

Factors influencing Breast Cancer Screening Program Utilization in  
Georgia among Women aged 40-70

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# Factors influencing Breast Cancer Screening Program Utilization in Georgia among Women aged 40-70

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by

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# Table of Content

|   |     |
|---|-----|
| Table of Content .....  | i   |
| List of Tables, figures and Charts.....                               | ii  |
| Acknowledgement .....   | iii |
| Abstract .....  | iv  |
| List of Abbreviations .....   | v   |
| Introduction.....   | vi  |
| Chapter 1: Background information about Georgia.....                  | 1   |
| 1.1. General information .....  | 1   |
| 1.1.1. Geographical profile .....                                     | 1   |
| 1.1.2 Demographic and socio-economic indicators.....                  | 1   |
| 1.1.3 Political situation and administrative structure .....          | 1   |
| 1.1.4 Health care system .....  | 1   |
| 1.1.5 Health indicators .....   | 2   |
| Chapter 2: Problem Statement, Objectives and Methodology .....        | 3   |
| 2. 1 Problem Statement .....  | 3   |
| 2. 2 Breast Cancer (BC) Screening Process .....                       | 5   |
| 2.3 Justification.....  | 6   |
| 2.4 Overall Objective of the Study .....                              | 6   |
| 2.5 Specific Objectives .....   | 6   |
| 2.7 Methodology .....   | 7   |
| 2.7.1 Quantitative method.....  | 7   |
| 2.7.2. Qualitative method.....  | 7   |
| 2.7.3 Literature review.....  | 8   |
| 2.8 Ethical considerations.....                                       | 8   |
| 2.10 Conceptual framework: .....                                      | 9   |
| Chapter 3: Study findings.....  | 10  |
| 3.1 Results of the quantitative data .....                            | 10  |
| 3.1.1 Target population Coverage.....                                 | 10  |
| 3. 1. 2 Age group distribution .....                                  | 12  |
| 3.1.3 Screening rounds and follow up visits .....                     | 13  |
| 3.2. Views of the health care providers .....                         | 14  |
| 3.2.1 Facilitating factors for BC screening service utilization ..... | 14  |
| 3.4 Findings of the literature review.....                            | 17  |
| 3.4.1 Women perception on screening service utilization .....         | 17  |

|  |    |
|--|----|
| 3.4.2 Different country experiences in screening programs .....    | 18 |
| 3.4.3 Comparison of the different country screening programs ..... | 19 |
| 3.4.4 Comparison of different country strategies .....             | 21 |
| Chapter 4. Discussion .....  | 23 |
| Chapter 5. Conclusion and recommendations .....                    | 26 |
| 5.1 Conclusion .....   | 26 |
| 5.2 Recommendations .....  | 27 |
| References .....   | 28 |

## List of Tables, figures and Charts

|   |    |
|---|----|
| Table 1: Summary of vital statistics .....  | 2  |
| Table 2: Coverage level of the target population by regions .....   | 12 |
| Table 3: Number of women attended breast cancer screening for different rounds and follow up in Tbilisi .....                         | 13 |
| Table 4: Number of women attended breast cancer screening for different rounds and follow up in the regions of Georgia .....          | 13 |
| Table 5: Themes from semi-structure interviews .....  | 14 |
| Table 6: Breast cancer screening programs in EU, General information, program organization and mode of invitation for screening ..... | 19 |
| Table 7: Breast cancer screening program in EU, Invitation coverage and examination coverage in women aged 50-69 years .....          | 20 |
| Figure 1: Figure 1: Mortality structure, Georgia .....  | 3  |
| Figure 2: Malignant neoplasms, incidence per 100,000 .....  | 3  |
| Figure 3: Breast cancer, new cases share by the stages .....  | 4  |
| Figure 4: Breast cancer screening process .....   | 5  |
| Figure 5: Conceptual framework .....  | 9  |
| Chart 1: Coverage level of the target population in Tbilisi, 2009-2016 .....  | 10 |
| Chart 2: Coverage level of the target population in the regions, 2011-2016 .....  | 11 |
| Chart 3: Distribution of the screened women by region in 2014-2016 (%) .....  | 11 |
| Chart 4: Women Screened in Tbilisi by age group distribution 2010-2016 .....  | 12 |
| Chart 5: Women Screened in the regions by age group distribution 2012-2016 .....  | 13 |

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## Abstract

**Background:** Breast cancer (BC) is a leading cause of death among women in Georgia. In 2012 mortality rate for BC among women was 13.2 per 100,000. Despite the free BC screening services that government provides for women aged 40-70, most cases are diagnosed at late stages, when the treatment is more expensive, complicated and less successful.

**Overall objective:** Explore the main factors influencing the target population coverage level in BC screening program in Georgia, in order to provide recommendation to policy makers on BC screening services.

**Methodology:** Secondary data from NSC are used to describe and analyse the women participation level, distribution of screened women by age and regions in BC screening program. Health care providers were interviewed to explore factors for service utilization. Relevant literature were reviewed. Conceptual framework adopted from Andersen behavioural model and Peters et al., model was used to analyse the findings.

**Findings:** The highest number of screened women are aged 40-49 years, followed by elder age groups. Coverage level significantly differs across the regions. Main facilitating factors for service use were outlined as: quality of services, qualified staff and other, while barriers were defined as low awareness, invalid invitation/recall system, and the low involvement of General Practitioners (GP).

**Conclusion:** additional efforts should be made to enrol more women in the BC screening program. Aside from raising target population awareness, coverage level and consequently the effectiveness of the screening program could be improved in Georgia by recruiting more women through reaching them invitation letters or the involvement of GPs.

**Key words:** breast cancer, screening, utilization, women, Georgia.

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Georgia

Word count: 12420

## List of Abbreviations

|          |   |
|----------|---|
| BC:      | Breast Cancer   |
| CBE:     | Clinical Breast Exam                                  |
| CPR:     | Cancer Population Registry                            |
| EU:      | European Union  |
| FNA:     | Fine Needle Aspiration                                |
| GDP:     | Gross Domestic Products                               |
| GEOSTAT: | National Statistic Offices of Georgia                 |
| GNI:     | Gross National Income                                 |
| GP:      | General Practitioner                                  |
| IARC:    | International Agency for Research on Cancer           |
| LMICs:   | Low and Middle income countries                       |
| MoLSHA:  | Ministry of Health, Labour and Social Affairs         |
| NCDC:    | National Centre for Disease Control and Public Health |
| NCDs:    | Non-communicable diseases                             |
| NSC:     | National Screening Centre                             |
| UHC:     | Universal Health Coverage                             |
| UNFPA:   | United Nations Population Fund                        |
| US:      | Ultrasound  |
| WHO:     | World Health Organization                             |

## Introduction

After graduating from Medical School, I spend several years working in the area of healthcare in Georgia, such as Ministry of Health, Labour and Social Affairs and the Committee of Healthcare and Social Affairs of the Georgian Parliament. In 2009 I joined the National Cancer Screening centre of Georgia, at the position of a manager of the centre. The mission of the organization is to implement the national cancer screening program of breast, cervical, colon and prostate cancer, with the aim to increase the early-stage cancer detection, and contribute to the related mortality reduction. The most commonly diagnosed type of cancer in women globally, as well as in Georgia is the breast cancer. It remains one of the major public health concerns, and fighting against breast cancer is one of the Georgian healthcare system priorities, as it stays the top second cause of death among Georgian women. As a manager of the screening centre and a member of program implementing team, one of my areas of interest was to raise the coverage level of the target population in the screening program and make program implementation process more effective. Working on that position I realized that breast cancer screening services were not utilized properly. After joining MPH/ICHD course, I had an opportunity to undertake the analysis of different factors determining the utilization of breast cancer screening services in the country. And based on the successful stories of other countries I hope to develop some recommendations that could contribute in the improvement of existing breast cancer screening program in Georgia.



# Chapter 1: Background information about Georgia

## 1.1. General information

### 1.1.1. Geographical profile

Georgia is a small country in the Caucasus region covering an area of 69 700 sq. Km, located at the crossroad of Eastern Europe and Western Asia. To the west, it borders the Black Sea. Russia is the neighbour to the North, Azerbaijan, Turkey and Armenia are to its South. A major part of the Georgian landscape is comprised of the mountains, hills and rivers. The climate is diverse in a different part of the country, varying from a dry and continental in the Eastern Georgia to warm and sub-tropical at the Black Sea coast and the Western side. The capital of Georgia is Tbilisi, and the administrative units consist of 11 regions and 64 districts (Georgia, 2014).

### 1.1.2 Demographic and socio-economic indicators

After gaining independence from the Soviet Union, the demographic situation in Georgia has significantly changed, the number of the total population has decreased from 5,3 million in 1989 to 3.7 million in 2016, with 52% female and 48% male population (Geostat, 2017). Life expectancy at birth in Georgia is doing relatively well, for a male it equals 68,6 and for women it's 77,2 years (NCDC 2016a).

Georgia is a multi-ethnic country, based on the 2014 general population census results, ethnic Georgians compose the major part with 86,8% of the total population, followed by 6,3% of Azeris, 4,5% of Armenians and 2,4% of other ethnic groups. The majority of the total population, 57,2% lives in urban areas, approximately half of them, 1,118.3 thousand is settled in Tbilisi. The major religion in the country is Orthodoxy Christianity, others are Muslim - 10.7%, Armenian Apostolic - 2.9% and Catholic - 0.5% (Geostat 2016).

As per the World Bank information, Georgia is a lower middle-income country. Between 2000 and 2016 GDP of the country increased from 3.05 till 14.33 billion US\$. Gross National Income (GNI) per capita in 2016 was 3,810 US\$ (Bank, 2017). According to the National Statistics of 2016, 20,6% of the total population were living below the national poverty line (Geostat, 2017). The official unemployment rate in Georgia is still at high 11,8% level (Geostat, 2017).

### 1.1.3 Political situation and administrative structure

Georgia was one of the first countries in the Soviet Union who took steps towards the independence. On April 9, 1991, the Declaration of Independence was adopted. During the 1992-1993 country faced a civil war and an armed conflict in the autonomous Republic of Abkhazia and the region of South Ossetia, which led to the internal displacement of more than 300,000 people.

The new constitution of Georgia was adopted in 1995, and the country became a presidential republic. The executive branch of government consists of the President and Prime Minister, supported by the Cabinet of Ministers (Georgia, 2014).

### 1.1.4 Healthcare system

Healthcare system is in a constant reform state since the independence from the Soviet Union. In 1995 the average household's out-of-pocket payment amounted to almost 80% of the total health expenditure, with the state contributing only 20% (Belli et al. 2004). In response to that Georgian government started adopting major reforms, and since then the health care financing system has undergone profound changes to ensure universal access to health care

for its citizens. The last wave of this reform started in 2013 and aimed to protect each citizen from the catastrophic expenditures for the health care services, to increase access level and improve the quality of the healthcare. Georgian government introduced the Universal Health Care (UHC) program to cover the entire population, people who had neither state nor private insurance by July, 2013. The number of beneficiaries amounted to more than 2 million (Georgia 2014). 515,000 people, approximately 15 % of the total population are using private or corporate insurance. The UHC program is financed by the general government revenues and administered by the state, via Social Service Agency.

### 1.1.5 Health indicators

Since 1990 the key health indicators of the Georgian population began to improve, although it still remains higher than the average level of the European countries' indicators. According to the national statistics, Under 5 Mortality Rate has strongly declined in recent years, from around 27,2 per 1000 live birth in 2000 to 10,2 in 2015. The Infant Mortality Rate has declined from about 21,2 per 1000 live birth in 2000 to around 8,6 in 2015. Despite these strong achievements, the above mentioned indicators are still exceeding the average of the European region. The trend of the Maternal Mortality Ratio was also decreasing in last decade, but in 2015 it still varies around 30 per 100,000 life birth, while the average for WHO European Region is almost half of it, (16 in 2015). (NCDC 2016b). The following table 1 presents the main health indicators of the Georgian population for 2015 year.

