

OPTIONS FOR DATA COLLECTION FROM THE MAIN STAKEHOLDERS INVOLVED IN THE PUBLIC HEALTH SYSTEM REFORM²⁸⁵

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The Romanian health care system is undergoing a continuous reform process with the aim to improve its efficiency and, consequently, the quality of the services provided to the citizens.

The paper presents the major steps in data collection and statistical analysis of the Romanian public health system's reform process using the procedure of statistical sampling. The analysis is conducted on three major stakeholders: family doctors, medical personnel from hospitals and clinics and personalities from the medical world.

In order to analyze all these aspects a structured survey plan has to be developed resulting in a questionnaire of 407 persons that was established to be representative for Bucharest municipality. In order to take into account all the stakeholders the conventional sampling methods have to be combined with the network sampling.

Key words: Public Health System, Statistical Survey, Sampling Procedures, Questionnaire

Introduction

The public health system's reform was and still is on the policy agenda of the Romanian government. In analyzing the implementation of the reforms in this sector three major stakeholders in the health area were identified. These stakeholders will contribute to an efficient implementation of the reform measures developed by the Ministry of Public Health (MPH). Meanwhile, the persons included in these groups could present various critical appreciations regarding the quality of the measures promoted by the Ministry of Public Health.

The three major stakeholders are represented by the following professional categories:

- Family doctors
- Medical personnel from hospitals and clinics
- Personalities from the medical world

The gathering of statistical data requires specialized statistical tools, used by the theory of statistical sampling. To define these instruments, the following steps have to be considered:

- a) Based on the number of all the three stakeholder groups defined earlier, the study proposes an analysis based on a statistical survey
- b) Statistical questionnaires were developed and applied to the personnel working in the health system. The questionnaires were completed taking into account the major **priority areas included in the strategy of public health system reform** in Romania. The questions were addressing issues regarding general aspects regarding the reform process in the public health system, the policy of the MPH, the medical education of the population, the analysis of the improper behavior of some of the personnel from the public health institutions, the research capacity and the current activities characteristics of the public health institutions.

- c) The questionnaires included as well some questions related to demographic and economic aspects of the respondents, that will be further used in developing econometric models
- d) The sample contains an explicit subset of personalities from the medical world, given the fact that their influence may have a strong impact on the reform process in the sector.
- e) The collected data was stored in a SPSS data base according to the questionnaire structure defined earlier.

2. The research methodology

The statistical survey techniques applied in this research considered several steps, such as data collection, tabulation and the estimation of the parameters of the statistical population for several variables defined in this research.

Step 1 Establishing the research objectives

In the first step the research objectives are defined as well the variables for which the statistical parameters are estimated. Obviously, the statistical population has to be clearly identified and estimations on the costs of the research and the required personnel are made, the data bases that could be used in generating the sample are identified.

Starting from the general objective of the analysis, namely the evaluation of the impact of the reform measures applied in the public health system in Romania, within the context of adapting this system to the population's as well the European Union's requirements, the major research areas were identified as follows:

- General aspects of the public health system reform process
- The public policy framework defined by the MPH
- The general public's education related to health aspects
- The analysis of the improper behavior of some of the personnel from the public health institutions,
- The research capacity of the public health system
- The current activities' characteristics of the public health institutions.

Step II: Designing the sample

The choice of the sampling technique is essential in estimating the statistical parameters. To obtain the best results using the statistical sampling method all the sampling techniques should be specified, taking into account the available information on the statistical population under research.

For the simple sampling method, the sample size is projected for a given accepted risk and a confidence in the result. The sample size can be calculated based on the following formula:

$$n = \frac{N \cdot (c \cdot t_{\alpha})^2}{N \cdot e_r + (c \cdot t_{\alpha})^2}$$

where

- a) $N = 47388$ represents the number of medical doctors in Romania (population size);
- b) c is the coefficient of variation calculated for the distribution of medical doctors according to their age;
- c) e_r is the relative error or the accuracy in estimating the parameter
- d) t_{α} the value of the quartile of t-Student statistic for a probability α .

The coefficient of variation was calculated based on the distribution of medical doctors according to their age. The data is presented in the following table:

Table 1 The distribution of medical doctors according to their age groups and gender

Age groups (years)	Total	Females	Males
Under 25	450	313	137
25 – 34	12909	9522	3387
35 – 44	11934	8712	3222
45 – 54	15171	10480	4691
55 – 64	5537	3070	2467
65 and more	1387	446	941
Total	47388	32543	14845

Based on the statistical data presented in Table 1, the following descriptive statistics indicators were calculated: i) The average age 43.43 years; ii) the variance 118.62; iii) the coefficient of variation 25.1%. The sample size calculation was made for several significance levels (and, hence, confidence levels) of 1%, 2%, 3%, 4%, and 5%. The resulted sample sizes are presented in the following table:

Table 2: Establishing the sample size

α (%)	Assumed risk (%)				
	1	2	3	4	5
5	2298	596	267	150	96
4	2512	654	293	165	106
3	2787	729	327	184	118
2	3175	836	375	212	136
1	3835	1021	459	259	166

For a sample size of 596 persons at national level, it will have the following distribution: 144 family doctors and 452 medical doctors from hospitals and clinics.

