

## **PILOT CROSS-SECTIONAL TELEPHONE SURVEY TEST MAINLY BASED ON THE U.S. BRFSS'S PROTOCOL CONDUCTED IN THE REPUBLIC OF MOLDOVA: CHALLENGES OF THE SURVEILLANCE QUALITY**

**ABABII ION<sup>1</sup>, ELEONORA VATAMAN<sup>2</sup>, ELENA RAEVSCHI<sup>3</sup> & LINDA PAUTZ<sup>4</sup>**

<sup>1,3</sup>Nicolae Testemitanu State University of Medicine and Pharmacy, Republic of Moldova

<sup>2</sup>Institute of Cardiology, Republic of Moldova

<sup>4</sup>School of Health Professions / Eastern Virginia Medical School, U.S.A

### **ABSTRACT**

The Republic of Moldova is a country with the health system in transition having a rate of 85% among all registered deaths in the country caused by non-communicable diseases. In this context it is important to note that a behavioral risk factors surveillance system (BRFSS) is not a current part of the information system in the Republic of Moldova. The goal of the study was to find out the challenges of quality performance of behavioral risk factors by telephone survey in the Republic of Moldova in order to contribute to the formation and implementation of a new and ongoing surveillance system based on the U.S. BRFSS standards.

The research is a pilot, cross-sectional behavioral risk factor telephone survey test conducted in Chisinau, Republic of Moldova. The methodology is mainly based on the U.S. Behavioral Risk Factor Surveillance System (BRFSS) protocol. There was applied systematic random sampling (similar to Random digit dialing). The study population considered were adults aged 18-69 years (n =800). As a tool of data collection, there was a questionnaire adapted to the component of behavioral risk factors assessment using a standardized BRFSS questionnaire for interviewing on the phone. The measures of Surveillance Quality Assessment were calculated according to the Summary Data Quality Report of BRFSS (CDC, U.S.A.): rates of resolution, completion, cooperation, refusal and response were based on categorized groups.

The results of the study established a Low Resolution Rate (37.5%) caused by a high level of collected calling data that were unknown or eligible. Consequently, the high level of unresolved cases led to a Low Response Rate (35.6%). Moldova does not want to make costly mistakes but, instead, wants to learn from the implemented system designs of other countries. Therefore, the initiation of a Delphi study will be helpful to gather international expert opinion on different policy issues concerning the management of a behavioral risk factors surveillance system. The consensus opinion of experts will provide a credible model for a new implementation system in the Republic of Moldova.

**KEYWORDS:** Non-Communicable Diseases, Behavioral Risk Factors, Surveillance System Quality

### **INTRODUCTION**

Non-communicable diseases are the leading cause of global mortality; thereby, representing more deaths than all other causes combined. In 2014 cardiovascular diseases, cancers, diabetes and respiratory chronic diseases were responsible for over 82% of global deaths (WHO, 2014). However, existing evidence demonstrates that the prevalence of

non-communicable diseases can be reduced considerable by controlling the four main behavioral risk factors: smoking, physical inactivity, alcohol abuse and unhealthy diet.

Tobacco use and smoking are responsible for more than six million deaths annually (WHO, 2012). Alcohol abuse is the main risk factor among men aged 15-59 years.

The Republic of Moldova is a country with the health system in transition with a population of 3.4 million. Non-communicable diseases are responsible for over 85% of all registered deaths in the country (WHO, 2014).

According to the national statistics in 2015 the following diseases were the main causes of deaths in the Republic of Moldova (National Center of Health Management, 2015):

- Cardiovascular diseases (648.2 per 100,000 population)
- Cancers (172.2 per 100,000 population)
- Digestive disease (106.0 per 100,000 population)
- Injuries (77.2 per 100,000 population)
- Respiratory Chronic diseases (51.6 per 100,000 population)

Cardiovascular diseases are the main cause of mortality in the Republic of Moldova.

A Behavioral Risk Factors Surveillance system is not a part of the current information system in the Republic of Moldova. The data about risk factors' prevalence were provided by the following study performed in the Republic of Moldova:

Moldova Demographic and Health Survey (DHS), 2005: BMI, tobacco use and alcohol consumption (National Scientific and Applied Center of Preventive Medicine (Moldova) and ORC Macro (2006).

Survey on health status of the population in the Republic of Moldova, 2005: BMI, food consumption patterns, tobacco use and alcohol consumption (National Bureau of Statistics of the Republic of Moldova, 2006).