*Table 1: Summary of vital statistics*

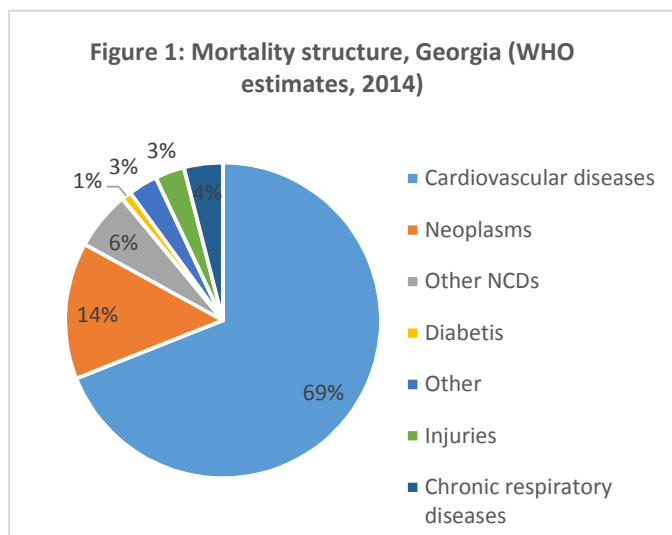
| Indicator   | Value     | Year |
|---|-----------|------|
| Under-5 mortality rate per 1000 LB <sup>1</sup>               | 10,2      | 2015 |
| Infant mortality rate per 1000 LB <sup>1</sup>                | 8,6       | 2015 |
| Maternal mortality ratio per 100 000 live births <sup>1</sup> | 32,1      | 2015 |
| Life Expectancy at birth M/F <sup>1</sup>                     | 68,6/77,2 | 2015 |
| Crude death rate per 1000 <sup>2</sup>                        | 13,2      | 2015 |
| Crude birth rate per 1000 <sup>2</sup>                        | 15,9      | 2015 |
| Natural increase rate per 1000 <sup>2</sup>                   | 2,7       | 2015 |
| stillbirth rate per 1000 birth <sup>2</sup>                   | 9,8       | 2015 |

Source: (NCDC 2016a), (GEOSTAT, 2017)

## Chapter 2: Problem Statement, Objectives and Methodology

### 2. 1 Problem Statement

Non-Communicable Diseases (NCDs), including cardiovascular diseases, diabetes, cancer and chronic respiratory disease constitutes the main burden of the world's population mortality and morbidity. Each year NCDs kill 38 million people and are responsible for almost 70% of all deaths worldwide. Almost 28 million NCD deaths take place in low and middle income countries (LMICs). Since 2000 the global burden of diseases has shifted from infectious diseases to NCDs in LMICs that is driven by the number of factors including rapid urbanization, globalization, unhealthy lifestyle and population ageing (WHO, 2017). In Georgia, 94% of mortality is caused by non-communicable diseases. Cardiovascular disease (69%) is on the first place, followed by the malignant neoplasms (14%) (Figure 1). Therefore fighting the cancer is one of the Georgian health care system's priorities as cancer remains the second largest cause of death in Georgia (NCDC 2016b).



Source: (NCDC 2016b)

New cases of malignant neoplasms are increasing every year in Georgia. In 2011 incidence of cancer per 100,000 population was 94.8, in 2013 it increased to 110.1 and in 2015 reached to 282.7 per 100,000 population. This rapid increase of cancer cases can be associated with the introduction of Cancer Population Registry (CPR), implementation of which started on January 1, 2015 (Figure 2). In past years statistical data on cancer in the country was quite insufficient due to the lack of the registration system until 2015 (NCDC 2016b).

Breast cancer continues to be a major killer of women in Georgia. Among the top 5 site of cancer in women in Georgia, breast cancer takes the first place. In 2015, 1,838 new cases of breast cancer were registered among females, incidence – 94.8 per 100,000 females. The share of breast cancer in the total number of new cases of malignant neoplasms in females was 34.4%. (NCDC 2016b)

In 2012 the age-adjusted incidence rate for breast cancer in Georgia was 44.0 per 100,000 women; the mortality rate was 13.2 per 100,000 women (GLOBOCAN, 2012).

Risk factors for breast cancer include strong family history of breast cancer, older age of first birth, early age at menarche, physical inactivity, alcohol consumption, oral contraceptive use and obesity (London et al. 2017)

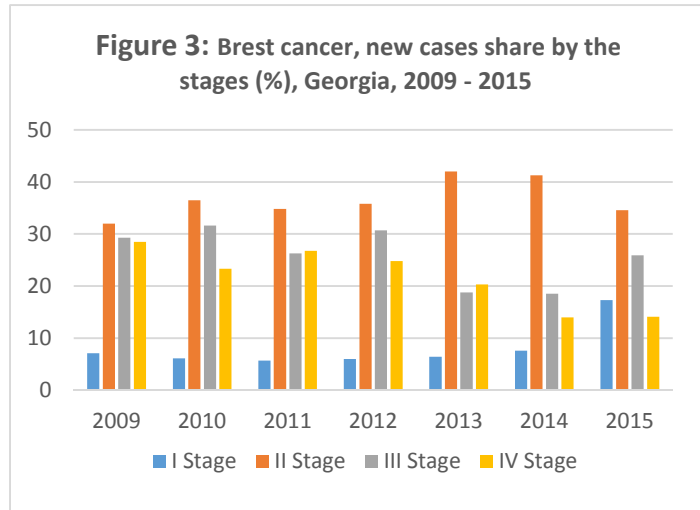
**Figure 2: Malignant neoplasms, incidence per 100,000**



Source: (NCDC 2016b)

In Georgia women tend to be diagnosed with breast cancer at the later stages (Figure 3) when the treatment is more expensive, more complicated, and less successful (NCDC 2016b).

Different studies show that the effective way to reduce the breast cancer mortality is the implementation of the National breast cancer (BC) screening program, which primary aims to reduce mortality from breast cancer through early detection. According to the “European guidelines for quality assurance in breast cancer screening and diagnosis”, detection at an earlier stages, together with effective diagnostic pathways and optimal



Source: (NCDC 2016b)

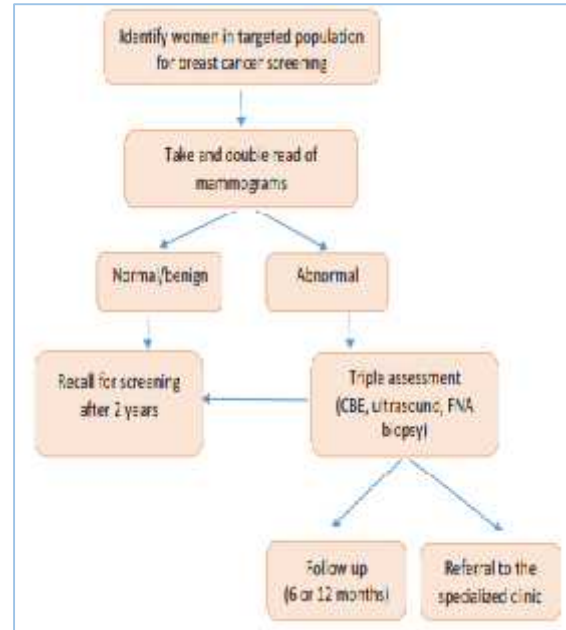
treatment has the potential to significantly reduce the burden of breast cancer in the population (Perry et al. 2008). Regular examination of the certain age asymptomatic individuals with evidence-based screening tests followed by an adequate treatment could play an important role in the reduction of mortality caused by breast cancer (Ponti et al. 2016). Based on AIRC Handbook on Cancer Prevention, BC screening could reduce mortality, if the screening techniques are used appropriately (IARC 2002). Based on WHO recommendations' chances of successful treatment is considerably increasing if the cancer is detected at an early stages. Education to promote early diagnosis and screening are the two major factors that contribute to an early detection of cancer. Screening considers systematic examination of healthy population with the simple test for the purpose to identify the individuals who have disease but are asymptomatic yet (WHO, 2017).

Considering WHO recommendation and experience of different countries, Georgian health policy makers, together with the international organizations started to establish cancer screening program in Georgia. In 2008 the Georgian National Council of the Reproductive Health initiated the National Screening Program for the purpose to contribute in the breast cancer mortality reduction, as the breast cancer remains the most frequent cancer and the most frequent cause of cancer induced deaths in women in Georgia. National Screening Centre (NSC) was established for the program implementation with the co-funding by Tbilisi Municipality and United Nations Population Fund (UNFPA) Georgia. The project was one of the first among the Eastern European and Central Asian countries that aimed to ensure the equal access of the target population to the screening services and also that the quality of the services are acceptable and appropriate to the needs of the eligible population. At the beginning of the program, free services were available only for residents of Tbilisi. After the remarkable success of the project, namely its contribution of increased number of the breast cancer detection at an early stages and the decline of those at the late stages (see the figure 3), the federal government of Georgia decided to scale up the project at the national level. Starting from 2011, the comprehensive cancer screening program became available not only for Tbilisi residents but also for the women living in regions aged 40-70 through the national program under the National Centre for Disease and Control, NCDC which was also implemented by the NSC (UNFPA 2014).

## 2. 2 Breast Cancer (BC) Screening Process

For early breast cancer diagnosis, the nation-wide screening program offers a free of charge biennial mammographic screening service to all women aged 40-70. Promotion of the program to the general population is through media campaign, namely with flyers, brochures, posters, TV and radio. For the first visit at the screening center women are registered in the NSC database. Free services include two-view mammography (craniocaudal and mediolateral oblique) of each breast. Mammograms are reviewed at the screening units immediately to judge on the technical quality and to make additional images if necessary. Clinical breast exam (CBE), ultrasound and FNA biopsy with cytology is also carried out free of charge if referred by the radiologist. Both digital mammography and screen-film systems are available. All mammograms are read independently by 2 radiologist at the screening units. The standard recall interval is 2 years, although some women with normal results could be recalled earlier for follow up visits, after 6 or 12 months depending on their personal history of breast cancer, family history, significantly dense breast tissue, atypical ductal hyperplasia or other reasons. Follow up visit includes mammography examination, CBE, US and FNA biopsy as required (See fig. 4). For the normal results a medical report is ready to pick-up within 10 working days. All women are informed personally about the outcome of the screen examination, in case of abnormal results the woman is referred to the specialized clinic for further medical examinations and treatment. All patient data and screening results since 2015 are recorded in the NSC software that was created for the purpose to establish centralized electronic database countrywide, increase effectiveness of the program performance, simplify the monitoring system and collect the epidemiological data. Before that the data were recorded and kept in the local electronic programs, without registering them in the centralized database.

**Figure 4: Breast cancer screening process**



For the normal results a medical report is ready to pick-up within 10 working days. All women are informed personally about the outcome of the screen examination, in case of abnormal results the woman is referred to the specialized clinic for further medical examinations and treatment. All patient data and screening results since 2015 are recorded in the NSC software that was created for the purpose to establish centralized electronic database countrywide, increase effectiveness of the program performance, simplify the monitoring system and collect the epidemiological data. Before that the data were recorded and kept in the local electronic programs, without registering them in the centralized database.

In 2008, when the BC screening program began to operate in Tbilisi, the program was carried out by NSC and together with three sub-contractors was delivering the screening services. After a year, one more NSC branch opened and several sub-contractors were added for the purpose to improve geographical accessibility of the target population of the screening services. At the end of 2016 two main NSC branches and 6 sub-contractors were delivering the services in Tbilisi. As already mentioned above, starting from 2011 screening services were also available in Georgian regions. In the beginning, 18 centres were delivering BC screening services for the residents of regions. The number of centres has been increased up to 22 in 2015 which significantly improved geographical accessibility of the population to the services.