In order to include in the sample the personalities from the medical world it is recommended to use the technique of **network sampling**. After applying this method of data collection it is recommended for this study to complete a number of 100 questionnaires²⁸⁶.

For this study the network sampling techniques was used to interview the personalities in the medical field, opinion setters as well the main decision makers in the public health system. Initially a list of 50 persons was established but it was revised to 100 persons based on the recommendations of the interview subjects.

The sampling plan had two steps. The first step included the medical units from Bucharest (hospitals, clinics, health centers). The second step was represented by the selection of medical doctors for each primary sampling unit. For Bucharest municipality the statistically representative sample size was established at 407 persons and it was chosen a 95% confidence in the result and a representativity error of $\pm 5\%$.

The structure of the samples the following: 75 family doctors, 279 medical doctors from hospitals and 53 medical doctors from clinics and health centers

The data was gathered within three weeks (in July 2007). This way the comparability of the answers was insured given the fact that no major decisions were made at the time by the Romanian government.

Step III: The construction of the statistical questionnaire

The questionnaire represents the key element in the statistical observation process that allows collecting the required information.

The quality of the questionnaire is directly linked to the quality of the gathered data and is influencing the observation errors. The questionnaire was based mainly on closed questions, with predefined answers. For each question measurement scales were defined, respecting the following aspects:

- A bi-univoque relationship between the questionnaire and the research questions
- A natural order of the sections (with the identification and demographic questions at the end of the questionnaire).
- A reasonable number of questions for each area from the research plan. This approach allows obtaining descriptive statistics in the analysis step as well the estimation of the parameters of the econometric models.
- Balanced scales defined for each question.
- For each measurement scale there are at most seven options.
- A constant direction of the Likert scale was maintained during the application of the questionnaire.
- An additional option “I don’t know” was introduced for several questions in order to avoid biased answers to the questions.
- The language used in the questionnaire was adapted to the subjects’ specificity.
- Only one open question was inserted in the questionnaire.
- The questions for different concepts were used in separate sections.
- The respondents were assured about respecting the main requirements of a correct sampling procedure: the confidentiality, the average time they need to complete the questionnaire, the contact data of the researchers (if they would like to follow up on the results of the study) and information on the use and dissemination of the results.

The structure of the questionnaire, according to the type of questions and number of variables for each research area, is summarized in Table 3.

Table 3. The structure of the questionnaire, by area of research

Nr. Crt.	Area of research	Number of closed questions	Number of open questions	Number of variables
1.	General aspects of the public health system reform process	5	-	41
2.	The public policy framework defined by the MPH	5	-	18
3.	The general public’s education related to health aspects	7	-	18
4.	The analysis of the improper behavior of some of the personnel from the public health institutions	7		24
5.	The research capacity of the public health system	5	1	24
6.	Current activities’ characteristics of the public health institutions	2	-	6
7.	Personal identification data	12		32
8.	General data	6	2	14

Step IV: Statistical data collection

The data collection can be conducted using several techniques: from direct interviews, telephone interviews to collection of data using the email. This is an essential step in the research process, given that the quality of the estimations depends on the quality of the data collected in the process of statistical observation of the sample units.

This study used the procedure of filling out a questionnaire on paper support using the direct approach of the subjects included in the sample.

Step V: The primary data tabulation

The data series from the questionnaire was introduced and analyzed using the SPSS program. Each question was labeled and introduced in the data base. To identify and correct some possible errors the variables from the data base was analyzed using primary descriptive statistics measures.

Step VI: Data series analysis

Taking into account the literature on the subject and the structure of the questionnaire, several econometric models will be developed in order to analyze the impact of the reform measures in the public health system on the quality of the services provided to the citizens by the public health care institutions. These models will be developed using SPSS and EViews programs.

Conclusions

The paper presents the major steps and issues regarding the data collection process and data analysis from a survey regarding a study on the impact of the measures in health system on the quality of the services provided to the public.

To define the questions in a questionnaire that has the goal to identify the impact of the reforms in the public health care system, three major aspects have to be considered: the reform measures undertaken by the Ministry of Public Health, the models applied in the European Union for analyzing the performance of the public health system and the stakeholders that will contribute to an efficient implementation of the reform measures

For analysing all these aspects a questionnaire of 407 persons was establish to be representative for Bucharest municipality, and, in order to take into account all the stakeholders the conventional sampling methods have to be combined with the network sampling.

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