

**Study of Cancer Control and Related Policies and Their Impact on Population
Behaviour in Georgia**

Marina Topuridze

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**Scientific Supervisor – Nino Makhashvili , PhD. Professor, Ilia State
University**



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As the author of the submitted dissertation, I declare that this thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis. This document has not been submitted for qualifications at any other academic institution.

Name, Surname: Marina Topuridze

Signature: 

Date: 19 December 2024

კიბოს კონტროლისა და მასთან დაკავშირებული პოლიტიკის ზეგავლენის შესწავლა პოპულაციის ქცევაზე საქართველოში

აბსტრაქტი

შესავალი

კიბო საზოგადოებრივი ჯანმრთელობის მნიშვნელოვანი გამოწვევაა საქართველოში, დაავადების მზარდი ინციდენტობისა და სიკვდილიანობის მაჩვენებლების გათვალისწინებით. ქცევითი ფაქტორები, კერძოდ, თამბაქოს მოხმარება და კიბოს სკრინინგის პროგრამებში დაბალი ჩართულობა, მნიშვნელოვან როლს თამაშობს ამ ტვირთის გაზრდაში. თამბაქოს კონტროლის არსებული პოლიტიკისა და კიბოს სკრინინგის ინიცირებული პროგრამების მიუხედავად, კიბოს კონტროლის აღნიშნული ზომების ეფექტიანობა მოსახლეობის ქცევების შეცვლის კუთხით ჯერ კიდევ ნაკლებადაა შესწავლილი.

კვლევის მიზანი

კვლევის მიზანია საქართველოში კიბოს კონტროლის პოლიტიკის გავლენის შეფასება მოსახლეობის ქცევებზე და მის მიღების პროცესზე მზემოქმედი ფაქტორების იდენტიფიცირება, თამბაქოს კონტროლსა და კიბოს სკრინინგის პოლიტიკაზე ფოკუსირებით.

მეთოდები

კვლევა მოიცავს ორ ფართომასშტაბიან რაოდენობრივ კვლევას:

თამბაქოსგან თავისუფალი ჰაერის კოალიციები საქართველოში და სომხეთში: რანდომიზებული კონტროლირებადი კვლევა (2017-2021): აღნიშნული რანდომიზებული კონტროლირებადი კვლევა აფასებს თამბაქოს კონტროლის ზომების ეფექტიანობას მოწევის ქცევასა და მასთან დაკავშირებულ ფაქტორებზე.

კიბოს სკრინინგის ბარიერები: ცოდნა, დამოკიდებულებები და პრაქტიკა (KAP) კვლევა პირველადი ჯანდაცვის მუშაკებს შორის (2023): არნიშნული ჯვარედინ-სექციური კვლევა შეისწავლის კიბოს სკრინინგის პროგრამებს, აფასებს ბარიერებს როგორც სამედიცინო პერსონალის, ასევე პაციენტების პერსპექტივიდან.

მონაცემთა შეგროვების მეთოდები მოიცავს კვლევებს, ინტერვიუებს და არსებული ანგარიშების ანალიზს, რაც უზრუნველყოფს კიბოს კონტროლთან დაკავშირებული ჯანმრთელობის ქცევების განმსაზღვრელი ფაქტორების სრულყოფილ გაგებას.

შედეგები

კვლევამ აჩვენა, რომ თამბაქოს კონტროლის ფართო პოლიტიკამ ხელი შეუწყო მოწევის გავრცელების შემცირებას და გაზარდა საზოგადოებრივი მხარდაჭერა თამბაქოსგან თავისუფალი გარემოსთან მიმართებაში. თუმცა, პრობლემად რჩება პოლიტიკის აღსრულების გამოწვევები და მოწევის ქცევებზე მოქმედი სოციალურ-კულტურული ფაქტორები. კიბოს სკრინინგის მიმართულებით, კვლევამ გამოავლინა მნიშვნელოვანი ბარიერები, მათ შორის დაბალი ინფორმირებულობა, ხელმისაწვდომობის პრობლემები და სამედიცინო პერსონალის არასაკმარისი ჩართულობა, რაც ხელს უშლის მოსახლეობის ჩართვას სკრინინგის პროგრამებში.

დასკვნები

თამბაქოს კონტროლის პოლიტიკამ დადებითად იმოქმედა მოწევის ქცევებზე, თუმცა, აღსრულების გამოწვევებისა და სოციალურ-კულტურული ფაქტორების გამო, მისი სრული პოტენციალი შეზღუდულია. კიბოს სკრინინგის ინიციატივები მნიშვნელოვანი ბარიერების წინაშეა, რომლებიც ზღუდავენ მათ ეფექტიანობას. ამ გამოწვევების მოგვარება მოითხოვს მიზანმიმართულ ინტერვენციებს, საზოგადოებრივი ინფორმირებულობის გაზრდას და ჯანდაცვის ინფრასტრუქტურის გაძლიერებას, რათა გაუმჯობესდეს პოლიტიკის დანერგვა და ეფექტიანობა კიბოსთან დაკავშირებული დაავადებისა და სიკვდილიანობის შემცირების მიზნით საქართველოში.

საკვანძო სიტყვები: კიბოს კონტროლი, თამბაქოს პოლიტიკა, კიბოს სკრინინგი, ქცევითი ფაქტორები, საქართველო

Abstract

Background

Cancer poses a significant public health challenge in Georgia, with rising incidence and mortality rates. Behavioural factors, notably tobacco use and low participation in cancer screening programs, substantially contribute to this burden. Despite the implementation of tobacco control policies and cancer screening initiatives, the effectiveness of these measures in altering population behaviours remains underexplored.

Objective of the Study

This study aims to evaluate the impact of cancer control policies on population behaviours in Georgia and to identify factors influencing their adoption, with a specific focus on tobacco control and cancer screening policies.

Methods

The research comprises two comprehensive quantitative studies including: (1) Tobacco-Free Air Coalitions in Georgia and Armenia: A Randomized-Controlled Survey (2017-2021): This study evaluates the effectiveness of tobacco control measures through a randomized-controlled survey, analysing their impact on smoking behaviour and related factors. And (2) Cancer Screening Barriers: Knowledge, Attitudes, and Practices (KAP) Study among Primary Healthcare Workers (2023): This study investigates cancer screening programs by assessing barriers to uptake from both provider and patient perspectives.

Data collection methods include surveys, interviews, and analysis of existing health reports, ensuring a comprehensive understanding of the factors influencing health behaviours related to cancer control.

Results

The findings indicate that comprehensive tobacco control policies have led to a reduction in smoking prevalence and increased public support for smoke-free environments. However, challenges persist in policy enforcement and addressing socio-cultural factors influencing smoking behaviours. Regarding cancer screening, the study identified significant

barriers, including limited awareness, accessibility issues, and healthcare provider engagement, which hinder participation in screening programs.

Conclusions

While tobacco control policies have positively influenced smoking behaviours, their full potential is hindered by enforcement challenges and socio-cultural factors. Cancer screening initiatives face substantial barriers that limit their effectiveness. Addressing these challenges requires targeted interventions, enhanced public awareness, and strengthened healthcare infrastructure to improve policy adoption and effectiveness in reducing cancer-related morbidity and mortality in Georgia.

Key Words: *Cancer control, tobacco policies, cancer screening, behavioural factors, Georgia*

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List of Abbreviations (Required if there are any)

BCI - Behavioral and Cultural Insights

BCW - Behavior Change Wheel

C/Can - City Cancer Challenge

CCAT - Community Coalition Action Theory

CME - Continuous Medical Education

CPD - Cigarettes Smoked Per Day

CRCT - Cluster Randomized Controlled Trial

DALYs - Disability-Adjusted Life Years

ENDS - Electronic Nicotine Delivery Systems

FTCT - Framework Convention on Tobacco Control

GMF - Global Monitoring Framework

GBCI - Global Breast Cancer Initiative

GYTS - Global Youth Tobacco Survey

HPV - Human Papillomavirus

HTPs - Heated Tobacco Products

IARC - International Agency for Research on Cancer

ICC - Intra-Class Correlation

IQOS - I Quit Original Smoking (heat-not-burn tobacco product)

KAP - Knowledge, Attitudes, and Practices

KPIs - Key Performance Indicators

LMIC - Low and Middle-Income Countries

NCDs - Non-Communicable Diseases

NCDC - National Center for Disease Control

PRH - Primary Healthcare

RCT - Randomized Controlled Trial

SHSe - Secondhand Smoke Exposure

STEPS - Non-Communicable Disease Risk Factor Survey

UHCP - Universal Health Care Program

UHC - Universal Healthcare

UN - United Nations

UNDP - United Nations Development Program

UV - Ultraviolet Rays

WHO - World Health Organization

WHO/IARC - International Agency for Research on Cancer (WHO)

YLLs - Years of Life Lost

Cancer Burden

Cancer is a leading global health concern, with its burden projected to increase significantly in the coming decades. This rise is anticipated to disproportionately affect low- and middle-income countries (LMICs), where incidence rates are expected to grow by 65% to 95% due to demographic shifts and lifestyle risk factors (Sung et al. 2021a; World Health Organization, n.d.). The prevalence of cancer risk factors, such as tobacco use, unhealthy diets, physical inactivity, and low screening uptake, poses serious challenges for these regions. Emerging economies are witnessing a shift in cancer types, from infection-related cancers to those prevalent in high-income countries, such as breast, lung, and colorectal cancers (Sung et al. 2021a). The economic and social consequences of this trend are profound, extending beyond medical expenses to impact individuals and their families/caregivers globally, thereby affecting healthcare systems, workforce productivity, and national economies.(Alzehr et al. 2022)

In Georgia, cancer presents a significant public health challenge, characterized by a higher mortality-to-incidence ratio and lower survival rates compared to many nations in the World Health Organization (WHO) European region and other post-Soviet states. (De Angelis et al. 2024a; “Cancer Today,” n.d.) In 2022, Georgia recorded 13,689 new cancer cases, reflecting an age-standardized incidence rate of 197.5 per 100,000 population, with 39% of new cancer cases diagnosed at late stages (III and IV), and a pattern consistent with that observed in neighbouring countries. (Sung et al. 2021a; Ryzhov et al. 2021a) The country also recorded a high cancer mortality rate, with an age-standardized mortality rate of 111.7 per 100,000 population and 8,459 cancer-related deaths reported, resulting in a mortality-to-incidence ratio of 0.4.(Sung et al. 2021a)

Cancer's economic impact is also substantial, with the total economic loss from cancer and other non-communicable diseases (NCDs) in Georgia exceeding 3 billion GEL, approximately 6.2% of the national GDP. This underscores the urgent need for a multifaceted approach to cancer control that considers both health and economic consequences. (“National

strategy for prevention and control of non-communicable diseases in Georgia for 2023-2030 and 2023-2025 action plan approval.” n.d.)

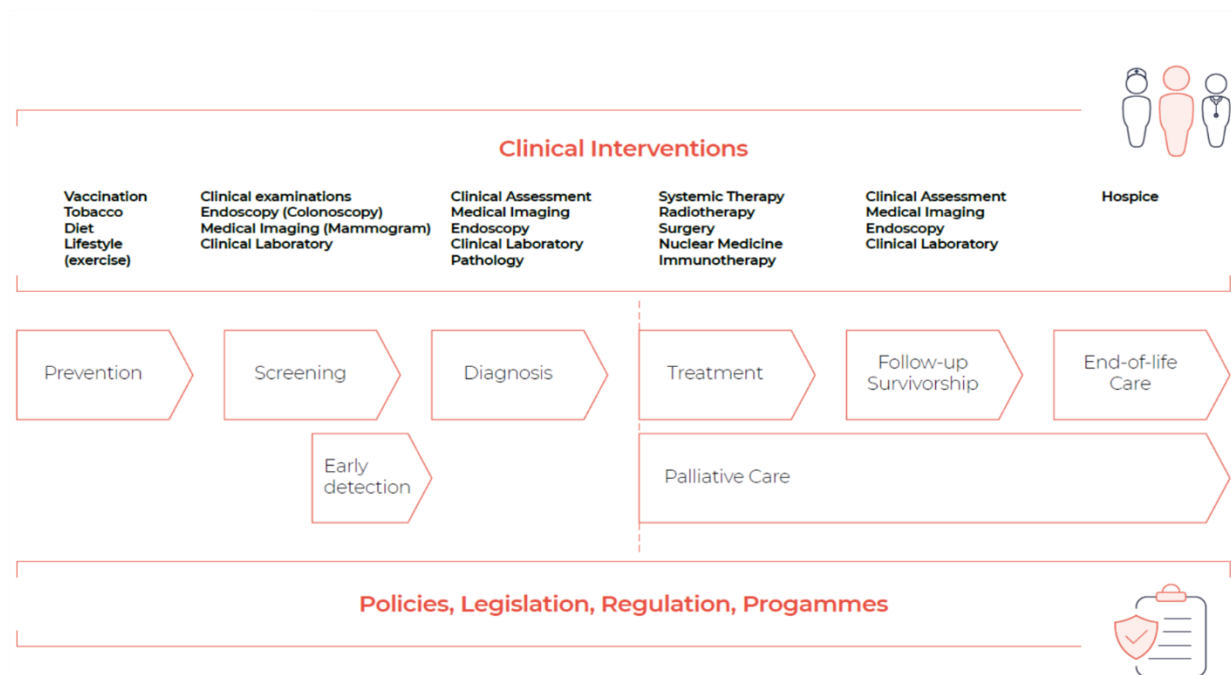
Cancer control and Role of Behavioural Factors

Despite the significant burden cancer poses on individuals and health systems worldwide, its impact can be effectively addressed through comprehensive and holistic strategies in cancer control. According to the WHO’s Cancer Control: Knowledge into Action – Planning Module, *"Cancer control aims to reduce the incidence, morbidity, and mortality of cancer and to improve the quality of life of cancer patients in a defined population, through the systematic implementation of evidence-based interventions for prevention, early detection, diagnosis, treatment, and palliative care."* (WHO 2007a) This approach focuses on taking coordinated actions at every stage of cancer care to ensure fair access to services and better outcomes for individuals and communities.

An essential aspect of cancer control is the cancer control continuum, a framework (NIH 2020) developed in the mid-1970s that outlines the various stages of cancer care, including understanding causes, prevention, early detection, diagnosis, treatment, survivorship, and end-of-life care. This framework provides a systematic approach to addressing the complex processes involved in managing cancer. In addition to serving as a planning tool, it highlights the interconnections between different stages of care, enabling stakeholders to identify key opportunities for intervention and address any gaps in service delivery.

The cancer control continuum framework identifies population behaviours as one of the key determinants of cancer morbidity, mortality and years of life lost (YLLs) across all stages, from aetiology and prevention to diagnosis, treatment, survivorship, and end-of-life care. (National Cancer Institute., n.d.).

Figure 1 Cancer Control Continuum



* Adopted from (National Cancer Institute., n.d.)

Behavioural factors play a crucial role across all four main categories of cancer control: prevention, early detection, diagnosis, treatment including palliative care. (WHO 2007a) Risky behaviours, including tobacco use, poor diet, alcohol consumption, sedentary lifestyles, and excessive ultraviolet (UV) exposure, have been identified as leading contributors to nearly half of all cancer cases globally. (Marino et al. 2024; Poorolajal et al. 2021; O’Sullivan et al. 2022; Diao et al. 2023) Additionally, uptake of vaccination such as the human papillomavirus (HPV) and hepatitis B vaccines, are crucial for preventing HPV and Hepatitis B associated cancers, including cervical, or pharyngeal, vulvar, vaginal, penile, anal and liver cancers. (Huh et al. 2017; M. Cao et al. 2022) In the secondary prevention, low uptake of cancer screening among the general population, coupled with inadequate patient consultation and screening practices by healthcare workers, significantly hinders early detection and timely intervention. (Mandrik et al. 2019; Bellhouse et al. 2021) These barriers contribute to late-stage diagnoses and poorer health outcomes.

Furthermore, in the context of treatment and palliative care, where the goal is to manage and improve the quality of life for individuals diagnosed with cancer, consistent and proactive engagement in healthy lifestyle, recommended medical follow-ups and adherence to treatment plans are often influenced by behavioural factors. (Meneu et al. 2024; Schenker et al. 2021; Bonetti et al. 2022) Collectively, existence or absence of the listed behaviours not

only worsen the global cancer burden but also emphasize the need for adequate policies and program at place that effectively address behaviour change at every stage of cancer control continuum.

Cancer control policies and programs

The increasing global cancer burden, the urgency to achieve the United Nations Sustainable Development Goals (SDGs), and the need to mitigate the impact of recent and future health emergencies highlights the importance of comprehensive, evidence-based cancer control policies, plans, and programs. (Collaborators 2020; “Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem,” n.d.; Anderson et al. 2021) Such policy actions, proven effective in high-income countries, include implementing tobacco-free policies (Bafunno et al. 2020; Cornelius et al. 2022), expanding immunization efforts (Wang et al. 2022), promoting regular cancer screening (Hanna et al. 2020), and encouraging healthy lifestyle choices, have been shown to significantly reduce cancer incidence and mortality (Montagnese et al. 2020).

Georgia has implemented a series of comprehensive strategies to address cancer and its primary behavioural risk factors, collaborating with international partners to enhance public health outcomes. Key initiatives include the National Strategy for the Prevention and Control of Non-Communicable Diseases (2023–2030), which outlines evidence-based interventions for cancer prevention and health promotion (“National strategy for prevention and control of non-communicable diseases in Georgia for 2023-2030 and 2023-2025 action plan approval,” n.d.). Additionally, the integration of hepatitis B vaccination into the routine immunization schedule since 2002 and the introduction of the human papillomavirus (HPV) vaccine in 2019 have been pivotal in reducing infection-related cancer risks. The country's ambitious program to eliminate hepatitis C further underscores its commitment to combating cancer-associated infections (“2023-2025 National Viral Hepatitis Elimination Strategy and Action Plan of Georgia,” n.d.)

A key achievement within cancer control efforts was the enactment of new tobacco control legislation on May 1, 2018. This legislation marked a major step in reducing tobacco-related health risks, a key factor in cancer control, by banning smoking—including e-cigarettes and hookahs—in all enclosed public spaces, workplaces, and public transportation.

Additionally, it prohibited tobacco advertising, sponsorships, and promotions, mandated plain packaging with health warnings covering 65% of tobacco product packaging, and classified e-cigarettes containing nicotine as tobacco products. Such comprehensive tobacco control measures are crucial in lowering the incidence of tobacco-related cancers and improving overall public health outcomes (UNDP 2018b). Introduction of the Universal Health Care Program (UHCP) since 2013 and comprehensive tobacco control policies (WHO 2021c) have led to improvements in self-reported health status and a reduction in chronic disease prevalence between 2007 and 2023 (Gorgodze T., Gotsadze G. 2023). Comprehensive tobacco control policies (WHO 2021c), which have led to improvements in self-reported health status and a reduction in chronic disease prevalence between 2007 and 2023 (Gorgodze T., Gotsadze G. 2023).

Since 2015, Georgia has implemented a state-funded health promotion program aimed at addressing cancer-related behavioural risk factors and enhancing public health. This initiative has significantly contributed to cancer control by reducing the prevalence of risk factors, facilitating early detection through screening, and promoting preventive behaviours among the population (“State Health care program for 2024,” n.d.). The program encompasses three key components, including:

1. **Strengthening Tobacco Control** This involves rigorous enforcement monitoring to ensure compliance with anti-tobacco laws, aiming to reduce smoking rates and associated cancer risks.
2. **Providing Psychological Support through Professional Services:** Establishing services such as quit lines offers individuals the necessary support to overcome tobacco addiction, thereby decreasing cancer incidence linked to smoking.
3. **Promoting Health Promotion Initiatives and Enhancing Services within State Health Programs:** This focuses on educating the public about behavioral risk factors and environmental health issues, as well as promoting services available under state health programs, including cancer screening and immunization programs.

Another important advancement in cancer control is the establishment of a national cancer registry (WHO 2021a). Implemented in 2015 by the National Centre for Disease

Control and Public Health (NCDC), the registry utilizes the CanReg-5 program, an open-source tool developed by the World Health Organization's International Agency for Research on Cancer (WHO/IARC). This system enables the collection, storage, and analysis of population-based cancer data, providing robust evidence to inform policy-making and resource allocation.

As part of its ongoing efforts in cancer control, Georgia has joined the City Cancer Challenge (C/Can) initiative (C/Can 2023), focusing on enhancing cancer care through local commitment and collaboration. Since 2018, Tbilisi has actively participated in this initiative, leading to significant advancements in cancer care. Patients now receive medications directly at treatment centres, improving accessibility and allowing them to focus on recovery. The cancer care workforce has been strengthened through training aligned with international best practices, ensuring high-quality care across the system. A Breast Cancer Action Plan has been developed to implement the Global Breast Cancer Initiative (GBCI), and a manual has been created to harmonize data collection across medical facilities, enhancing cancer information for better public health planning and resource allocation. Building on these successes, Tbilisi has embarked on the second phase of the initiative, aiming to expand its impact and reach more patients, thereby driving sustainable improvements in cancer care systems.

However, the country still faces serious challenges, in addressing cancer, including outdated surveillance systems, limited public awareness, and inadequate healthcare infrastructure. (Rukhadze 2016) The country is also confronted with an increasing prevalence of lifestyle-related cancer risk factors, such as tobacco use, unhealthy diet, and low physical activity. (World Health Organisation 2017; 2023c; 2023d; 2016) Furthermore, Georgia's healthcare system struggles with a shortage of trained personnel and under-prioritized cancer research. (National center for disease control and public health, n.d.) Efforts to implement effective screening programs have not yielded the desired impact, as late-stage diagnoses remain prevalent, undermining patient outcomes and increasing treatment costs. Although free cervical, breast, and colorectal screening is offered nationwide, the lack of funding for subsequent diagnostic tests limits the effectiveness of these programs. This gap creates barriers to confirming cancer diagnoses and completing necessary staging and treatment processes.

The absence of continuity in patient pathways from screening to diagnosis and treatment reduces the effectiveness of investments in early detection and risks discouraging public participation in screening programs. Health professionals at the primary care level often lack sufficient training to identify early cancer signs, further contributing to delays in diagnosis. Access to quality diagnostic services remains a major issue, compounded by the limited availability of molecular pathology and a shortage of specialized pathologists. These challenges are exacerbated by a reliance on international laboratories for advanced testing, high costs for patients, and insufficient resources to develop specialized services within the country.

Georgia's cancer treatment services, although comprehensive, suffer from uneven distribution and varying quality. Many cancer centers lack the required infrastructure, equipment, and trained personnel to ensure high-quality care. Public trust in the healthcare system is low due to the historical inadequacies of cancer care services, further complicating efforts to improve patient outcomes. Additionally, the lack of national guidelines for cancer diagnosis and treatment and inadequate regulation of cancer surgery services hinder the development of consistent, high-quality care. The underutilization of radiotherapy, despite sufficient equipment, reflects gaps in accessibility, affordability, and early diagnosis.

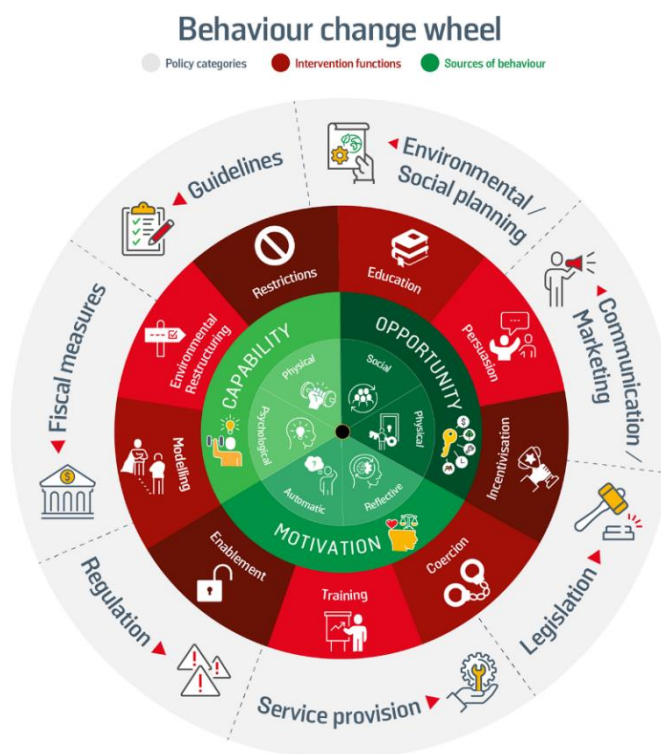
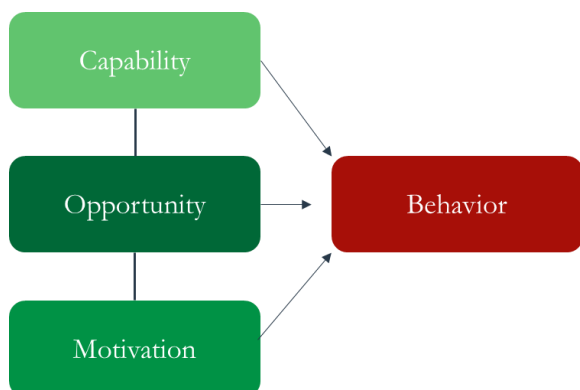
Palliative care services are critically underdeveloped, with limited access to essential medications and the absence of comprehensive in-hospital or ambulatory services. In childhood cancer care, half of the pediatric cancer patients are sent abroad for treatment, with no clear national plan for local service development. Georgia also lacks adequate national policies, infrastructure, and financial support for training programs aimed at addressing the shortage of specialized cancer care professionals. Combined, these challenges highlight the need for an integrated, well-funded, and strategic approach to cancer care and policy in Georgia.

Cancer control policy challenges and opportunities to address the health behaviour

The role of health policies in shaping health-related behaviours, such as smoking in public places, maintaining a healthy diet, getting vaccinated, or attending screening services, is well established. However, developing comprehensive policies that effectively influence behaviour remains challenging due to their complexity. Considering this the World Health Organization (WHO) has recognized the crucial role of studying behavioural insights to enhance health policies. This recognition was solidified through the adoption of the first-ever global resolution on behavioural sciences for health, passed at the Seventy-sixth World Health Assembly on May 29, 2023. (World Health Organisation 2023b) It aligns with the earlier 2022 WHO European regional resolution on behavioural and cultural insights (BCI) for health, reinforcing a global commitment to integrating behavioural insights into health strategies for more effective policy-making and improved public health outcomes. (World Health Organisation 2023a)

Recently developed frameworks such as Behaviour Change Wheel (BCW) (Michie, Stralen, and West 2011) offer valuable tools for analysing behaviours and the factors that influence them, enabling the design of evidence-based policies to address challenges in cancer control (fig. 2). Central to the BCW is the COM-B model, which serves as a comprehensive theory of change. This model highlights that health behaviours are influenced by a complex interplay of three primary factors: capability (C), opportunity (O), and motivation (M), which collectively drive behaviour change (B). By understanding these elements, policymakers and public health professionals can create targeted interventions that effectively promote healthier behaviours and reduce the burden of cancer.

Figure 2. The Behavior Change Wheel and COMB-B model



**Adopted from (Michie, Stralen, and West 2011)*

There is a lack of evidence-based data on how the cancer related health behaviours change due to cancer control policy measures including in low and middle-income countries like Georgia [International Agency for Research on Cancer, 2020].

Cancer control policy adoption challenges

Policy adoption in cancer control is a complex and challenging process, influenced by various factors including political, economic, and social dynamics. Public support plays a crucial role in this process, as evidenced by the WHO report (WHO 2021b). The successful policy implementation often hinges on the public's understanding and acceptance of the measures, such as tobacco-free policies, immunization, and cancer screening programs. Studies on population perceptions of these policies are important to identify potential barriers and tailor strategies to increase public support and compliance.

While tobacco free policies like smoking bans and voluntary home-based cessation efforts are essential for reducing tobacco-related harm, there is limited knowledge about the behavioural, social, and cultural determinants that affect their adoption and compliance. Identifying these factors can reveal why certain policies succeed or face resistance, highlighting gaps in public awareness, support, and adherence.

Despite the growing body of research on cancer control (World Health Organisation 2018), there remains a significant gap in understanding how current cancer control policies particularly in low- and middle-income countries (LMICs) like Georgia influence challenging health behaviours and address the factors impacting those behaviours. This understanding is particularly important in the context of public health emergencies, which have wide-ranging implications—from disrupting health service delivery to altering environmental factors that enable risk behaviours and complicating communication efforts due to infodemics and decreased trust in science, government, and public health authorities. Gaining insight into the effectiveness of these policies, as well as identifying the enablers and barriers to behavioural change, is essential. Evidence-based knowledge on primary and secondary prevention policies, such as those targeting tobacco use or promoting cancer screening, can guide the development of more effective, locally adapted strategies. This valuable insight can also provide essential guidance for resource-limited regions, ultimately strengthening cancer control efforts and improving health outcomes globally, with particular benefits for low- and middle-income countries (LMICs).

Purpose of the Study

The overall goal of my PhD research is to assess the impact of cancer control policies on population behavior in Georgia and the factors influencing their adoption, with a specific focus on tobacco and cancer screening policies, to facilitate the enhancement of these policies.

In my research, I focus on two critical aspects of cancer control: tobacco control policies and cancer screening initiatives. This focus is due to the significant impact of tobacco use on cancer incidence and the vital role of early detection in improving cancer outcomes, as detailed in the literature review. By concentrating on these two areas—tobacco control and cancer screening—my study addresses both primary prevention (reducing risk factors) and secondary prevention (early detection), which are fundamental components of the comprehensive cancer control continuum (National Cancer Institute., n.d.). This targeted approach aims to provide actionable insights for

polymakers to develop effective, evidence-based interventions that reduce cancer-related morbidity and mortality in Georgia.

While this study focuses specifically on tobacco control and cancer screening policies, the findings are expected to have broader implications for other areas of cancer control. Insights gained from evaluating these policies can inform strategies across the cancer control continuum, including prevention, early detection, treatment, and palliative care. By understanding the factors that influence policy adoption and effectiveness, stakeholders can develop more comprehensive approaches to reduce cancer-related morbidity and mortality in Georgia.