Organized BC screening program does not exist in the country and the services are utilized on an opportunistic basis. Participation of the beneficiaries in the program is accomplished only by self-enrolment or by referral. There is no system in place to recruit people, monitor participation and follow-up. The major disadvantage of such type of screening is that it covers only those patients who visits the NSC units on their own initiative, putting those who do not do so in danger of being inadvertently left out of the preventive program (Deger 2008).

The participation rate of the beneficiaries in the National BC Screening program was increasing gradually year by year. In 2008 in the frame of screening program 9,741 women were screened. In 2011 after introducing program outside Tbilisi, the number raised to 23,710 and in 2016 it reached to 44,407. But it is worst mentioning that despite the growing trend of women participation in the program, the recruitment rate is still not enough to influence on the breast cancer related mortality reduction. Data show, that the optimal reduction in breast cancer rate will be seen if a large proportion, 75% of the target population is being regularly screened, and the provided services are of high quality (IARC 2002).

### 2.3 Justification

Different study shows that for the purpose of significant reduction in breast cancer mortality, the rate of target population attendance at the mammography screening program should be high. Van der Maas and colleagues (1989) estimate that, with a >70% participation rate of the eligible population in the BC screening program every two years, can produce 12% reduction in breast cancer mortality (Colditz 2000). European guidelines set an acceptable level of participation rate of at least 70% of the eligible female population to reduce the breast cancer related mortality (Perry et al. 2008). In 2008, on the first year of the national BC screening program implementation in Georgia, the coverage rate of the target population amounted to 9.1 %, which is significantly lower compared to the desirable percentage. There is no adequate information available on how the coverage level evolved from 2009 till 2016, based on the residence place of the target population. Little is known about the age group distribution of the screened women during the program implementation period. The influencing factors for BC screening service utilization in the country has not been yet studied in depth. In order to explore the barriers and facilitating factors for the women participation in the BC screening program, there is a need to conduct research and based on the study results provide health policy makers with the recommendations on how to improve the BC screening program for the purpose to contribute breast cancer mortality rate reduction in Georgia.

### 2.4 Overall Objective of the Study

Explore the main factors influencing the coverage level of the target population in the breast cancer screening program in Georgia, in order to provide the policy makers with the recommendations on breast cancer screening services.

### 2.5 Specific Objectives

1. To describe the evolvement of coverage level of the target population from 2009 till 2016 by the place of residence; describe and analyse distribution of screened women by regions in 2014-2016, age group distribution among the screened women from 2010 till 2016 and define the rate of women participated in the BC screening program for first, or subsequent rounds and follow up visits in 2015 and 2016 years.
2. To explore the barriers and facilitating factors for breast cancer screening services utilization from the perspective of health care providers.
3. To explore the barriers and facilitating factors for breast cancer screening services utilization from the perspective of beneficiaries.
4. To analyse the ways that different countries used for effective improvement of breast cancer screening service utilization rate among the target population, which could be successful in Georgia.
5. To provide recommendations for policy makers to improve the coverage level of the target population in the breast cancer screening program in Georgia in order to contribute in morbidity and mortality rate reduction caused by breast cancer.

## 2.7 Methodology

Quantitative and qualitative research methods, as well as the literature review was applied for the preparation of this thesis.

### 2.7.1 Quantitative method

Quantitative method was used in order to describe and analyse the coverage level evolution of the target population in the BC screening during 2009-2016 by place of residence; describe and do a comparative analysis of the age group distribution among the women screened in different years and distribution of screened women by regions. Define a rate of women who participated in the program for initial or subsequent rounds, and came for follow up visits in 2015 and 2016. Data were collected from the NSC of Georgia for further analysis. To review the secondary data, as a former staff of the NSC I had an access to all available data in the office, however all personal identifiers of the patients were deleted and totally anonymous data were analysed. The data were in excel format including the following information about beneficiaries: date of examination, age and place of residence. For women screened from January 1, 2015 the type of visit, namely: initial or subsequent rounds, and follow up visit were also available.

BC screening is offered to all Georgian women aged 40-70 who represent the source population for the program. As the mammography screening is conducted once in two years, the coverage of the target population is calculated as the number of screened women in a given year divided by half of the source population. Considering the fact that until 2015 the database of BC screening program was not perfect and the recording system did not function adequately countrywide, it was difficult to do an exact calculation of the coverage, differentiate and subtract the patients attending screening more than once in a given year, their follow up visits or the subsequent rounds. Therefore, the population coverage calculation would be an estimate, based on the total number of women attending screening in a given year that will show the maximum percentage of the women participation in the program and potentially overestimate the coverage. The other reason for choosing the mentioned methodology was to have an opportunity to compare the study results to other reports published in Georgia, where the same methodology of calculation for the target population coverage was used.

Age group calculation from 2010 till 2014 is based only on the electronic database obtained from NSC's Didube and Varketili branch, who provided screening service to around 83% of all the screened women in Tbilisi. The hard copy database, received from other sub-contracted medical institutions who screened the rest of the 17% was incomplete for an age group calculation. 2015-2016 age group calculation includes the data of all women screened in Tbilisi. For the regional program it is based on the electronic database obtained from the NSC, which includes data of all screened women from 2012 to 2016 and are residents of the regions of Georgia.

As already mentioned since 2015 all patient data and screening results are recorded in the NSC software. Therefore the information on women attending BC screening for different rounds and follow up visits in 2015 and 2016 was extracted from the electronic database of the NSC. First round screening is defined as the first time a women is screened within the BC screening program. Subsequent rounds are defined as re-screens performed after 2 years from the previous screen. Follow up visit is defined as re-screening of the patient within 6 or 12 months in case of an abnormal mammogram. The calculation was done as the number of women attending different rounds divided by the total number of women screened in a given year

### 2.7.2. Qualitative method

Given the fact that limited amount of people are involved in BC screening management and implementation, in total seven semi-structured interviews were conducted for the qualitative

method. The interviews were held in Tbilisi, Georgia for the purpose to explore barriers and the facilitating factors for BC screening services utilization from the perspective of health care providers. Three respondents were from the NSC management team, two others were service providers, namely radiographer and the operator. The former director of the cancer screening program, who retired in 2017 was also chosen as a respondent as well as one representative of the National Centre for Disease Control (NCDC). The study participants were selected based on their experience in the implementation of this program, and also were knowledgeable about its strengths and weaknesses. The interviews were conducted using an interview guide consisting of open-ended questions to allow respondents to explain their personal perspective and opinion about the factors influencing the BC screening service utilization among target population as completely as possible. Duration of each session was around 30 minutes. Interviews were held in Georgian and was audio-recorded. Verbatim transcription is in MS word format and translated into English. The data was coded manually according to the objectives and entered into MS excel tables. Data was summarized and analysed manually.

### 2.7.3 Literature review

The aim of the literature review was to explore the influencing factors for the utilization of the BC screening program among the target population from the perspective of beneficiaries not only in Georgia, but also in the neighbouring countries. Also to analyse the options that different countries used for effective improvement of the service utilization rate among the target population and could also be replicable in Georgia. For finding the relevant information international database, national and international sources were used, namely Google scholar, PUBMED, VU database, website of WHO, NCDC Georgia, and Ministry of Health.

Search of the mentioned databases for the breast cancer and Georgia found less than 10 articles, most of which were quantitative and oriented on breast cancer treatment, only one qualitative publication was done in Georgia that described perceptions and experiences of women, living with breast cancer (Dvaladze 2012).

### 2.8 Ethical considerations

Following ethical issues were taken into consideration during the study design development and field implementation: all personal identifiers of the patients were deleted and totally anonymous data were used in the process of secondary data analysis. Interview respondents were informed about the purpose and the design of this study via email. Participation in the study was strictly voluntary and respondents were free to withdraw from the study at any time as per their decision. Participants of the study gave their consent to enrolment by the email. Complete anonymity of the respondents were assured, names or personal identifiers were not recorded, and therefore the documentation was coded to ensure complete confidentiality. The place for conducting interviews were selected by the choice of respondents, considering safety, privacy and comfortable environment.

### 2.9 Limitation of the study:

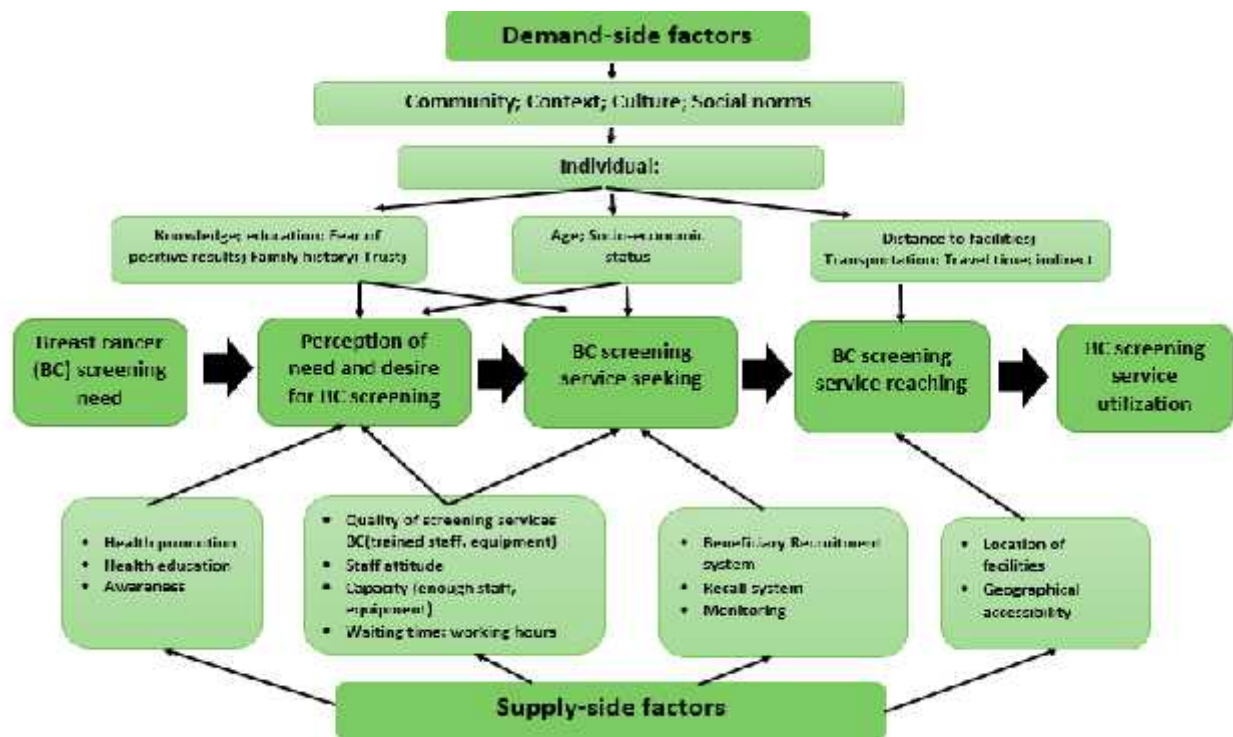
1. Secondary data generated from NSC for quantitative analysis was incomplete, as until 2015 the database and recording system of the screening program was not functioning adequately. The mentioned data limitation reflected on the coverage level and age group calculation.
2. Results of the second objective are based on the opinion of healthcare providers working within the BC screening program. Considering the fact that the respondents are involved in the program implementation process the results could be biased.
3. To find the answer for the objective three and explore the perception of women about barriers and the facilitating factors for BC screening services utilization, the best way would have been to conduct interviews with women, although considering the limited time frame for thesis, the literature review was done. Hence, the review of only one study conducted in Georgia along with some studies in similar context countries, may not give comprehensive picture of overall perceptions of Georgian women.