In 2004 and 2008 there were international surveys regarding tobacco consumption in Moldova (CDC, 2004, 2008).

According to the data of DHS, the rate of daily smoking was 28%. Low consumption of vegetables was responsible for 6.6% DALY's in women and 5.1% DALY's in men in 2002 (WHO, 2014).

According to the STEPS 2013 survey on the prevalence of non-communicable diseases risk factors, one quarter of the Moldovan adult population aged 18-69 years were found to be current daily smokers; 62% were current alcohol drinkers; 66.6% consumed fewer than five servings of fruit and vegetables per day; 10% were physically inactive; 56% were overweight, and 40% had hypertension (WHO, 2014).

As was mentioned in previous research results, the current health care system in the Republic of Moldova is not adequately focused on control and prevention of behavioral risk factors. There are no ongoing surveillance systems of behavioral risk at the regional or national level in the Republic of Moldova (Pautz L., Raevschi E., Patel A., Ciubotaru E., 2016). In a SWOT analyses it was stressed that Moldova's behavioral risk factor' ongoing surveillance system would incorporate the best practices of the US system along with looking at the CDC's design of similar systems for Italy and

Canada. Moldova does not want to make costly mistakes but, instead, wants to learn from the system designs of other countries.

The Aim of the study was to find out what the challenges of creating a quality behavioral risk factor program would be based on telephone surveys in the Republic of Moldova.

## Methods

The research is a pilot, cross-sectional behavioral risk factor telephone survey test conducted in Chisinau (Republic of Moldova) during the period of time February – July 2016. The methodology is mainly based on the U.S. Behavioral Risk Factor Surveillance System (BRFSS) protocol in order to find an adapted methodological model of behavioral risk factor surveillance development for BRFSS implementation in the Republic of Moldova. The city of Chisinau was selected as a place for the survey due to a high level of the telephone communications. The size of the sample was defined according to the following equation( Naing L., WinnT., Rusli B.N., 2006) (1):

$$n = \frac{z^2 p(1-p)}{d^2} \quad (1)$$

where:

n – sample size,

z – statistic for a level of confidence: z = 1.96 with 95% confidence interval (CI),

p – expected prevalence: if unknown p = 0.5

d – precision: in proportion of one, if 5%, d = 0.05

$$n = \frac{1.96^2 \times 0.5(1 - 0.5)}{0.05^2} = 384$$

This was performed adjusting for sample size according to the design effect for a prevalence study and an estimated rate of non-response as follows:

$$n_{\text{adjusted}} = n \times \text{deff} \times q$$

Where:

deff – design effect standard value for prevalence study = 1.5

q – adjustment factor = 1/1-f,

f - estimated rate of non-response = 0.2

$$n_{\text{adjusted}} = 384 \times 1.5 \times 1.25 = 720$$

There was an applied systematic random sampling (similar to Random digit dialing) using the total official list of telephone numbers in the city in 2016: office numbers were excluded from the sampling frame. The study population was considered adults aged 18-69 years from the city, Chisinau, in the Republic of Moldova. The interviews were conducted with one person at each household. The first person at the age 18-69 who answered or could be reached by phone was considered an eligible person for survey participation.

As a tool of data collection there was a questionnaire adapted to the behavioral risk factors assessment using a standardized BRFSS questionnaire for interviewing on the phone. Questions were structured in these areas: health status, smoking, healthy diet, alcohol consumption, physical activity, and the presence of cardiovascular disease.

In order to ensure the quality of the data, there was:

- Training of interviewers,
- Control of interviewing.

The measures of the Surveillance Quality Assessment were calculated according to The Summary Data Quality Report of BRFSS (CDC, U.S.A.) using standards set by the American Association of Public Opinion Research (BRFSS, 2014) (Table 1).

**Table 1: Categories of Landline Disposition Codes**

Category	Disposition Code Definitions	Formulae Abbreviation
Completed Interview	1100+1200	COIN
Eligible	1100+1200+2111+2112+2120++2210+2220+2320+2330	ELIG
Contacted Eligible	1100+1200+2111+2112+2120++2210+2320+2330	CONELIG
Terminations and Refusals	2111+2112+2120	TERE
Ineligible Phone Nr.	All 4000 level dispositions codes	INELIG
Unknown Whether Eligible	All 3000 level dispositions codes	UNKELIG
Eligibility factor	ELIG/(ELIG+ INELIG)	E

**Source:** BRFSS 2014 Summary Data Quality Report (7/29/2015). Available at:

[https://www.cdc.gov/brfss/annual\\_data/2014/pdf/2014\\_dqr.pdf](https://www.cdc.gov/brfss/annual_data/2014/pdf/2014_dqr.pdf)

The calculations of calling-outcome quality indicators are: rates of resolution, completion, cooperation, refusal and response are based on categorized groups illustrated in Table 1 using final disposition codes assigned to the case at the end of the telephone survey.