To achieve the overarching goal of enhancing cancer control policies in Georgia by assessing their impact on population behavior and identifying factors influencing their adoption, while focusing on tobacco control and cancer screening, the study will pursue the following

Specific Objectives:

Objective #1 Evaluate the Impact of Tobacco Control Policies on smoking behavior and related factors

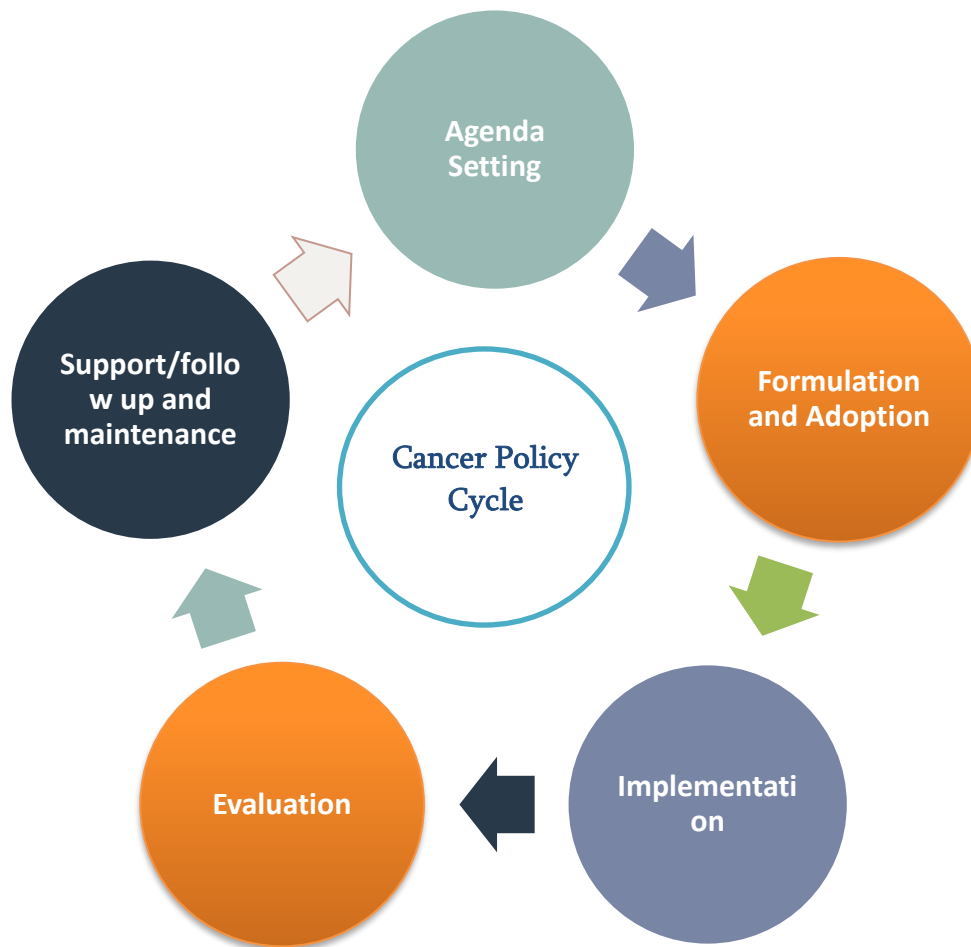
Objective #2 Assess Cancer Screening Uptake Barriers from Provider and Patient perspective

Objective #3 Identify Determinants Influencing Tobacco Policy Adoption

Objective #4 Develop Evidence-Based Cancer Control Policy Recommendations

The results of my PhD research will inform key aspects of the policy cycle for cancer primary and secondary prevention, with a particular focus on the policy evaluation and policy formulation stages. Specifically, my findings will provide evidence to strengthen anti-tobacco policy advocacy and communication efforts, as well as support the elaboration of the national cancer screening action plan. This research will contribute to the development of targeted, evidence-based strategies that enhance public health outcomes and inform comprehensive cancer control initiatives. (fig.3).

Figure 3 Cancer Policy Cycle



Research Questions

The PhD thesis narrative and logical flow are supported by four research papers derived from two comprehensive studies. The first study - **Tobacco-Free Air Coalitions in Georgia and Armenia: A Randomized-Controlled Survey (2017-2021)** critically examines the effectiveness of tobacco control measures, resulting in two published papers: one analysing their impact on smoking behaviour and related factors, and another exploring factors influencing policy adoption and enforcement, specifically:

- Wysota CN, **Topuridze M**, Sargsyan Z, Dekanosidze A, Sturua L, Kegler MC, Petrosyan V, Harutyunyan A, Hayrumyan V, Berg CJ. Psychosocial Factors,

Smoke-Free Restrictions, and Media Exposure in Relation to Smoking-Related Attitudes and Behaviors among Adults in Armenia and Georgia. *Int J Environ Res Public Health*. 2021 Apr 11;18(8):4013. doi: 10.3390/ijerph18084013. PMID: 33920451; PMCID: PMC8068968 (Appendix 1)

- **Topuridze M**, Berg CJ, Dekanosidze A, Torosyan A, Grigoryan L, Bazarchyan A, Sargsyan Z, Hayrumyan V, Maglakelidze N, Sturua L, Haardörfer R, Kegler MC. Smokers' and Nonsmokers' Receptivity to Smoke-Free Policies and Pro- and Anti-Policy Messaging in Armenia and Georgia. *Int J Environ Res Public Health*. 2020 Jul 30;17(15):5527. doi: 10.3390/ijerph17155527. PMID: 32751714; PMCID: PMC7432748. (Appendix 2)

The second study **Cancer Screening Barriers: Knowledge, Attitudes, and Practices (KAP) Study among Primary Healthcare Workers (2023)** investigates cancer screening programs, producing two papers (in the process of submission): one assessing cancer screening uptake barriers from providers, and another from patient perspective, specifically:

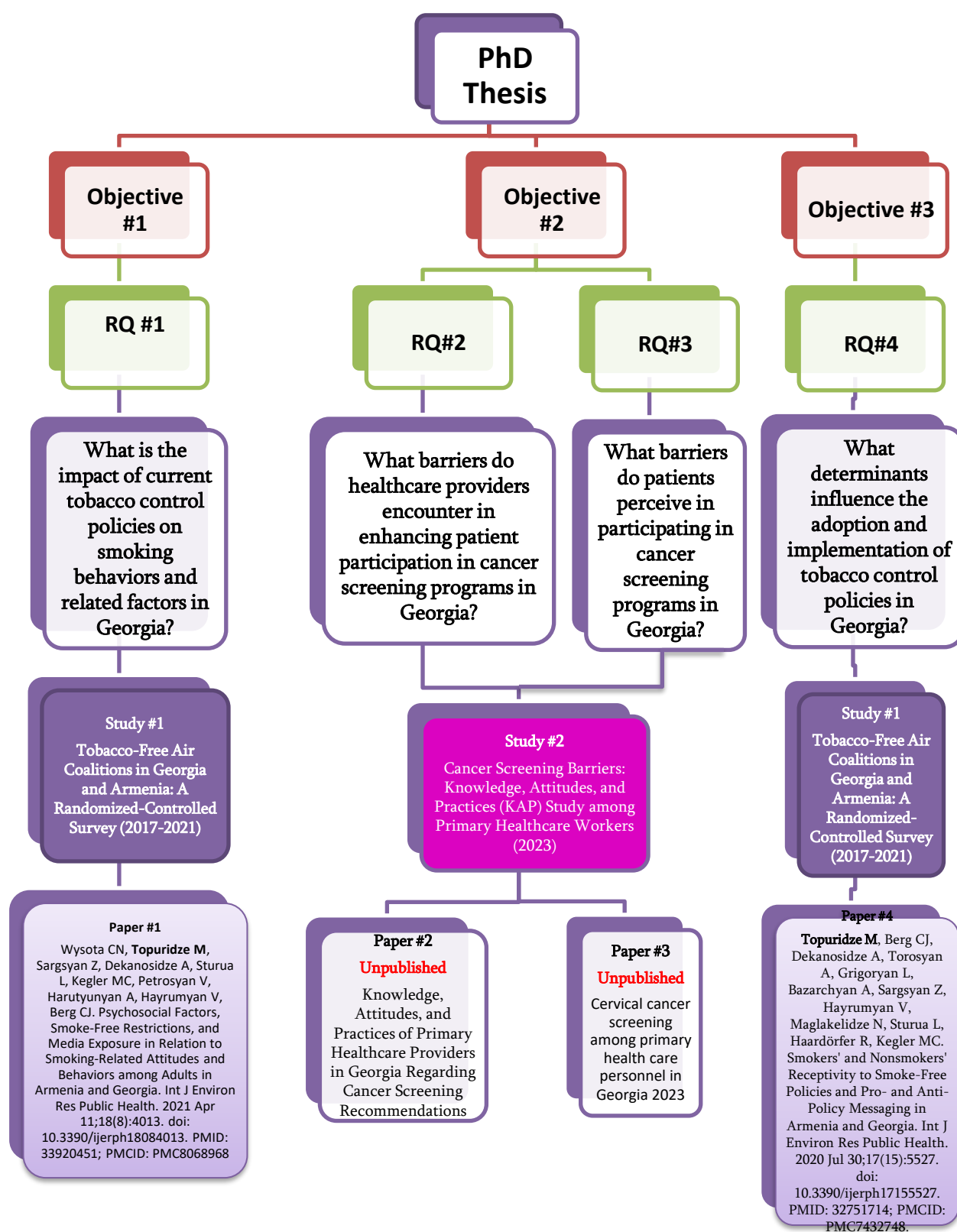
- Knowledge, Attitudes, and Practices of Primary Healthcare Providers in Georgia Regarding Cancer Screening Recommendations
(Paper prepared for submission to [*European Journal of General practice*](#))
- Cervical cancer screening among primary health care personnel in Georgia 2023
(Paper prepared for submission to the [*Journal of Epidemiology and Community Health*](#))

Collectively, these papers provide a thorough analysis of primary and secondary prevention strategies, aligning with the dissertation's objectives to assess policy impacts and inform evidence-based recommendations for reducing cancer-related morbidity and mortality in Georgia. This is achieved by addressing four main research questions (Fig. 4):

- **RQ#1** - What is the impact of current tobacco control policies on smoking behaviors and related factors in Georgia?
- **RQ#2** - What barriers do healthcare providers encounter in enhancing patient participation in cancer screening programs in Georgia?

- **RQ #3** - What barriers do patients perceive in participating in cancer screening programs in Georgia?
- **RQ#4** - What determinants influence the adoption and implementation of tobacco control policies in Georgia?

Figure 4 Project goals, objectives, papers and specific research question



Policy Areas Studied

- **Tobacco Control Policies:** Smoke-free laws, public awareness campaigns, local coalitions.
- **Cancer Screening Policies:** National guidelines, healthcare provider practices, patient participation initiatives.

Key Constructs

- **Policy Inputs:** Legislation, communication campaigns, coalition efforts.
- **Behavioral Outcomes:** Smoking prevalence, adoption of smoke-free homes, recommendation and referral of patients to cancer screening, participation in cancer screening programs.
- **Barriers and Enablers:**
 - **For Tobacco Control:** Public attitudes, media influence, enforcement challenges.
 - **For Cancer Screening:** Provider knowledge, attitudes, and practices (KAP); patient awareness and access barriers.

Factors Influencing Behavior

- **Sociocultural Factors:** Norms, beliefs, and stigma.
- **Structural Factors:** Access to services, healthcare capacity, enforcement mechanisms.
- **Individual Factors:** Awareness, attitudes, and motivation.

Evaluation Dimensions

- **Impact Assessment:** Quantitative and qualitative evaluation of policy influence on behaviors (e.g., RCT for tobacco control, KAP survey for screening barriers).
- **Adoption and Implementation:** Determinants influencing policy adoption (e.g., stakeholder support, political will, and resource availability).

Research Objectives and Questions Alignment

- **Objective 1 & RQ#1:** Assessing the impact of tobacco control policies on smoking behaviors and related factors.
- **Objective 2 & RQ#2/RQ#3:** Identifying barriers to cancer screening uptake from provider and patient perspectives.
- **Objective 3 & RQ#4:** Determining factors influencing the adoption and implementation of tobacco control policies.
- **Objective 4:** Developing actionable recommendations based on findings.

Data Sources and Methods

- **Quantitative:** Cluster RCT for tobacco control, surveys for KAP study.
- **Qualitative:** Interviews with stakeholders, focus groups for in-depth perspectives.

Figure 5. Analytical Framework



1. Cancer burden global and local statistics

Global statistics

Cancer is the second leading cause of death globally, with the highest burden disproportionately affecting lower-middle-income and low-income countries, where access to effective prevention and treatment services remains limited. (Bray et al. 2024) (Murthy et al. 2024).

In 2022, approximately 20 million new cases of cancer were reported, accompanied by 9.7 million deaths. The number of individuals alive within five years following a cancer diagnosis was estimated to be 53.5 million, reflecting the persistent and growing challenge posed by cancer worldwide (WHO 2024b). The lifetime risk of developing cancer stands at about 1 in 5, while the mortality risk is around 1 in 9 for men and 1 in 12 for women (WHO 2024b).

In 2022, cancer continued to be a leading global health concern, with the ten most common cancer types responsible for approximately two-thirds of all new diagnoses and deaths worldwide. Among these, three types were particularly prominent in terms of both incidence and mortality, (WHO 2024b) including:

- **Lung cancer** was the most prevalent and deadly, with 2.5 million new cases, making up 12.4% of all cancer diagnoses globally. It also accounted for 1.8 million deaths, or 18.7% of total cancer-related fatalities. This high burden is largely driven by persistent tobacco use, particularly in regions like Asia, where smoking remains widespread. As a result, lung cancer is not only the most commonly diagnosed cancer but also the leading cause of cancer death.
- **Breast cancer**, with 2.3 million new cases (11.6% of global cancer cases), remains the most common cancer among women worldwide. Despite progress in screening and treatment, it caused 670,000 deaths in 2022, representing 6.9% of all cancer-related deaths. It is the leading cancer type among women

in 157 countries, highlighting the global importance of early detection and intervention strategies.

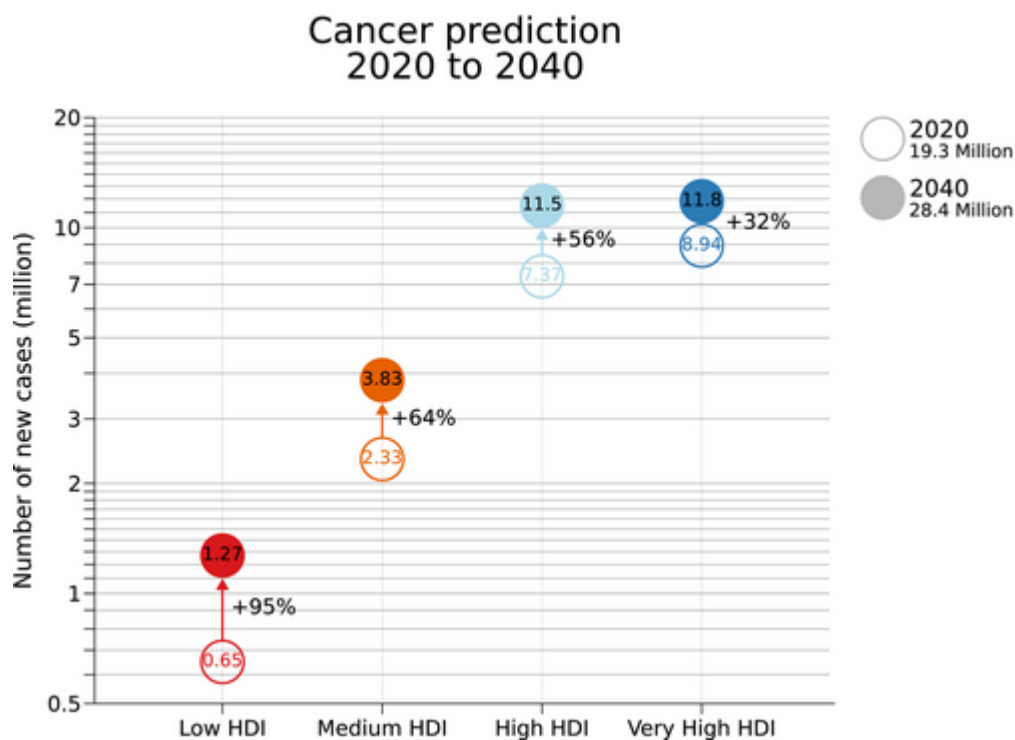
- **Colorectal cancer** followed closely, with 1.9 million new cases, or 9.6% of the total global cancer cases. It resulted in 900,000 deaths, accounting for 9.3% of cancer-related fatalities. This type of cancer affects both men and women and is particularly prevalent in populations with higher rates of diet-related risk factors, such as low dietary fibre intake and sedentary lifestyles.

Other significant cancers included prostate cancer (1.5 million new cases), stomach cancer (970,000 new cases), and liver cancer, which had a particularly high mortality rate with 760,000 deaths.

Challenges

The global burden of cancer is expected to rise significantly in the coming decades. By 2040, the number of new cancer cases is projected to reach 28.4 million, a 47% increase from the 19.3 million cases reported in 2020.(WHO 2020) This increase will be most pronounced in countries with low and medium Human Development Index (HDI) levels, where cancer cases are expected to grow by 64%. However, in terms of absolute numbers, high-HDI countries will see the largest increase, with an additional 4.1 million new cases by 2040. (Sung et al. 2021b) While this rise is largely driven by population growth and aging, it is further compounded by the increasing prevalence of cancer risk factors across various regions. (W. Cao et al. 2024) In many developing countries, the prevalence of risk factors such as smoking, unhealthy diets, obesity, and physical inactivity has been rising rapidly, and these trends are expected to outpace similar increases in high-income countries.(Islami et al. 2018)

Figure 6. Projected Number of New Cases for All Cancers Combined (Both Sexes Combined) in 2040 According to the 4-Tier Human Development Index (HDI). Source: GLOBOCAN 2020.



This growing burden highlights the urgent need for global attention to cancer prevention and healthcare systems, particularly in low- and middle-income countries (LMICs), which are likely to bear the greatest burden. These countries are already facing significant challenges related to late cancer detection, limited access to diagnosis and treatment services, and inadequate healthcare infrastructure. (WHO 2024c; CP, E, and BW, n.d.) According to the World Cancer Report 2020, late detection and low access to cancer care remain critical global challenges. (CP, E, and BW, n.d.) In many LMICs, the lack of early detection programs and essential treatment services such as chemotherapy, radiotherapy, and palliative care exacerbates the cancer burden.

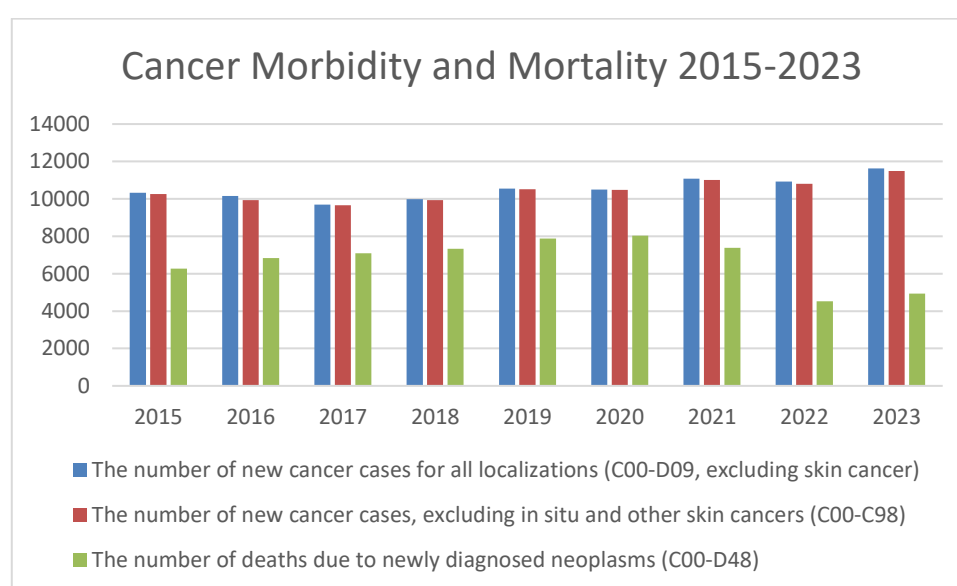
The economic impact of cancer is also growing, particularly in LMICs. The global cost of cancer is estimated to reach approximately \$458 billion USD annually, and the economic burden in LMICs alone is projected to exceed \$300 billion USD by 2030. This underscores the urgent need for improved cancer prevention, early detection, and treatment efforts, especially in countries with limited healthcare resources. Despite global efforts to reduce cancer rates, many LMICs still lack essential cancer management services, such as early diagnostic tools, effective treatments, and pain management. A WHO survey found that only 39% of countries include essential cancer management in their health benefit packages, and just 28% provide palliative care services. (WHO 2024c)

To address the growing cancer burden, it is critical to focus on improving prevention, early detection, and equitable access to treatment services. Primary prevention remains one of the most effective ways to control cancer, with up to half of all cancers being preventable. (Vineis and Wild 2014) However, much work remains to integrate effective prevention interventions into existing health plans and develop new ones to address global risk factors and cancers for which prevention options are currently limited. (Bray et al. 2015; Armstrong 2018) Strengthening healthcare systems, expanding workforce capacity, and enhancing access to cancer care, particularly in LMICs, will be essential to manage the anticipated increase in cancer cases and mitigate the economic and health impacts of the disease.

Georgia Cancer Profile

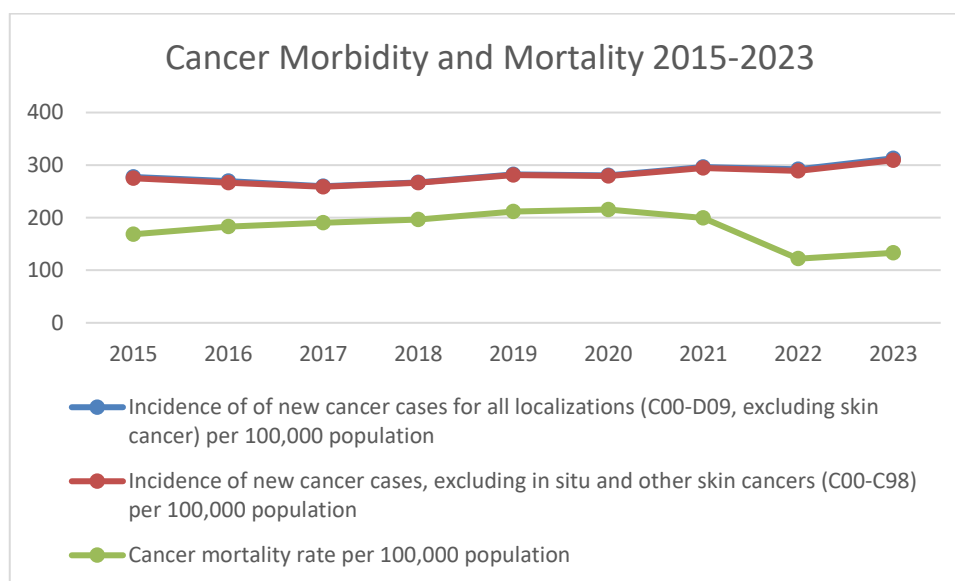
Cancer remains a significant public health issue in Georgia, where the burden is particularly high compared to many countries in the World Health Organization (WHO) European region and other post-Soviet states. (De Angelis et al. 2024b; International Agency for Research on Cancer (IARC), n.d.) In 2023, Georgia recorded 11,625 new cancer cases across all cancer types (excluding skin cancer), which equates to an age-standardized incidence rate of 312.9 per 100,000 population. This represents an increase from 9,696 new cases in 2015, highlighting a rising cancer burden over the years.

Figure 7. Cancer Morbidity and Mortality trends (in absolute numbers) in Georgia 2015-2023



**Source – NCDC Cancer 2025-2023 (unpublished)*

Figure 8 Cancer Morbidity and Mortality trends (per 100,000 population) in Georgia 2015-2023



**Source – NCDC Cancer 2025-2023 (unpublished)*

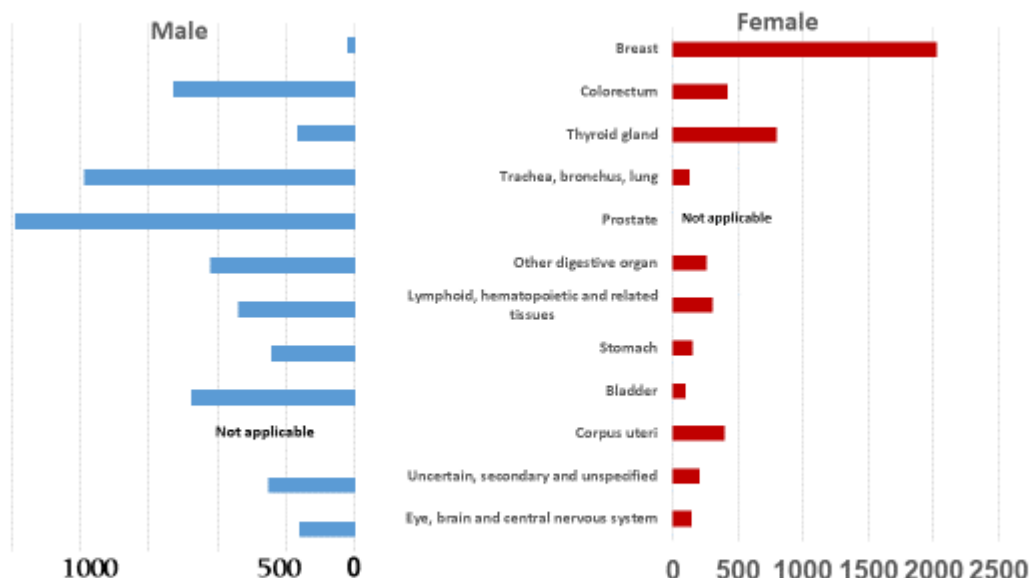
Table 1. Cancer, main indicators of morbidity and mortality, Georgia, 2015-2023

	2015	2016	2017	2018	2019	2020	2021	2022	2023
The number of new cancer cases for all localizations (C00-D09, excluding skin cancer)	10334	10148	9696	9977	10556	10505	11087	10922	11625
Incidence per 100,000 population	277.2	269.2	259.8	267.1	282.1	280.2	296.4	291.8	312.9
The number of new cancer cases, excluding in situ and other skin cancers (C00-C98)	10256	9938	9657	9941	10523	10473	11014	10807	11489
Incidence per 100,000 population	275.1	266.2	258.8	266.2	281.2	279.3	294.5	288.7	309.2
The number of deaths due to newly diagnosed neoplasms (C00-D48)	6268	6829	7095	7329	7873	8024	7388	4530	4939
Cancer mortality rate per 100,000 population	168.3	183.2	190.3	196.7	211.6	215.5	199.2	122.0	132.9

**Source – NCDC Cancer 2025-2023 (unpublished)*

Interestingly, the gender distribution of these new cases is almost equal, with 53% of diagnoses in women and 47% in men. Furthermore, about 66% of new cases are registered in the most economically active age group (30-70 years), while 31% are seen in individuals aged 70 and older.

Figure 9. Cancer, sites with high incidence by sex, Georgia, 2023

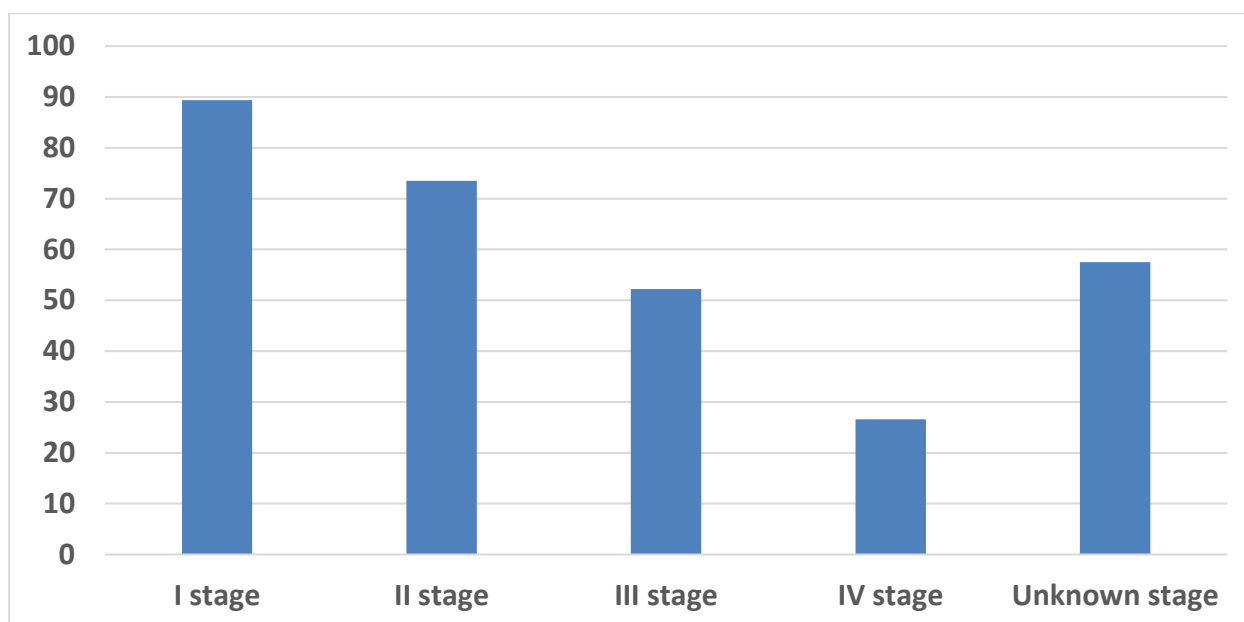


**Source – NCDC Cancer 2025-2023 (unpublished)*

Among the most common cancers in Georgia, breast cancer, thyroid cancer, and colorectal cancer stand out in women, while prostate cancer, lung cancer, and colorectal cancer are the leading types for men. Notably, cancers of the respiratory system (trachea, bronchi, and lungs) account for a significant portion of cancer-related deaths in the country, representing 16% of all cancer fatalities. Additionally, breast cancer contributes to 8% of cancer deaths among women.