## 2.10 Conceptual framework:

To identify and analyse the factors influencing the utilization of the BC screening program in Georgia among the women aged 40 to 70 the new conceptual framework was developed by modifying Andersen behavioural model of health services use (Andersen 1995) and Peters et al model for assessing access the health care services (Peters et al. 2008). The Andersen model was chosen as a basic approach that specifies relationships among contextual factors (e.g., environmental, health behaviour, and outcomes) and individual characteristics (e.g., predisposing factors, need and access) that influence the use of health services. Peter et al. framework describes four main dimensions of access to healthcare services that include geographic accessibility, availability, financial accessibility and acceptability. Each of them include demand and supply aspects and enables health planners or policy makers to identify the different dimensions of barriers to access the healthcare services. Demand-side factors have influence on the ability to use health services at an individual or community level, while supply-side factors are characteristics of health system that enables or constrains health service utilization by individuals or community. Geographic accessibility includes travel time or physical distance from a user to a healthcare facility. Availability – capacity of medical staff, equipment, working hours of the facility, waiting time and quality of services. Financial accessibility – considering the fact that the BC screening services is free for Georgian citizens, the travel cost to facility and other indirect costs could be a financial barrier for the users. Acceptability includes interpersonal skills and attitudes of medical and non-medical staff, as well as trust and expectations of the users. For the supply-side determinants health promotion, awareness, monitoring, recruitment and recall system of the beneficiaries were also added. The conceptual framework includes all main aspects from personal to community and health system factors that can influence the screening service utilization (see figure 5).

Figure 5: Conceptual framework



Source: Adopted from: Andersen behavioural model of health service use  
Peters et al., model

## Chapter 3: Study findings

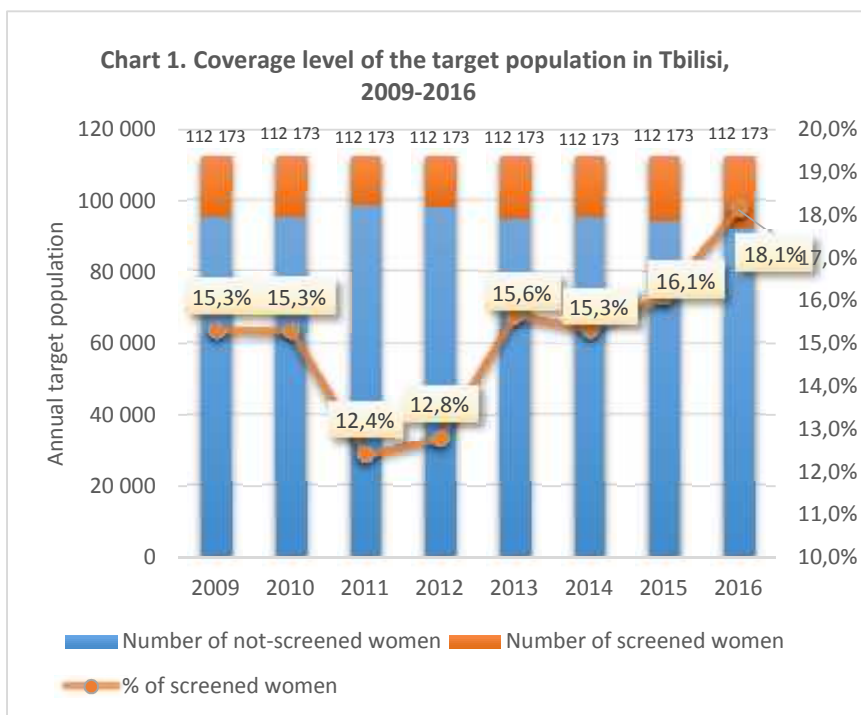
The next chapter will describe the main findings of the study. In answering research question 1, the following information will be presented: coverage level of the target population in BC screening program from 2009 till 2016 by residence; distribution of screened women by regions 2014-2016; age group distribution among screened women during 2010-2016 and the rate of women participating in the program for the first, subsequent and follow up visits in years 2015 and 2016. In answering research question 2, perceptions of the health care providers on the barriers and facilitating factors for BC screening service utilization in Georgia will be presented. The results on the barriers and facilitating factors affecting BC screening services utilization from the perspective of women will answer the research question 3 and for the research question 4 the findings on experience of different countries for improvement BC screening service utilization rate among the target population will be presented.

### 3.1 Results of the quantitative data

#### 3.1.1 Target population Coverage

Based on the general population census results from 2014 (Geostat 2016), the number of women aged 40-70 years in Tbilisi amounted to 224 345, who represent the target population for BC screening. As BC screening is conducted biennially, the annual source population amounted to 112 173 (224 345/2). According to the same source, number of females of the same age in the regions of Georgia amounted to 524 508, thus annual source population for BC screening was 262 254 (524 508/2). The following chart 1 includes only the data of women that are registered and screened in Tbilisi.

In 2009, Tbilisi BC screening program screened 17150 women, which is a 15,3% of the annual target population. In 2010 the number of screened women was approximately the same. In 2011 it dropped to 12,4% and from 2012 started to increase gradually and by the end of 2016 it reached 20337 women, which is 18,1% of the target population. To summarize the chart, overall the coverage level seems relatively stable at 15 to 16% on average, although with some fluctuation that might be due to technical issues and the amount of effort put into the program promotion.



The findings on coverage level before 2013 has been in accordance with those reported by UNFPA, on capacity assessment and the recommendations for cancer screening in Georgia (Davies 2015).

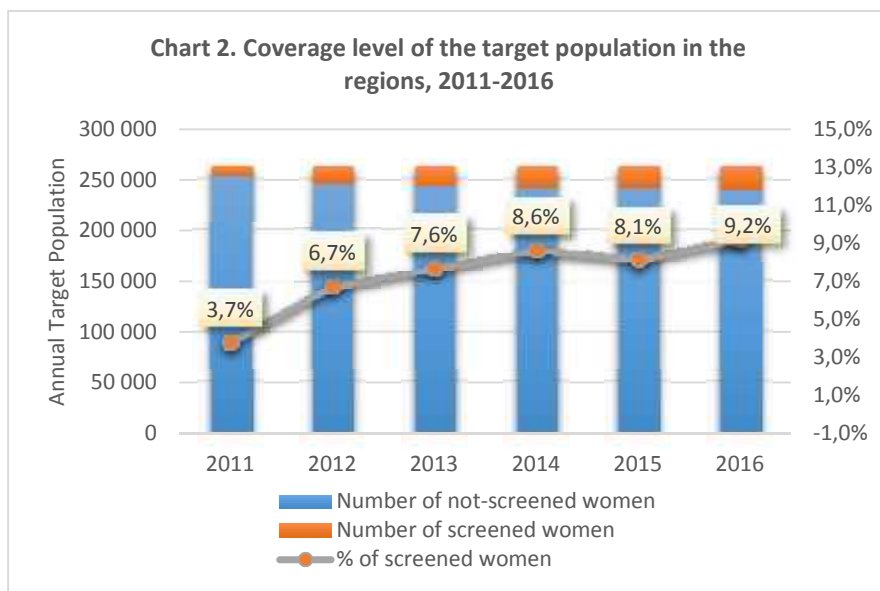


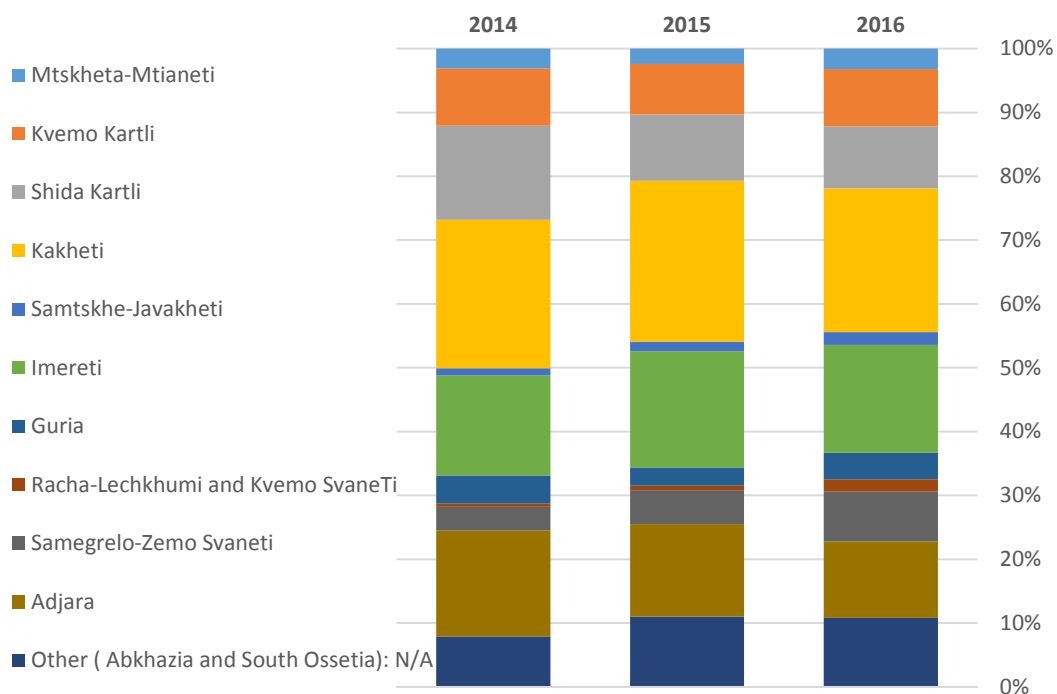
Chart 2 includes the data of women that are registered in the regions but undergo screening either in the regional screening facilities or in Tbilisi. Around 25% out of total number of screened women that are registered in the regions undergo the screening procedures in Tbilisi.

The regional BC screening program started to operate in 2011 and on the first year of functioning it screened 9798 female that is 3.7%

of the target population. The number of screened women was almost double next year at 17552, or 6.2%. Since that time the trend of screened women was slightly growing every year and in 2016 it grew to 24070 females, 9.2% of the target population.

Chart 3 compares the distribution of the target population in the BC screening program by regions in years 2014-2016. The chart shows that during three year period the participants' distribution is almost stable among regions, with the highest rate in Kakheti, the central region and the lowest in Racha-Lechkhumi and Kvemo Svaneti, the mountainous region.

**Chart 3: Distribution of the screened women by region in 2014-2016 (%)**



Comparing coverage levels of the target population across regions, in the table 2 we can see the highest participation rate, 17% is in Kakheti region and the lowest coverage, 3% in Samtskhe-Javakheti. The advantage of Kakheti region could be explained by the close location of the region to the capital city, also with the quality of equipment and staff.