The formulas used for calculation of calling-outcome quality indicators were as follows:

Resolution Rate = ((ELIG + INELIG) / (ELIG+INELIG+UNKELIG))*100	(2)
Interview Completion Rate = (COIN / (COIN + TERE)) * 100	(3)
Cooperation Rate = (COIN / CONELIG) *100	(4)
Refusal Rate = (TERE / (ELIG + (E * UNKELIG))) * 100	(5)
Response Rate = (COIN / ((ELIG + (E * UNKELIG))) * 100	(6)

In order to provide the confidentiality of the study, the Informed consent was collected by telephone interview separately before the administration of the questionnaire. The collected data was entered into password secured electronic databases with access only for members of the group carrying out the research. The analysis of the survey results was performed without disclosing information that could allow direct or indirect identification of research participants.

## RESULTS AND DISCUSSIONS

Listed below are the calling-outcome quality rates for the landline telephone survey based on BRFSS standards conducted in the Republic of Moldova (Chisinau city) in February – July 2016 is shown in table 2.

**Table 2: Calling-Outcome Quality Rates for Landline Telephone Survey Based on BRFSS Standards Conducted in the Republic of Moldova, 2016**

	Calling-Outcome Quality Rates	%
1.	Resolution Rate	37.5
2.	Interview Completion Rate	95.1
3.	Cooperation Rate	95.1
4.	Refusal Rate	1.8
5.	Response Rate	35.6

**Resolution Rate** was calculated according to formula (2) representing the proportion of calling numbers in the total sample for which eligibility has been established. The total phone numbers of eligible (ELIG) and ineligible (INELIG) categories were divided by total numbers of the selected sample: ELIG+INELIG+UNKELIG. The resolution rate, according to the study results, was 37.5% being determined by a large number of unknown calls whether or not they were eligible (UNKELIG) which represents 62.5% of the total sample.

**Interview Completion Rate** is the proportion of complete provided interviews among all cases of the sample for which eligibility was determined. Following the formula (3), the number of completed (inclusively partially) interviews (COIN) was divided by the sum of the total number of completed (inclusively partially) interviews (COIN), and all refusals and terminations (TERE). The interview completion rate was found to be 95.1 % which means that refusals and termination cases (TERE) were rare enough, representing 1.6% of the total sample. This represents an impressive willingness of the population to participate.

**Cooperation Rate** is defined according to the formula (4) as the proportion of completed (inclusively partially) interviews (COIN) by the number of contacted and eligible respondents (CONELIG). Non-contacts were excluded from the calculation. The cooperation rate was found to be 95.1% being close to the Interview completion rate. The survey did not register the cases eligible, non-interview (2000 level codes): household answering device (code 2220), selected respondents physically or mentally unable to complete the interview (code 2320), and language barriers of the selected respondents (code 2330) which may explain the similarity of results for Interview completion rate and Cooperation rate. Both rates provide evidence for a high level of willingness of the population to participate in the Landline Telephone survey.

**Refusal Rate** was calculated using the formula (5) which represents the proportion of all eligible cases that refused to participate or terminated the interview within the questionnaire. This is the sum of the total number for which eligibility has been established (ELIG) and the estimated number of eligibility ( $E * UNKELIG$ ) assuming that the cases attributed to the category Unknown Whether Eligible contains the same percentage of eligibility.

Where:

$E$  (Eligibility factor) =  $ELIG / (ELIG + UNKELIG)$

UNKELIG – cases of category Unknown Whether Eligible

As shown in table 2 the survey results demonstrated a Refusal Rate of 1.8 %.

**Response Rate** is calling-outcome quality rate which represents (formula 6) which is the number of completed (inclusively partially) interviews (COIN) and an estimated eligibility ( $E * UNKELIG$ ). The high level of unresolved numbers (62.5%) determined the Response Rate of 36.6%. According to the study results, unresolved numbers were composed of two categories: no answer calls (code 3130) and telecommunication barrier (code 3150). Following the BRFSS protocol procedures, no answer calls were considered for the sampled people who have a telephone number available, but who could not be contacted despite repeated attempts up to 15 (BRFSS, 2014).