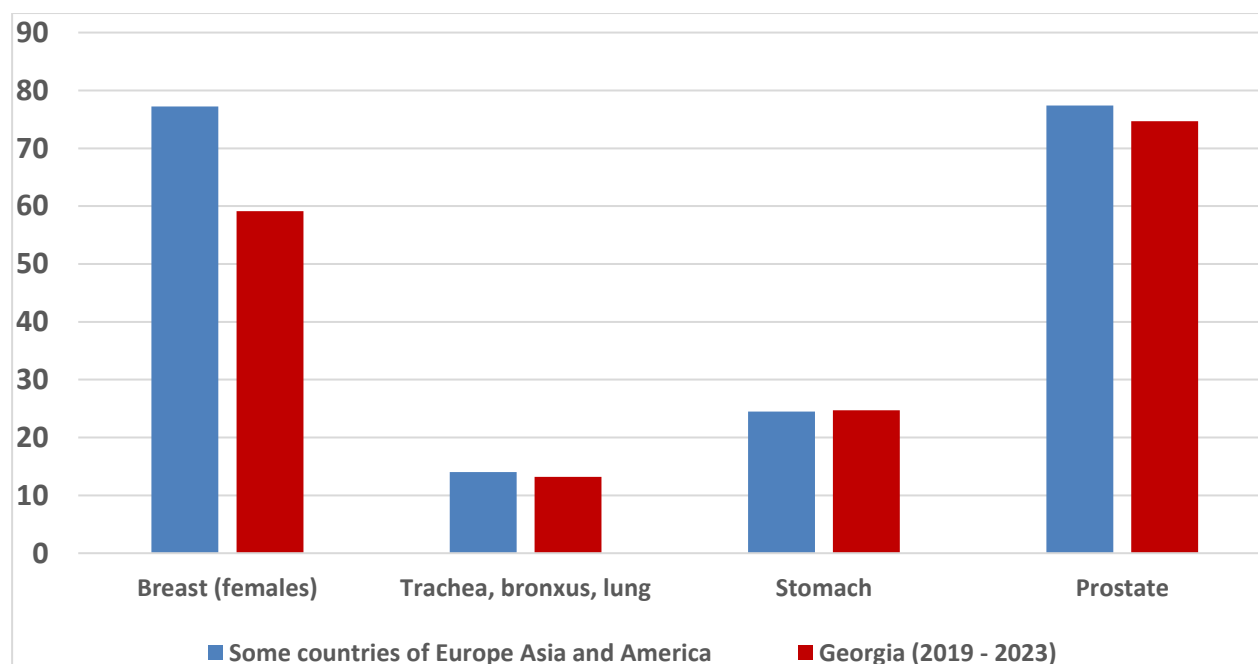
In terms of cancer stage at diagnosis, about 40.2% of all new cases in Georgia in 2023 were diagnosed at late stages (III and IV), with 37.2% diagnosed at early stages (I and II). These late-stage diagnoses reflect the challenges in early detection and access to cancer care, contributing to lower survival rates in comparison to other regions.

Figure 10. Five-year survival rates of cancer by stages, both sexes, Georgia, 2019-2023



The five-year survival rate for all cancer types diagnosed in 2019 was calculated at 58.3%, using the direct method of survival assessment. This pattern is consistent with that observed in neighboring countries. (“GLOBOCAN. Georgia Fact Sheet.” 2023; Ryzhov et al. 2021b)

Figure 11. Five-year survival rates for some cancer sites



* Source: <https://worldpopulationreview.com/country-rankings/cancer-survival-rates-by-country>, *NCDC*

In Georgia, as in other parts of the world, leukemia, lymphomas, and brain cancers represent the most common malignant diseases in children. Despite the relatively high survival rates for childhood cancers—around 80.3% for boys and 83.6% for girls under the age of 20—overall survival rates remain lower than in higher-income countries.

Regarding treatment, the majority of new cancer cases require surgery (51%), chemotherapy (72%), and radiotherapy (57%). Data from the cancer registry reveals that 46.8% of new cancer cases in 2023 received surgical treatment, 37.6% underwent chemotherapy and hormone therapy, and 18.4% received radiotherapy.

Looking toward the future, projections indicate that the number of new cancer cases in Georgia will increase by 6% from 2018 to 2030, with a larger increase expected among men (7%) compared to women (5%). This increase mirrors a broader trend observed across Europe, where new cancer cases are expected to rise by 14%, with higher rates of increase in men (18%) compared to women (10%).

These trends highlight the growing challenge that cancer represents in Georgia, especially as the population ages and the burden of cancer risk factors, such as smoking, poor diet, and physical inactivity, increases. Improved cancer prevention, early detection, and access to treatment are critical for addressing this rising burden and improving cancer outcomes in the country.

2. *Behavioral Risk Factors of Cancer*

A significant proportion of cancer deaths is linked to preventable behavioural risk factors. Recent findings published in *The Lancet* (Tran et al. 2022) indicate that 44.4% of all cancer deaths globally, equivalent to 4.45 million deaths, are attributable to one of 34 preventable risk factors. Smoking, along with alcohol use and unsafe sex, emerged as the leading risk factors contributing to cancer-related Disability-Adjusted Life Years (DALYs) in low Socio-demographic Index (SDI) regions in 2019.

In the period from 2010 to 2019, there was a notable increase in global cancer deaths and DALYs linked to risk factors, with cancer deaths rising by 20.4% and DALYs by 16.8%.

The most significant increases were seen in metabolic risks, with cancer deaths attributed to these factors rising by 34.7% and DALYs by 33.3%.

These statistics reinforce earlier findings which emphasized that a third of cancer deaths are linked to five major behavioural risk factors: tobacco and alcohol consumption, insufficient physical activity, low intake of fruits and vegetables, and high body mass index (BMI) (Wu et al. 2018; GBD 2015 Risk Factors Collaborators 2016).

Tobacco Use Global Public Health Challenge

Tobacco use is the leading preventable risk factor for cancer globally, contributing to a significant portion of cancer-related deaths. (WHO 2023b) According to WHO nicotine in tobacco is highly addictive, and tobacco use is linked to over 20 different types of cancer, including lung, mouth, and throat cancers. Tobacco kills up to half of its users who do not quit, making it a major global health threat. Each year, more than 8 million people die as a result of tobacco use, including an estimated 1.3 million non-smokers who die from exposure to second-hand smoke. Around 80% of the world's 1.3 billion tobacco users live in low- and middle-income countries, where the burden of tobacco-related diseases, including cancer, is heaviest. These countries also experience increased poverty, as spending on tobacco diverts household resources from essential needs like food and shelter.

Cigarette smoking remains the most common form of tobacco use, though other products, including water pipes, cigars, smokeless tobacco, and heated tobacco, contribute to the cancer burden. All forms of tobacco use are harmful, and there is no safe level of exposure. In 2020, 22.3% of the world's population used tobacco, with 36.7% of men and 7.8% of women affected. (Theilmann et al. 2022) The economic costs of tobacco use are

substantial, encompassing significant healthcare expenditures for treating tobacco-related diseases and the lost productivity due to tobacco-related illness and death.

Tobacco use in Georgia

Georgia is one of the countries being most at risk of a tobacco epidemic, where 33% of the average adult population (57% of men and 7% of women at the age of 18 to 64), are active users of tobacco. (WHO 2016) In the last decade, an increasing trend of tobacco consumption has been observed among women and girls, especially in Tbilisi. 43% of the adult population are exposed to second-hand smoke at home and 16% at workplaces. Tobacco use is responsible for around 11,418 deaths annually, with 2,093 of those fatalities attributed to exposure to second-hand smoke.

Tobacco use continues to be a significant public health issue among Georgian youth as well. The findings from the 2023 Global Youth Tobacco Survey (GYTS) reveal that 41% of adolescents aged 13-15 have ever used any form of tobacco. The rate is higher among boys at 44% compared to 38% for girls. Current use of any tobacco product in this age group stands at 14%, with boys at 16% and girls at 11%. The prevalence of ever smoking cigarettes is 36% overall, with boys at 40% and girls at 33%. Both boys and girls have a current smoking rate of 5%. The survey also shows that electronic cigarette use is notable, with 37% of youth having tried them (39% of boys and 36% of girls), and 11% currently using them (12% of boys and 10% of girls). Heated tobacco products have been used at least once by 11% of respondents, while 8% have ever used smokeless or non-smoking tobacco, with 4% currently using such products (6% of boys and 2% of girls).

The 2019 European School Survey Project on Alcohol, Tobacco, and Other Drugs (ESPAD) provides insights into tobacco use among 16-year-olds. The data indicate that 36% have ever smoked cigarettes, with a significant gender disparity: 46% of boys compared to 27% of girls. Current smoking rates are 12% overall, with 17% for boys and 7% for girls. Electronic cigarette use is prevalent among this age group, with 32% having ever used them (42% of boys and 23% of girls) and 25% reporting current use (33% of boys and 19% of girls).

Smokeless tobacco use is lower, with 5% having ever used such products and 8% currently using them (10% of boys and 6% of girls).

The 2019 National Tobacco Prevalence Survey highlights the smoking behavior among young adults aged 18-29. It reports that 27% are current smokers, with a stark contrast between genders: 50% of young men smoke, compared to only 4% of young women. The current use of electronic cigarettes is minimal at 1% overall, with slightly higher usage among women at 1%. Ever use of smokeless tobacco is recorded at 0.3%, with no current use reported.

The 2016 Non-Communicable Disease Risk Factor Survey (STEPS) further emphasizes the prevalence of smoking in the 18-29 age group. The data indicate that 34% are current smokers, with 60% of young men smoking compared to 7% of young women. These findings underscore the persistent gender gap and the substantial tobacco use among young adults.

In summary, these surveys reflect a significant burden of tobacco use among youth and young adults, with notable gender differences and varying levels of engagement with different tobacco products. The data signal the need for targeted tobacco control measures, especially among high-prevalence groups, to address this ongoing public health challenge.

Table 2. Tobacco use behavioue among youth, results of the studies in Georgia

Product	Age	Boy	Girl	All
Global Youth Tobacco Survey (GYTS), 2023				
Ever users of any tobacco product	13-15	44%	38%	41%
Current users of any tobacco product		16%	11%	14%
Ever smokers of cigarettes		40%	33%	36%
Current smokers of cigarettes		5%	5%	5%
Ever users of electronic cigarettes		39%	36%	37%
Current users of electronic cigarettes		12%	10%	11%
Ever users of heated tobacco products		11%	10%	11%

Ever users of smokeless/non-smoking tobacco		11%	6%	8%
Current users of smokeless/non-smoking tobacco		6%	2%	4%
European School Survey Project on Alcohol, Tobacco, and Other Drugs (ESPAD), 2019				
Ever smokers of cigarettes	16	46%	27%	36%
Current smokers of cigarettes		17%	7%	12%
Ever users of electronic cigarettes		42%	23%	32%
Current smokers of cigarettes		11%	4%	7%
Current users of electronic cigarettes		33%	19%	25%
Ever users of smokeless/non-smoking tobacco		7%	4%	5%
Current users of smokeless/non-smoking tobacco		10%	6%	8%
Current smokers of cigarettes			3%	2%
National Tobacco Prevalence Survey, 2019				
Current smokers of cigarettes	18-29	50%	4%	27%
Current users of electronic cigarettes		0	1%	1%
Ever users of smokeless/non-smoking tobacco		1%	0%	0.3%
Current users of smokeless/non-smoking tobacco		0	0	0
Non-Communicable Disease Risk Factor Survey (STEPS), 2016				
Current smokers of cigarettes	18-29	60%	7%	34%

Tobacco consumption imposes a substantial economic burden on Georgia, affecting both the public and private sectors. Passive smoking alone accounts for approximately 10% of the overall economic costs linked to tobacco use. According to The Case for Investing in WHO FCTC Implementation in Georgia (2018) (UNDP 2018a), tobacco costs the Georgian economy GEL 824.9 million each year, representing 2.43% of the nation's GDP. These costs

are divided into direct and indirect categories. Direct costs primarily consist of healthcare expenditures, totalling GEL 327.3 million, which are incurred from treating diseases associated with tobacco use, including respiratory illnesses, cardiovascular diseases, and cancer. These expenses strain the national healthcare system, diverting resources from other urgent public health priorities. Indirect costs are driven by the broader economic consequences of reduced productivity and income loss. Tobacco-related illnesses result in the loss of 188,936 life years annually, leading to a decrease in economic productivity.

Additionally, economic losses related to premature death, disability, and reduced workplace efficiency amount to GEL 497.5 million each year. Projections indicate that these economic losses will rise to GEL 2.5 billion after 5 years and GEL 7.5 billion after 15 years. Notably, over half (60%) of the total economic burden of tobacco use stems from these indirect costs, highlighting the widespread impact on all sectors and the need for collective investment in tobacco control. (UNDP 2018a)

3. Cancer Control Policies

Global Strategies and Efforts for Cancer Control

A number of international policy instruments have been developed to reduce early mortality from cancer and other chronic diseases, such as the United Nations Sustainable Development Goals (United Nations 2024) and the WHO Global Action Plan for the Prevention and Control of Non-communicable Diseases (WHO 2013; 2022b). These international policy instruments point to the critical importance of states implementing comprehensive cancer control policies, improving early detection and increasing access to screening and treatment services (WHO 2013).

A comprehensive cancer control policy includes key components such as prevention, early diagnosis and screening, treatment, palliative care and follow-up care for cancer survivors. For the effectiveness of cancer control policy, it is important to include each component in the National Cancer Control Plan, develop robust monitoring mechanisms (including development of the cancer registry) and establish an integrated and population-centered care system (WHO 2015). Cancer control is a complex process and having the

appropriate capacity and financial support for all key components is essential to its effective impact on public health.

Prevention is the most cost-effective public health strategy particularly in the field of non-communicable diseases.(WHO 2023a) In case of effective implementation and enforcement preventive policies and interventions such as the Framework Convention on Tobacco Control and immunization against papillomavirus and hepatitis B represent one of the most effective and cost-effective primary prevention measures to combat cancer and the number of other no communicable diseases (WHO 2007b; NCDs 2018). Prioritization and multi-sectoral efforts are required also for policies against low physical activity, obesity, harmful alcohol consumption, air pollution, occupational and environmental exposure to carcinogens (NCDs 2018).

Tobacco Policy: A Cornerstone of Primary Prevention

In 2003, WHO Member States took a significant step in addressing the global tobacco crisis by adopting the WHO Framework Convention on Tobacco Control (WHO 2003) , which now includes 182 countries as parties. The WHO MPOWER measures, designed in line with the WHO FCTC, have been proven effective in saving lives, reducing tobacco consumption, and preventing the substantial economic burden associated with tobacco-related cancers and other diseases. Addressing the tobacco epidemic is essential for lowering cancer incidence and related mortality rates worldwide, particularly in low- and middle-income countries, where the impact is most pronounced.

A number of studies have shown that comprehensive national anti-tobacco legislation and policies are an effective measure to promote tobacco cessation in the community, to prevent the initiation of tobacco use, and to reduce the impact of secondary smoke in indoor spaces (including workplaces, restaurants, and bars) (D Dobbs et al. 2020; Callinan et al. 2010; Levy et al. 2018; Flor et al. 2021) These studies also show that in the

countries where anti-tobacco policies have been introduced, tobacco-related morbidity, mortality, and medical care costs have been significantly reduced.

Interestingly, policies to ban tobacco use in public spaces have also reduced the use of tobacco in private spaces (homes and cars) and reduced the impact of second-hand smoke on children and non-smoker adults (Frazer, McHugh, et al. 2016; Frazer, Callinan, et al. 2016; Nanninga et al. 2019; Nanninga, Lhachimi, and Bolte 2018) . A policy to ban tobacco use inside homes is, in turn, an effective intervention to protect non-smoking residents from second-hand smoke (Possenti et al. 2024). Studies indicate the anti-tobacco legislation supported voluntary smoke free home policies and respectively decrease the second-hand exposure (Monson and Arsenault 2017; Borland et al. 2006).

Screening Policies: Key Secondary Prevention Measures for Cancer

Early detection of cancer is an important component of cancer control policy. Cancer screening strategies, in contrast to early detection, aim to detect cancer and pre-cancerous changes in a virtually healthy population with no symptoms (WHO 2007b). The purpose of screening is not to diagnose, it is to direct referral cases to further comprehensive diagnostic and treatment services (Wilson, Jungner, and Organization 1968). WHO provides screening strategies and policy selection criteria that determine their subsequent effectiveness in reducing the burden of cancer, namely: the balance between benefits and harms, an integrated monitoring and evaluation system, equality and informed choices based on the available evidence (Andermann et al. 2008)

Effective cancer screening is critical for early detection and prevention, significantly impacting survival rates and treatment costs (Loud and Murphy 2017). Comprehensive cancer screening programs are integral to cancer control policies, especially in low- and middle-income countries (LMICs) where late-stage cancer diagnoses are common. (Martinez et al. 2024) The WHO recommends that cancer screening programs should achieve coverage of 70% of the target population to be effective (WHO Regional Office for Europe; 2022).

According to WHO criteria, the EU recommends screening for three localizations of cancer including- breast, cervical and colorectal cancers (European Parliament, n.d.; WHO 2022a). The effectiveness and cost-effectiveness of population-based cancer screening

programs have been studied and confirmed including breast cancer screening by mammography (Lauby-Secretan et al. 2015), cervical cancer screening (C Kitchener et al. 2014) and colorectal cancer screening (Bénard et al. 2018). Cancer survival rate is one of the important indicators of the effectiveness of cancer control policy, both in terms of early detection and treatment. In recent years, for example, the five-year survival rate for cervical cancer mortality has improved significantly in a number of countries, which is likely to be explained by the introduction of screening and treatment policies and programs in those countries (Allemani et al. 2018).

However, there are a number of barriers that prevent the effective implementation of the recommended policy, including low financial support for the implementation of policy and relevant infrastructure by policy-makers (Anttila et al. 2009; Nicula et al. 2009). Also, during the preparatory phase of policy implementation, miss-planning of organizational, legal or financial issues (Nicula et al. 2009).

However, prevention alone is not enough. Millions of people will continue to develop cancer because not all cancers are preventable, the causes of cancer are multifactorial, and existing prevention strategies cannot cover the entire population. Therefore, it is important to develop a diagnostic and treatment policies and programs and make investment to increase access to screening and treatment services. Among mentioned strategies the early diagnosis plays the biggest role since the treatment of cancer on early stages is more effective, less complicated and less expensive (Mezei et al. 2017).

Cancer Control Policies in Georgia

The Government of Georgia has outlined a comprehensive framework for addressing non-communicable diseases (NCDs) through its strategic policies aimed at prevention and control. The National Strategy for the Prevention and Control of NCDs (2023–2030) (“National strategy for prevention and control of non-communicable diseases in Georgia for 2023-2030 and 2023-2025 action plan approval,” n.d.) And it’s Action Plan for 2023–2025 are pivotal in guiding the nation’s response and setting measurable targets to be achieved by 2026 and 2030. These efforts align with the global NCD targets defined in the NCD Global Monitoring Framework (GMF) (WHO 2011) and the Sustainable Development Goals

(SDGs)(United Nations 2024) for 2030, to which Georgia, as a UN Member State, is committed.

Georgia has made significant strides in cancer control through public health initiatives, notably the Universal Health Care Program (UHCP), which has increased access to healthcare services and facilitated the early detection and treatment of various cancers. Furthermore, state-funded cancer screening programs focus on early detection, particularly for common cancers such as breast and cervical cancer, strengthening the country's secondary prevention efforts.

The introduction of comprehensive tobacco control policies also plays a pivotal role in cancer control. A key milestone was the adoption of new tobacco legislation on May 1, 2018, which prohibited smoking (including e-cigarettes and hookahs) in enclosed public spaces, workplaces, and public transportation. The law also banned tobacco advertising, sponsorships, and promotions, mandated plain packaging with health warnings covering 65% of packaging, and classified e-cigarettes containing nicotine as tobacco products. These measures are vital in reducing tobacco-related cancers and improving public health outcomes.

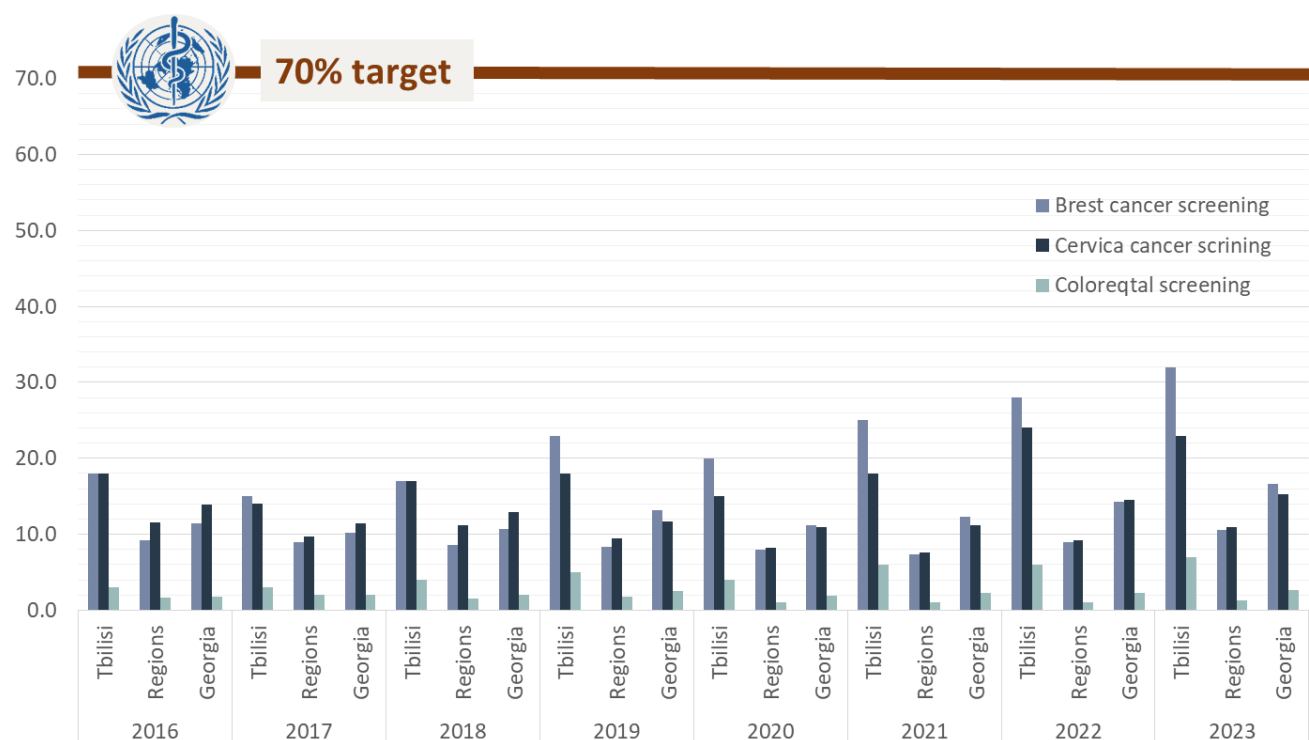
Since 2011, Georgia has implemented several cancer screening programs as part of its secondary prevention efforts:

- **Breast cancer screening** for women aged 40-70
- **Cervical cancer screening** for women aged 25-60
- **Prostate cancer risk management** for men aged 50-70
- **Colorectal cancer screening** for the population aged 50-70

The uptake of these screening programs, however, has been a challenge, despite the availability of free screening services since 2005 in Tbilisi and 2011 nationwide. Communication campaigns have been active since 2015 to increase awareness, but participation remains limited. According to data from the **Unified Cancer Information System**, the number of individuals screened for various cancers in 2023 was as follows - breast cancer screening 16.0% of the eligible population, for cervical cancer – 15.3% and for

colorectal cancer - just 2.6%. There is a significant disparity in cancer screening uptake between Tbilisi, the capital city and the regions, with Tbilisi showing much higher participation rates, and a notable improvement trend observed in the capital compared to the rest of the country.

Figure 12. Screening coverage rates in Tbilisi and the regions (2016 -2023)



Chapter III: Methodology

This chapter outlines the methodology employed to achieve the research objectives presented in Chapter 1. It describes the research design, data collection methods, and analytical approaches used to explore the impact of cancer control policies on the population behaviour and also factors affecting their adoption to facilitate the development of evidence-based strategies for the reduction of behavioural risk factors and cancer-related morbidity and mortality in Georgia.

The chapter begins with an overview of the methodological framework of Research Studies #1 **Tobacco-Free Air Coalitions in Georgia and Armenia: A Randomized-Controlled Survey (2017-2021)** and #2 **Cancer Screening Barriers: Knowledge, Attitudes, and Practices (KAP) Study among Primary Healthcare Workers (2023)** to address the specific objectives:

- **Objective #1** Evaluate the Impact of Tobacco Control Policies on smoking behavior and related factors
- **Objective #2** Assess Cancer Screening Uptake Barriers from Provider and Patient perspective
- **Objective #3** Identify Determinants Influencing Tobacco Policy Adoption
- **Objective #4** Develop Evidence-Based Cancer Control Policy Recommendations

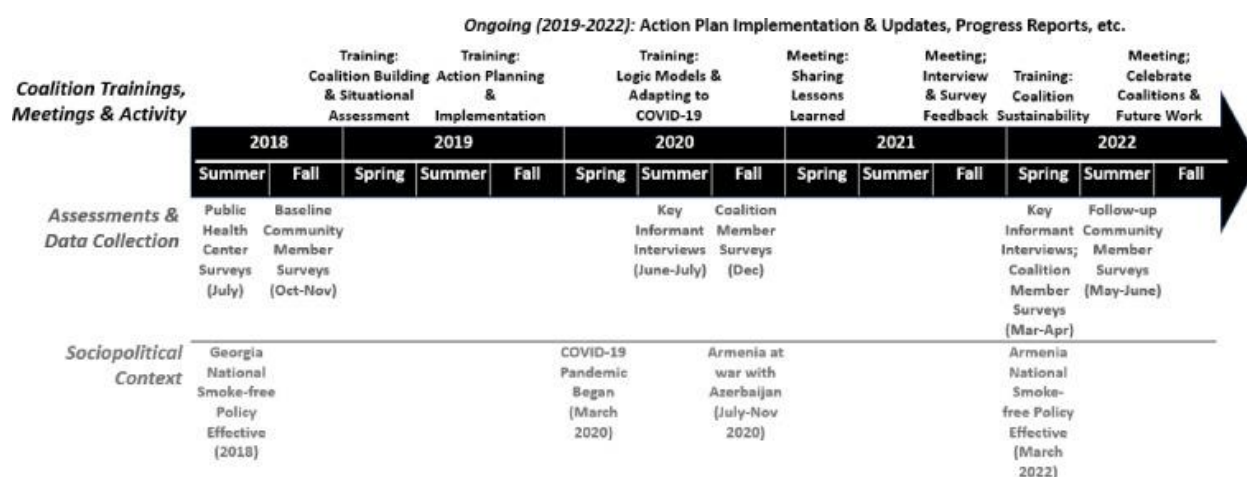
Followed by details of the specific techniques for population selection, exploration of contextual challenges and data collection tool employed. Measurement and analysis methodologies related to each objective are also discussed. Additionally, ethical considerations, strengths and limitations of the chosen methods are examined to ensure the integrity and validity of the research findings.

Research Study #1 Tobacco-Free Air Coalitions in Georgia and Armenia: A Randomized-Controlled Survey (RCT)

The Georgia and Armenia Teams for Healthy Environments and Research project, funded by Fogarty, was a collaborative effort involving Georgia's National Centre for Disease Control and Public Health, Armenia's National Institute of Health and National Centre for Disease Control, the American University of Armenia, George Washington University, and Emory University.

This cluster randomized controlled trial (CRCT) aimed to evaluate the behavioral impact of tobacco control policies by assessing the role of local coalitions in promoting support for smoke-free policies, increasing the adoption of smoke-free homes, and reducing second-hand smoke exposure (SHSe). The study sought to provide evidence on how policy-driven interventions influence individual and community behaviors related to tobacco use and exposure. The trial commenced in the fall of 2018 and concluded in the summer of 2022. (Fig. 12).(Berg et al. 2024; NIH, n.d.)

Figure 13. Action Plan and Implementation Progress Report



*Source (Berg et al. 2024)

Community Selection and Randomization

To calculate the minimum number of communities needed for adequate power, power analyses were conducted, assuming an intraclass correlation of 10%, 50 participants per community, and an effect size ($d = 0.35$) reflecting small-to-medium impacts for days of

SHSe. These calculations suggested that 28 communities would suffice. Fourteen communities in each country (defined as distinct municipalities) were chosen based on purposeful selection criteria. Communities with populations ranging from 5,000 to 60,000 were considered eligible, as coalitions typically perform best in areas of these sizes. Armenia and Georgia had approximately 37 and 34 eligible communities, respectively. Communities were paired by population size and administrative region (10 pairs in Armenia, 9 in Georgia) to ensure equal representation and comparable conditions. These matched pairs (overall: $M = 24,114$, $SD = 11,735$; Armenia: $M = 19,835$, $SD = 10,873$; Georgia: $M = 28,392$, $SD = 11,330$) were randomly allocated to either an intervention group or a control group, with 14 communities in each condition.

Intervention and Control Conditions

Local public health centers or regional offices in intervention communities acted as lead agencies, receiving around \$17,500 in grant funding for coalition activities over the three-year study period (2019–2022). Coalition activities were structured using the Community Coalition Action Theory (CCAT), including coalition formation, resource pooling, and implementation of evidence-based strategies. The research team conducted training sessions for lead agency members on coalition development and situational assessments between January and February 2019. Coalitions then recruited partners from sectors like healthcare, education, and municipal administration and performed situational assessments on local smoke-free policy needs. By June 2019, coalitions were trained to create and carry out action plans aimed at advancing smoke-free policy adoption and enforcement. Progress was documented through regular submissions of action plans and reports, with annual meetings between the research team and community grantees to discuss achievements and challenges.