Table 2 Coverage level of the target population by regions

| Regions                                  | Target population by regions | Annual target population by regions (target population/2) | number of screened women by regions in 2016 | Coverage rate of screened women (%) |
|--|------------------------------|---|---|-------------------------------------|
| <u>Mtskheta-Mtianeti</u>                 | 17662                        | 8831  | 770   | 9%                                  |
| <u>Kvemo Kartli</u>                      | 77704                        | 38852   | 2166  | 6%                                  |
| <u>Shida Kartli</u>                      | 52505                        | 26253   | 2335  | 9%                                  |
| <u>Kakheti</u>                           | 65239                        | 32620   | 5416  | 17%                                 |
| <u>Samtskhe-Javakheti</u>                | 30030                        | 15015   | 481   | 3%                                  |
| <u>Imereti</u>                           | 108780                       | 54390   | 4068  | 7%                                  |
| <u>Guria</u>                             | 24432                        | 12216   | 1011  | 8%                                  |
| <u>Racha-Lechkhumi and Kvemo SvaneTi</u> | 7 269                        | 3635  | 457   | 13%                                 |
| <u>Samegrelo-Zemo Svaneti</u>            | 71137                        | 35569   | 1877  | 5%                                  |
| <u>Adjara</u>                            | 62459                        | 31230   | 2888  | 9%                                  |
| Other ( Abkhazia and South Ossetia)      | NA                           | NA  | 2600  | NA                                  |
| Total                                    | 517217                       | 258609  | 24070                                       | 9%                                  |

### 3. 1. 2 Age group distribution

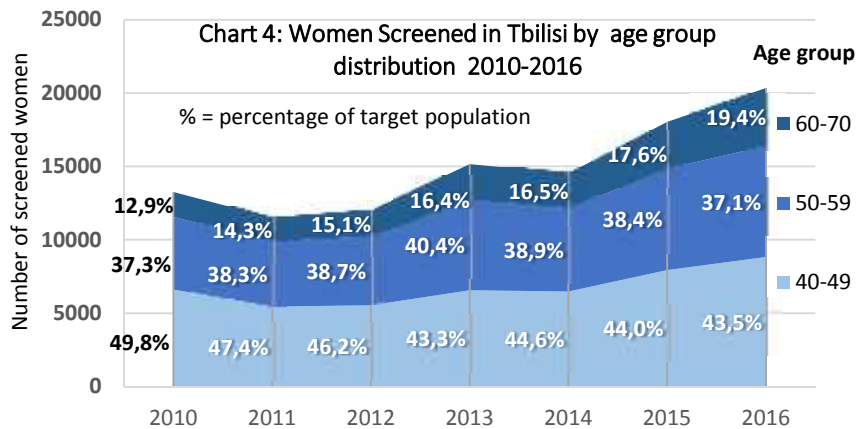
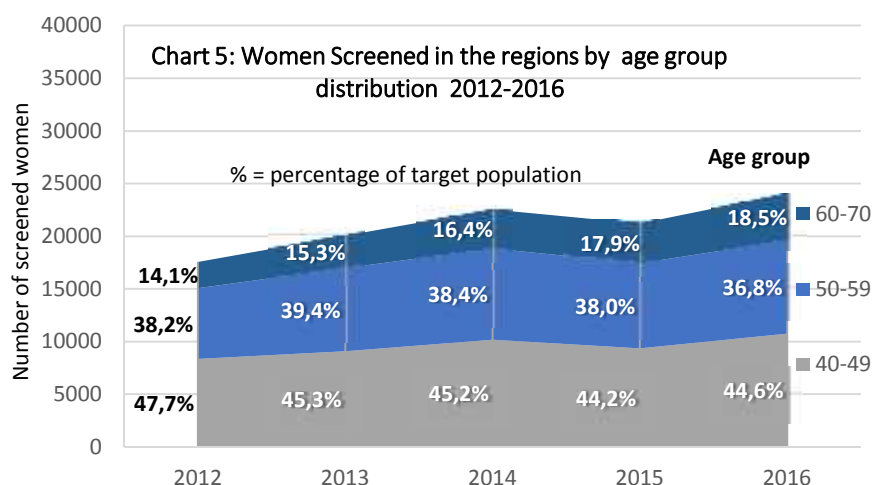


Chart 4 presents the age group distribution of the screened women under the Tbilisi BC screening program from 2010 to 2016. In 2010 the highest attendance rate, 49,8% was found in 40-49 age group, 37,3% in 50-59 age group and 12,9% in 60-70 age group respectively. To summarize the chart in the given years most of the screened women are from 40-49 age group, followed by 50-59 and 60-70 groups.

The absolute number of the participation tends to increase slightly, while the percentage of screened women over time seems relatively stable (See Chart 4).

Chart 5 shows the age group distribution of the screened women under the regional BC screening program from 2012 to 2016. The trend of age distribution seems similar to Tbilisi. The youngest group participates the most, while the oldest group participates the least. In 2012 the participation rate in the screening program was the highest, 47,7% in 40-49 age group, 38,2% in 50-59 age group and 14,1% in 60-70 age group. Similar to Tbilisi screening program, the absolute number of the participation in the regional program tends to increase slightly, while the percentage of screened women over time is relatively stable (See Chart 5).



### 3.1.3 Screening rounds and follow up visits

Table 3 shows the number and percentage of women attended BC screening first or subsequent rounds and also follow up visits in Tbilisi in 2015-2016. 50% of total number of screened women in 2015 attended screening for the first time, 24,4% for second round and small percentage 11,4% and 2,7% for 3<sup>rd</sup> and 4<sup>th</sup> round. The follow up visit amounted to 11,6%. In 2016 the results were quite similar to 2015 year; almost half of all screened women attended examination for the first time, 27% for the second round, and again little percentage for subsequent rounds and follow up tests. Considering the fact that Tbilisi screening program operates since 2008, it could explain the low percentage of participation for subsequent rounds and follow up visits compare to initial screening. Only women started screening in 2008, 2009 and 2010 are eligible for 4<sup>th</sup> round.

|           | Round 1 | Round 2 | Round 3 | Round 4 | Follow up | Total number of screened women |
|-----------|---------|---------|---------|---------|-----------|--------------------------------|
| 2015 year | 9 008   | 4 400   | 2 050   | 489     | 2 086     | 18 033                         |
| 2015 (%)  | 50,0%   | 24,4%   | 11,4%   | 2,7%    | 11,6%     | 100,0%                         |
| 2016 year | 9 626   | 5 499   | 1 886   | 448     | 2 878     | 20 337                         |
| 2016 (%)  | 47,3%   | 27,0%   | 9,3%    | 2,2%    | 14,2%     | 100,0%                         |

|           | Round 1 | Round 2 | Round 3 | Follow up | Total  |
|-----------|---------|---------|---------|-----------|--------|
| 2015 year | 16 466  | 1 463   | 118     | 3 159     | 21 216 |
| 2015 (%)  | 77,6%   | 6,9%    | 0,6%    | 14,9%     | 100,0% |
| 2016 year | 17 620  | 3 477   | 84      | 2 879     | 24 070 |
| 2016 (%)  | 73,2%   | 14,4%   | 0,3%    | 12,0%     | 100,0% |

Table 4 present the number and percentage of women attended BC screening first or subsequent rounds and follow up visits in the regions in 2015-2016. For the first given year the participation rate on initial round was considerably high compare to subsequent rounds and follow up visits. For the next year there was a slight fluctuations, but in general the situation looks similar for both years where the attendance rate for initial round extremely exceeds to any other subsequent rounds. The young age of the regional program could explain here also the low participation rate on subsequent rounds and follow up visits.

### 3.2. Views of the health care providers

Qualitative analysis of the data revealed five major facilitating factors that contributed to the success of the program and also five major barriers that affected the breast cancers screening program utilization in Georgia. The themes that came up during the interviews are summarized in table 5:

|                     | Main themes                   |   |
|---------------------|-------------------------------|---|
|                     | Facilitators                  | Barriers                                |
| Supply-side factors | • Quality of services         | • The role of General Practitioner (GP) |
|                     | • Trained and qualified staff | • Regional screening program distrust   |
|                     | • Geographical accessibility  | • Invitation or recall system           |
| Demand-side factors | • Trust                       | • Awareness and level of education      |
|                     | • Free screening services     | • Religion/culture                      |

Table 5: Themes from semi-structure interviews

To link the mentioned themes to the conceptual framework, quality of services, trained and qualified staff, geographical accessibility, the role of general practitioner, regional screening program distrust and invitation/recall system are more linked to supply-side factors while trust, awareness and level of education, free screening services and religion/cultural factors are more linked to demand-side factors. In the following chapter facilitating factors will be discussed in the first place, followed by the barriers.

#### 3.2.1 Facilitating factors for BC screening service utilization

##### 3.2.1.1 Quality of the services

Almost all participants pointed out the high quality of provided services as a facilitating factor. According to the representative of the NCDC, people who were in charge of the BC screening program implementation, were always doing their best to improve the quality of the services, data and results; "The team was always open for any innovation and development that was sufficiently reflected on the patients satisfaction" - stated the respondent from NCDC. Operator of the screening centre mentioned in her interview that there is a system at their facility where the patient could write feedback on provided services, and in most cases women write positively and express readiness to attend next rounds of screening. Quality of the equipment also plays a role in the service utilization rate. NSC Didube and Varketili branches in Tbilisi (covers around 83% of the patients) are equipped with digital mammography machines with high quality imaging and better functionalities than the analog mammography machines. "Women living in Tbilisi prefer to do screening in the facilities where the quality of equipment and services are better" – said one of the respondents.

##### 3.2.1.2 Trained and qualified medical staff

Trained and qualified medical staff of the screening program also came up as one of the facilitating factors for the service utilization. "Qualification and experience of the medical staff is one of the priority for NSC Management team as this is crucial for effective implementation of the program, in this regard the radiologist always have support to undergo the trainings and master classes in leading European institutions" - stated one of the NSC managers. "Sometimes, during the mammography examinations, women note that they have heard about the qualified and experienced medical staff working at the screening centers, and this is the reason why they choose using the screening services" said the radiographer.

##### 3.2.1.3 Trust and reliability of medical results

Trust to the screening centres and medical results produced by the program was also a facilitating factor that almost all participants mentioned. "The level of trust to the cancer screening program is quite high, women rely on the experience of radiologist and medical results prepared by them" – stated the NCDC representative.

During the interview, the manager of NSC mentioned that in the beginning of the screening program when patients were referred to the specialized clinics for further treatment, oncologist or surgeons were requesting them to undergo the same breast examinations in their health facilities while it was already done at the screening centre. The underline reason was low level of trust to the medical results brought from the screening centres. Currently situation is absolutely opposite, most of the oncologists or surgeons are referring patients to the screening centres for mammography examination before start of any type of treatment. "In recent years Georgian oncologists got convinced that medical results prepared within the national BC screening program are accurate and are not subject for verification; the level of trust improved which has a positive reflection on the program implementation process" – declared the manager of NSC.

#### 3.2.1.4 Geographical accessibility

According to responses of current and former management team members of the screening centre and also based on NCDC representative's opinion, the geographical accessibility is a facilitating factor for screening service utilization. As they stated, the number of BC screening service providers were increasing gradually not only in Tbilisi but also in the regions of Georgia, for the purpose to increase the geographical accessibility for the target population. For the same purpose, particular BC screening centres located in Tbilisi, had permission to provide services to women that had residence in the other regions of Georgia. "Some residents of the regions are moving to the capital for better job. Physically they live and work in Tbilisi, but they are registered in the region. Considering the mentioned fact, the funders of the screening program made a decision to provide screening services to them in Tbilisi" – said the respondent.

#### 3.2.1.5 Free breast cancer screening services

During the semi-structured interviews, free BC screening services also emerged as a facilitator for the service utilization. In respondent's opinion, government funded medical services are very important and attractive for citizens of developing countries, where unemployment rate is almost 12% and around 20% of the population lives under the poverty line. It's true that women are not doing mammography screening just because the service is free, but this factor still plays a positive role in service utilization process. As the screening centre operator stated, part of the patients often express gratitude for the services provided free of charge for them.

### 3.2.2 Barriers for screening service utilization

#### 3.2.2.1 Awareness and education level

According to the study of the participants' opinion general awareness and level of education about breast cancer issues, prevention measures and the risk factors is very poor among the women in Georgia. They believe that few women have adequate knowledge about effectiveness of the screening tests and benefits of the breast cancer early detection. Therefore the mentioned factor is one of the major barriers for screening service utilization. "Many women could not realize the life-saving benefit of the BC screening practice that becomes the reason for detecting breast cancer at late stages" – said one of the respondents. She also added that the government does not allocate sufficient funds for media and communication campaigns and without adequate funding it is impossible to raise awareness among target population and increase the coverage level. "For some women breast cancer is associated with death, I strongly believe that the mentioned perception is in direct correlation with low level of education and awareness" – pointed out one of the study participants. According to this respondent the communication campaigns undertaken by the NSC for the purpose to change population behaviour and raise awareness on breast cancer issues among the target population was not enough to achieve this objective. Based on the NSC manager's opinion current PR activities, namely distribution of brochures on cancer early detection and screening benefits, posting information banners on public places and medical websites,

printing and distributing information flyers among the population, is not enough and could not rise the coverage to the desired level. "Some women are afraid to hear positive results, they think that if they are diagnosed with breast cancer, despite the treatment options, they will die soon. Therefore they refrain to use BC screening services and prefer not to know their breast conditions. I think that if women have better understanding, knowledge and awareness about breast cancer, preventive measures and benefits of screening, they could overcome the fear and change their behaviour"- said the study participant.

