>All ages &gt; 50 years</td>
<td>6</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td>13,084,446</td>
<td>12,832,446</td>
<td>12,580,446</td>
<td>12,328,446</td>
<td>12,076,446</td>
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