A published process evaluation provided a detailed overview of coalition activities, indicating an average coalition size of seven members, with representatives from education (30.5%), healthcare (17.1%), public health (17.1%), and local administration (12.2%). Half of the coalitions developed at least one smoke-free policy, while all 14 promoted existing

policies through signage and community outreach. The majority organized events to raise awareness in schools, healthcare facilities, and community spaces.

Contextual Challenges

Community-based research can face various unforeseen challenges that influence implementation and outcomes. The process evaluation identified several key contextual factors. Historically, tobacco control measures in both countries have lagged. However, significant policy advancements were made during the study. Georgia enacted comprehensive smoke-free legislation in 2018. These policy changes likely impacted community capacities, norms, and SHSe levels, potentially introducing ceiling effects.

The COVID-19 pandemic, declared in March 2020, presented additional challenges. These included limited public health resources, varying constraints on coalition activities, and stressors affecting tobacco use and engagement. Military conflicts also impacted the study. Armenia experienced a five-day battle with Azerbaijan in July 2020, followed by a 44-day war later that year. Ongoing tensions and escalations affected numerous communities. Both Armenia and Georgia were also impacted by the displacement of thousands due to the 2022 Russian invasion of Ukraine.

Community Survey Data Collection

Community member surveys were conducted in 2018 (prior to coalition activities) and 2022 (post-activities). In Armenia, random sampling was used to select addresses and interview participants aged 18–64. In 2018, 1,128 households were visited with an 86.1% participation rate; in 2022, 1,140 households were visited with the same rate. In Georgia, a cluster sampling method was used, achieving an 82.5% participation rate in 2018 and an 84.0% rate in 2022. (Appendix 3)

Ethical Considerations

This study was approved by the Institutional Review Boards of Emory University (#IRB00097093), the National Academy of Sciences of the Republic of Armenia (#IRB00004079), the American University of Armenia (#AUA-2017-013), and the National

Centre for Disease Control and Public Health of Georgia (#IRB00002150). Before enrolment in the study and collection of data, all participants completed an informed consent. Potential participants were informed that their participation was strictly voluntary and that, if they agreed to participate, they could decline to answer any question or withdraw from the study at any time. To maintain confidentiality, only verbal consent was provided, and only participant IDs were assigned to the address indicated on the data lists. This linked data were subsequently maintained in a secure server to which only key research staff were allowed access as necessary.

Measurements (1)

Related to the Research Question #1 (Wysota et al. 2021)

Dependent Variables. Outcomes of interest were current smoking status, cessation-related attitudes and behaviours among smokers (i.e., readiness to quit, past-year quit attempts, quitting importance and confidence), and perceived harm of tobacco use among non-smokers. Regarding smoking characteristics, we assessed past 30-day cigarette smoking and created a dichotomous outcome of current (past 30-day) smokers versus non-smokers. Among past 30-day smokers, we assessed: (1) readiness to quit (e.g., in the next 30 days, in the next 6 months), which was used to create a dichotomous outcome of ready to quit in the next 6 months versus not ready; (2) number of past-year quit attempts, which was used to create a dichotomous outcome of any past-year quit attempt versus none; and (3) importance and confidence in quitting (0 = not at all to 10 = extremely), respectively, which were conceptualized as continuous outcomes. Perceived harm was assessed by asking, “How harmful to your health do you think the use of each of the following tobacco products is, on a scale of 1 = not at all harmful to 7 = extremely harmful: regular cigarettes; large or little cigars; electronic cigarettes or vaporizers; heat-not-burn tobacco, such as IQOS; and hookah, water pipe, or argil.” We created a perceived harm index score (continuous variable) by calculating the average rating across items (i.e., products assessed; range: 1–7; Cronbach’s $\alpha = 0.94$). This variable was conceptualized as an outcome among non-smokers (as a proxy for likelihood of use), as well as a predictor for all other outcomes.

Independent Variables. Predictors of interest included other tobacco use characteristics, social influences, smoking restrictions, and tobacco-related media exposure. To further characterize tobacco use behaviours among past 30-day smokers, we assessed the number of days smoked (categorized as every day vs. some days) and cigarettes smoked per day (CPD).

To assess social influences, participants were asked, “How many of your closest friends (who might include relatives and co-workers) smoke cigarettes? 0 = none; 1 = almost none; 2 = less than half; 3 = about half; 4 = more than half; 5 = almost all; 6 = all.” This item was operationalized as a continuous variable for analysis (range: 0 = 6). We also asked current smokers, “What do people who are important to you, like your friends and family, think about you smoking cigarettes?” and “What do you think the general public’s attitude is towards smoking cigarettes?” with response options of: “0 = all or nearly all disapprove; 1 = most disapprove; 2 = about half approve and half disapprove; 3 = most approve; 4 = all or nearly all approve.” These two items were operationalized as a friend/family/public attitude index score by calculating the average rating across items (range: 0–4; Cronbach’s alpha = 0.59).

Regarding smoking restrictions, we assessed restrictions in personal settings by asking, “Which of the following statements best describes the smoking rules in your home: smoking in your home is allowed, smoking in your home is generally not allowed with certain exceptions, smoking in your home is never allowed, or there are no rules about smoking in your home? Allowed; not allowed but with exceptions; never allowed; no rules.” To assess restrictions in cars, participants were asked, “Which statement best describes the rules about smoking in your household vehicles (cars or trucks)? Allowed in all vehicles; sometimes allowed in some vehicles; never allowed in any vehicle; no rules about smoking in the vehicles; don’t own a vehicle.” For each of these items, we created a 3-level restrictions “dose” variable (0 = allowed/no rules, 1 = partial restrictions, 2 = complete restrictions). We recoded “don’t own a vehicle” (n = 790) as “allowed/no rules”, as this represents the lack of a setting with smoking restrictions.

To assess smoke-free restrictions at work, we first asked participants if they worked outside of the home, and if so, whether their workplace included an indoor setting. Among those indicating that their workplace included an indoor setting, we asked, “Which of the following best describes the policy regarding smoking in indoor areas at your work: smoking is permitted everywhere, smoking is permitted only in certain indoor areas, smoking prohibited in all indoor areas, or there is no policy? Permitted everywhere; permitted only in certain indoor areas; prohibited in all indoor areas; there is no policy.” We created a 3-level restriction “dose” variable (0 = allowed/no rules, 1 = partial restrictions, 2 = complete restrictions). We recoded those who were unemployed ($n = 743$) or employed without indoor settings ($n = 31$) as “allowed/no rules”, as this represents the lack of a setting with smoking restrictions or related social norms.

Regarding public smoke-free policies, country serves as an indicator of what the actual policy context was during survey administration, as Armenia had limited public smoke-free policies, which did not include restaurants and bars, and Georgia had complete smoke-free policies, which did include restaurants and bars. However, enforcement of and compliance with these policies have been challenges historically. Thus, we assessed participants’ perceptions about restrictions in restaurants and bars in their communities by asking, “Which of the following best describes the rules about smoking in (1) restaurants in the community where you live? And (2) drinking establishments, such as a pub or bar, in the community where you live?” Response options include: smoking is allowed in all indoor areas; smoking is allowed only in some indoor areas; smoking is not allowed in any indoor area; every [restaurant/bar] has its own rules.” (Note that the percent reporting complete restaurant restrictions in each country were 5.0% and 77.2% in Armenia and Georgia, respectively, indicating that community members’ experiences did not align fully with actual policy context.) Each of these items was converted to single 3-level restrictions “dose” variables (0 = allowed/no rules, 1 = partial restrictions/each has its own rules, 2 = complete restrictions). We then created a single 3-level restriction for both restaurants and bars (Cronbach’s $\alpha = 0.94$).

To assess media exposure, participants were asked, “In the past 6 months, how often have you noticed (e.g., on the internet, in social media, in newspapers, in magazines, on TV, on the radio, on signs, or in leaflets): (1) information about the dangers of smoking cigarettes or information that encourages quitting smoking? (2) Information about the dangers of being exposed to the smoke of others? (3) Any signs in public places indicating that “no smoking is allowed”? (4) Any news stories talking about the harms of second-hand smoke or the importance of public smoke-free air policies in your community? (5) Any advertisements or signs promoting cigarettes? And (6) any news stories talking about the negative aspects of public smoke-free air policies?” Response options were: 0 = never, 1 = rarely, 2 = sometimes, 3 = frequently. The first 4 questions were summarized as an index (i.e., average) of anti-tobacco media exposure (Cronbach’s alpha = 0.72); the last 2 were summarized as an index score (i.e., average) of pro-tobacco media exposure (Cronbach’s alpha = 0.32; ranges for both: 0–3).

Covariates.

Covariates included sociodemographics, specifically age, sex, education level, employment status, monthly household income, marital status, and children under the age of 18 in the home.

Data Analysis

We began by performing descriptive analyses to summarize participant characteristics. Subsequently, we used bivariate analyses to explore variations in sociodemographic data, smoking-related attributes, and key predictors (e.g., perceived harm, social influences, smoke-free policies, media exposure) concerning the dependent outcomes: (1) differences between smokers and non-smokers; (2) among smokers, regarding (a) readiness to quit within six months, (b) attempts to quit in the past year, (c) importance of quitting, and (d) confidence in quitting; and (3) among non-smokers, focusing on perceived harm (excluding perceived harm as a predictor).

We developed multivariable regression model corresponding to these comparisons: binary logistic regression for smoking status, readiness to quit, and past-year quit attempts

among smokers; linear regression for importance of quitting and confidence in quitting among smokers, and perceived harm among non-smokers. The models controlled for variables such as country, age, sex, employment status, perceived harm, number of friends who smoke, smoke-free restrictions (in homes, vehicles, workplaces, and restaurants/bars), and media exposure (both anti- and pro-tobacco). For smokers, the models also included smoking frequency (daily vs. occasional) and attitudes toward smoking from friends, family, and the public.

Regression analyses were additionally conducted using multilevel modelling to account for the nested structure of data (individual participants within communities). Intra-class correlation coefficients ranged from 0 to 0.01, with no significant differences in outcomes. Therefore, the simpler models, adjusted for country, are presented. We also performed sub-analyses by country to assess variations in predictors within the multivariable regression framework. All statistical analyses were executed using SPSS v. 26 (IBM Corp., Armonk, NY, USA), with the significance level set at 0.05.

Measurements (2)

Related to the research Question#4 (Topuridze et al. 2020)

Socio-demographics: The current analyses included participants' age, sex, education level, employment status, monthly household income, marital status, and presence of children under 18 years in the home.

Smoking Characteristics: We assessed lifetime cigarette use (as well as ENDS and HTPs) among all participants and evaluated past 30-day use among lifetime users. For those who reported smoking in the past 30 days, we collected data on the number of days smoked, cigarettes smoked per day (CPD), readiness to quit within the next 30 days and 6 months, and the number of quit attempts in the past year (categorized as any vs. none). Additionally, we assessed the importance of quitting using a scale from 0 to 10 ("How important is quitting smoking to you?"), and a similar scale was used to measure confidence in quitting.

Reactions to Smoke-Free Policy: Participants were asked to indicate their level of support or opposition to a complete smoking ban in various settings and a similar ban on ENDS/HTPs (e.g., IQOS). Table 2 lists the assessed settings for cigarette smoking, with a subset shown in Figure 1 assessed for ENDS/HTPs. Response options were: Strongly oppose, Somewhat oppose, Don't know, Somewhat support, Strongly support. "Don't know" responses were coded as a neutral midpoint (1 = Strongly oppose, 2 = Somewhat oppose, 3 = Don't know, 4 = Somewhat support, 5 = Strongly support). Composite index scores were created for items related to cigarettes, ENDS/HTPs, and combined categories by averaging responses across items. Cronbach's alpha for responses related to cigarettes, ENDS/HTPs, and combined categories were 0.91, 0.93, and 0.93, respectively, with a correlation of 0.46 ($p < 0.001$) between cigarette and ENDS/HTP index scores.

Persuasiveness of Policy-Related Messaging: Participants were asked how persuasive they found specific statements related to smoke-free policies ("Indicate how convincing each statement is, regardless of your agreement with it"). The items assessed are shown in Figure 2. Response options were: Not at all persuasive, don't know, moderately persuasive, extremely persuasive. "Don't know" responses were coded as a middle response (1 = Not at all persuasive, 2 = don't know, 3 = moderately persuasive, 4 = extremely persuasive). Composite index scores were calculated for pro-policy and anti-policy messages by averaging responses. Cronbach's alpha for pro-policy and anti-policy messaging scores were 0.78 and 0.86, respectively, with a correlation of 0.18 ($p < 0.001$) between the indices.

Data Analysis

We began with descriptive analyses to profile participants. Next, we performed bivariate analyses to compare socio-demographics, support for smoke-free policies, and perceived persuasiveness of pro- and anti-policy messages between smokers and non-smokers.

For further analysis, index scores for support of cigarette and ENDS/HTP bans were used as outcomes in smoking status-stratified multilevel linear regression models. We used random intercept models to account for the hierarchical structure of participants nested within municipalities, applying GenLinMixed with an identity link function in SPSS. Unconditional models estimated the intra-class correlation (ICC), and full models included

country, age, sex, employment status, relationship status, and children in the home as fixed effects. For smokers, analyses included smoking frequency and quitting importance/confidence. An unstructured covariance matrix was used, and cases with missing covariate data (3–5%) were excluded. Full Model ICCs were calculated for all models. Similar multilevel regression analyses were conducted for the perceived persuasiveness of pro- and anti-policy messaging index scores. All analyses were performed using SPSS v. 26, with alpha set at 0.05.

Research study #2 Cancer Screening Barriers: Knowledge, Attitudes, and Practices (KAP) Study among Primary Healthcare Workers (2023).

Study Design

We conducted a cross-sectional survey among primary healthcare (PHC) providers in Georgia in December 2023. The study aimed to assess the practice related to recommending and referring patients for cancer screening and the factors influencing it.

Study Population

The survey targeted PHC providers who participated in a state-funded continuous medical education (CME) training program on cancer screening. A total of 3,249 trainees, including family doctors, nurses, and subspecialty physicians from both urban and rural PHC facilities were invited to participate. Out of these, 3,097 agreed to participate (response rate = 95.3%), and the final analysis focused only on 2,985 family doctors and nurses who according to the national policy are directly responsible for communication and referral of the beneficiaries to the cancer screening program. For the research question #3 analysis was performed on the subsample of the medical personnel between 25 and 60 years age who represent the eligible target group for cervical cancer screening national program in Georgia.

Setting

The study was conducted within Georgia's primary healthcare (PHC) system, which features distinct models for urban and rural healthcare. Rural healthcare is primarily managed by the state-owned Georgian Medical Holding, overseeing approximately 5,000 medical personnel and 28 health facilities. Urban PHC practices are privately owned and operate under contracts with the National Health Agency as part of the Universal Healthcare Program. Preventive and primary healthcare services are funded through a capitation model, with most providers managing over 2,000 patients, despite recommendations to serve no more than 2,500 patient per PHC provider. In 2019, 6% of rural and 28% of urban doctors served more than 2,000 patients, with some exceeding 3,000. (World Health Organization Regional Office for Europe 2021)

Procedures

Before the initiation of the training session, participants were offered the opportunity to participate in the survey. Those who consented to the study completed a structured, self-administered questionnaire, either paper-based or computer-assisted (using tablets). The survey was distributed once, and responses were collected in a single round. Data were entered into an Excel database and checked for consistency.

Research Tools

The questionnaire was adapted from the International Agency for Research on Cancer (IARC) tool on barriers to cancer screening from the healthcare provider's perspective [reference for IARC tool], tailored to reflect the local context. The survey included several domains and 42 questions. Domains and questions relevant for the current study were as follows: **Healthcare provider and facility characteristics** - gender, age, specialty, work experience in PHC, and type/region of the PHC setting; **healthcare system-level factors** - availability of guidelines, training programs, systems for identifying and inviting target populations, notifying results, follow-up procedures, recall notices for non-compliant individuals, program performance evaluations, staffing levels, infrastructure adequacy, waiting lists, coordination between various levels of medical services, public promotion, and electronic registration systems; **provider-level factors** - knowledge, motivation, opportunity, capacity, perception, and self-reported medical related to recommending and referring to cancer screening services. (Appendix 4)

Measurements (1)

Related to Research Question #2

The primary outcome variable was the number of patients recommended and referred for cancer screening during a typical week, which represented the proactive role of healthcare providers in promoting cancer screening. This could range from informing patients about available services to helping them book appointments through the online scheduling system. The variable encompassed both direct and indirect interactions within the primary healthcare setting, including active communication through phone calls or in-

person discussions during routine visits for other health concerns. The responses were initially grouped into five response categories: (1) 0 patients, (2) 1-5 patients, (3) 6-10 patients, (4) 11-20 patients, and (5) 21 or more patients per week.

To simplify the analysis and improve statistical power, these categories were collapsed into two groups: 0-5 patients and 6 or more patients per week. The decision to collapse the five categories was based on a Chi-Square Test of Independence, which was used to assess whether there were significant differences in the distribution of responses across adjacent categories. The test indicated that there were no statistically significant differences between certain adjacent categories, specifically between 0 patients and 1-5 patients, and between 6-10 patients and 11 or more patients, justifying their combination into broader groups. This transformation allowed for a more interpretable dichotomous outcome, while maintaining the integrity of the data.

Variables measuring providers' knowledge were analyzed separately for each cancer type and were also combined to construct a comprehensive knowledge scale index. We used Cronbach's alpha to assess the reliability of the knowledge scale, with a value of 0.7 or higher indicating acceptable internal consistency of the knowledge-related items. (Cronbach, Lee J. 1951) The knowledge scale index ranged from 0 (no knowledge) to 7 (high knowledge), based on the number of correct responses to questions regarding the target group of the cancer screening program and screening frequency. Variables measuring the motivation, opportunity, capacity, and perception were measured on a 5-point Likert scale with categories Strongly agree, Agree, Not agree neither disagree, Disagree, Strongly disagree (Likert 1932) and collapsed into three categories (Strongly agree, somewhat agree and other) for bivariate and dichotomous categories ("Agree" vs. "Other") for multivariate analysis.

Measurement (2)

Related to Research Question #3

Study questions and related variables were organized according to COM-B model:

Demographic and Professional Information: Captures marital status, number of children, specialty, experience in primary healthcare (PHC), place of work, and region of work.

Behavior (Cancer Screening-Related Actions): Assesses history of cervical cancer screening, frequency, reasons for not screening, and provider perceptions of patient barriers (e.g., lack of knowledge, trust issues, cultural influences).

Capability (Knowledge and Awareness): Measures knowledge of the national screening program, perceived information level on screening, beliefs about screening effectiveness, and training received on cancer screening.

Motivation (Beliefs, Attitudes, and Intentions): Evaluates the importance of cervical cancer screening, perceptions of cancer danger, confidence in making informed decisions, prioritization of screening, and intentions for future screening.

Opportunity (Environmental and Social Factors): Explores social norms regarding support for screening, perceived embarrassment, advice from health professionals, and healthcare system-level barriers (e.g., access, infrastructure, promotion of screening).

Statistical Methods

Descriptive and bivariate analyses were conducted using SPSS software (version 26.0). Frequencies and means were calculated for each variable.

For the research Question #2 a chi-square test was used to compare the associations between various factors and the primary outcome variable, with stratification by urban versus rural settings and by family doctors versus nurses. We performed a multivariate analysis to adjust for potential confounders and evaluate how characteristics of healthcare providers, system-level and provider-level factors were associated with the PHC provider practices to recommend and refer cancer screening to their patients.

For the research Question #3 the bivariate analysis were performed to measured associations between cervical cancer screening behavior and items related to demographic and professional information, capability, motivation and opportunity. Variables identified as statistically significant in the bivariate analysis ($p < 0.05$) were further tested in the multivariate analysis to adjust for potential confounders. This approach provided a comprehensive understanding of how the COM-B model items influenced cancer screening behavior among PHC personnel.

Ethics

This study was approved by the Research Ethics Committee of Tbilisi State Medical University on December 1, 2023. Participation was entirely voluntary, and informed consent was obtained from all respondents prior to their participation.

Consent Process:

For the paper-based survey, written consent was obtained, ensuring participants fully understood the purpose and procedures of the study. For the computer-assisted survey, electronic consent was obtained at the beginning of the survey, requiring participants to acknowledge their agreement to participate after reviewing the consent form.

Anonymity and Confidentiality:

The survey was designed to be fully anonymous. No personally identifiable information was collected, ensuring that individual responses could not be traced back to participants. This anonymity mitigates concerns about participants feeling obligated to respond or fear of judgment for their answers. Data confidentiality was strictly maintained throughout the study.

Separation from Training Activities:

The survey was explicitly separate from the pre-training tests and evaluation. Respondents were informed that participation in the survey was not linked to their training performance, certification, or professional standing. This separation was emphasized during the consent process to reduce any perceived coercion.

Trusted Data Collection Process:

The survey was conducted by the Primary Healthcare Association, a trusted and independent organization among the study target group. Their involvement ensured that participants could trust the process and feel secure in providing honest responses.

Freedom from Coercion:

To further ensure participants were free from coercion:

They were explicitly informed that their participation was voluntary, with no penalties or consequences for non-participation.

They had the option to withdraw at any time without providing justification or impacting their involvement in the training program.

Survey responses were collected in a manner that allowed participants to skip questions they were uncomfortable answering.

Chapter IV: Results

Results below are organised according to the specific research questions, specifically:

- **RQ#1** - What is the impact of current tobacco control policies on smoking behaviors and related factors in Georgia?
- **RQ#2** - What is the impact of current tobacco control policies on smoking behaviors and related factors in Georgia?
- **RQ #3** - What barriers do patients perceive in participating in cancer screening programs in Georgia?
- **RQ#4** - What determinants influence the adoption and implementation of tobacco control policies in Georgia?

RQ#1 - What is the impact of current tobacco control policies on smoking behaviors and related factors in Georgia?

(Wysota et al. 2021)

Participant Characteristics

Participants were an average age of 43.45 years old, 60.5% female, 32.1% with $\geq$ Bachelor's degree, and 49.0% employed. Overall, 27.3% reported smoking on some days or every day. Among smokers, 12.7% indicated that they would quit in the next 6 months (including 4.2% indicating within the next month), and 43.5% of smokers never tried to quit, with only 19.2% reporting a past-year quit attempt. Table 3 also presents data by smoking status and by country to characterize differences across the samples.

Table 3. Participant characteristics and bivariate comparisons of nonsmokers vs. smokers and those in Armenia vs. Georgia.

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia n = 705	Georgia n = 751	<i>p</i>
	n = 1456 (100%)	n = 1058 (72.7%)	n = 398 (27.3%)				
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Country, n (%)				<0.001			--
Armenia	705 (48.4)	561 (53.0)	144 (36.2)		--	--	
Georgia	751 (51.6)	497 (47.0)	254 (63.8)		--	--	
Sociodemographics							
Age, M (SD)	43.45 (13.49)	43.34 (13.59)	43.38 (13.24)	0.957	42.56 (13.41)	44.08 (13.53)	0.032
Male, n (%)	575 (39.5)	207 (19.6)	368 (92.5)	<0.001	210 (29.8)	365 (48.6)	<0.001
Education, n (%)				0.164			
<High school	233 (15.3)	157 (14.8)	66 (16.6)		161 (22.8)	62 (8.3)	<0.001
High school to some college	765 (52.5)	546 (51.6)	219 (55.0)		327 (45.1)	447 (59.6)	
≥College degree	468 (32.1)	355 (33.6)	113 (28.4)		226 (32.1)	242 (32.2)	

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia n = 705	Georgia n = 751	<i>p</i>
	n = 1456 (100%)	n = 1058 (72.7%)	n = 398 (27.3%)				
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Employed, n (%)	713 (49.0)	438 (41.4)	275 (69.1)	<0.001	311 (44.1)	402 (53.5)	<0.001
Married/cohabitating, n (%)	1061 (72.9)	784 (74.1)	277 (69.6)	0.085	534 (75.7)	527 (70.2)	0.017
Children under 18 in the home, n (%)	731 (51.0)	541 (52.1)	190 (48.1)	0.174	386 (56.6)	345 (45.9)	<0.001
Smoking Characteristics (for smokers)							
Number of days smoked, past 30, n (%)				-			0.448
Every day	-	-	350 (87.9)		129 (89.6)	221 (87.0)	
Some days	-	-	48 (12.1)		15 (10.4)	33 (13.0)	
CPD, M (SD)	-	-	22.09 (12.6)	-	21.72 (11.12)	21.02 (10.62)	0.548
Readiness to quit, next 6 months, n (%)			48 (12.7)	-	23 (21.7)	25 (13.7)	0.080
Lifetime quit attempt, n (%)			216 (56.5)	-	100 (74.1)	114 (46.5)	0.001

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia n = 705	Georgia n = 751	<i>p</i>
	n = 1456 (100%)	n = 1058 (72.7%)	n = 398 (27.3%)				
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Past-year quit attempt, n (%)			73 (19.2)	-	42 (29.2)	31 (12.2)	<0.001
Importance of quitting, M (SD)	-	-	5.75 (3.23)	-	6.47 (3.71)	5.33 (2.86)	0.001
Confidence in quitting, M (SD)	-	-	4.80 (3.18)	-	4.78 (3.88)	4.79 (2.73)	0.967
Perceived Harm, M (SD)							
Regular cigarettes	5.92 (1.96)	6.14 (1.91)	5.36 (1.97)	<0.001	5.74 (2.18)	6.09 (1.71)	0.001
Large or little cigars	5.83 (1.98)	6.10 (1.87)	5.14 (2.07)	<0.001	5.69 (2.12)	5.97 (1.82)	0.007
Electronic cigarettes or vaporizers	5.33 (2.09)	5.66 (1.96)	4.47 (2.21)	<0.001	5.32 (2.13)	5.35 (2.07)	0.793
Heat-not-burn (IQOS)	5.23 (2.11)	5.55 (1.97)	4.37 (2.21)	<0.001	5.20 (2.14)	5.25 (2.08)	0.644
Hookah/waterpipe/nargila	4.91 (2.22)	5.27 (2.11)	3.96 (2.23)	<0.001	4.78 (2.29)	5.04 (2.15)	0.026
Perceived harm score, M (SD)	5.45 (1.86)	5.74 (1.77)	4.66 (1.87)	<0.001	5.35 (1.92)	5.54 (1.80)	0.047
Social Influences							

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia n = 705	Georgia n = 751	<i>p</i>
	n = 1456 (100%)	n = 1058 (72.7%)	n = 398 (27.3%)				
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Number of friends who smoke, n (%)				<0.001			<0.001
None	143 (9.8)	143 (13.5)	0 (0.0)		28 (4.0)	115 (15.5)	
Almost none	175 (12.0)	169 (16.0)	6 (1.5)		84 (12.0)	91 (12.3)	
Less than half	390 (26.8)	310 (29.3)	80 (20.1)		158 (22.6)	232 (31.3)	
About half/Don't know	324 (22.3)	190 (18.0)	134 (33.7)		170 (24.3)	139 (18.7)	
More than half	310 (21.3)	178 (16.8)	132 (33.2)		166 (23.7)	144 (19.4)	
Almost all	99 (6.8)	61 (5.8)	38 (9.6)		78 (11.2)	21 (2.8)	
All	15 (1.03)	7 (0.7)	8 (2.0)		15 (2.1)	0 (0.0)	
Number friends who smoke score, M (SD)	2.58 (1.43)	2.29 (1.45)	3.35 (1.02)	<0.001	2.94 (1.39)	2.23 (1.38)	<0.001
Friends/family attitude of smoking, n (%)				-			<0.001

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia	Georgia	<i>p</i>
	n = 1456 (100%)	n = 1058 (72.7%)	n = 398 (27.3%)		n = 705	n = 751	
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
All or nearly all disapprove	-	-	105 (27.5)		59 (43.1)	46 (18.8)	
Most disapprove	-	-	181 (47.4)		49 (35.8)	132 (53.9)	
About half approve, half disapprove	-	-	81 (21.2)		24 (17.5)	57 (23.3)	
Most approve	-	-	13 (3.4)		4 (2.9)	9 (3.7)	
All or nearly all approve	-	-	2 (0.5)		1 (0.7)	1 (0.4)	
General public attitude of smoking, n (%)				-	0.001		
All or nearly all disapprove	-	-	100 (26.2)		52 (38.0)	48 (19.6)	
Most disapprove	-	-	125 (32.7)		38 (27.7)	87 (35.5)	
About half approve, half disapprove	-	-	148 (38.7)		41 (29.9)	107 (43.7)	
Most approve	-	-	3 (0.9)		2 (1.5)	1 (0.4)	

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia	Georgia	<i>p</i>
	n = 1456 (100%)	n = 1058 (72.7%)	n = 398 (27.3%)		n = 705	n = 751	
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
All or nearly all approve	-	-	6 (1.6)		4 (2.9)	2 (0.8)	
Friend/family/public attitude, M (SD)	-	-	1.10 (0.72)	-	0.93 (0.83)	1.20 (0.63)	<0.001
Smoke-free Restrictions							
Home restrictions, n (%)				<0.001			<0.001
Allowed/no rules	507 (34.9)	348 (32.9)	159 (40.1)		381 (54.2)	126 (16.8)	
Partial restrictions	386 (26.6)	250 (23.7)	136 (34.3)		154 (21.9)	232 (30.9)	
Complete restrictions	561 (38.6)	459 (43.4)	102 (25.7)		168 (23.9)	393 (52.3)	
Dose, M (SD)	1.04 (0.86)	1.11 (0.87)	0.86 (0.80)	<0.001	0.93 (0.83)	1.20 (0.63)	<0.001
Household vehicle restrictions, n (%)				<0.001			<0.001
Allowed/no rules/no car	1044 (71.8)	728 (68.9)	316 (79.6)		533 (75.8)	511 (68.0)	