#### 3.2.2.2 The role of a General Practitioner (GP)

Conducted interviews revealed that the low level of referrals from the General Practitioners to the BC screening program was one of the major constraining factors for the screening service utilization. One respondent stated that almost all primary health care centres in Georgia are privatized, therefore GPs employed in the private sector have no motivation to refer patients to the state program for BC screening. "GPs have an important role in looking after patient, significant part of their work is health promotion and preventive medicine. Considering the fact that GPs often are the first point of contact for the patient, they should be in charge to explain the benefits of the preventive measures and refer the target population to BC screening program. But unfortunately in Georgia GPs have no incentives to send a patient for mammography examination within the state cancer screening program" – mentioned the respondent. Based on the screening centre operator's statement, in some occasions patients that are referred by the GPs to the screening centres, are not fully informed about the free screening services. "Sometimes younger than 40 years or older than 70 years women come and ask to take a free mammography examination. For the reason that they have insufficient information from GP, it creates inconvenience, and the need to explain that only aged 40-70 women are eligible for free services" – said the operator.

#### 3.2.2.3 Regional screening program distrust

As per opinion of a study participant quality and the capacity of technical equipment, namely mammography machines is lower in regions compared to those in Tbilisi. "The low quality of the equipment has an influence on the quality of service, it causes distrust of women towards the screening program in the regions and negatively reflects on the participation rate. Considering the fact that Georgia is a small country, where every detail is easily spreading, women tend to use services where the quality is better, in this case in the Capital city. The mentioned fact causes barrier in terms of geographical accessibility for women living in the rural area and seeking screening services in the urban area" said the respondent. She also mentioned the lack of qualified technical staff that can repair the machines, when out of order. It takes time for technicians from the city to come and repair the machines in the regions. "The number of mammography machines, throughout the country, especially in the regions are not enough to provide services to the eligible population. For the purpose to increase the geographical accessibility, mobile mammography services are taken periodically to the areas where women have difficulty in accessing health facilities" – said the screening management team member.

#### 3.2.2.4 Invitation and Recall system

As already mentioned above the BC screening program is opportunistic in Georgia, which means that involvement into the program depends on the individual's decision or on referral. The study participants think that opportunistic system is also a constraint for improving the coverage rate of the target population. "We realize that moving from opportunistic to organized screening will increase the coverage level of the target population in the program, although this amendment faces some challenges. In an organized screening, invitations are issued from the centralized population registers. Considering the fact that the population registers include individual's personal information, having access to that data is related to certain barriers" – said one of the respondents from the management team. Manager of the screening centre shared the experience on the recall system: "In the existing situation is was



difficult to change the total screening system and move from opportunistic to organized one for the purpose to increase the service utilization rate, therefore in two main branches of the NSCs since 2012 we started to use the local NSC database for inviting women to the next screening round or follow-up visit by telephone call. It is worth mentioning that the system was successful and it significantly increased the patients' involvement in the program in the mentioned centres."

### 3.2.2.5 Religion/cultural factors

Only one of the respondents, who usually attends the mammography examination in the regions mentioned that religion is also a barrier for the BC screening service utilization. According to her experience in Akhmeta, region of Kakheti, where part of the residents are Kist minority of Muslim religion, women could not attend the screening without permission of their family leader. The mentioned practice has influence on seeking behaviour of BC screening service and could increase the risk of worse outcome for breast cancer if the diagnosis are delayed, when the treatment is complicated, expensive and less effective.

### 3.3 Respondents recommendations for screening program improvement

The first recommendation that was pointed out from almost all participants of the study was to raise awareness and knowledge about the breast cancer issues and the benefits of the screening services among the target population. The information should be provided regularly through media campaign, TV-shows and advertising. The second important recommendation was to enhance the role of general practitioners in promoting preventive measures to the target population and referring them to the screening programs. Next recommendation was on the recruitment strategy of the eligible population to the screening program. "Based on the international experience the next step for improving the Georgian national screening program and women recruitment strategy, the opportunistic approach should be transformed to the organized approach" said one of the participants. Some respondent suggested that considering the barriers in accessing the population register, for starting the pilot organized screening in one of the Tbilisi districts would be reasonable, and in case of its success it could be replicated to the other parts of the country. There also was a recommendation regarding technical and human resources: to increase the number of high-quality digital mammography equipment across the country; trainings and continuing education of the medical staff providing high quality services; improvement in the mobile mammography unit services to the regions where the local screening services are not easily accessible.

The above mentioned results are coming from health care providers, people working within the BC screening program and are dealing with women coming in the centres for screening. There is no information on unscreened women's opinion. To complement the views and perception of women not attending the mammography screening, the following literature review was done.

### 3.4 Findings of the literature review

#### 3.4.1 Women perception on screening service utilization

The following chapter will feature a review of studies related to the factors influencing the BC screening service utilization from the perspective of women not only in Georgia, but also in other countries. Several examples were found from Eastern European emigrants, also from Romania and Turkey. In the following studies mostly the demand-side factors were mentioned. Lack of knowledge, fear, stigma and disbelief was covered in the Georgian study. Low trust, age group, income level, low enthusiasm and level of education were highlighted in the rest of the reviewed articles. From supply-side factors, staff attitude, source of information and lack of referral was emphasised in the same studies.

Allison Dvaladze in her study about the experience and perception of women living with breast cancer in Georgia, reveals barriers for detection and treatment of breast cancer and also

facilitating factors for survival. The main barriers for detection were expressed in terms of fear, disbelief and denial factors, while facilitators for survival were faith and dignity. Most study participants mentioned fear of learning positive results as the barrier for using screening services. Breast cancer is viewed as a death sentence for them. For some participants' lack of awareness of survivorship resulted in delay of diagnosis. Disbelief and lack of general awareness regarding breast cancer lead to refrain from screening and early diagnosis. 95% of the study participants attend BC screening after detecting lump in their breasts, only one of them were using screening services on a regular basis prior to the breast cancer diagnosis. Some of them could not believe that one day they may also get breast cancer, therefore they do not perceive screening as an important preventive measure. Low level of utilization of screening services is also reinforced by the limited knowledge of the breast cancer risk factors. Concerning the facilitator factors for survival, participants of the study positively assessed their experience with the cancer screening centres. As they mentioned, the relationship and attitude of the screening centre staff had an overwhelming influence on their decision about the future care and treatment. Test results given to them in much shorter time than the standard results come, gave them a sense of being valued and cared for. "You know, we did what they suggested at the screening centre, because after finding out the diagnosis they called and later they checked back to track the outcome. You have the feeling that you matter to them" – stated the study participant (Dvaladze, 2012).

Different studies in other countries revealed some similar barriers for mammography screening utilization as in Georgia, though different constraint factors were also found that potentially could be expected in Georgia. For example the article on Eastern European immigrants showed low health motivation and health-related self-efficacy, low trust and belief in provider's intent for prevention or screening referral (Andreeva & Pokhrel 2013).

The example from Romania seems interesting, for the purpose that screening program is as young as in Georgia. Cornelia Rada's study in Romania reveals three main factors, age group, source of information and income level as influencers in mammography screening use. The most influential factor was the level of income, the rate of attendance on the mammography examination was relatively high in case of high income compared to low income level. The use of mammography also increases if the women is in the age group of 44 or over. Source of information is the third significant factor. Getting mammography in Romania increases if the women are informed about preventive measures from the medical staff rather than from unreliable source, e.g. from friends (Rada et al. 2011).

The lack of referral to the mammography by physician, low enthusiasm and low level of education about the importance of screening services were emphasized as the barriers for mammography examination in Turkey. Having health insurance, visiting physician that refers to mammography and having information about breast cancer were mentioned as the facilitating factors for screening utilization among Turkish women. The study underlines that younger and well educated women are more prone to BC screening behaviours; and also suggests that television and radio are the main and important source of breast cancer information for women (Å & Nahcivan 2006).

The observed barriers in other countries: low health motivation, low enthusiasm, health related self-efficacy, low trust, income level, etc. and the facilitating factors like having health insurance, visits to physicians or better information source could also be affecting Georgian women, although it is not evidence-based as the study has not been done yet.

#### 3.4.2 Different country experiences in screening programs

Considering the fact that incidence of breast cancer in Georgia is high (94.8/100,000), and it continues to be a major killer of Georgian women, improvement of target population coverage level in the national BC screening program will be beneficial for Georgia.

The following studies show that organized BC screening program is effective in reducing breast cancer mortality for the target population. In a review of observational studies on the impact of mammographic screening on the breast cancer mortality in Europe, Broeders et al. revealed that for women invited for screening the mortality reduction is 25-31%, while for women actually screened the reduction is 38-48% (Broeders et al. 2012). The IARC handbook on cancer prevention states that studies conducted in high income countries revealed that women aged 50-69 who attended an organized mammography screening, had a reduction of around 40% in breast cancer mortality (Release 2015). Fabio Levi et al. in their study showed that in several countries, especially where the organized BC screening programs were introduced in 1990s the rate of breast cancer related mortality declined or levelled off (Levi et al. 2001). Introduction of the organized mammography service screening in 7 Swedish counties also resulted in around 40-45% reduction in breast carcinoma mortality among the screened women. According to the study results, the mortality reduction of the majority of breast carcinoma is due to the organized service screening (Duffy et al. 2002). The study that looks for correlations between a breast cancer mortality reduction and the mammography screening programs, states that the decrease is observed in around 16-36% among women invited to screening (Schopper & de Wolf 2009).

The following studies prove that beside the mortality reduction, the benefits outweigh the adverse effect in organized cancer screening programs. IARC handbook points out that for women aged 50-69 years the benefits of mammography screening outweigh the adverse effects, namely false-positive, radiation-induced breast cancer and over diagnosis (Release 2015). European guideline states that organized screening program provides optimal balance between benefit and harm of the screening, it also provides most equitable and cost-effective reduction in cancer rates. The same guideline points out that the cost-effectiveness of the BC screening mainly favours the organized programs, for the reasons of its better organization, invitation system, quality assurance and high coverage level of the eligible population. Organized screening which includes not only recruitment system but also the quality assurance, evaluation of screening results, routine training of health care staff and the follow-up of already screened women, could improve the benefits of screening and reduce social and psychological burden (Perry et al. 2008).