The Response Rate of 36.6% obtained in Moldova's pilot test for the new implementation of BRFSS as shown in table 3 is less than the majority of countries where BRFSS based on CDC's standards were implemented; however, having a level higher than some US states (min 26.7% - max 61.6 %)(Table 3).

**Table 3: Response Rates for Landline Telephone Surveys using as a base BRFSS Methodology**

Indicator	Implemented Surveillance Systems			New Implementation
	US* by State	Italy	Canada	MOLDOVA's pilot test (using U.S. model)
Landline Response Rates, %				
	Min 26.7	-	-	-
	Max 61.6	-	-	-
	Median 48.7	-	-	-
<b>Mean</b>	<b>47.1</b>	<b>97.1</b>	<b>69</b>	<b>35.6</b>

\*BRFSS 2014 Summary Data Quality Report (7/29/2015). Available at:

[https://www.cdc.gov/brfss/annual\\_data/2014/pdf/2014\\_dqr.pdf](https://www.cdc.gov/brfss/annual_data/2014/pdf/2014_dqr.pdf)

The high Response Rate of 97.1% of Italian Behavioral Risk Factors Surveillance System PASSI is determined by using the sample selected from lists of Local Health Units (LHU) which have access to all residents' demographic data and telephone numbers (EpiCentro PASSI, 2013). PASSI achieves a wider coverage than other implemented surveys (e.g., Random digit dialing). According to the PASSI coordinating group: "Direct involvement of LHU personnel in managing the system provided them with the opportunity and motivation to identify and monitor the needs of their populations and their perceptions of the preventive interventions offered" (Baldissera S, Campostrini S, Binkin N, Minardi V, Minelli G, Ferrante G, et al., 2011). In addition, the experience of the PASSI risk factor surveillance system proves that applying surveillance during the first line of contact with the population through local health units, who are able to monitor information about patients more accurately than any others, provides the opportunity to improve the willingness of people to participate and decrease unresolved numbers especially due to population migration. In order, to obtain the necessary numbers of interviews sampled, people who were not reached by the survey must be substituted following the same procedures (BRFSS, 2014; EpiCentro PASSI, 2013).

In this way continued good practices of the developed behavioral risk factor surveillance systems becomes very useful in order to manage challenges of the risk factor surveillance quality established by study, as well as, to provide an evidence-based credible model of new implementation in the Republic of Moldova. According to Dalkey & Helmer, 1963, Reid et al., 1990, and Hsu, C., & Sandford, B. 2007, the Delphi method is an effective and reliable data collection method that allows jointly, but anonymously, to reach consensus of a group of experts in the field analyzing issues using many rounds of on-line surveys.

The initiation of the Delphi study in the Republic of Moldova could be helpful in gathering expert opinion on different policy issues concerning the management of a risk factor surveillance system. These expert opinions and arguments will, along with the provided pilot cross-sectional telephone survey test in the Republic of Moldova, and research findings of other work sets of the Control and Prevention of Non-communicable diseases, be part of the foundation for the development of a Behavioral Risk Factors Surveillance System (BRFSS) in the Republic of Moldova.

## CONCLUSIONS/RECOMMENDATIONS

- The pilot, cross-sectional telephone survey tests mainly based on the U.S. BRFSS's protocol conducted in the Republic of Moldova has established the following challenges of the surveillance quality:
- Low Resolution Rate was caused by a high number of calls unknown to be eligible;
- The high level of unresolved cases led to a Low Response Rate;
- Unresolved numbers were attributed to categories: no answer calls and telecommunication barriers.
- It is important to apply good practices of surveillance first-line contact with the population through local health units having access to all residents' demographic data. This provides the opportunity to improve the willingness of people to participate, and it decreases unresolved numbers inclusively due to population migration.
- Issues in interview performance, defined by the pilot telephone survey test, must be taken into account in considering anew implementation of an ongoing behavioral risk factor surveillance system in the Republic of Moldova.
- The initiation of the Delphi Study Development of Behavioral Risk Factor Surveillance System in the Republic of Moldova will contribute to providing an evidence-based credible model for new implementation.