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia	Georgia	<i>p</i>
	n = 1456 (100%)	n = 1058 (72.7%)	n = 398 (27.3%)		n = 705	n = 751	
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Partial restrictions	120 (8.3)	73 (6.9)	47 (11.8)		32 (4.6)	88 (11.7)	
Complete restrictions	290 (19.9)	256 (24.2)	34 (27.3)		138 (19.6)	152 (20.2)	
Dose, M (SD)	0.48 (0.81)	0.55 (0.86)	0.29 (0.61)	<0.001	0.44 (0.80)	0.52 (0.81)	0.047
Workplace smoking restrictions, n (%)				<0.001			0.002
Allowed/unemployed/no indoors	987 (67.8)	724 (68.4)	263 (66.1)		505 (71.6)	482 (64.2)	
Partial restrictions	79 (12.0)	41 (10.0)	38 (15.2)		41 (5.8)	38 (5.1)	
Complete restrictions	390 (59.0)	293 (71.3)	97 (38.8)		159 (22.6)	231 (30.8)	
Dose, M (SD)	0.59 (0.88)	0.60 (0.89)	0.58 (0.86)	0.852	0.51 (0.84)	0.67 (0.92)	0.001
Restaurants in your community, n (%)				<0.001			<0.001
Allowed/no rules/don't know	391 (26.9)	321 (30.5)	70 (17.6)		277 (39.5)	114 (15.2)	

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia n = 705	Georgia n = 751	<i>p</i>
	n = 1456 (100%)	n = 1058 (72.7%)	n = 398 (27.3%)				
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Partial restrictions/each has own rules	441 (30.4)	331 (31.4)	110 (27.7)		389 (55.5)	52 (6.9)	
Complete restrictions	619 (42.7)	402 (38.1)	217 (54.7)		35 (5.0)	584 (77.9)	
Dose, M (SD)	1.16 (0.82)	1.08 (0.83)	1.37 (0.77)	<0.001	0.65 (0.57)	1.63 (0.73)	<0.001
Bars in your community, n (%)				<0.001			<0.001
Allowed/no rules	488 (33.6)	396 (37.6)	92 (23.2)		341 (48.6)	147 (19.6)	
Partial restrictions/each has own rules	371 (25.6)	280 (26.6)	91 (22.9)		334 (47.6)	37 (4.9)	
Complete restrictions	592 (40.8)	378 (35.9)	214 (53.9)		26 (3.7)	566 (75.5)	
Dose, M (SD)	1.07 (0.86)	0.98 (0.86)	1.31 (0.82)	<0.001	0.55 (0.57)	1.56 (0.80)	<0.001
Restaurant/bar restrictions dose, M (SD)	2.23 (1.63)	2.06 (1.63)	2.68 (1.54)	<0.001	1.21 (1.05)	3.19 (1.49)	<0.001
Media Exposure, M (SD)							

Variable	Total	Nonsmokers	Smokers	<i>p</i>	Armenia	Georgia	<i>p</i>
	n = 1456 (100 %)	n = 1058 (72.7%)	n = 398 (27.3%)		n = 705	n = 751	
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Anti-tobacco media							
Dangers of smoking cigarettes	1.84 (1.14)	1.89 (1.12)	1.69 (1.19)	0.003	1.92 (1.09)	1.76 (1.19)	0.010
Dangers of SHSe	1.50 (1.20)	1.55 (1.18)	1.36 (1.23)	0.007	1.54 (1.15)	1.46 (1.24)	0.190
“No smoking is allowed” sign	2.27 (0.99)	2.23 (1.00)	2.38 (0.95)	0.012	1.99 (1.01)	2.54 (0.89)	<0.001
News on SHSe	0.69 (0.98)	0.71 (0.98)	0.64 (0.99)	0.126	0.66 (0.90)	0.72 (1.05)	0.264
Anti-tobacco media exposure score	1.58 (0.80)	1.60 (0.80)	1.52 (0.81)	0.094	1.53 (0.75)	1.62 (0.85)	0.031
Pro-tobacco media							
Advertisements promoting cigarettes	0.31 (0.73)	0.33 (0.76)	0.24 (0.64)	0.030	0.40 (0.84)	0.22 (0.60)	<0.001
Anti-smoke-free policy media	0.69 (0.98)	0.55 (0.92)	0.45 (0.85)	0.073	0.65 (0.96)	0.40 (0.84)	<0.001
Pro-tobacco media exposure score	0.42 (0.64)	0.44 (0.66)	0.35 (0.57)	0.012	0.53 (0.72)	0.31 (0.52)	<0.001

Notes: M = Mean; SD = Standard Deviation; n = Number; *p* = *p*-value. M and SD reported to hundredths; % reported to tenths; *p*-values reported to thousandths.

Readiness to Quit Among Smokers

The bivariate analysis results for readiness to quit are summarized in the Table. Multivariable analysis (refer to Table 2) identified significant predictors for readiness to quit, including being unemployed compared to employed ($p = 0.005$), smoking occasionally rather than daily ($p = 0.002$), holding more positive views of smoking within social circles ($p = 0.007$), reduced exposure to anti-tobacco media ($p = 0.001$), and increased exposure to pro-tobacco media ($p = 0.015$). A country-specific subanalysis was not feasible due to limited sample sizes of those expressing readiness to quit.

Past-Year Quit Attempts Among Smokers

Details on past-year quit attempts can be found in Supplementary Table S1. Multivariable analysis highlighted that among smokers, factors associated with attempting to quit in the past year included residing in Armenia compared to Georgia ($p = 0.047$), younger age ($p = 0.019$), smoking on some days versus daily ($p = 0.001$), having more friends who smoke ($p = 0.035$), stricter home smoke-free policies ($p = 0.032$), reduced anti-tobacco media exposure ($p = 0.036$), and higher exposure to pro-tobacco media ($p = 0.012$). The small number of participants reporting quit attempts precluded country-specific subanalysis.

Importance of Quitting Among Smokers

The bivariate findings for the importance of quitting are provided in Supplementary Table S2. Multivariable analyses showed that smokers who placed greater importance on quitting were more likely to perceive higher harm from smoking ($p < 0.001$), have less positive attitudes toward smoking among peers and the public ($p < 0.001$), enforce more stringent home smoking restrictions ($p < 0.001$), have fewer restrictions in restaurants and bars ($p = 0.027$), and report higher pro-tobacco media exposure ($p = 0.018$). In country-specific analyses, shared predictors included perceived harm, negative social attitudes toward smoking, and home restrictions; additional factors among Armenian participants were younger age, being female, and fewer restaurant/bar restrictions.

Table 4. Linear regression analyses examining predictors of the importance of quitting and confidence to quit among past 30-day smokers and perceived harm among nonsmokers.

Variable					Among Smokers				Among Nonsmokers			
	Importance				Confidence				Perceived Harm			
	B	CI	SE	<i>p</i>	B	CI	SE	<i>p</i>	B	CI	SE	<i>p</i>
Country: Georgia (ref: Armenia)	-0.1 3	-1.0 5, 0.78	0.4 6	0.77 2	-0.8 2	-1.7 9, 0.14	0.4 9	0.09 4	0.08	-0.2 1, 0.37	0.1 5	0.60 9
Sociodemographic and Smoking Factors												
Age	-0.0 1	-0.0 3, 0.01	0.0 1	0.39 7	-0.0 4	-0.0 7, -0.0 2	0.0 1	0.00 2	-0.0 0	-0.0 1, 0.01	0.0 1	0.72 2
Male (ref: female)	-0.0 5	-1.3 1, 1.21	0.6 4	0.93 3	-0.1 0	-1.4 3, 1.23	0.6 8	0.88 3	0.37	0.09 , 0.64	0.1 4	0.01 0
Employment (ref: other)	-0.1 5	-0.8 9, 0.58	0.3 7	0.68 0	0.53	-0.2 4, 1.30	0.3 9	0.17 9	-0.1 5	-0.4 9, 0.20	0.1 7	0.40 5
Smoke every day (ref: some days)	-0.2 3	-1.2 3, 0.84	0.5 4	0.67 8	-1.8 3	-2.9 6, -0.7 1	0.5 7	0.00 1	--	--		--
Perceived Harm Score	0.41	0.24 , 0.59	0.0 9	<0.0 01	0.22	0.03 , 0.40	0.0 9	0.02 0	--	--		--
Social Influences												
Number of friends who smoke	0.05	-0.2 7, 0.35	0.1 6	0.77 7	-0.2 1	-0.5 3, 0.12	0.1 7	0.21 9	-0.0 1	-0.0 9, 0.07	0.0 4	0.82 7
Friend/family/p ublic attitude	-1.1 7	-1.6 3, -0.7 2	0.2 3	<0.0 01	0.49	0.01 , 0.97	0.2 4	0.04 6	--	--		--
Smoke-free Restrictions (doses)												

Variable					Among Smokers				Among Nonsmokers			
	Importance				Confidence				Perceived Harm			
	B	CI	SE	<i>p</i>	B	CI	SE	<i>p</i>	B	CI	SE	<i>p</i>
Home restrictions	0.79	0.37 , 1.21	0.2 1	<0.0 01	0.52	0.08 , 0.97	0.2 3	0.02 2	0.16	0.02 , 0.30	0.0 7	0.02 8
Household vehicle restrictions	-0.3 4	-0.8 9, 0.20	0.2 8	0.21 6	-0.2 5	-0.8 2, 0.33	0.2 9	0.40 2	-0.1 4	-0.2 7, -0.0 2	0.0 6	0.02 6
Workplace (indoor) restrictions	0.27	-0.1 5, 0.68	0.2 1	0.21 3	-0.0 2	-0.4 6, 0.43	0.2 3	0.94 7	0.04	-0.1 5, 0.22	0.1 0	0.70 6
Restaurant/bar restrictions	-0.3 1	-0.5 9, -0.0 4	0.1 4	0.02 7	0.07	-0.2 3, 0.36	0.1 5	0.67 9	0.13	0.05 , 0.21	0.0 4	0.00 2
Media Exposure												
Anti-tobacco media exposure	-0.2 5	-0.6 7, 0.17	0.2 1	0.23 8	0.12	-0.3 2, 0.57	0.2 3	0.58 7	0.26	0.11 , 0.40	0.0 7	0.00 1
Pro-tobacco media exposure	0.72	0.13 , 1.32	0.3 0	0.01 8	-0.5 7	-1.2 0, 0.07	0.3 2	0.08 0	-0.6 4	-0.8 1, -0.4 7	0.0 9	<0.0 01
Adjusted R-square	0.224				0.087				0.090			

Notes: B = Beta; CI = 95% Confidence Interval; SE = Standard Error; *p* = *p*-value. B, CI, and SE reported to hundredths; *p*-values reported

Confidence to Quit Among Smokers

Bivariate results for confidence in quitting are presented in Supplementary Table S2. Multivariable analysis identified several predictors of higher confidence in quitting, including younger age (*p* = 0.002), smoking on some days rather than every day (*p* = 0.001), higher perceived harm from smoking (*p* = 0.020), more positive attitudes toward smoking among friends, family, and the public (*p* = 0.046), and more smoke-free home restrictions (*p*

= 0.022). Country-specific sub analyses revealed that among Armenians, smoking on some days (vs. daily) was a predictor of confidence, while among Georgians, factors such as younger age, greater perceived harm, more positive attitudes toward smoking in others, and more home restrictions were significant.

Perceived Harm among Nonsmokers

Bivariate results for perceived harm among nonsmokers are provided in Supplementary Table S2. Multivariable analysis showed that greater perceived harm to health among nonsmokers was associated with being male ($p = 0.010$), stricter smoke-free restrictions in the home ($p = 0.028$) and in restaurants/bars ($p = 0.002$), but fewer restrictions in cars ($p = 0.026$), greater exposure to anti-tobacco media ($p = 0.001$), and lower exposure to pro-tobacco media ($p < 0.001$). Sub analyses by country revealed that predictors of greater perceived harm included being male and having more restaurant/bar restrictions in both Armenia and Georgia. In Armenia, greater anti-tobacco media exposure and less pro-tobacco media exposure were additional predictors, while in Georgia, more restaurant/bar restrictions were also associated with greater perceived harm.

RQ#2 - What barriers do healthcare providers encounter in enhancing patient participation in cancer screening programs in Georgia?

Of the 2,985 survey participants, the majority were female (95%; n=2840) with a mean age of 57.5 years. Most respondents were family doctors (56%; n=1665) with over 20 years of experience in primary healthcare settings (60% n= 1782; mean: 25 years). A majority worked in rural healthcare settings (67%; n=2012), with respondents primarily residing in the Imereti region (18%; n=533), followed by Tbilisi (the capital city), Samegrelo-Zemo Svaneti, and Kakheti regions (12%; n=366-371 each).

Practice related to facilitating cancer screening

A large majority (98%; n=2036) perceived that they actively recommended and referred their patients for cancer screening. However, only 21.2% reported recommending and referring screening to 6 or more patients per week, with 14.3% recommending and referring it to 6-10 patients, 3.2% to 11-15 patients, 1.5% to 16-20 patients, and 2.2% to 20 or more patients. The majority recommended and referred screening to 1-5 patients per week (64.8%), while 14.1% reported to provide recommendation and referral to 0 patients .

System-level factors

When asked about existing policies and procedures supporting PHC involvement in cancer screening, a majority of respondents reported that the cancer screening program in Georgia is guided by a policy framework from health authorities (90%; n=2695). They also reported the availability of protocols/guidelines for cancer screening (86%; n=2562), receiving training on cancer screening (75%; n=2250), existence of a system for identifying target populations (58%; n=1738), and reported no high staff turnover, which supports program continuity (95%; n=2843). Additionally, most respondents indicated there are no significant delays in accessing screening services (95%; n=2841) or further management for screen-positive cases (94%; n=2806) .

However, fewer respondents reported the presence of systems for inviting eligible individuals for screening (39%; n=1159), for notifying results and informing about follow-up

(40%; n=1184), and for sending recall notices to non-compliant individuals (23%; n=696). Only a minority believed there is a sufficient number of providers to ensure screening program delivery (13%; n=385), adequate infrastructure for screening (21%; n=637) and further management (12%; n=363), adequate coordination between agencies at different levels of medical services (13%; n=377), and effective public promotion of the screening program (24%; n=723). Notably, only 27% (n=792) were aware of an electronic system for registering cancer screening visits. Finally, only a minority indicated that they have access to the program performance data (15%; n=446)

Provider-level factors – knowledge and attitudes

Knowledge of the target age and recommended screening frequency varied among PHC personnel, with correct identification rates ranging from 39% to 75% for different cancer screenings – see Table 3 for details. The average knowledge score was 3.3 (SD 1.6) out of 10. The vast majority of PHC personnel believed in the effectiveness of cancer screening in reducing cancer morbidity (99%; n=2955) and mortality (99%; n=2960), 70% (n=2092) considered themselves well-informed about cancer screening procedures, and 69% (n=2068) believed their role in cancer screening was important. Additionally, 71% (n=2132) felt they had enough time to discuss cancer screening with patients, 72% (n=2160) prioritized cancer screening over other healthcare issues, 71% (n=2042) believed it was part of their job to help patients make informed decisions, 74% (n=2137) were confident in helping patients make informed decisions about screening, and 73% (n=2117) believed they had the necessary knowledge to do so. However, only 63% (n=1889) felt motivated to recommend cancer screening to their patients.

The stratified analysis by location and primary healthcare (PHC) personnel specialty revealed statistically significant differences ($p \leq 0.05$) in healthcare system-level and provider-level factors, including knowledge, perception, and practices related to facilitating cancer screening. These differences were evident among participants from urban and rural areas, as well as between family doctors and nurses.

Notably, nurses were less likely than family doctors to recommend or refer more than five patients per week for cancer screening. Additionally, nurses demonstrated lower awareness of the policy framework governing the cancer screening program (88% versus

92%, $p < 0.002$), as well as cancer screening protocols and guidelines (84% versus 87%, $p = 0.035$). Significant differences were also observed in the knowledge of systems for identifying target populations (37% versus 62%, $p < 0.001$), notifying results and informing about follow-up (37% versus 42%, $p = 0.002$), and issuing recall notices to non-compliant individuals (20% versus 26%, $p < 0.001$).

In terms of infrastructure, nurses were less likely to report the presence of adequate screening infrastructure (18% versus 24%, $p < 0.001$) or infrastructure for further management (9% versus 15%, $p < 0.001$). Coordination between different healthcare levels was also perceived to be less adequate by nurses compared to family doctors (11% versus 14%, $p = 0.004$), and nurses were less likely to believe there was proper public promotion of the screening program among the population (22% versus 26%, $p = 0.008$). Awareness of an electronic system for cancer screening visit registration was also lower among nurses (22% versus 26%, $p < 0.001$).

Nurses reported less knowledge about the national colorectal cancer screening program's target age group (48% versus 55%, $p < 0.001$), cervical cancer screening frequency (42% versus 51%, $p < 0.001$), and breast cancer screening frequency (55% versus 62%, $p < 0.001$). Moreover, nurses were less likely to believe in the effectiveness of cancer screening in reducing cancer morbidity (98% versus 99%, $p < 0.001$). They were also less likely to strongly agree that they were well-informed about cancer screening procedures (16% versus 23%, $p = 0.011$), that their role as primary healthcare providers in cancer screening is important (21% versus 31%, $p < 0.001$), that cancer screening should be a higher priority than other healthcare issues (18% versus 21%, $p = 0.039$), and that it is part of their job to help individuals make informed decisions about screening (24% versus 28%, $p = 0.011$) (Table 1).

Statistically significant differences were also observed between PHC providers serving in rural and urban settings. Providers from rural settings were more likely to be aware of the policy framework on cancer screening (92% versus 88%, $p < 0.001$) and the cancer screening protocol or guidelines (88% versus 82%, $p < 0.001$). They were also more likely to report that systems were in place for identifying target populations (60% versus 55%, $p = 0.017$) and that adequate infrastructure existed for cancer screening (24% versus 20%, $p = 0.007$) (Table 1).

However, rural providers were less likely to report systems for notifying patients of results and informing them about follow-up (37% versus 41%, $p = 0.032$) or for issuing recall notices to non-compliant individuals (20% versus 25%, $p = 0.004$). Furthermore, rural providers were less knowledgeable about cervical cancer screening frequency (46% versus 50%, $p = 0.034$) and were less likely to strongly agree that they were well-informed about cancer screening procedures (18% versus 22%, $p = 0.015$). They were also less likely to strongly agree that their role as primary healthcare providers in cancer screening is important (25% versus 30%, $p < 0.001$).

Table 5 Socio-demographic characteristics and cancer screening related knowledge, attitudes and practices of primary healthcare providers stratified by work location and specialty, Georgia, 2023

Characteristics	Total		Urban		Rural			Doctors		Nurses		
	(N=2985)	%	(N=973)	%	(N=2012)	%	P-value	(N=1665)	%	(N=1320)	%	P-value
Healthcare Provider and Facility Characteristics												
Gender												
Male	145	4.86	20	2.1	125	6.2	<0.001	142	8.5	3	0.2	<0.001
Female	2840	95.14	953	97.9	1887	93.8		1523	91.5	1317	99.8	
Age (Mean, SD)			56.03 (SD 12.9)		58.2 (SD 9.9)		<0.001	58.8 (SD 9.4)		55.9 (SD 10.7)		<0.001
Specialty												
Family Doctor	1665	55.78	613	63.0	1052	52.3	<0.001	----		----		
Nurse	1320	44.22	360	37.0	960	47.7		----		----		
Work experience in PHC* (Mean, SD)**	25.6 (SD 12.9)		25.0 (SD 12.9)		25.9 (SD 12.9)		0.102	25.7 (SD 12.3)		25.5 (SD 13.7)		0.785
1-10 years	373	12.5	155	15.9	219	10.9	0.783	168	10.1	206	15.6	0.038
11-20 years	830	27.8	234	24.0	596	29.6		476	28.6	354	26.8	
21< years	1782	59.7	584	60.1	1197	59.5		1021	61.3	760	57.6	
PHC facility location type												
Rural	2012	67.4	----	----	----	----	----	1052	63.2	960	72.7	<0.001
Urban	973	32.6	----	----	----	----		613	36.8	360	27.3	
PHC facility location Region												
Imereti	533	17.9	205	21.1	328	16.3	<0.001	287	17.2	246	18.6	<0.001
Tbilisi	371	12.4	369	37.9				257	15.4	114	8.6	
Samegrelo –Zemo Svaneti	366	12.3	90	9.2	276	13.7		191	11.5	175	13.3	
Kakheti	368	12.3	23	2.4	345	17.1		210	12.6	158	12.0	

Adjara	293	9.8	147	15.1	146	7.3		180	10.8	113	8.6	
Kvemo Kartli	256	8.6	93	9.6	163	8.1		129	7.7	127	9.6	
Shida Kartli	198	6.6	20	2.1	178	8.8		144	8.6	54	4.1	
Samtskhe-Javakheti	164	5.5	6	0.6	158	7.9		70	4.2	94	7.1	
Guria	149	5.0	2	0.2	147	7.3		75	4.5	74	5.6	
Racha-Lechkhumi and Kvemo Svaneli	146	4.9	0	0	146	7.3		51	3.1	95	7.2	
Mtskheta-Mtianeti	141	4.7	18	1.8	123	6.1		71	4.3	70	5.3	
Practice related to facilitating cancer screening												
Actively recommend cancer screening to their patients												
Yes	2936	98.4	931	95.7	1907	95.2	0.117	1574	5.2	1264	96.1	0.242
NO	46	1.6	42	4.3	97	4.8		87	94.8	52	3.9	
How many patients during the week do you recommend and refer for cancer screening?												
0	420	14.1	139	14.3	281	14.0	0.628	246	14.8	174	13.2	0.030
1-5	1933	64.8	610	62.7	1323	65.8		1039	62.4	895	67.7	
6-10	426	14.3	148	15.2	278	13.8		253	15.2	173	13.1	
11-15	95	3.2	37	3.8	58	2.9		62	3.7	33	2.5	
16-20	45	1.5	15	1.5	30	1.5		31	1.9	14	1.1	
20<	66	2.2	24	2.5	42	2.0		34	2.0	32	2.4	
Healthcare system-level factors to cancer screening												
The cancer screening program is defined by a policy framework from the health authorities												

Yes	2693	90.2	853	87.7	1840	91.5	<0.001	1530	91.9	1163	88.1	<0.001
No	292	9.8	120	12.3	172	8.5		135	8.1	157	11.9	
There is a protocol/guideline for cancer screening												
Yes	2562	85.8	797	81.9	1765	87.7	<0.001	1449	87.0	1113	84.3	0.035
No	423	14.2	176	18.1	247	12.3		216	13.0	207	15.7	
Received training on cancer screening including how to advise people to get screened, as well as benefits and risks												
Yes	2250	75.6	724	74.4	1526	76.1	0.300	1276	76.8	974	74.0	0.076
No	727	24.4	249	25.6	478	23.9		385	23.2	342	26.0	
There is a system in place for identifying target population.												
Yes	1737	58.2	536	55.1	1201	59.7	0.017	1046	62.8	619	37.2	<0.001
No	1248	41.8	437	44.9	811	40.3		691	52.3	629	47.7	
There is a system in place for inviting eligible individuals for screening.												
Yes	1159	38.8	372	38.2	787	39.1	0.643	660	39.6	499	37.8	0.307
No	1826	61.2	1225	60.9	601	61.8		1005	60.4	821	62.2	
There is a system in place for notifying the results and informing about follow-up												
Yes	1184	39.7	825	41.0	359	36.9	0.032	702	42.2	482	36.5	0.002
No	1801	60.3	1187	59.0	614	63.1		963	57.8	838	63.5	
There is a system in place for sending recall notice to												

the non-compliant individuals.												
Yes	696	23.0	200	24.9	196	20.1	0.004	427	25.6	269	20.4	<0.001
No	2289	76.7	1512	75.1	777	79.9		1238	74.4	1051	79.6	
There is an evaluation of performance of the programme which is published and accessible for providers												
Yes	446	14.9	312	15.5	134	13.8	0.213	243	14.6	203	15.4	0.551
No	2539	85.1	1700	84.5	839	86.2		1422	85.4	1117	84.6	
There is a sufficient number of providers to ensure screening programme												
Yes	385	12.9	246	12.2	139	14.3	0.116	235	14.1	150	11.4	0.026
No	2600	87.1	1766	87.8	834	85.7		1430	85.9	1170	88.6	
There is high staff turnover, which prevents proper continuity of the programme.												
Yes	142	4.8	97	4.8	45	4.6	0.813	78	4.7	64	4.8	0.835
No	2843	95.2	1915	95.2	928	95.4		1587	95.3	1256	95.2	
There is an adequate infrastructure for screening.												
Yes	637	21.3	401	19.9	236	24.3	0.007	397	23.8	240	18.2	<0.001
No	2348	78.7	1611	80.1	737	75.7		1268	76.2	1080	23.48	
There is an adequate infrastructure for further management.												
Yes	363	12.2	234	11.6	129	13.3	0.202	245	14.7	118	8.9	<0.001

No	2622	87.8	1778	88.4	844	86.7		1420	85.3	1202	91.1	
There are long waiting lists for screening.												
Yes	144	4.8	97	4.8	47	4.8	0.991	73	4.4	71	5.4	0.208
No	2841	95.2	1915	95.2	926	95.2		1592	95.6	1249	94.6	
There are long waiting lists for further management in case of screen positive result												
Yes	179	6.0	127	6.3	52	5.3	0.297	95	5.7	84	6.4	0.452
No	2806	94.0	1885	93.7	921	94.7		1570	94.3	1236	93.6	
There is an adequate coordination between different healthcare levels.												
Yes	377	12.6	263	13.1	114	11.7	0.296	236	14.2	141	10.7	0.004
No	2608	87.4	1749	86.9	859	88.3		1429	85.8	1179	89.3	
There is a proper public promotion of the screening programme among the population.												
Yes	723	24.2	486	24.2	237	24.4	0.904	434	26.1	289	21.9	0.008
No	2262	75.8	1525	75.8	736	75.6		1231	73.9	1031	78.1	
There is cancer screening visit registration electronic system for patients												
Yes	792	26.5	527	26.2	265	27.2	0.545	484	29.1	308	23.3	<0.001
No	2193	73.5	1485	73.8	708	72.8		1181	70.9	1012	76.7	
Provider-level factors												
Knowledge												
Knows about the national cervical cancer screening program target age	2236	74.9	731	75.1	1505	74.8	0.847	1255	75.4	981	74.3	0.508

Knows about the national <u>breast cancer</u> screening program target age	1792	60.0	573	58.9	1219	60.6	0.289	1022	61.4	770	58.3	0.107
Knows about the national <u>colorectal cancer</u> screening program target age	1548	51.9	508	52.2	1040	51.7	0.790	910	54.7	638	48.3	<0.001
Knows about the <u>cervical cancer</u> screening frequency	1577	52.8	486	49.9	922	45.8	0.034	851	51.1	557	42.2	<0.001
Knows about the national <u>breast cancer</u> screening frequency	1763	59.1	566	58.2	1197	59.5	0.491	1039	62.4	724	54.8	<0.001
Knows about the national <u>colorectal cancer</u> screening frequency	1165	39.1	359	36.9	806	40.1	0.097	646	38.8	519	39.3	0.773
Knowledge about cancer screening program Scale (Mean, SD)	3.3 (SD 1.6)		3.3 (SD 1.47)		3.3 (SD 1.61)			3.4 (SD 1.55)		3.2 (SD 1.57)		
Perceptions												
Do you believe that cancer screening is effective in decreasing cancer morbidity?												
Yes	2955	98.9	967	99.4	1986	99.1	0.076	1657	99.8	1297	98.3	<0.001
No	30	1.1	6	0.6	18	0.9		4	0.2	7	1.7	
Do you believe that cancer screening is effective in decreasing cancer mortality?												
Yes	2960	99.20	968	99.5	1992	99.4	0.138	1652	99.5	1308	99.4	0.921
No	25	0.8	6	0.5	12	0.6		9	0.5	8	0.5	
Motivated to recommend cancer screening to patients												

Strongly Agree	1047	35.1	415	42.7	632	31.4	0.765	700	42.1	347	26.3	0.334
Somewhat agree	1889	63.3	543	55.8	1346	66.9		941	56.5	948	71.8	
Other**	49	1.6	15	1.5	34	1.7		24	1.4	25	1.9	
Well informed about cancer screening procedures												
Strongly Agree	584	19.6	215	22.1	369	18.3	0.015	380	22.8	204	15.5	<0.001
Somewhat agree	2092	70.1	664	68.3	1428	70.9		1122	67.5	970	73.5	
Other	309	10.3	93	9.6	215	10.8		163	9.7	146	11.0	
Consider that their as primary healthcare provider role in cancer screening is important												
Strongly Agree	789	26.4	296	30.4	493	24.5	<0.001	517	31.1	272	20.6	<0.001
Somewhat agree	2068	69.3	615	63.2	1453	72.2		1094	65.7	974	73.8	
Other	128	4.3	62	6.4	66	3.3		54	3.2	74	5.6	
Have enough time to inform or discuss cancer screening program to the patients												
Strongly Agree	401	13.4	123	12.6	278	13.8	0.377	227	13.6	174	13.2	0.719
Somewhat agree	2132	71.4	609	62.6	1523	75.7		1120	67.3	1012	76.7	
Other	452	15.2	241	24.8	211	10.5		318	19.1	134	10.1	
Cancer screening is higher priority than other healthcare issues												
Strongly Agree	598	20.0	207	21.3	391	19.4	0.239	356	21.4	242	18.3	0.039
Somewhat agree	2160	72.4	664	68.2	1496	74.4		1153	69.2	1007	76.3	
Other	227	7.6	102	10.5	125	6.2		156	9.4	71	5.4	
Part of my job is to help people make an informed decision to be screened												

Strongly Agree	754	26.1	263	27.8	491	25.2	0.113	450	27.9	304	23.8	0.011
Somewhat agree	2042	70.6	645	68.3	1397	71.8		1110	68.9	932	72.9	
Other	94	3.3	37	3.9	57	3.0		52	3.2	42	3.3	
I am confident that I can help people make an informed decision about getting cancer screening												
Strongly Agree	622	21.6	211	22.4	411	21.2	0.541	368	22.9	254	19.9	0.747
Somewhat agree	2137	74.0	694	73.5	1444	74.4		1166	72.4	972	76.2	
Other	127	4.4	39	4.1	87	4.4		76	4.7	50	3.9	
I believe that I have the necessary knowledge to help people make an informed decision to undergo cancer screening												
Strongly Agree	481	16.7	165	17.5	316	16.3	0.990	277	17.3	204	15.9	0.430
Somewhat agree	2117	73.4	687	72.8	1431	73.7		1165	72.6	953	74.5	
Other	286	9.9	91	9.7	194	10.0		163	10.1	122	9.6	

Bivariate analysis identified several healthcare provider and facility characteristics that significantly increased the odds of PHC providers recommending and referring for cancer screening: being a family doctor ($OR_0=1.25$, 95% CI: **1.048-1.499**), having more than 20 years of experience in PHC ($OR_0=1.224$, 95% CI: **1.021-1.468**), working in the Tbilisi region ($OR_0=1.491$, 95% CI: 1.165-1.909) (Table 4).