### 3.4.3 Comparison of the different country screening programs

The following table 6 shows the general information on BC screening program in the EU member states, their program organization and the mode for invitation (Commission 2017). Based on the given information, in almost all countries, except Bulgaria, Greece and Slovak Republic the BC screening program is population based, inviting eligible population to the examination via invitation letters or general practitioner/primary healthcare (Romania, Lithuania).

| Table 6. Breast cancer screening programs in EU                                |                              |                    |                            |  |   |                                      |   |   |
|--|------------------------------|--------------------|----------------------------|--|---|--------------------------------------|---|---|
| General information, program organization and mode of invitation for screening |                              |                    |                            |  |   |                                      |   |   |
| Member states  | Year of programme initiation | Target age (years) | Screening interval (years) | Is there a population based programme? | Does the programme issue individual Invitations through the screening registries? | Are the invitations sent as letters? | Does the invitation include a fixed appointment date? | Does the programme actively invite the screen positives for further assessment? |
| Austria  | 2014                         | 45-69              | 2                          | ✓                                      | ✓   | ✓                                    | x   | ✓   |
| Belgium  | 2001 <sup>1</sup>            | 50-69              | 2                          | ✓                                      | ✓   | ✓                                    | ✓ <sup>1</sup>  | x <sup>1</sup>  |
| Bulgaria   | NA                           | 50-69              | —                          | x                                      | NA  | NA                                   | NA  | NA  |
| Croatia  | 2006                         | 50-69              | 2                          | ✓                                      | ✓   | ✓                                    | ✓   | ✓   |
| Cyprus   | 2003                         | 50-69              | 2                          | ✓                                      | ✓   | ✓                                    | x   | ✓   |
| Czech Republic   | 2002                         | 45+ <sup>2</sup>   | 2                          | ✓                                      | ✓   | ✓                                    | x   | ✓   |
| Denmark  | 2008                         | 50-69              | 2                          | ✓                                      | ✓   | ✓                                    | ✓   | ✓   |
| Estonia  | 2003                         | 50-64              | 2                          | ✓                                      | ✓   | ✓                                    | x   | ✓   |
| Finland  | 1987                         | 50-69              | 2                          | ✓                                      | ✓   | ✓                                    | ✓   | ✓   |
| France   | 2004                         | 50-74              | 2                          | ✓                                      | ✓   | ✓                                    | x   | ✓   |

|                 |                   |                    |                      |   |                |                |    |    |
|-----------------|-------------------|--------------------|----------------------|---|----------------|----------------|----|----|
| Germany         | 2005              | 50-69              | 2                    | ✓ | ✓              | ✓              | ✓  | ✓  |
| Greece          | NA                | 40+                | 2 (40-49); 1 (50+)   | x | NA             | NA             | NA | NA |
| Hungary         | 2001              | 45-64              | 2                    | ✓ | ✓              | ✓              | ✓  | ✓  |
| Ireland         | 2000              | 50-69              | 2                    | ✓ | ✓              | ✓              | ✓  | ✓  |
| Italy           | 1990              | 45-74 <sup>3</sup> | 1 (45-49); 2 (50-74) | ✓ | ✓              | ✓              | ✓  | ✓  |
| Latvia          | 2009              | 50-69              | 2                    | ✓ | ✓              | ✓              | x  | x  |
| Lithuania       | 2005              | 50-69              | 2                    | ✓ | x <sup>4</sup> | ✓ <sup>4</sup> | x  | x  |
| Luxembourg      | 1992              | 50-69              | 2                    | ✓ | ✓              | ✓              | x  | ✓  |
| Malta           | 2009              | 50-69              | 3                    | ✓ | ✓              | ✓              | ✓  | ✓  |
| Netherlands     | 1989              | 50-75              | 2                    | ✓ | ✓              | ✓              | ✓  | x  |
| Poland          | 2006              | 50-69              | 2                    | ✓ | ✓              | ✓              | x  | ✓  |
| Portugal        | 1990              | 45-74 <sup>5</sup> | 2                    | ✓ | ✓              | ✓              | x  | ✓  |
| Romania         | 2015              | 50-69              | —                    | ✓ | x <sup>6</sup> | ✓              | ✓  | ✓  |
| Slovak Republic | NA                | —                  | —                    | x | NA             | NA             | NA | NA |
| Slovenia        | 2008              | 50-69              | 2                    | ✓ | ✓              | ✓              | ✓  | ✓  |
| Spain           | 1990              | 50-69 <sup>7</sup> | 2                    | ✓ | ✓              | ✓              | ✓  | ✓  |
| Sweden          | 1986              | 40-74              | 1.5-2                | ✓ | ✓              | ✓              | ✓  | ✓  |
| United Kingdom  | 1988 <sup>8</sup> | 50-70              | 3                    | ✓ | ✓              | ✓              | ✓  | ✓  |

Legends: ✓ = yes, x = no, NA = Not applicable, OR = Official recommendation

<sup>1</sup>In Belgium the population based programme started in 2001 in the Flemish region and 2002 in the Wallonia and Brussels regions. Only in the Flemish Region the letters have a pre-fixed appointment. Screen positive patient is informed through the treating physician to have further investigation; <sup>2</sup>In Czech Republic the invitations are sent only to the women up to 70 years of age; <sup>3</sup>In Lithuania the invitation is sent through primary health care. It may or may not be by letter depending on the organization sending the invitation; <sup>4</sup>In the pilot programme in Cluj (Romania), women are invited by the General Practitioners (GPs) from their patient enrollment lists;

Source: Report on the implementation of the Council Recommendation on cancer screening, 2017

Table 7 shows the invitation coverage and the examination coverage of the BC screening program in the EU member states (Commission 2017). Invitation coverage is defined as target population who received invitation for screening over the total number of annual population, while examination coverage is a proportion of target population who actually had a screening test over the total number of annual population. In 2013 invitation coverage ranged from 21%, (Slovenia) to 100% (France, Ireland, Belgium, Croatia, Poland, Luxemburg and UK). In total 78.9% of the EU member states target population was invited for screening, and 49.2% was actually screened. The highest

| Age-50-69 years;<br>Index year-2013<br>(unless otherwise specified) | Annual population<br>EUROSTAT<br>2013 | Women invited     | Women Screened    | Invitation Coverage<br>(On Annual population) % | Examination Coverage<br>(On annual population) % |
|---|---------------------------------------|-------------------|-------------------|---|--|
| Austria   | 531,160                               | 0                 | 196,049           | 0.0%  | 36.9%  |
| Belgium   | 691,515                               | 689,459           | 228,204           | 99.7%   | 33.0%  |
| Bulgaria  | 527,002                               | 0                 | 0                 | 0.0%  | 0.0%   |
| Croatia   | 582,397                               | 610,279           | 262,910           | 104.8%  | 45.1%  |
| Cyprus  | 48,904                                | 19,385            | 8,091             | 39.6%   | 16.5%  |
| Czech Republic  | 708,367                               | 0                 | 418,475           | 0.0%  | 59.1%  |
| Denmark   | 357,246                               | 294,022           | 257,224           | 82.3%   | 72.0%  |
| Estonia   | 72,087                                | 49,906            | 33,106            | 69.2%   | 45.9%  |
| Finland   | 373,976                               | 342,616           | 284,433           | 91.6%   | 76.1%  |
| France  | 4,102,054                             | 4,212,556         | 2,146,905         | 102.7%  | 52.3%  |
| Germany   | 5,377,480                             | 4,881,399         | 2,832,631         | 90.8%   | 52.7%  |
| Greece  | 692,509                               | 0                 | 0                 | 0.0%  | 0.0%   |
| Hungary   | 549,682                               | 431,408           | 210,887           | 78.5%   | 38.4%  |
| Ireland   | 189,595                               | 209,533           | 144,508           | 110.5%  | 76.2%  |
| Italy   | 3,875,770                             | 2,737,153         | 1,515,395         | 70.6%   | 39.1%  |
| Latvia  | 144,392                               | 142,115           | 48,459            | 98.4%   | 33.6%  |
| Lithuania   | 207,552                               | 0                 | 93,113            | 0.0%  | 44.9%  |
| Luxembourg  | 29,603                                | 31,834            | 17,893            | 107.5%  | 60.4%  |
| Malta   | 19,716                                | 15,531            | 7,169             | 78.8%   | 36.4%  |
| Netherlands   | 1,086,042                             | 1,049,781         | 841,444           | 96.7%   | 77.5%  |
| Poland  | 2,591,705                             | 2,637,179         | 1,141,351         | 101.8%  | 44.0%  |
| Portugal  | 696,297                               | 385,664           | 235,035           | 55.4%   | 33.8%  |
| Romania   | 1,297,027                             | 3,000             | 2,460             | 0.2%  | 0.2%   |
| Slovakia Republic   | 351,211                               | 0                 | 0                 | 0.0%  | 0.0%   |
| Slovenia  | 134,371                               | 28,066            | 25,695            | 20.9%   | 19.1%  |
| Spain   | 2,772,700                             | 2,349,369         | 1,654,865         | 84.7%   | 59.7%  |
| Sweden  | 941,165                               | 878,537           | 719,689           | 93.3%   | 76.5%  |
| United Kingdom  | 2,639,565                             | 2,930,416         | 2,205,962         | 111.0%  | 83.6%  |
| <b>European total</b>   | <b>31,591,090</b>                     | <b>24,929,208</b> | <b>15,531,953</b> | <b>78.9%</b>                                    | <b>49.2%</b>                                     |

Cyprus Nicosia, Romania Cluj and all Swedish regions except Stockholm: EUROSTAT target population data not available, used own local sources.

Austria, Czech Republic and Lithuania did not issue or could not document personal invitations at the time of the index year.

Source: Report on the implementation of the Council Recommendation on cancer screening, 2017

examination coverage was observed in the countries, where the screening was initiated around 30 years ago, in United Kingdom, Netherlands, Ireland, Sweden and Finland. Countries without invitation system show the lowest coverage rate. In the countries where the program is still young, the examination coverage is still lower than desired level (70%). Georgia also counts in the list where the coverage level is relatively low, with estimated 18,1% in Tbilisi and 9,2% in the regions.

#### 3.4.4 Comparison of different country strategies

This chapter shares different strategies for improving women participation rate in the BC screening program from countries, such as Czech Republic, Hungary, Poland and New South Wales that could be important for Georgia to consider for implementing screening program more effectively. Systematic reviews that supported the success stories of presented countries will also be presented.

The study from Hungary and Poland suggests that personal invitation letter is the effective strategy for women recruitment in the screening program. The same strategy is supported by Camilloni et al. in 2013 in the systematic review. Boncz et al. in 2008, analyses the effect of an organized BC screening program on non-organized mammography screening in Hungary, where the organized program was introduced in 2002. Women were invited to mammographic screening by personal letter that resulted in an increase of the number of mammography. In 2000-2001 the number of women involved in non-organized mammography screening were around 250,000 when in 2005 it increased to 350,000 (Boncz et al. 2008). In Poland the population-based BC screening was adopted in 2007. Personal invitation based on the population register was used as the most important part in the invitation process, although other methods as media campaign, advertising, health professionals, web-sites and phone hot-lines were used for invitation for screening. Based on the study results, in the Lower Silesia region of Poland, 75,5% of the target population were invited by personal letters, while remaining 24,5% were informed via other above mentioned means and examined by self-recruitment. When summarized, the coverage by examination was 40% of the eligible population. (Matkowski & Szynglarewicz 2011). The systematic review done in 2013 by Camilloni et al. supports the idea of inviting women by personal letters and concludes that the postal reminders have a modest positive effect. Phone calls also have an effect on recruiting women, although the approach was not assessed as a pragmatic method. There was an evidence that the different style of invitation letters can affect the participation level e.g. long letters can discourage women with lower education level, while the invitation letters with a GP signature have a very positive effect (Camilloni et al. 2013).

One study done by Page et al. in New South Wales in 2007, and a systematic review on the strategies for increasing participation of women in BC screening conducted by Bonfill Cosp et al. in 2001 found the invitation letter plus phone call strategy as the most effective method for women recruitment. In New South Wales the invitation strategy for screening includes invitation letter for initial examination and for subsequent screening in every two years. The author compared the existing strategy to the following ones: two invitation letters – initial and reminder for women who did not respond in six weeks and invitation letter together with the follow-up phone call if women do not respond within six weeks. No-intervention group was also taken for comparison. As the result showed, all three intervention was much effective and increased initial mammography screening rate compared to no-intervention group. The highest screening rate was evident for the invitation letter plus phone call strategy (Page et al. 2007). The systematic review supported the above mentioned strategy and suggested that the most effective ways for recruiting women were sending invitation letters, making phone calls, organizing training activities and sending educational materials. Combination of the phone calls and invitation letters have been tested as an effective method for lower socio-economic groups. Based on the evidence, if the recruitment is addressed individually without merging with other examinations, the participation rate of women is higher. The methods like home visits and combination of invitation letters with educational materials showed no effect

on participation rate. The authors of the study suggest that the interventions as letters and phone calls are the cheapest, simplest and effective alternatives to consider at the first instance (Bonfill Cosp et al. 2001).