## REFERENCES

1. Baldissera S, Campostrini S, Binkin N, Minardi V, Minelli G, Ferrante G, et al.(2011).Features and initial assessment of the Italian Behavioral Risk Factor Surveillance System (PASSI), 2007-2008. *Prev. Chronic Dis.* 8(1):A24. Retrieved from: [http://www.cdc.gov/pcd/issues/2011/jan/10\\_0030.htm](http://www.cdc.gov/pcd/issues/2011/jan/10_0030.htm).
2. BRFSS (2014). Summary Data Quality Report (7/29/2015). Centers for Disease Control and Prevention. Retrieved from: [https://www.cdc.gov/brfss/annual\\_data/2014/pdf/2014\\_dqr.pdf](https://www.cdc.gov/brfss/annual_data/2014/pdf/2014_dqr.pdf)
3. CDC (2004). Moldova (ages 13-15). Global Youth Tobacco Survey (GYTS). Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from: <http://ghdx.healthdata.org/record/moldova-global-youth-tobacco-survey-2004>.
4. CDC (2008). Moldova (ages 13-15). Global Youth Tobacco Survey (GYTS). Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from: <http://ghdx.healthdata.org/record/moldova-global-youth-tobacco-survey-2008>.
5. Dalkey D., Helmer O. (1963). An experimental application of the Delphi method to use of experts. *Management Science* 9, 93-90.

6. Danniel V.V. (1999). *Biostatistics: A Foundation for Analyses in the Health Sciences*. 7<sup>th</sup> edition. New York: John Wiley & Sons.
7. EpiCentro PASSI (2013). Retrieved from: [http://www.epicentro.iss.it/passi/en/surveillance\\_system.asp](http://www.epicentro.iss.it/passi/en/surveillance_system.asp). Accessed August 24, 2015
8. Hsu, C., & Sandford, B. (2007). The Delphi Technique: Making Sense Of Consensus. *Practical Assessment, Research & Evaluation*, Volume 12, Nr.10, 1-8.
9. Naing L., WinnT., Rusli B.N. (2006). Practical issues in calculating the sample size for prevalence studies. *Archives of Orofacial Sciences*, 1:9-14.
10. National Bureau of Statistics of the Republic of Moldova (2006). Results of Survey on health status of population in the Republic of Moldova. Retrieved from: <http://www.statistica.md/>.
11. National Center of Health Management (2015). Annual public health statistical book of the Republic of Moldova, 2015. Chisinau. Retrieved from: <http://cnms.md/ro/rapoarte>.
12. National Scientific and Applied Center for Preventive Medicine (NCPM) [Moldova] and ORC Macro (2006). *Moldova Demographic and Health Survey 2005*. Calverton, Maryland: National Scientific and Applied Center for Preventive Medicine of the Ministry of Health and Social Protection and ORC Macro. Retrieved from: [http://www.unecce.org/fileadmin/DAM/stats/gender/vaw/surveys/Moldova/DHS\\_Moldova.pdf](http://www.unecce.org/fileadmin/DAM/stats/gender/vaw/surveys/Moldova/DHS_Moldova.pdf).
13. Pautz L., Raevschi E., Patel A., Ciubotaru E. (2016). Development of Behavioral Risk Factor Surveillance System Management in the Republic of Moldova based on the U.S. BRFSS Standards. *International Journal of Business and Management Invention*, Volume 5, Issue 7, 33-36.
14. Reid W.D., Pease J.& Taylor R.G.(1990) The Delphi technique as an aid to organization development activities. *Organization Development Journal* Fall, 37-42.
15. WHO (2012). WHO global report: mortality attributable to tobacco. Retrieved from: [http://www.who.int/tobacco/publications/surveillance/rep\\_mortality\\_attributable/en/](http://www.who.int/tobacco/publications/surveillance/rep_mortality_attributable/en/).
16. WHO (2014). Global status report on noncommunicable diseases 2014. World Health Organization. Retrieved from: <http://www.who.int/nmh/publications/ncd-status-report-2014/en/>.
17. WHO (2014). Prevalence of Noncommunicable disease risk factors in the republic of Moldova: STEPS 2013, World Health Organization, Regional Office for Europe. Retrieved from: [http://www.euro.who.int/\\_data/assets/pdf\\_file/0009/252774/PREVALENCE-OF-NONCOMMUNICABLE-DISEASE-RISK-FACTORS-IN-THE-REPUBLIC-OF-MOLDOVA-STEPS-2013.pdf](http://www.euro.who.int/_data/assets/pdf_file/0009/252774/PREVALENCE-OF-NONCOMMUNICABLE-DISEASE-RISK-FACTORS-IN-THE-REPUBLIC-OF-MOLDOVA-STEPS-2013.pdf).