Significant healthcare system-level predictors included the perceptions about availability of a national cancer screening policy framework ($OR_0=1.41$, 95% CI: 1.019-1.994), training provided to healthcare workers ($OR_0=1.50$ 95% CI: 1-197-1.855), a system for identifying target populations ($OR_0=1.25$, 95% CI: 1.039-1.491), a system for notifying results and informing about follow-up ($OR_0=1.44$, 95% CI: 1.208-1.721), sufficient number of screening service providers ($OR_0=1.57$, 95% CI: 1.232-1.997), adequate infrastructure ($OR_0=1.83$, 95% CI: 1.502-2.236), coordination between various levels of medical services ($OR_0=1.62$, 95% CI:1.272-2.066), public promotion of the screening program ($OR_0=1.80$, 95% CI: 1.487-2.184), and the existence of an electronic system for screening visit registration ($OR_0=1.25$, 95% CI: 1.030-1.517) (Table 5).

No significant associations were found between participants' knowledge about the national cancer screening program and their practice to facilitate screening (Table 2). However, significant perception-related predictors included participants' considering themselves well-informed ($OR_0=1.47$, 95% CI: 1.196-1.817) , viewing their role in screening as important ($OR_0=1.63$, 95% CI: 1.348-1.969), having sufficient time to discuss screening with patients ($OR_0=1.56$, 95% CI:1.231-1.980), prioritizing cancer screening over other health issues ($OR_0=1.43$, 95% CI: 1.164-1.764), believing it is their job to help patients make informed decisions ($OR_0=2.27$, 95% CI: 1.883-2.742), having confidence in helping patients decide about screening ($OR_0=2.42$, 95% CI: 1.101-5.328), and believing they have the necessary knowledge to influence patient decisions ($OR_0=1.88$ 95% CI: 1.137-3.122).

Table 6 Demographic characteristics, knowledge and attitudes of PHC providers by weekly number of patients recommended for cancer screening (<5 and 5<), Georgia, 2023

Characteristics	<i>Provides recommendation to get screening to <u>more than 5</u> patients a week</i>		<i>Provides recommendation to get screening to <u>less than 5</u> patients a week</i>				
	N	(%)	N	(%)	Unadjusted OR	95% CI	P-value
Healthcare Provider and Facility Characteristics							
Gender:							
Female	608	21.42	2232	78.6	1.373	0.878-2.147	0.878
Male	24	16.6	121	83.4	Ref		
Specialty							
Family doctor	380	22.8	1285	77.2	1.253	1.048-1.499	0.013
Nurse	252	19.1	1068	80.9	Ref*		
Work experience in PC							
≥20 years	401	22.5	1380	77.5	1.224	1.021-1.468	0.029
Other	231	19.2	973	80.8	Ref		
Place of Work							
Urban	408	20.3	1604	79.7	1.176	0.978-1.414	0.085
Rural	224	23.0	749	77.0	Ref		
Region of Work							
Tbilisi	102	27.5	269	72.5	1.491	1.165-1.909	0.001
Other Regions	530	20.3	2084	79.7	Ref		
Healthcare system-level barriers to cancer screening							
The cancer screening program is defined by a policy framework from the health authorities							
Yes	584	21.7	2109	78.3	1.408	1.019-1.994	0.037
No	48	16.4	244	83.6	Ref		
There is a protocol/guideline for cancer screening							
Yes	557	21.7	2005	78.3	1.289	0.987-1.683	0.061
No	75	17.7	348	82.3	Ref		
Received training on cancer screening including how to advise people to get screened, as well as benefits and risks							
Yes	512	22.8	1738	77.2	1.490	1-1.97-1.855	<0.001
No	120	16.5	607	83.5	Ref		

There is a system in place for identifying target population.							
Yes	394	22.7	1343	77.3	1.245	1.039-1.491	0.017
No	238	19.1	1010	80.9	Ref		
There is a system in place for inviting eligible individuals for screening.							
Yes	266	23.0	893	77.0	1.188	0.994-1.420	0.058
No	366	20.0	1460	80.8	Ref		
There is a system in place for notifying the results and informing about follow-up							
Yes	295	24.9	889	75.1	1.442	1.208-1.721	<0.001
No	337	18.7	1464	81.3	Ref		
There is a system in place for sending recall notice to the non-compliant individuals.							
Yes	163	23.4	533	76.6	1.187	0.969-0.453	0.098
No	469	20.5	1820	79.5	Ref		
There is an evaluation of performance of the programme which is published and accessible for providers							
Yes	107	24.0	339	76.0	1.211	0.955-1.536	0.114
No	525	20.7	2014	79.3	Ref		
There is a sufficient number of providers to ensure screening programme							
Yes	109	28.3	276	71.7	1.568	1.232-1.997	<0.001
No	523	20.1	2077	79.9	Ref		
There is high staff turnover, which prevents proper continuity of the programme.							
Yes	38	26.8	104	73.2	1.383	0.944-2.028	0.095
No	594	20.9	2249	79.1	Ref		
There is an adequate infrastructure for screening.							
Yes	190	29.8	447	70.2	1.833	1.502-2.236	<0.001
No	442	18.8	1906	81.2	Ref		

There is an adequate infrastructure for further management.							
Yes	104	28.7	259	71.3	1.592	1.244-2.038	<0.001
No	528	20.1	2094	79.9	Ref		
There are long waiting lists for screening.							
Yes	38	26.4	106	73.6	1.356	0.926-1.986	0.116
No	594	20.9	2247	79.1	Ref		
There are long waiting lists for further management in case of screen positive result							
Yes	41	22.9	138	77.1	Ref		
No	591	21.1	2215	78.9	0.898	0.626-1.288	0.558
There is an adequate coordination between different healthcare levels.							
Yes	109	28.9	268	71.1	1.621	1.272-2.066	<0.001
No	523	20.1	2085	79.9	Ref		
There is a proper public promotion of the screening programme among the population.							
Yes	211	29.2	512	70.8	1.802	1.487-2.184	<0.001
No	421	18.6	1841	81.4	Ref		
There is cancer screening visit registration electronic system for patients							
Yes	190	24.0	602	76.0	1.250	1.030-1.517	0.024
No	442	20.2	1751	79.8	Ref		
Provider-level barriers							
Knowledge							
Knowledge about the national <u>cervical cancer</u> screening program target age							
Yes	465	20.8	1771	79.2	0.915	0.749-1.118	0.384
No	167	22.3	582	77.7	Ref		
Knowledge about the national <u>breast cancer</u> screening program target age							
Yes	388	21.7	1404	78.3	1.070	0.893-1.282	0.463

No	242	20.5	937	79.5	Ref		
Knowledge about the national <u>colorectal cancer</u> screening program target age							
Yes	338	21.8	1210	78.2	1.086	0.911-1.295	0.845
No	294	20.5	1143	79.5	Ref		
Knowledge about the <u>cervical cancer</u> screening frequency							
Yes	281	20.0	1127	80.0	0.871	0.730-1.039	0.125
No	351	22.3	1226	77.7	Ref		
Knowledge about the national <u>breast cancer</u> screening frequency							
Yes	370	21.0	1393	79.0	0.973	0.814-1.163	0.766
No	262	21.4	960	78.6	Ref		
Knowledge about the national <u>breast cancer</u> screening frequency							
Yes	233	20.0	932	80.0	0.912	0.790-1.053	0.210
No	399	21.9	1421	78.1	Ref		
Cancer screening program knowledge scale			t=0.1425 df=3076 p=0.8867				
Perceptions							
Do you believe that cancer screening is effective in decreasing cancer morbidity?							
Yes	629	21.3	2325	78.7	1.804	0.534-6.089	0.335
No	3	13.0	28	87.0	Ref		
Do you believe that cancer screening is effective in decreasing cancer mortality?							
Yes	631	21.3	2329	78.7	4.335	0.574-32.750	0.121
No	1	5.9	24	94.1	Ref		
Motivated to recommend cancer screening to patients							
Motivated	626	21.3	2310	78.7	1.942	0.823-4.584	0.123
Other**	6	12.2	43	87.8	Ref		
Well informed about cancer screening procedures							
Very informed	156	26.7	428	73.3	1.474	1.196-1.817	<0.001

Other	476	19.8	1925	80.2	Ref		
Consider that their as primary healthcare provider role in cancer screening is <u>HIGHLY</u> important							
Strongly Agree	217	27.5	572	72.5	1.630	1.348-1.969	<0.001
Other	413	18.9	1774	81.1	Ref		
Have enough time to inform or discuss cancer screening program to the patients							
Strongly Agree	113	28.2	288	71.8	1.561	1.231-1.980	<0.001
Other	519	20.1	2065	79.9	Ref		
Cancer screening is <u>higher</u> priority than other healthcare issues							
Strongly Agree	157	26.3	441	73.7	1.433	1.164-1.764	<0.001
Other	475	19.9	1912	80.1	Ref		
Part of my job is to help people make an informed decision to be screened							
Strongly Agree	251	33.3	503	66.7	2.272	1.883-2.742	<0.001
Other	378	18.0	1721	82.0	Ref		
I am <u>confident</u> that I can help people make an informed decision about getting cancer screening							
Agree	616	22.3	2144	77.7	2.422	1.101-5.328	0.023
Other	7	10.6	59	89.4	Ref		
I <u>believe</u> that I have the necessary knowledge to help people make an informed decision to undergo cancer screening							
Agree	588	22.6	2011	77.4	1.884	1.137-3.122	0.013
Other	18	13.4	116	86.6	Ref		

**Ref- Reference group*

Multivariate analysis identified six statistically significant ($p \leq 0.05$) independent predictors of cancer screening self-reported recommendation and referral practices: (1) being family doctor (OR=1.3695% CI: 1.105-1.672 $P=0.003$); (2) working in Tbilisi (OR=1.36

95% CI: 1.143-1.948 P=0.003) (3) receiving comprehensive training on cancer screening (including how to advise people to get screened, as well as benefits and risks) (OR=1.492 95% CI: 1.038-1.682, P=0.024); (4) perceived that there is an adequate infrastructure for screening (OR=1.39, 95% CI: 1.067-1.808, P=0.015); (5) perception that there is a proper public promotion of the screening program among the population (OR=1.411, 95% CI: 1.122-1.776, P=0.003) and (6) perceive that it is part of the PHC provider's job to help people make informed decisions about cancer screening) (OR=1.87, 95% CI: 1.526-2.296, P<0.001) .

Table 7. Multivariate analysis results of the factors associated with cancer screening recommendation behavior among primary healthcare providers, Georgia, 2023

Factors	<i>Provides recommending cancer screening to 5+ patients a week *</i>		
	Adjusted OR	95 % CI	P-value
Specialty			
Family doctor	1.356	1.105-1.672	0.003
Nurse	Ref		
Region of Work			
Tbilisi	1.492	1.143-1.948	0.003
Other Regions	Ref		
Received training on cancer screening including how to advise people to get screened, as well as benefits and risks			
Yes	1.322	1.038-1.682	0.024
No	Ref		
There is an adequate infrastructure for screening			
Yes	1.389	1.067-1.808	0.015
No	Ref		
There is a proper public promotion of the screening programme among the population.			
Yes	1.411	1.122-1.776	0.003
No	Ref		
Part of my job is to help people make an informed decision to be screened			
Strongly Agree	1.871	1.526-2.296	<0.001
Other	Ref		

**Provides recommendation to get screening to more than 5 patients a week*

RQ #3 - What barriers do patients perceive in participating in cancer screening programs in Georgia?

Of the 1613 female survey participants, the majority were married (80%, n=1278), with a mean age of 50.88 years (SD = 6.85). Most participants had one or two children (72%, n=1166) and were employed as family doctors (44%, n=705) or nurses (52%, n=832). Nearly half (46%, n=740) had more than 20 years of work experience in the primary healthcare system and were predominantly from rural regions (65%, n=1038). Representation across regions varied, with the Imereti region having the highest number of participants (18%, n=282) and the Guria region the lowest (4%, n=65) (Table 1).

Cancer screening related Behavior

Only 57% (n=916) of participants reported having undergone cervical cancer screening at least once in their lifetime. Among those who had been screened, 53% (n=487) were screened once, 28% (n=253) were screened twice, 17% (n=154) were screened three or more times, and 2% (n=22) could not recall the number of screenings. Regarding the timing of the last screening, 42% (n=385) were screened within the past three years, 23% (n=208) were screened four to five years ago, 33% (n=298) were screened six or more years ago, and 3% (n=25) did not remember.

When asked about reasons for never having been screened or not attending the most recent screening, 33% (n=526) of respondents could not identify a reason. Other commonly cited reasons included fear of a cancer diagnosis (26%, n=420) and lack of time due to busy schedules (12%, n=191).

In contrast, when asked about reasons for non-screening among their patients, the most commonly perceived reasons included anxiety, fear, or shame about the procedure (35%, n=556), prioritization of other health issues over preventive activities like cancer screening (29%, n=467), fear or anxiety about a cancer diagnosis (25%, n=397), and lack of information about cancer screening (23%, n=365).

A large majority (96%, n=1544) of participants reported actively recommending cancer screening to their patients. However, only 14% (n=231) recommended and referred 6-10 patients per week, while 3% (n=53) referred 11-15 patients, 2% (n=26) referred 16-20

patients, and 2% (n=37) referred 20 or more patients. The majority (67%, n=1078) referred 1-5 patients per week, while 12% (n=188) reported not recommending or referring any patients.

Cervical Cancer Screening Capability (Knowledge and Awareness)

The majority of respondents correctly identified the national cervical cancer screening program's target age (77%, n=1234). However, more than half (53%, n=849) incorrectly named the recommended frequency of the procedure. A large portion of respondents (69%, n=1112) believed they were somewhat informed about cancer screening procedures, while 54% (n=876) felt they had enough information to make an informed decision about participating in cervical cancer screening. Almost all respondents considered cancer screening effective in decreasing morbidity (99%, n=1603) and mortality (100%, n=1607). Additionally, 75% (n=1213) reported receiving training on cancer screening, including how to advise people to get screened, as well as the benefits and risks.

Motivation (Beliefs, Attitudes, and Intentions)

The majority of respondents strongly agreed that cervical cancer screening is important for their health (72%, n=1162) and that cervical cancer can be extremely dangerous (72%, n=1153). Sixty-three percent (n=1009) felt they knew where and how to get screened, and 72% (n=1162) believed cancer screening should be prioritized over other healthcare issues.

When asked about their plans for future cervical cancer screening, 32% (n=517) indicated they definitely plan to get screened, 36% (n=581) probably will, 10% (n=156) found it difficult to decide, 14% (n=221) probably will not, and 9% (n=138) definitely will not.

Opportunity (Environmental and Social Factors)

Regarding social norms, most respondents reported that neither their spouse nor partner (92%, n=1490), nor their family (84%, n=1353), believed they should participate in regular cervical cancer screening. A significant portion (82%, n=1318) felt that cervical cancer screening is not widely supported in Georgia. Most respondents (99%, n=1595) found

cervical cancer screening to be embarrassing, and 70% (n=1122) did not know other women who had been screened. However, 90% (n=1452) reported receiving advice from health professionals to participate in cervical cancer screening.

On health system-related issues, the majority reported facing several challenges to accessing cervical cancer screening services, including indirect costs (54%, n=886), lack of a system to notify results and inform about follow-ups (60%, n=971), insufficient number of providers for the screening program (86%, n=1393), inadequate infrastructure (78%, n=1254), challenges in managing further treatment (87%, n=1410), insufficient public promotion of the screening program (76%, n=1231), and lack of awareness about the cancer screening visit registration system (73%, n=1180).

Table 8. Social-demographic characteristics, cancer screening knowledge, attitudes and behavior of primary healthcare providers, Georgia, 2023

Characteristics	N (1613)	(%)
Demographic and Background Information		
Age	Mean: 50.88 (SD 6.85) Range: 25-60	
Marital status		
Married	1278	79.2
Living with partner	17	1.1
Divorced	73	4.5
Never married	100	6.2
Widow	0	0
Other	16	1.0
Children		
0	177	11.0
1-2	1166	72.3
3 or more	265	16.4
Refuse to answer	5	0.3
Specialty		
Family Doctor	705	43.7
Nurse	832	51.6
Other Specialty doctors	76	4.7
Experience in PC*	Mean: 50.88 (SD 6.856)	
1-10 years	308	19.1
11-20 years	565	35.0
20+	740	45.9

Place of work		
Rural	1038	64.4
Urban	575	35.6
Region of Work		
Imereti	282	17.5
Tbilisi	221	13.7
Samegrelo –Zemo Svaneti	189	11.7
Kakheti	200	12.4
Adjara	175	10.8
Kvemo Kartli	130	8.1
Shida Kartli	119	7.4
Samtskhe-Javakheti	83	5.1
Guria	65	4.0
Racha-Lechkhumi and Kvemo Svaneti	68	4.2
Mtskheta-Mtianeti	81	5.0
Cancer Screening Related Behavior		
If you have ever had cervical cancer screening?		
Yes	916	56.8
No	697	43.2
How many times have you been screened for cervical cancer in your lifetime?		
1	487	53.2
2	253	27.6
3 or more	154	16.8
DNR*	22	2.4
When was the last time you had a cervical cancer screening?		
Less than 3 years ago	385	42.0
4-5 years ago	208	22.7
6 years or more	298	32.5
DNR	25	2.7
Reasons for never been screened for cervical cancer or not attending last screening		
I do not know	526	32.6
Fear of a bad results	420	26.0
My busy schedule	191	11.8
Inconvenient times-schedule of screening services	142	8.8
Do not have uterine cervix	115	7.1
It is painful	101	6.3
I don't think the test is necessary	79	4.9
I didn't know about cervical cancer screening	73	4.5

Scared of potential treatment costs if cancer is found	61	3.8
Feeling of shame	47	2.9
I thought the test would be paid	30	1.9
Male doctor	27	1.7
Negative experience with cervical cancer screening in the past	22	1.4
Had undergone treatment for gynecological cancer	15	0.9
Do not trust quality	12	0.7
My family members were not supportive	8	0.5
Cultural/religious reasons	1	0.1
Provider Perceptions of Patient Barriers		
My patients feel anxiety, fear, or shame about the screening procedure	556	34.5
My patients prioritize other health issues over preventive activities (e.g., cancer screening).	467	29.0
My patients feel anxiety, fear, or shame about the diagnosis.	397	24.6
Most of my patients do not know or are not informed about cancer screening	365	22.6
My patients cannot undergo further tests if the screening test result is positive	277	17.2
My patients cannot afford to pay for cancer treatment	221	13.7
Most of my patients do not perceive cancer as a serious health threat	203	12.6
My patients struggle to understand information or instructions	179	11.1
Most of my patients do not know that the screening test is free	150	9.6
My patients feel anxiety, fear, or shame about treatment	153	9.5
The chance of my female patients undergoing screening tests is lower if the test is conducted by a male	118	7.3
My patients do not trust the medical staff, the screening provider, or the healthcare system.	51	3.2

The ethnic background (cultural norms) or religion of my patients influences their decision about undergoing screening tests.	38	2.4
Actively recommend cancer screening to their patients		
Yes	1544	95.7
No	69	4.3
How many patients during the week do you recommend cancer screening?		
0	188	11.6
1-5	1078	66.8
6-10	231	14.3
11-15	53	3.3
16-20	26	1.6
20+	37	2.3
Cervical Cancer Screening Capability (Knowledge and Awareness)		
Knows about the national <u>cervical cancer</u> screening program target age		
Yes	1234	76.5
No	379	23.5
Knows about the <u>cervical cancer</u> screening frequency		
Yes	754	46.7
No	849	53.3
Perceive to be well informed about cancer screening procedures		
Very well informed	327	20.3
Somewhat informed	1112	68.9
Other	108	6.7
I have enough information to make an informed decision about participating in cervical cancer screening		
Yes	876	54.3
No	737	45.7
Believes that cancer screening is effective in decreasing cancer morbidity		
Yes	1603	99.4
No	10	0.6
Believes that cancer screening is effective in decreasing cancer mortality		
Yes	1607	99.6
No	6	0.4
Received training on cancer screening including how to advise people to get screened, as well as benefits and risks		
Yes	1213	75.2

No	400	24.8
Motivation (Beliefs, Attitudes, and Intentions)		
Cervical cancer screening is important for my health		
Strongly agree	1162	72.0
Somehow agree	242	15.0
Neither agree, nor refuse	86	5.3
Somehow do NOT agree	18	1.1
Strongly disagree	105	6.5
I think cervical cancer can be extremely dangerous.		
Strongly Agree	1153	71.5
Somehow agree	249	15.4
Neither agree, nor refuse	65	4.0
Somehow do NOT agree	20	1.2
Strongly disagree	126	7.8
I am sure I would know where and how to get cervical cancer screening if I wanted to.		
Strongly Agree	1009	62.6
Somehow agree	362	22.4
Other	242	15.0
Cancer screening is <u>higher</u> priority than other healthcare issues		
Strongly Agree	1162	72.0
Somehow agree	242	15.0
Other	209	13.0
If you are eligible, do you plan to get cervical cancer screening in the future		
Definitely no	138	8.6
Probably not	221	13.7
I find it difficult to make decisions	156	9.7
Yes, probably	581	36.0
Yes definitely	517	32.1
Opportunity (Environmental and Social Factors)		
Social Norms		
My spouse or partner believes that I should participate in regular cervical cancer screening		
Yes	123	7.6
No	1490	92.4
My family believes that I should participate regularly in cervical cancer screening		
Yes	260	16.1
No	1353	83.9

In general, people in Georgia support cervical cancer screening		
Yes	295	18.3
No	1318	81.7
I think cervical cancer screening is embarrassing		
Yes	18	1.1
No	1595	98.9
I know other women who have been screened for cervical cancer		
Yes	491	30.4
No	1122	69.6
Health professionals advised me to participate in cervical cancer screening		
Yes	161	10.1
No	1452	90.0
Healthcare System Level factors		
Long distance to the service provider services		
Yes	779	48.3
No	834	51.7
Indirect costs that are not covered (e.g., travel expenses, loss of workday salary, etc.)		
Yes	866	53.7
No	747	46.3
Competing priorities (e.g., caring for family members, work, etc.)		
Yes	608	37.7
No	1005	62.3
Physical barriers (e.g., disability)		
Yes	133	8.2
No	1480	91.8
Language barriers		
Yes	55	3.4
No	1558	96.6
There is a system in place for inviting eligible individuals for screening.		
Yes	628	38.9
No	985	61.1
There is a system in place for notifying the results and informing about follow-up		
Yes	642	39.8
No	971	60.2

There is a system in place for sending recall notice to the non-compliant individuals.		
Yes	371	23.0
No	1242	77.0
There is a sufficient number of providers to ensure screening programme		
Yes	220	13.6
No	1393	86.4
There is an adequate infrastructure for screening.		
Yes	359	22.3
No	1254	77.7
There is an adequate infrastructure for further management.		
Yes	203	12.6
No	1410	87.4
There are long waiting lists for screening.		
Yes	86	5.3
No	1527	94.7
There are long waiting lists for further management in case of screen positive result		
Yes	104	6.4
No	1509	93.6
There is a proper public promotion of the screening programme among the population.		
Yes	382	23.7
No	1231	76.3
There is cancer screening visit registration electronic system for patients		
Yes	433	26.8
No	1180	73.2

Cervical Cancer Screening Current Status

Bivariate analysis of factors associated with cervical cancer screening uptake revealed significant associations ($p \leq 0.05$) with several variables. (Table 9)

Behavior

Respondents who recommended and referred more than five patients for screening per week had higher screening uptake (64% vs. 55%, OR = 1.49, 95% CI: 1.16-1.90, $p = 0.002$).

Cervical Cancer Screening Capability (Knowledge and Awareness)

Those who perceived having enough information to make an informed decision about screening also showed higher uptake (62% vs. 51%, OR = 1.59, 95% CI: 1.31-1.94, $p < 0.001$). Belief in the effectiveness of screening in reducing cancer morbidity was strongly associated with screening uptake (57% vs. 20%, OR = 5.31, 95% CI: 1.12-25.07, $p = 0.018$). Awareness of the recommended screening frequency also showed a significant association, with those aware of the frequency having lower screening uptake (53% vs. 60% OR = 0.89, 95% CI: 0.81- 0.97, $p = 0.006$). Additionally, respondents who had received training on cancer screening, including advice on how to counsel others and understand the benefits and risks, reported higher chances of screening uptake (59% vs. 51%, OR = 1.37, 95% CI: 1.09-1.71, $p = 0.007$).

Motivation (Beliefs, Attitudes, and Intentions)

Further, respondents who believed that cervical cancer screening was important for their health were more likely to get screened (62% vs. 43%, OR = 1.45, 95% CI: 1.36-1.57, $p < 0.001$), as were those who perceived cervical cancer as extremely dangerous (60% vs. 50%, OR = 1.68, 95% CI: 1.55-1.85, $p < 0.001$). Confidence in knowing where and how to access screening services also correlated with higher uptake (64% vs. 44%, OR = 1.44, 95% CI: 1.36-1.54, $p < 0.001$). Respondents who planned to get screened in the future had significantly higher uptake rates (74% vs. 48%, OR = 1.32, 95% CI: 1.26-1.41, $p < 0.001$).

Opportunity (Environmental and Social Factors)

Having a supportive spouse or partner was another factor linked to increased screening uptake (72% vs. 56%, OR = 2.01, 95% CI: 1.34-3.01, $p < 0.001$), as was having family members who believed in the importance of regular screening (69% vs. 55%, OR = 1.85, 95% CI: 1.39-2.45, $p < 0.001$). Finally, respondents who did not know other women who had been screened had higher uptake (60% vs. 50% OR = 0.67, 95% CI: 0.54-0.83, $p < 0.001$).