While a different strategy was chosen in Czech Republic for increasing women participation, it was still successful. Women were referred to the BC screening program by their general practitioner as the centralized invitation system was not established. The system was also reinforced by the media campaigns and the recall for subsequent mammography screenings by screening facilities. Based on the evidence, mammography screening in Czech Republic successfully transformed from opportunistic to an organized screening. During 2002 to 2008 the coverage level reached 51,2% in the target age group. According to the author's conclusion, next step for Czech Republic to reach the coverage targets set by the European Guidelines is to implement addressed invitation and establish system to monitor the impact of cancer screening on population epidemiology (Majek et al. 2011). The systematic review that compared studies on population-based BC screening programs and spontaneous access, supported both invitation letter-based or general practitioner-based approach. The author points out that for obtaining higher screening test uptake both strategies are effective, although GP-based programs seemed to be more relevant by their cost-effectiveness (Ferroni et al. 2012).

Based on the above evidences, improvement of the target population coverage level into BC screening programs directly reflects on the breast cancer mortality reduction. In order to decrease breast cancer mortality, Georgia should take into consideration the presented successful stories and try to choose and implement the most relevant strategy for the country.

## Chapter 4. Discussion

The findings of this study show that generally the coverage level of the target population in Georgian BC screening program seems relatively stable. It slightly dropped in 2011 and 2012, explained by some technical issues and possibly by less effort in the program promotion. However, the positive trend is observed since 2012, which could be attributed to the introduction of recall system in particular centres to invite already screened women for subsequent screening rounds. Apart from that, with time the program earned more trust among the population and more women were willing to join the program for the first or subsequent rounds. It is worth mentioning that in the beginning the program was very young and women were eligible only for initial screening. Over the years the follow up visits or subsequent screening rounds have a positive impact on the coverage level.

In 2011, during the first year of the regional program, coverage rate was 3,7% which raised sharply in one year reaching 6,7%. After that the slight growth till 2016 took the level to 9.2%. Despite the growing trend of the coverage level, it is still below the standard desired level of 70% to enable the decrease breast cancer related mortality. Based on different country experience, it is obvious, that reaching desired coverage level in Georgia would be difficult if the existing enrolment strategy for women is not changed. From the conceptual model the following demand-side factors were found as barriers for the service utilization in Georgia: low awareness and knowledge of eligible population on breast cancer issues, fear, stigma, disbelief and in some occasion the religious or cultural factor. In regards of the supply-side: low level of GPs involvement in referral process, insufficient invitation and the recall system, and regional screening program distrust could play a role.

Participation rate of the screened women in 2014 – 2016 is quite similar across the regions during these three years, with the highest participation rate in Kakheti region and with lowest in Racha-Lechkhumi and Kvemo Svaneti. The reason why the latest has the lowest number of screened women out of the total, is that the target population is relatively small compared to other regions. Looking at the target population coverage level in the mentioned region 13% of the target population was already screened in 2016.

The comparison was also done by coverage level of the target population by regions, where the highest, 17% of the target population was screened in Kakheti and lowest, 3% in Samtskhe-Javakheti. There is no study done in Georgia that could explain the actual factors for such a huge gap between the participation rates in different regions. There was nothing mentioned by the study participants that could explain this gap. It could be estimated that Kakheti region has more convenient location compared to Samtske-Javakheti because of its proximity to the capital city. The estimated factors for Kakheti region that screens the highest number of eligible population could be: better developed area vs. the mountain regions, adequate quality of equipment and good managerial skills of the local staff.

The analysis of the age group distribution showed that most of the screened women are from 40-49 of age, followed by 50-59 and 60-70 age groups. Trend is the same in rural or urban areas of Georgia. Data analysis revealed slight fluctuation of the participation rate over time. There is no study or analysis done in Georgia that can explain this fluctuating trend of the participation rate. Based on participants' opinion, when female reproductive system starts age related changes, women become more sensitive and attentive towards their health. Therefore participation rate in the cancer screening program are higher in younger age women, rather than over 60 years. The other reason mentioned by study participants was the communication methods through which the information about screening program is disseminated. According to their view, the social media, flyers and information brochures are more accessible for younger age groups.

The findings of current study revealed that almost half of the women screened in 2015 and 2016 came for mammography screening for the first time. And small percentage came for subsequent rounds. Between 11-14% came for the follow up visits. Apart from the young age of both Tbilisi and regional screening programs, the other reason for low attendance rate on subsequent rounds and follow up visits could be the invalid recall system. As one of the respondents shared her experience on the recall system, it was working successfully in two centres in Tbilisi, therefore it was suggested that the same recall system be introduced and implemented in other screening facilities.

As mentioned in the conceptual model, the supply-side factors such as quality of services and the role of trained and qualified medical staff were found as facilitating for the service utilization. Qualitative analysis and also the interviews revealed geographical accessibility also to be a facilitator, for the fact that women registered in the rural regions can use screening services in Tbilisi. From the demand side it was trust and free of charge services that showed a positive influence on the mammography screening attendance.

Awareness and knowledge of the breast cancer issues among women has a crucial role on screening. Based on this study findings, knowledge of breast cancer risk factors, preventive measures and screening among Georgian women seems to be very low. Such lack of knowledge is strongly related to the fear about positive results and fear of death. If a woman is not aware on the benefit of cancer early detection and treatment options, it will negatively affect the future desire to attend screening services. Routine educational campaigns on breast cancer related topics among women, also media campaigns and TV shows can increase this awareness and knowledge to help women to overcome fear, change behaviour and use breast cancer screening services routinely.

Less active role of general practitioners in providing women with the information about the preventive measures and lack of referral to the mammography screening was also revealed as one of the major constraint factors in screening service utilization. Lack of high quality mammography machines and qualified technician staff in Georgian regions negatively reflects on using services. Absence of invitations and invalid recall system was revealed as a direct barrier for utilizing screening services across the county. Based on one respondents opinion religion also could play a negative role in the service utilization in one of the Georgian regions, although it could also be a cultural factor, given that this region is populated by one particular ethnic group, with its own distinct cultural norms. Poverty came up as a barrier while reviewing the example from Romania that could also be applicable for Georgia.

With the methods used in this study, referring to the conceptual model, nothing was found on the family history and indirect cost from the demand-side factors, neither on the waiting time, working hours and monitoring from the supply-side factors. To explore the mentioned factors, further research is needed. Especially for the family history, as I believe that it could be one of the major determinants for screening service utilization in Georgia.

In order to increase target population coverage in the BC screening program and implement it more effectively, several strategies were suggested from the study participants and the reviewed literature. During revising the successful examples of different countries, it turns out that vast majority of the countries have experience of the population-based, organized BC screening programs. In most of them the recruitment system is based on sending invitation letters, making phone calls, sending educational materials, organizing training activities, media campaign, advertising or combinations of different mentioned methods. Some countries have experience in GP-based programs, where general practitioner refers women to the mammography screening. To summarize different articles, any intervention is more effective in raising coverage level, than no intervention. Combination of the interventions, e.g. invitation letter and phone calls, seems to be the most effective way. GP-based approach was mentioned as more cost-effective method, rather than letter-based. According to Majek et al.,



study experience from Czech Republic shows that referring women to mammography screening by the GP increased the coverage level to 51,2%, although the system was also reinforced by the media campaigns and recall for subsequent mammography screenings by the screening facilities.

Study participants also suggested transformation of the existing opportunistic screening process to the organized one, although they mentioned specific constrains that this latter might face. The major challenges seems to be the access to the population register and women's personal data for the purpose of sending personal invitation letters, along with the cost of the postal services.

Rapid transformation of the entire BC screening program to the organized one will be costly for Georgia if it is based on personal invitations. The new system will require additional human resources and expenses for the invitation sending procedures and postal services. Besides the mentioned barriers, rapid growth of the demand on the screening services should also be considered. As interviews show, there is a shortage of quality mammography machines in the regions. Therefore in response to the beneficiaries' high demand for high quality services there should be sufficient technical and human resources put in place. Changing the women enrolment strategy for BC screening program could also have implications for other existing cancer screenings programs in Georgia, such as cervical and colorectal cancer. Improved participation in BC screening could raise participation for other screenings as well, considering the fact that women attending screening facility try to undergo all the examinations she is eligible for. Hence changing the approach for BC screening program should be aligned with other programs also in terms of trained staff and the equipment capacity. Discussing the option of GPs involvement into recruiting system in Georgia, despite the barriers such as being employed in private sector with no motivation or incentives to refer women to the state screening program, the respondents still support the idea that enhancement of GPs role in providing information to the target group on breast cancer issues and referring them to the screening program will significantly increase the participation rate.

## Chapter 5. Conclusion and recommendations

### 5.1 Conclusion

This study described the main factors determining the utilization of BC screening services in Georgia, analysed different countries experience of screening programs, the ways of effective implementation and improvement of target population coverage level.

In conclusion the study results have shown that BC screening service utilization is low in Georgia, with the highest estimated rate of 18,1% in Tbilisi and 9,2% in the rural regions in 2016. The level of coverage in the regions significantly differs across. The participation rate of younger-age women exceeds that of the elder ones. Almost half of the screened women are attending mammography screening for the first time, while the rate of attendance for subsequent screening rounds is relatively low.

The paper revealed different barriers and facilitating factors associated with the demand and supply-sides as mentioned in the model that influence the screening service utilization in Georgia. Trust in high quality screening services and a free of charge services emerged as the demand-side facilitating factors, while supply-side factors include quality of services, trained and qualified medical staff and geographical accessibility.

From demand-side barriers for service utilization low awareness and knowledge on BC issues came up as one of the major factors, also culture, fear, stigma and disbelief play a significant role for low utilization rate. GPs low involvement in promoting screening services, lack of referral to mammography screening, insufficient invitation and recall system, lack of high quality mammography equipment and qualified technician staff in Georgian rural regions are all mentioned as the constraints for screening service utilization from the supply-side.

Different strategies were reviewed from the literature and interviews concerning the improvement of the utilization rate and effectiveness of the screening program. The best suggested options were to recruit women through invitation letters, in combination with phone calls and involvement of general practitioners in the enrolment process. Based on the scientific evidences, the combination of these methods with educational and media campaigns can be a possible strategy to increase the effectiveness of intervention.

Considering Georgian reality, with different health priorities and limited budget, the best way would be to choose the strategy with less cost and high potential to increase the target population coverage in the mammography screening and maximise the program effectiveness. Therefore introduction of GPs-based approach would be less costly and effective to raise the coverage level. On the other hand, pilot program of letter-based approach could be introduced in one of the Tbilisi districts, with future opportunity to scale up gradually across other regions as a response to the growing demand for such services.

## 5.2 Recommendations

1. Government should increase awareness and knowledge of the target population on breast cancer issues, risk factors, preventive measure and screening programs through media and communication campaign for women aged between 40-70 years.
2. A system for GP involvement in women recruiting process should be introduced by policy makers that will include promotion of preventive measures to the target population and referring them to the mammography screening.
3. Tbilisi municipality being a primary stakeholder for BC screening program should run a pilot program on letter-based invitation system for women recruitment. It can be started from one of Tbilisi districts to test the effectiveness of the program.
4. BC screening program managers should enable the recall system in every screening facility for inviting already screened women for subsequent rounds or follow up visits.
5. Government should establish the system through NSC to monitor the impact of new recruitment strategies.
6. NSC should conduct regular outreach services in rural areas for the purpose to monitor the quality of screening services. It should include service delivery process, capacity of trained staff and technical equipment in the regions.
7. Ministry of Health should be promoting further research in the direction of better understanding other potential influencing factors like: family history, income level and socio-economic status. More research of unscreened women is also needed to identify the reasons for them not attending BC screening in Georgia.

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