Table 9. Association Between Demographic Characteristics, Knowledge, Attitudes, and Cervical Cancer Screening Behaviors Among Primary Healthcare Providers in Georgia, 2023

Characteristics	Screened on cervical Cancer		<u>Not screened</u> on Cervical Cancer				
	N	(%)	N	(%)	Unadjusted OR	95 % CI	P-value
Healthcare Provider and Facility Characteristics							
Age	Mean (SD) 50.93 (SD 6.759)		Mean (SD) 50.82 (SD 6.985)		t=0.313		<i>0.754</i>
Marital status							
Married	738	57.7	540	42.3	0.830	0.652-1.056	<i>0.129</i>
Other	178	53.1	157	46.9			
Children							
0	91	49.2	91	50.8	0.624	0.347-1.012	<i>0.091</i>
1-2	666	57.1	500	42.9			
3 or more	106	40.0	159	60.0			
Specialty							
Family doctor	328	42.0	453	58.0	0.909	0.746-1.107	<i>0.340</i>
Nurse	463	55.6	369	44.4			
Work experience in PC (Mean, SD)	Mean (SD) 19.92 (SD 10.025)		Mean (SD) 20.14 (SD 10.087)			t= -0.437	<i>0.662</i>
≥20 years	414	55.9	326	44.1	1.013	0.842-1.287	<i>0.529</i>
Other	502	57.5	371	42.5			

Place of Work							
Urban	310	53.9	265	46.1	1.199	0.977-1.472	0.083
Rural	606	58.4	432	41.6			
Region of Work							
Tbilisi	121	54.8	100	45.2	1.101	0.827-1.464	0.510
Other Regions	795	57.1	597	42.9			
Cancer Screening Related Behavior							
Actively recommend cancer screening to their patients							
Yes	884	57.3	660	42.7	1.549	0.955-2.512	0.074
No	37	53.6	32	46.4			
How many patients during the week do you recommend cancer screening?							
<5 patients	693	54.7	573	45.3	1.49	1.16-1.90	0.002
≥6 patients	223	64.3	124	35.7			
Cervical Cancer Screening Capability (Knowledge and Awareness)							
Knows about the national <u>cervical cancer</u> screening program target age							
Yes	692	56.1	542	43.9	1.132	0.896-1.430	0.298
No	224	59.1	155	40.9			
Knows about the <u>cervical cancer</u> screening frequency							
Yes	401	53.2	353	46.8	0.89	0.81 - 0.97	0.006
No	515	60.0	344	40.0			

Perceive to be well informed about cancer screening procedures							
Very well informed	187	57.2	140	42.8	0.968	0.757-1.239	0.797
Other	688	56.4	532	43.6			
Perceive to have enough information to make an informed decision about participating in cervical cancer screening							
Yes	543	62.0	333	38.0	1.59	1.31-1.94	<0.001
No	373	50.6	364	49.4			
Believes that cancer screening is effective in decreasing cancer morbidity							
Yes	914	57.0	689	43.0	5.31	1.12-25.07	0.018
No	2	20.0	8	80.0			
Believes that cancer screening is effective in decreasing cancer mortality							
Yes	914	56.9	693	43.1	2.638	0.482-14.443	0.245
No	2	33.3	4	66.7			
Received training on cancer screening including how to advise people to get screened, as well as benefits and risks							
Yes	715	58.7	501	41.3	1.37	1.09-1.71	0.007

No	204	51.0	196	49.0			
Motivation (Beliefs, Attitudes, and Intentions)							
Cervical cancer screening is important for my health							
Strongly agree	723	62.2	439	37.8	1.45	1.36-1.57	<0.001
Other	193	42.8	258	57.2			
I think cervical cancer can be extremely dangerous.							
Strongly Agree	686	59.5	467	40.5	1.68	1.55-1.85	<0.001
Other	230	50.0	230	50.0			
I am sure I would know where and how to get cervical cancer screening if I wanted to							
Strongly Agree	645	63.9	364	36.1	1.442	1.358-1.544	<0.001
Other	252	43.9	322	56.1			
If you are eligible, do you plan to get cervical cancer screening in the future							
Yes definitely	383	74.1	134	25.9	1.32	1.26-1.41	<0.001
Other	512	48.0	554	52.0			
Opportunity (Environmental and Social Factors)							
<u>Social Norms</u>							
My spouse or partner believes that I should participate in regular cervical cancer screening							
Yes	88	71.5	35	28.5	2.01	1.34-3.01	<0.001
No	828	55.6	662	44.4			

My family believes that I should participate regularly in cervical cancer screening							
Yes	179	68.8	81	31.2	1.85	1.39-2.45	<i><0.001</i>
No	737	54.5	616	45.5			
In general, people in Georgia support cervical cancer screening.							
Yes	155	52.2	140	47.5	0.810	0.629-1.044	<i>0.103</i>
No	761	57.7	557	42.3			
I think cervical cancer screening is embarrassing							
Yes	8	44.4	10	55.6	0.605	0.238-1.542	<i>0.288</i>
No	908	56.9	687	43.1			
I know other women who have been screened for cervical cancer							
Yes	245	49.9	246	50.1	0.67	0.54-0.83	<i><0.001</i>
No	671	59.8	451	40.2			
Health professionals advised me to participate in cervical cancer screening							
Yes	84	52.2	77	47.8	0.813	0.587-1.127	<i>0.213</i>
No	832	57.3	620	42.7			
Healthcare System Level factors							
Long distance							
Yes	432	55.5	347	44.5	0.900	0.739-1.096	<i>0.296</i>
No	484	58.0	350	42.0			
Indirect costs that are not covered (e.g., travel expenses, loss of workday salary, etc.)							
Yes	487	56.2	379	43.8	0.952	0.782-1.161	<i>0.665</i>
No	429	57.4	318	42.6			

Competing priorities (e.g., caring for family members, work, etc.)							
Yes	358	58.9	250	41.1	1.147	0.936-1.407	0.187
No	558	55.5	447	44.5			
Physical barriers (e.g., disability)							
Yes	78	58.6	55	41.4	1.086	0.758-1.557	0.652
No	838	56.6	642	43.4			
Language barriers							
Yes	33	60.0	22	40.0	1.147	0.662-1.985	0.625
No	883	56.7	675	43.3			
There is a system in place for inviting eligible individuals for screening.							
Yes	358	57.0	270	43.0	1.015	0.829-1.242	0.888
No	558	56.6	427	43.4			
There is a system in place for notifying the results and informing about follow-up							
Yes	379	58.6	266	41.4	1.128	0.922-1.380	0.241
No	540	55.6	431	44.4			
There is a system in place for sending recall notice to the non-compliant individuals.							
Yes	226	60.9	145	39.1	1.247	0.984-1.580	0.067
No	690	55.6	552	44.4			
There is a sufficient number of providers to ensure screening programme							
Yes	137	62.3	83	37.7	1.301	0.971-1.743	0.077
No	779	55.9	614	44.1			
There is an adequate infrastructure for screening.							

Yes	217	60.4	142	39.6	1.213	0.955-1.541	0.113
No	699	55.7	555	44.3			
There is an adequate infrastructure for further management.							
Yes	126	61.6	78	38.4	1.254	0.927-1.696	0.141
No	791	56.1	619	43.9			
There are long waiting lists for screening.							
Yes	53	61.6	33	38.4	1.236	0.791-1.931	0.352
No	863	56.5	664	43.5			
There are long waiting lists for further management in case of screen positive result							
Yes	55	52.9	49	47.1	0.845	0.567-1.258	0.406
No	861	57.1	648	42.9			
There is a proper public promotion of the screening programme among the population.							
Yes	223	58.4	159	41.6	1.089	0.863-1.374	0.473
No	693	56.3	538	43.7			
There is cancer screening visit registration electronic system for patients							
Yes	248	57.3	185	42.7	1.027	0.823-1.284	0.811
No	668	56.6	512	43.4			

Cervical Cancer Screening Future Plans

The bivariate analysis of factors associated with future plans for cervical cancer screening revealed several significant associations ($p \leq 0.05$) across demographic, behavioral, capability, motivation, and opportunity dimensions (Table 10).

Demographic

Younger respondents were more likely to report plans for future cervical cancer screening (Mean 50 vs. Mean 51 $t = -4.19$ $p < 0.001$). Similarly, being married (34% vs. 23%, OR = 1.72, 95% CI: 1.31–2.28, $p < 0.001$) and having less than 20 years of work experience in primary care (29% vs. 34%, OR = 1.26, 95% CI: 1.02–1.56, $p = 0.031$) were also positively associated with future screening intentions.

Behavior

Past screening behavior was a strong predictor, with respondents who had previously undergone cervical cancer screening being significantly more likely to plan future screening (42% vs. 19%, OR = 3.02, 95% CI: 2.40–3.80, $p < 0.001$). Additionally, respondents who recommended or referred more than five patients per week for screening were also more likely to plan future screenings (41% vs. 30%, OR = 1.62, 95% CI: 1.27–2.07, $p < 0.001$).

Cervical Cancer Screening Capability (Knowledge and Awareness)

Knowledge and awareness played a critical role. Respondents who knew the recommended frequency for cervical cancer screening (35% vs. 29%, OR = 1.30, 95% CI: 1.05–1.60, $p = 0.015$) and those who felt they had sufficient information to make an informed decision (39% vs. 24%, OR = 2.06, 95% CI: 1.66–2.56, $p < 0.001$) were significantly more likely to plan future screening.

Motivation (Beliefs, Attitudes, and Intentions)

Strong beliefs about the importance of screening significantly influenced future plans. Respondents who believed that cervical cancer screening was critical for their health (40% vs. 12%, OR = 4.64, 95% CI: 3.42–6.28, $p < 0.001$), acknowledged the dangers of cervical cancer (36% vs. 23%, OR = 1.85, 95% CI: 1.44–2.37, $p < 0.001$), and knew where and

how to access screening (42% vs. 16%, OR = 3.85, 95% CI: 2.99–4.96, $p < 0.001$) were more likely to report future screening plans.

Opportunity (Environmental and Social Factors)

Several environmental and social factors were linked to future screening intentions. Having a supportive spouse or partner (45% vs. 31%, OR = 1.80, 95% CI: 1.24–2.61, $p = 0.002$) and family members who believed in regular screening (40% vs. 31%, OR = 1.49, 95% CI: 1.13–1.96, $p = 0.004$) were significant. Surprisingly, competing priorities (e.g., caregiving responsibilities) slightly increased the likelihood of screening plans (35% vs. 30%, OR = 1.26, 95% CI: 1.02–1.56, $p = 0.035$).

Structural and systemic factors were also influential. Respondents who reported no language barriers to accessing screening services (20% vs. 33%, OR = 1.92, 95% CI: 1.00–3.76, $p = 0.050$), effective systems for result notification and follow-up (35% vs. 30%, OR = 1.26, 95% CI: 1.02–1.55, $p = 0.036$), and recall notices for non-compliant individuals (37% vs. 31%, OR = 1.35, 95% CI: 1.06–1.72, $p = 0.016$) were more likely to plan future screenings.

Moreover, adequate infrastructure (44% vs. 30%, OR = 1.79, 95% CI: 1.34–2.39, $p < 0.001$), sufficient providers (42% vs. 29%, OR = 1.76, 95% CI: 1.38–2.24, $p < 0.001$), and facilities for follow-up care (42% vs. 31%, OR = 1.67, 95% CI: 1.24–2.26, $p < 0.001$) significantly supported screening intentions. Public promotion of the screening program (38% vs. 30%, OR = 1.39, 95% CI: 1.10–1.77, $p = 0.007$) and electronic registration systems (37% vs. 30%, OR = 1.33, 95% CI: 1.06–1.68, $p = 0.015$) further enhanced the likelihood of future screening plans.

Table 10. Factors Associated with Cervical Cancer Screening Future Plans among Primary Healthcare Providers, Bivariate Analysis, Georgia, 2023

Characteristics	Plans to get cervical cancer screening		Not plans to get cervical cancer screening				
	N	(%)	N	(%)	Unadjusted OR	95 % CI	P-value
Healthcare Provider and Facility Characteristics							
Age	49.8 (SD 7.31)		51.3 (6.60)		t= -4.19		<0.001
Marital status							
Married	439	34.4	839	65.6	1.72	1.31-2.28	<0.001
Other	78	23.3	257	76.7			
Children							
0	56	32.4	117	67.6	Ref		
1-2	369	32.2	776	67.6	0.932	0.738-1.177	0.553
3 or more	92	35.4	168	64.6	Ref		
Specialty							
Family doctor	267	34.0	514	65.8	1.209	0.981-1.491	0.075
Nurse	250	30.0	582	70.0			
Work experience in PC (Mean, SD)	19.06 (SD 9.98)		20.47 (SD 10.09)		t = -2.606		0.570
≥20 years	217	29.3	523	70.7	Ref		
Other	300	34.4	573	65.6	1.26	1.02-1.56	0.031
Place of Work							
Urban	191	33.2	384	66.8			

Rural	326	31.4	712	68.6	1.086	0.874-1.350	<i>0.455</i>
Region of Work							
Tbilisi	69	31.2	152	68.8	0.957	0.704-1.299	<i>0.776</i>
Other Regions	448	32.2	944	67.8			
Cancer Screening Related Behavior							
Ever being screened on Cervical Cancer							
Yes	383	41.8	533	58.2	3.02	2.40-3.80	<i><0.001</i>
No	134	19.2	563	80.8			
Actively recommend cancer screening to their patients							
Yes	502	32.5	1042	67.5	1.734	0.696-3.103	<i>0.061</i>
No	15	21.7	54	78.3			
How many patients during the week do you recommend cancer screening?							
≥6 patients	141	40.6	206	59.4	1.62	1.27-2.07	<i><0.001</i>
<5 patients	376	29.7	890	70.3			
Cervical Cancer Screening Capability (Knowledge and Awareness)							
Knows about the national cervical cancer screening program target age							
Yes	393	31.8	841	68.2	0.961	0.752-1.229	<i>0.751</i>
No	124	32.7	255	67.3			
Knows about the cervical cancer screening frequency							
Yes	298	34.7	561	65.3	1.30	1.05-1.60	<i>0.015</i>

No	219	29.0	535	71.0			
Perceive to be well informed about cancer screening procedures							
Very well informed	117	35.8	210	64.2	1.234	0.956-1.593	<i>0.106</i>
Other	400	31.1	886	68.9			
Perceive to have enough information to make an informed decision about participating in cervical cancer screening							
Yes	342	39.0	534	61.0	2.06	1.66-2.56	<i><0.001</i>
No	175	23.7	562	76.3			
Believes that cancer screening is effective in decreasing cancer morbidity							
Yes	515	32.1	1088	67.9	1.893	0.401-8.948	<i>0.413</i>
No	2	20.0	8	80.0			
Believes that cancer screening is effective in decreasing cancer mortality							
Yes	517	32.2	1090	67.8	0.678	0.652-0.702	<i>0.092</i>
No	0	0.0	6	100			
Received training on cancer screening including how to advise people to get screened, as well as benefits and risks							
Yes	384	31.7	829	68.3	0.930	0.731-1.183	<i>0.554</i>

No	133	33.3	267	66.8			
Motivation (Beliefs, Attitudes, and Intentions)							
Cervical cancer screening is important for my health							
Strongly agree	461	39.7	701	60.3	4.64	3.42-6.28	<0.001
Other	56	12.4	395	87.6			
I think cervical cancer can be extremely dangerous.							
Strongly Agree	411	35.6	742	64.4	1.85	1.44-2.37	<0.001
Other	106	23.0	354	77.0			
I am sure I would know where and how to get cervical cancer screening if I wanted to							
Strongly Agree	422	41.8	587	58.2	3.85	2.99-4.96	<0.001
Other	95	15.7	509	84.3			
Opportunity (Environmental and Social Factors)							
<u>Social Norms</u>							
My spouse or partner believes that I should participate in regular cervical cancer screening							
Yes	55	44.7	68	55.3	1.80	1.24-2.61	0.002
No	462	31.0	1028	69.0			
My family believes that I should participate regularly in cervical cancer screening							
Yes	103	39.6	157	60.4	1.49	1.13-1.96	0.004
No	414	30.6	939	69.5			

In general, people in Georgia support cervical cancer screening.							
Yes	95	32.2	200	67.8	1.009	0.770-1.321	0.951
No	422	32.0	896	68.0			
I think cervical cancer screening is embarrassing							
Yes	6	33.3	12	66.7	1.061	0.396-2.842	0.907
No	511	32.0	1084	68.0			
I know other women who have been screened for cervical cancer							
Yes	141	28.7	350	71.3	0.799	0.634-1.007	0.058
No	376	33.5	746	66.5			
Health professionals advised me to participate in cervical cancer screening							
Yes	51	31.7	110	68.3	0.981	0.691-1.392	0.914
No	466	32.1	986	67.9			
Healthcare System Level factors							
Long distance							
Yes	244	31.8	523	68.2	1.078	0.873-1.330	0.486
No	273	33.5	543	66.5			
Indirect costs that are not covered (e.g., travel expenses, loss of workday salary, etc.)							
Yes	267	31.3	586	68.7	1.143	0.926-1.411	0.213
No	250	34.2	480	65.8			
Competing priorities (e.g., caring for family members, work, etc.)							
Yes	214	35.2	394	64.8	1.26	1.02-1.56	0.035
No	303	30.1	702	69.9			

Physical barriers (e.g., disability)							
Yes	51	38.3	82	61.7	0.761	0.528-1.099	0.144
No	466	32.1	984	67.9			
Language barriers							
Yes	11	20.0	44	80.0	Ref		
No	506	32.5	1052	67.5	1.92	1.00-3.76	0.050
There is a system in place for inviting eligible individuals for screening.							
Yes	211	31.4	417	66.4	0.891	0.7191.103	0.288
No	306	31.4	679	68.9			
There is a system in place for notifying the results and informing about follow-up							
Yes	225	35.0	417	65.0	1.26	1.02-1.55	0.036
No	292	30.1	679	69.9			
There is a system in place for sending recall notice to the non-compliant individuals.							
Yes	138	37.2	233	62.8	1.35	1.06-1.72	0.016
No	379	30.5	863	69.5			
There is a sufficient number of providers to ensure screening programme							
Yes	96	43.6	124	56.4	1.79	1.34-2.39	<0.001
No	421	30.2	972	69.8			
There is an adequate infrastructure for screening							
Yes	151	42.1	208	57.9	1.76	1.38-2.24	<0.001
No	366	29.2	888	70.8			

There is an adequate infrastructure for further management.							
Yes	86	42.4	117	57.6	1.67	1.24-2.26	<0.001
No	431	30.6	979	69.4			
There are long waiting lists for screening.							
Yes	26	30.2	60	69.8	0.914	0.570-1.467	0.710
No	491	32.2	1036	67.8			
There are long waiting lists for further management in case of screen positive result							
Yes	32	30.8	72	69.2	0.938	0.610-1.443	0.772
No	485	32.1	1024	67.9			
There is a proper public promotion of the screening programme among the population.							
Yes	144	37.7	238	62.3	1.39	1.10-1.77	0.007
No	373	30.3	858	69.7			
There is cancer screening visit registration electronic system for patients							
Yes	159	36.7	274	63.3	1.33	1.06-1.68	0.015
No	358	30.3	822	69.7			

Multivariate analysis

Cervical Cancer Screening Past Status

Multivariate analysis revealed following six factors significantly associated with respondents' cervical cancer screening status, including perception of having enough information to make an informed decision about participating in cervical cancer screening (aOR=1.60 95%CI: 1.28-2.01 $p<0.001$), self-confidence to know where and how to get cervical cancer screening if needed (aOR= 1.61 95%CI:1.26-2.07 $p<0.001$), received training on cancer screening including how to advise people to get screened, as well as benefits (aOR= 1.94 95% CI:1.24-3.06 $p=0.004$), having spouse or partner (aOR= 2.09 95%CI: 1.37-3.19 $p<0.001$) and family screening (aOR= 1.94 95%CI:1.42-2.67 $p<0.001$) who believes that they should participate in regular cervical cancer, And Having plans to get cervical cancer screening in the future (aOR=2.25 95%CI:1.75-2.89 $p<0.001$).

Cervical Cancer Screening Future Plans

The multivariate analysis of factors associated with future plans for cervical cancer screening highlighted several significant predictors. Respondents who were married (aOR = 1.77, 95% CI: 1.30–2.40, $p < 0.001$) and those with less than 20 years of work experience (aOR = 1.32, 95% CI: 1.04–1.67, $p = 0.021$) were more likely to report plans for future screening. Additionally, having a history of prior screening (aOR = 2.15, 95% CI: 1.68–2.76, $p < 0.001$) and recommending or referring more than five patients per week for cancer screening (aOR = 1.34, 95% CI: 1.02–1.77, $p = 0.039$) were also associated with increased likelihood of future screening plans.

Beliefs and perceptions were important determinants. Respondents who considered screening important for their health (aOR = 2.63, 95% CI: 1.85–3.74, $p < 0.001$), perceived themselves as having enough information to make an informed decision about screening participation (aOR = 1.84, 95% CI: 1.42–2.39, $p < 0.001$), and expressed confidence in knowing where and how to access screening services (aOR = 2.50, 95% CI: 1.88–3.33, $p < 0.001$) were significantly more likely to plan future screening.

Social support also played a critical role. Having a supportive spouse or partner (aOR = 1.71, 95% CI: 1.11–2.64, $p = 0.016$) and family members who believed in regular cervical cancer screening (aOR = 1.47, 95% CI: 1.06–2.03, $p = 0.020$) were associated with increased likelihood of future screening plans.

Furthermore, respondents without language barriers to accessing screening services (aOR = 2.43, 95% CI: 1.15–5.12, $p = 0.020$) and those who reported the presence of adequate screening infrastructure (aOR = 1.51, 95% CI: 1.08–2.11, $p = 0.016$) were more likely to have future screening intentions.

Table 11. Multivariate analysis results of the factors associated with cervical cancer screening behavior and plans among primary healthcare providers, Georgia, 2023

Factors	Got Cervical Cancer Screening			Plans to get Cervical Cancer Screening		
	Adjusted OR	95 % CI	P-value	Adjusted OR	95 % CI	P-value
Being married				1.77	1.30-2.40	<0.001
Work experience 20 years and more				1.32	1.04-1.67	0.021
Ever done screening				2.15	1.68-2.76	<0.001
How many patients during the week do you recommend cancer screening? 6 and more				1.34	1.02-1.77	0.039
Screening is important for my health				2.63	1.85-3.74	<0.001
Perceive to have enough information to make an informed decision about participating in cervical cancer screening	1.60	1.28-2.01	<0.001	1.84	1.42-2.39	<0.001
Self-confident that know where and how to get cervical cancer screening if needed	1.61	1.26-2.07	<0.001	2.50	1.88-3.33	<0.001
Received training on cancer screening including how to advise people to get screened, as well as benefits and risks	1.94	1.24-3.06	0.004	-----	-----	-----
Have spouse or partner who believes that they should participate in regular cervical cancer screening	2.09	1.37-3.19	<0.001	1.71	1.11-2.64	0.016
My family believes that I should participate regularly in cervical cancer screening	1.94	1.42-2.67	<0.001	1.47	1.06-2.03	0.020
Have plans to get cervical cancer screening in the future	2.25	1.75-2.89	<0.001			
Language is NOT a barrier				2.43	1.15-5.12	0.020
Adequate infrastructure				1.51	1.08-2.11	0.016

RQ#4 - What determinants influence the adoption and implementation of tobacco control policies in Georgia?

(Topuridze et al. 2020)

Participant Characteristics

Participants were an average age of 43.35 years old, 60.5% female, 32.1% with a college education, and 49.0% employed (Table 1). Overall, 27.3% reported to smoking on some days or every day. Only 3.3% and 1.0% indicated lifetime use of ENDS and HTPs, respectively, with past 30-day use showing extremely low prevalence (ENDS, $n = 9$; HTPs, $n = 4$). Among smokers, 83.4% were not ready to quit in the next six months and 43.7% never tried to quit. Former smokers represented 9.6% of current non-smokers. Compared to smokers, non-smokers were more supportive of public policies banning cigarette and ENDS/HTPs use and reported pro-policy messaging as more persuasive (p 's < 0.001).

Table 12. Participant characteristics and bivariate comparisons of nonsmokers' vs. smokers' support for smoke-free air policies.

Variable	All Participants, N = 1456 n (%) or M (SD)	Nonsmokers, $n = 1058$ (72.7%) n (%) or M (SD)	Smokers, $n = 398$ (27.3%) n (%) or M (SD)	p
Country, N (%)				<0.001
Armenia	705 (48.4)	561 (53.0)	144 (36.2)	
Georgia	751 (51.6)	497 (47.0)	254 (63.8)	
<i>Sociodemographics</i>				
Age, M (SD)	43.35 (13.49)	43.34 (13.59)	43.38 (13.26)	0.957
Sex, N (%)				<0.001
Male	575 (39.5)	207 (19.6)	368 (92.5)	
Female	881 (60.5)	851 (80.4)	30 (7.5)	
Education, N (%)				0.027
Less than high school	223 (15.3)	157 (14.8)	66 (16.6)	
High school	260 (17.9)	175 (16.5)	85 (21.4)	
Vocational school	407 (28.0)	307 (29.0)	100 (25.1)	

Variable	All Participants, N = 1456 n (%) or M (SD)	Nonsmokers, n = 1058 (72.7%) n (%) or M (SD)	Smokers, n = 398 (27.3%) n (%) or M (SD)	p
Some college	98 (6.7)	64 (6.0)	34 (8.5)	
College degree or more	468 (32.1)	355 (33.6)	113 (38.4)	
Employment, N (%)				<0.001
Employed	713 (49.0)	438 (41.4)	275 (69.1)	
Unemployed/other	743 (51.0)	620 (58.6)	123 (30.9)	
Income per month, N (%)				0.111
≤500 GEL/100,000 AMD	563 (45.1)	423 (47.7)	140 (42.3)	
>500 GEL/100,000 AMD	685 (54.9)	463 (52.3)	191 (57.7)	
Marital status, N (%)				0.050
Married/cohabitating	1061 (72.9)	784 (74.1)	277 (69.6)	
Other	395 (27.1)	274 (25.9)	121 (30.4)	
Children under 18 in the home, N (%)				0.097
No	702 (49.0)	497 (47.9)	205 (51.9)	
Yes	731 (51.0)	541 (52.1)	190 (48.1)	
<i>Smoking characteristics</i>				
Former smoker, N (%)				-
No	-	956 (90.4)	-	
Yes	-	102 (9.6)	-	
Number of days smoked, past 30, N (%)				-
Every day	-	-	350 (87.9)	
Some days	-	-	48 (12.1)	
CPD, M (SD)	-	-	21.27 (10.79)	-
Readiness to quit, next 6 months, N (%)				-
No	-	-	242 (83.4)	
Yes	-	-	48 (16.6)	
Lifetime quit attempt, N (%)				-
No	-	-	166 (43.7)	
Yes	-	-	214 (56.3)	

Variable	All Participants, N = 1456 n (%) or M (SD)	Nonsmokers, n = 1058 (72.7%) n (%) or M (SD)	Smokers, n = 398 (27.3%) n (%) or M (SD)	p
Importance of quitting, M (SD)	-	-	5.74 (3.23)	-
Confidence in quitting, M (SD)	-	-	4.79 (3.18)	-
<i>Support for bans index scores, M (SD)</i>				
Cigarettes	4.20 (0.66)	4.38 (0.56)	3.72 (0.66)	<0.001
ENDS/HTPs	4.24 (0.92)	4.34 (0.89)	3.99 (0.94)	<0.001
Both	4.21 (0.63)	4.37 (0.56)	3.80 (0.65)	<0.001
<i>Messaging persuasiveness index scores, M (SD)</i>				
Support	3.30 (0.66)	3.41 (0.57)	3.01 (0.79)	<0.001
Opposition	2.36 (0.94)	2.33 (0.93)	2.43 (0.94)	0.081

Across settings, non-smokers reported greater support for both cigarette and ENDS/HTPs smoke-free policies (p 's < 0.05; Table 2). The support for cigarette smoke-free policy across all settings was relatively higher compared to ENDS/HTPs policy.

Table 13. Nonsmokers and smokers support for smoke-free air policies in various settings (Means, Standard Deviations).

Cigarettes	All, N = 1456	Nonsmokers, n = 1058	Smokers, n = 398	p	Georgia, n = 751	Armenia, n = 705	p
Healthcare facilities	4.85 (0.62)	4.89 (0.54)	4.74 (0.78)	<0.001	4.89 (0.46) *	4.81 (0.76) *	0.019
Workplaces	4.59 (0.90)	4.76 (0.66)	4.11 (1.23)	<0.001	4.57 (0.91) **	4.60 (0.90) **	0.595
Government institutions	4.67 (0.78)	4.79 (0.61)	4.34 (1.03)	<0.001	4.66 (0.75) **	4.68 (0.81) **	0.612
Religious institutions	4.85 (0.60)	4.88 (0.53)	4.77 (0.75)	0.002	4.93 (0.35) **	4.77 (0.77) **	<0.001
Indoor areas of schools, kindergartens	4.85 (0.60)	4.88 (0.55)	4.79 (0.71)	0.018	4.86 (0.49) *	4.85 (0.69) *	0.772
Schoolyards of schools, kindergartens	4.75 (0.78)	4.77 (0.73)	4.66 (0.89)	0.015	4.87 (0.44) *	4.60 (1.00) ***	<0.001

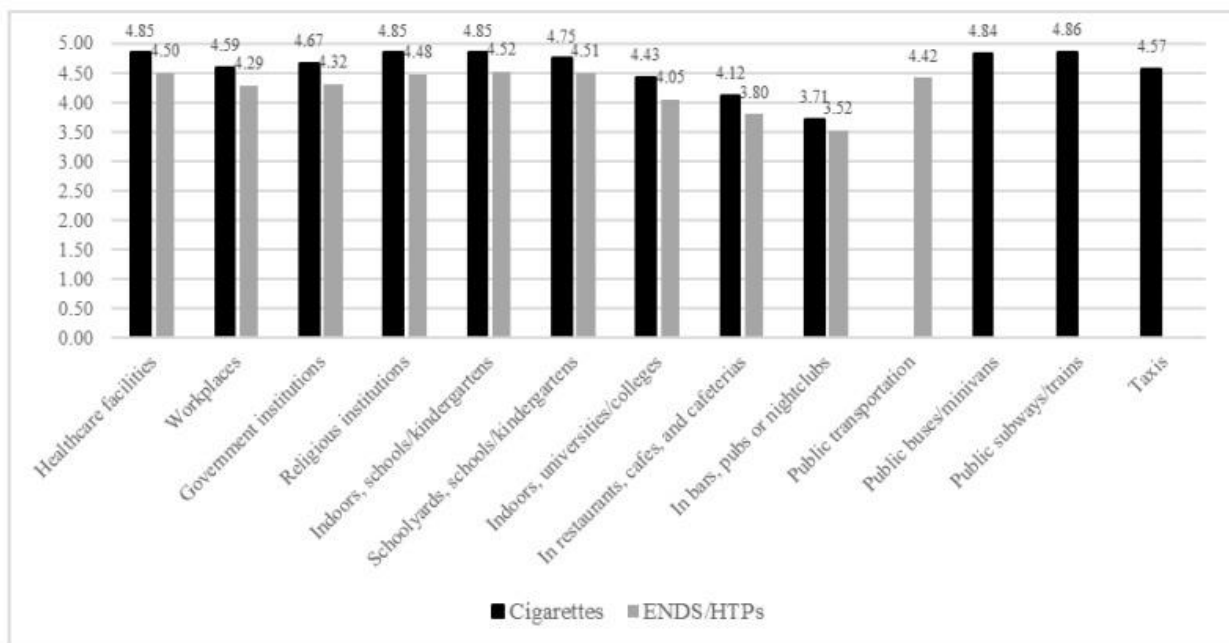
Cigarettes	All, N = 1456	Nonsmokers, n = 1058	Smokers, n = 398	<i>p</i>	Georgia, n = 751	Armenia, n = 705	<i>p</i>
Indoor areas of universities, institutes, colleges	4.43 (1.14)	4.56 (1.02)	4.09 (1.36)	<0.001	4.07 (1.33) *	4.81 (0.73) *	<0.001
In outdoor areas of university, college campuses	4.42 (1.09)	4.46 (1.05)	4.32 (1.21)	0.025	4.82 (0.53) *	4.00 (1.35) ***	<0.001
In restaurants, cafes, cafeterias	4.12 (1.30)	4.41 (1.04)	3.34 (1.55)	<0.001	4.17 (1.27) *	4.05 (1.32) ***	0.075
Outdoor terrace of restaurants, cafes, cafeterias	2.98 (1.60)	3.35 (1.53)	2.01 (1.35)	<0.001	2.78 (1.63) ***	3.19 (1.54) ***	<0.001
In bars, pubs, or nightclubs	3.71 (1.48)	4.02 (1.31)	2.90 (1.48)	<0.001	3.85 (1.43) *	3.57 (1.52) ***	<0.001
Outdoor terrace of bars, pubs, nightclubs	2.88 (1.60)	3.23 (1.54)	1.94 (1.32)	<0.001	2.72 (1.63) ***	3.04 (1.54) ***	<0.001
Indoor common areas of apts, condos	3.99 (1.38)	4.30 (1.16)	3.16 (1.56)	<0.001	3.98 (1.33) *	4.00 (1.43) ***	0.783
Outdoor common areas of apts, condos	3.76 (1.43)	4.06 (1.24)	2.96 (1.57)	<0.001	3.74 (1.43) ***	3.77 (1.42) ***	0.697
Within individual apt/condo units	3.79 (1.47)	4.10 (1.27)	3.00 (1.64)	<0.001	3.63 (1.52) ***	3.96 (1.39) ***	<0.001
Public bus or minivan stops	4.10 (1.29)	4.30 (1.12)	3.58 (1.54)	<0.001	4.03 (1.32) ***	4.18 (1.25) ***	0.023
In public buses, minivans	4.84 (0.62)	4.88 (0.54)	4.73 (0.78)	<0.001	4.85 (0.49) *	4.82 (0.73) *	0.367
Public subway, train stations	4.53 (0.96)	4.62 (0.85)	4.29 (1.19)	<0.001	4.62 (0.84) *	4.44 (1.08) *	<0.001
In public subways, trains	4.86 (0.60)	4.89 (0.53)	4.77 (0.75)	0.001	4.88 (0.45) *	4.83 (0.73) *	0.142
Taxis	4.57 (1.01)	4.77 (0.72)	4.05 (1.40)	<0.001	4.37 (1.15) ***	4.79 (0.78) ***	<0.001
Within 5 m public building entrances	3.33 (1.50)	3.62 (1.41)	2.56 (1.48)	<0.001	3.45 (1.39) ***	3.20 (1.61) ***	0.002
Private vehicles with children <18	4.75 (0.72)	4.83 (0.62)	4.55 (0.93)	<0.001	4.70 (0.68) ***	4.81 (0.77) ***	0.004
Playgrounds	4.37 (1.10)	4.55 (0.88)	3.89 (1.43)	<0.001	4.21 (1.18) **	4.54 (0.98) ***	<0.001

Cigarettes	All, N = 1456	Nonsmokers, n = 1058	Smokers, n = 398	p	Georgia, n = 751	Armenia, n = 705	p
Parks, beaches	3.53 (1.47)	3.83 (1.35)	2.73 (1.49)	<0.001	3.21 (1.48) ***	3.88 (1.39) ***	<0.001
Other public outdoor areas (e.g., open stadiums)	3.41 (1.56)	3.72 (1.43)	2.59 (1.58)	<0.001	3.00 (1.61) ***	3.84 (1.38) ***	<0.001
ENDS/HTPs							
Healthcare facilities	4.50 (1.03)	4.53 (0.99)	4.42 (1.11)	0.077	4.49 (0.97) *	4.51 (1.09) ***	0.737
Workplaces	4.29 (1.13)	4.37 (1.07)	4.09 (1.26)	<0.001	4.29 (1.09) *	4.30 (1.19) ***	0.860
Government institutions	4.32 (1.09)	4.39 (1.02)	4.12 (1.22)	<0.001	4.30 (1.07) *	4.35 (1.11) ***	0.471
Religious institutions	4.47 (1.03)	4.50 (1.00)	4.41 (1.13)	0.174	4.53 (0.95) *	4.43 (1.12) ***	0.076
Indoors of schools, kindergartens	4.51 (1.00)	4.55 (0.95)	4.42 (1.13)	0.033	4.49 (0.99) *	4.55 (1.03) ***	0.238
Schoolyards of schools, kindergartens	4.51 (1.00)	4.53 (0.96)	4.44 (1.08)	0.131	4.50 (0.98) *	4.53 (1.03) ***	0.536
Indoors of universities, colleges	4.04 (1.34)	4.18 (1.24)	3.68 (1.52)	<0.001	3.63 (1.45) *	4.49 (1.05) ***	<0.001
In restaurants, cafes, cafeterias	3.80 (1.38)	4.05 (1.20)	3.13 (1.59)	<0.001	3.67 (1.37)	3.95 (1.38) ***	<0.001
In bars, pubs, nightclubs	3.51 (1.48)	3.77 (1.35)	2.84 (1.59)	<0.001	3.48 (1.45)	3.56 (1.52) ***	0.261
Public transportation	4.42 (1.08)	4.46 (1.03)	4.32 (1.18)	0.031	4.42 (1.04)	4.43 (1.13) ***	0.862

* Total ban implemented in the country; ** Partial restrictions implemented in the country;

*** No restrictions implemented in the country.

Table 14. Support for cigarette smoking bans and bans on use of ENDS/HTPs in select settings. 1 = Strongly oppose, 2 = Somewhat oppose, 3 = Don't know, 4 = Somewhat support, 5 = Strongly support. Note: All comparisons of cigarette vs. ENDS/HTPs policy support indicated significant differences.



The greatest support (ave. > 4/5) was for policies in healthcare, religious, government, and workplace settings; public transport; schools; and vehicles with children present. The least support (ave. < 3/5) was for policies in outdoor areas of bars or restaurants. Support was mixed (ave. 3–4/5)—and higher in non-smokers versus smokers (ave. > 1 point)—regarding indoor and outdoor areas of bars or restaurants, multiunit housing (common indoor/outdoor areas, individual units), and outdoor public areas (e.g., playgrounds, public transportation stops).

There were also differences across countries in relation to support for cigarette and ENDS/HTPs smoke-free policies (Table 2). Participants from Georgia versus Armenia reported greater support for cigarette smoke-free policies in healthcare facilities; religious institutions; schoolyards; outdoor areas of university or college campuses; bars, pubs and nightclubs; public transportation; and near public building entrances. However, participants from Armenia versus Georgia reported greater support for cigarette smoke-free policies in indoor areas of universities, institutes, colleges; outdoor terrace of restaurants, cafes, bars, and nightclubs; individual apt/condo units; public transportation stops and taxis; private vehicles with children present; and outdoor areas (e.g., playgrounds, parks, beaches, open stadiums). Finally, Georgian versus Armenian participants reported higher support for ENDS/HTP-related policies in universities/colleges indoor places.

In multilevel linear regression, among non-smokers, correlates indicating greater support for cigarette smoke-free air policies included being female ($B = 0.19$, CI: 0.08, 0.23, $p < 0.001$) and not being former smokers ($B = -0.21$, CI: -0.35 , -0.08 , $p = 0.002$); there were no significant correlates of ENDS/HTP-related policy support. Among smokers, correlates of greater support for cigarette smoke-free air policies included smoking less than daily (vs. daily; $B = 0.36$, CI: 0.14, 0.57, $p = 0.001$) and reporting quitting as more important ($B = 0.07$, CI: 0.05, 0.09, $p < 0.001$); greater support for ENDS/HTPs policies was correlated with participants' reporting quitting as more important ($B = 0.03$, CI: 0.00, 0.06, $p = 0.047$).

Table 15. Nonsmokers' and smokers' support for use bans of cigarettes and ENDS/HTPs and rated persuasiveness of smoke-free policy messages.

(a) Nonsmokers' and Smokers' Support for Use Bans of Cigarettes and ENDS/HTPs	Nonsmokers				Smokers			
	Cigarettes, <i>n</i> = 1019		ENDS/HTPs, <i>n</i> = 1015		Cigarettes, <i>n</i> = 372		ENDS/HTPs, <i>n</i> = 376	
	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>
Intercept	4.14 (3.95, 4.33)	<0.001	4.38 (4.04, 4.71)	<0.001	3.31 (2.93, 3.68)	<0.001	3.97 (3.40, 4.54)	<0.001
Georgia (vs. Armenia)	0.11 (-0.06, 0.28)	0.198	0.00 (-0.32, 0.32)	0.977	-0.17 (-0.40, 0.06)	0.141	-0.18(-0.57, 0.20)	0.350
<i>Sociodemographics</i>								
Age	0.001 (-0.001, 0.001)	0.380	0.00 (0.00, 0.00)	0.507	0.00 (0.00, 0.01)	0.324	0.00 (-0.01, 0.01)	0.795
Female (vs. male)	0.19 (0.08, 0.23)	<0.001	0.02 (-0.15, 0.18)	0.845	0.13 (-0.12, 0.38))	0.309	0.07 (-0.31, 0.44)	0.730
Unemployed/other (vs. employed)	0.02 (-0.04, 0.08)	0.544	0.00(-0.10, 0.10)	0.982	-0.07 (-0.21, 0.06)	0.286	0.06(-0.15, 0.26)	0.589
Other (vs. married/cohabitating)	-0.01 (-0.09, 0.06)	0.714	-0.09 (-0.22, 0.03)	0.126	-0.04 (-0.20, 0.12)	0.619	-0.11 (-0.34, 0.13)	0.367
Children <18 in home (vs. no)	0.01 (-0.05, 0.08)	0.677	0.07 (-0.04, 0.18)	0.227	0.01 (-0.12, 0.15)	0.872	0.04 (-0.16, 0.24)	0.675
<i>Smoking Characteristics</i>								
Former smoker (vs. never)	-0.21 (-0.35, -0.08)	0.002	-0.03 (-0.24, 0.18)	0.763	-	-	-	-
Smoking some days (vs. every)	-	-	-	-	0.36 (0.14, 0.57)	0.001	0.23 (-0.08, 0.55)	0.151
Importance of quitting	-	-	-	-	0.07 (0.05, 0.09)	<0.001	0.03 (0.00, 0.06)	0.047
Confidence in quitting	-	-	-	-	-0.01 (-0.03, 0.01)	0.517	-0.01 (-0.04, 0.02)	0.494

Unconditional Model ICC	16.83%		19.58%		11.00%		21.18%	
Full Model ICC	15.79%		21.42%		15.31%		21.12%	
(b) Nonsmokers' and Smokers' Rated Persuasiveness of Smoke- free Policy Messages	Nonsmokers				Smokers			
	Support, $n = 1023$		Opposition, $n = 1016$		Support, $n = 375$		Opposition, $n = 373$	
	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p
Intercept	3.31 (3.11, 3.52)	<0.001	2.66 (2.36, 2.95)	<0.001	3.41 (2.98, 3.84)	<0.001	2.83 (2.34, 3.33)	<0.001
Georgia (vs. Armenia)	-0.13 (-0.32, 0.06)	0.187	-0.95 (-1.21, -0.69)	<0.001	-0.46 (-0.66, -0.27)	<0.001	-0.82 (-1.06, -0.58)	<0.001
<i>Sociodemographics</i>								
Age	0.002 (-0.001, 0.004)	0.176	0.001 (-0.003, 0.005)	0.678	-0.01 (-0.01, -0.001)	0.026	0.00 (0.00, 0.01)	0.639
Female (vs. male)	0.06 (-0.05, 0.16)	0.289	0.14 (-0.01, 0.29)	0.074	-0.02 (-0.32, 0.29)	0.900	-0.29 (-0.64, 0.06)	0.105
Unemployed/other (vs. employed)	0.03 (-0.04, 0.10)	0.379	0.001 (-0.09, 0.10)	0.980	0.04 (-0.13, 0.21)	0.630	-0.01 (-0.20, 0.18)	0.929
Other (vs. married/cohabitating)	-0.05 (-0.12, 0.03)	0.262	-0.11 (-0.22, 0.01)	0.065	-0.09 (-0.29, 0.10)	0.340	0.16 (-0.06, 0.38)	0.150
Children <18 in home (vs. no)	0.06 (-0.1, 0.13)	0.118	0.02 (-0.08, 0.13)	0.647	-0.13 (-0.3, 0.03)	0.112	0.00 (-0.19, 0.19)	0.986
<i>Smoking Characteristics</i>								
Former smoker (vs. never)	-0.01 (-0.15, 0.13)	0.846	-0.05 (-0.25, 0.15)	0.622	-	-	-	-
Smoking some days (vs. every)	-	-	-	-	0.31 (0.04, 0.58)	0.022	0.51 (0.21, 0.81)	0.001
Importance of quitting	-	-	-	-	0.05 (0.02, 0.07)	<0.001	0.01 (-0.01, 0.04)	0.345
Confidence in quitting	-	-	-	-	-0.01 (-0.03, 0.02)	0.462	-0.02 (-0.05, 0.01)	0.117
Unconditional model ICC	17.79%		39.73%		13.90%		25.5%	

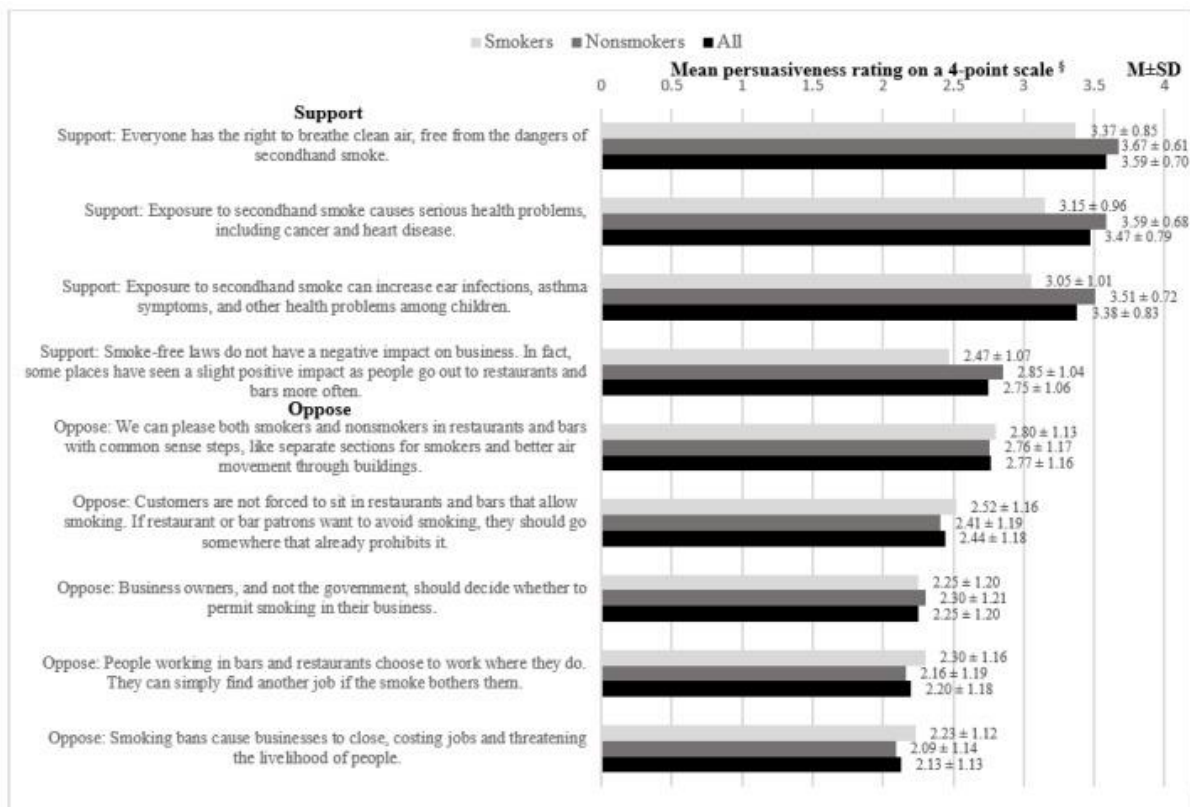
full model ICC	17.93%		16.49%		3.82%		5.7%	
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Persuasiveness of Messaging Strategies

Each pro-policy message was perceived as more persuasive among non-smokers versus smokers (p 's < 0.001). The most compelling messaging strategy among non-smokers and smokers focused on the right to breathe clean air ($M \pm SD$: 3.67 ± 0.61 vs. 3.37 ± 0.85 , $p < 0.001$), followed by SHSe health consequences ($M \pm SD$: 3.59 ± 0.68 vs. 3.15 ± 0.96 , $p < 0.001$); the least compelling messages focused on negligible policy impact on businesses ($M \pm SD$: 2.85 ± 1.04 vs. 2.47 ± 1.07 , $p < 0.001$). The most compelling anti-policy messaging focused on using smoking/non-smoking sections ($M \pm SD$: 2.76 ± 1.17 vs. 2.80 ± 1.13 , $p = 0.610$), followed by consumers' responsibility to guard against SHSe ($M \pm SD$: 2.41 ± 1.19 v. 2.52 ± 1.16 , $p = 0.034$); the least compelling was negative impact on businesses ($M \pm SD$: 2.09 ± 1.14 v. 2.23 ± 1.12 , $p = 0.293$).

In multilevel linear regression analyses (Table 3b), among non-smokers, there were no significant correlates of perceiving pro-policy messaging as more persuasive; the only correlate of rating anti-policy messaging as more persuasive was living in Armenia ($B = -0.95$, $CI: -1.21, -0.69$, $p < 0.001$). Among smokers, correlates of rating pro-policy messaging as more persuasive included being Armenian ($B = -0.46$, $CI: -0.66, -0.27$, $p < 0.001$), being younger ($B = -0.01$, $CI: -0.01, -0.002$, $p = 0.026$), smoking less than daily (vs. daily; $B = 0.31$, $CI: 0.04, 0.58$, $p = 0.022$), and reporting quitting as more important ($B = 0.05$, $CI: 0.02, 0.07$, $p < 0.000$). Correlates of rating anti-policy messaging as more persuasive among smokers included being Armenia ($B = -0.82$, $CI: -1.06, -0.58$, $p < 0.001$) and smoking less than daily (vs. daily; $B = 0.51$, $CI: 0.21, 0.81$, $p = 0.001$).

Figure 14. Nonsmokers' and smokers' rated persuasiveness of smoke-free policy messages. § 1 = Not at all, 2 = don't know, 3 = moderately, 4 = extremely; ** $p < 0.001$; * $p < 0.05$.



RQ#1 - Impact of Smoke-Free Policies on Behavior

Data from this study sample reflect the smoking prevalence among men and women per national estimates (albeit higher among men; 64% and 3% vs. 52–58% and 2–6%, respectively) (World Health Organization 2023) and similar cessation-related attitudes as documented in prior studies in other relevant countries/regions (i.e., only ~4% ready to quit in the next month among smokers in LMICs (Owusu et al. 2017b) , less than half with lifetime quit attempts in European countries (Petroulia et al. 2018). Moreover, these results indicate that key theoretical constructs involved across health behavior theories (Bandura 1998; 2004; DiClemente and Prochaska 1982; Ajzen 1991; Green et al. 2020; Joseph et al. 2016; McLeroy et al. 1988), particularly perceived risk, social influences, and restrictive environments, are critical in shaping—and potentially changing—behavior. Specific to these findings, in general, greater perceived harm of tobacco use, social norms against smoking, and more smoke-free restrictions across settings, particularly in the home, were associated with less likelihood of smoking and with more positive cessation-related behaviors and attitudes among smokers in Armenia and Georgia. However, these findings across outcomes differed, and findings regarding the roles of exposure to anti- and pro-tobacco media exposure are complex.

As expected, greater perceived harm was associated with being a nonsmoker, and among smokers, with greater cessation-related importance and confidence (Brewer et al. 2007; Mantler 2013; Smerecnik, Grispen, and Quaak 2012). Moreover, it was anticipated that having more friends who smoke was associated with being a current smoker, and perceiving less favorable attitudes toward smoking among friends, family, and the general public was associated with greater importance of quitting among smokers (Olds, Thombs, and Tomasek 2005; Riou França et al. 2009). However, other findings regarding social influences were seemingly counterintuitive, both in models across countries and in select sub analysis by country. For example, perceiving more favorable attitudes toward smoking among friends, family, and the general public was associated with readiness to quit and greater confidence in quitting; additionally, having more friends who smoke was associated with making past-year

quit attempts. The reasons for these findings are unclear, but they may be due to differing social norms regarding tobacco use in Armenia and Georgia. Given the high smoking prevalence in these countries and the social norms conducive to tobacco use, particularly among men (World Health Organization 2023), those who have more positive cessation-related behaviors and attitudes may do so despite pro-tobacco social norms within their social networks. Another possibility is that smokers' may be more likely to perceive that their referent group has a more favorable attitude toward smoking in an effort to justify or rationalize their smoking behavior and, thus, avoid psychological reactance (Festinger 1962).

In terms of smoke-free restrictions, having more home smoke-free restrictions was associated with being a nonsmoker and, among smokers, with attempting to quit in the past year, greater importance of quitting, and greater confidence to quit, as has been suggested by prior literature (Owusu et al. 2017a; Center for Disease Control and Prevention 2024). In addition, having more car smoke-free restrictions was associated with being a nonsmoker, and among nonsmokers, more smoke-free home and restaurant/bar restrictions and residing in Georgia (where complete public restrictions were implemented) were associated with greater perceived harm to health among nonsmokers. Unanticipated findings included that greater perceived harm among nonsmokers was associated with fewer restrictions in cars and that greater importance of quitting among smokers was related to fewer restrictions in restaurants/bars. Moreover, country of residence did not reflect what might be expected, as residing in Armenia (where complete public restrictions had not been implemented) was associated with past-year quit attempts and the importance of quitting. The reasons for these findings are unclear; however, there is the possibility that restrictions in primary areas, such as the home and workplace, may influence the extent to which people reserve smoking for cars and that those who perceive quitting as important are more likely to notice or be impacted by smoking around them in public spaces (i.e., the salience heuristic) (Groome and Eysenck 2016).

Regarding media exposure, as expected, among nonsmokers, greater perceived harm to health was associated with greater anti-tobacco media exposure and less pro-tobacco media exposure (Owusu et al. 2017a). However, findings among smokers were all seemingly

counterintuitive. For example, we found that less exposure to anti-tobacco media and greater exposure to pro-tobacco media was associated with readiness to quit and having made a past-year quit attempt, and the greater importance of quitting was associated with greater pro-tobacco media exposure among smokers. These findings may be partially explained through psychological reactance and cognitive dissonance experienced by smokers, such that smokers may avoid or dismiss messages that contradict their current behavior (Hall et al. 2016; Groome and Eysenck 2016). The elaboration likelihood model is a theory of persuasion that suggests that there are two different ways people can be persuaded—either peripherally or centrally—depending on how invested they are in a topic (“Petty: Communication and Persuasion: Central and... - Google Scholar,” n.d.). When people hear a message that is personally relevant, for example, they may process information through the central route, in which they carefully consider the information. However, when information may be less relevant or in conflict with one’s beliefs, they may more peripherally process the information. Thus, anti-tobacco messaging may be more noticeable to smokers unlikely to quit and less noticeable to those already motivated to quit; on the other hand, pro-tobacco messaging may be less noticeable to smokers unlikely to quit and more noticeable to those motivated to do so (“Petty: Communication and Persuasion: Central and... - Google Scholar,” n.d.).

Other findings indicated that smokers were more likely to be male and employed (as expected (World Health Organization 2023)). Moreover, those who were younger and/or those smoking less frequently were more likely to be ready to quit and have attempted to quit, and were more confident in their ability to quit. These findings likely reflect cohort effects in countries, such as Armenia and Georgia, where the trends regarding smoking are shifting toward less favorable attitudes toward smoking (Schoenaker et al. 2018) and that those more motivated to quit are likely to be reducing harm and/or preparing themselves to quit by reducing their overall cigarette consumption (Ferguson et al. 2003; A. Hyland et al. 2006; Andrew Hyland et al. 2004). Comparisons across countries should be interpreted with caution given the high prevalence of smoking among men (World Health Organization 2023) and the fact that the Armenia sample had a greater proportion of females versus males in their sample.

These results have implications for research and practice. The counterintuitive findings, particularly regarding perceived social norms and attitudes and media exposure, should be interpreted with caution and lend themselves to other research methods to determine if the associations documented here exist or if cognitive processes are involved in recall and perceptions of these factors. Relatedly, anti-tobacco media messaging must be carefully developed, pilot-tested, and studied over time to determine its actual impact among multiple segments of the nonsmoker and smoker populations, particularly with an eye toward age, sex, and baseline attitudes toward smoking and cessation. In addition, these cross-sectional findings lend themselves to replication using longitudinal approaches to examine potential causality. Finally, multilevel interventions addressing these dynamic multilevel determinants of smoking and cessation in LMICs with distinct sociopolitical contexts regarding smoking are needed.

Strengths and Limitations

This sample may not represent the general adult populations of these countries. Additionally, the sampling/recruitment methods across countries differed by necessity and yielded different response rates and composition by sex and smoking status. Our results could also be biased due to several factors, such as unmeasured variables associated with differential participation. Finally, the cross-sectional nature and self-reported assessments limit the ability to make causal attributions or account for bias. Thus, these results must be cautiously interpreted.

RQ#2 - What barriers do healthcare providers encounter in enhancing patient participation in cancer screening programs in Georgia?

This study represents one of the first comprehensive assessments of cancer screening recommendation and referral practices among PHC providers in Georgia. The findings highlight both the strengths and areas for improvement in the national cancer screening program, particularly regarding provider-level engagement, knowledge, and systemic support for facilitating cancer screening.

While the vast majority of PHC providers perceived themselves as actively recommending cancer screening, the actual number of patients recommended and referred for screening per week remained modest. This pattern of limited engagement in cancer screening recommendations and referral is in line with existing data and is not unique to Georgia, as it is observed both in high- and low- to middle-income countries (LMICs) (Muluneh, Atnafu, and Wassie 2019; ÖZDEMİR et al. 2020; Guliashvili et al. 2023; Tupper et al. 2024; Fuzzell et al. 2021; Earl et al. 2022; Luleci and Kilic 2022). For instance, Guliashvili et al. (2023) found that only 26% of women participants in Georgia learned about cervical cancer screening from medical personnel, highlighting a gap in communication between healthcare providers and patients. (Guliashvili et al. 2023) Similarly, in studies conducted in Armenia and Turkey only 20.6% and 38.2% of respondents (respectively) reported that their family doctors had recommended and referred them for cancer screening programs, reflecting low levels of proactive screening promotion across the region. (Özdemir et al. 2020) Cancer screening recommendation practices are typically more consistent and effective in high-income countries compared to lower-income settings. For example, the Spanish SUN cohort study by Sayon-Orea et al. (2022) demonstrated that nearly 70% of physicians offered counseling on cancer screening, including for breast, colorectal, and prostate cancers, reflecting a strong commitment to preventive care. In the United States, Siembida et al. found that over 65% of physicians recommended breast cancer screening to their patients, while Radhakrishnan et al. reported that approximately 80% of doctors advocated for breast cancer screening, regardless of their patients' family history. These studies underscore the

disparities in cancer screening practices across different economic contexts. (Sayon-Orea et al. 2022; Siembida et al. 2017; Radhakrishnan et al. 2018)

The contributors of the identified disconnect between healthcare providers' intentions and their actual practice may be system, provider and patient related factors resulting in underutilization of screening programs, as seen in various settings. (Farajimakin, n.d.; Agunwamba et al. 2023; Akoto and Allsop 2023; Wender 1993) Despite the perceived availability of national policies and guidelines supporting cancer screening, many respondents reported system-level challenges such as insufficient staffing, inadequate infrastructure, the lack of recall systems and coordination across different levels of the healthcare system. The lack of access to program performance data and the low awareness of electronic systems for screening registration suggest that more effort is needed to integrate digital health tools and performance tracking into the national screening program. These findings align with those from studies in both high-income countries and other LMICs, suggesting that similar challenges in cancer screening may hinder healthcare workers' ability to proactively recommend and facilitate these programs effectively. (Fuzzell et al. 2021; Earl et al. 2022)

On the provider level, although most respondents had a positive attitude toward cancer screening, knowledge gaps persisted, with correct identification of screening targets varying by cancer type. Similar findings were observed in the small-scale study in Georgia, where knowledge of colorectal cancer was found to be the lowest, followed by breast cancer, and then cervical cancer. (Gulbiani et al. 2022) Knowledge gaps are commonly identified barriers according to the studies carried out in other LMICs as well. (Akoto and Allsop 2023; Heena et al. 2019) This variation in knowledge, combined with self-reported barriers such as inadequate infrastructure and public promotion of screening programs, underscores the need for further training and resource allocation. Encouragingly, multivariate analysis revealed that receiving comprehensive training on cancer screening significantly increased the likelihood of PHC providers recommending screening to patients, suggesting that ongoing education initiatives could yield improvements.

While significant differences were observed between groups - such as urban vs. rural settings and family doctors vs. nurses - the overall trends reveal that system- and provider-level gaps persist across all groups. These challenges are widespread and systematic,

indicating that the barriers to recommending and referring for cancer screening are not confined to specific professional roles or locations. However, providers in Tbilisi, the capital city, were more likely to recommend screenings, suggesting that while systemic issues are consistent, certain regional factors in urban settings may still positively influence recommendation and referral practices.

The study revealed that the specialty of the provider - specifically the distinction between family doctors and nurses - plays a significant role in recommendation and referral practices. These differences can be attributed to variations in knowledge, perceptions, and practices regarding cancer screening protocols, with nurses demonstrating lower awareness and confidence in their roles compared to family doctors, ultimately affecting their ability to recommend and refer patients for screening. Our findings are in line with available literature suggesting that general practitioners, including family doctors, are more likely than nurses to engage in preventive care discussions due to their comprehensive training and the long-term relationships they develop with patients, which enhances their authority and the impact of their recommendations on patient adherence to screening protocols. (ÖZDEMİR et al. 2020; Krist et al. 2020; “Community and Provider Perceptions and Experiences of Cervical Cancer Screening in Rural Bolivia: A Qualitative Study - PubMed,” n.d.) However, the perception of PHC providers regarding their role in cancer screening remained a crucial independent predictor of recommendation and referral practices. Those who viewed screening as part of their job to help patients make informed decisions were far more likely to recommend it. This finding highlights an opportunity to further engage nurses in preventive care efforts, particularly in settings where they are the primary point of contact for patients, while also underscoring the importance of fostering a sense of ownership and responsibility among all PHC providers in cancer control effort.

Strengths and Limitations

This study has several strengths that enhance the validity of its findings. Firstly, it represents one of the few quantitative assessments of cancer screening practices among primary healthcare (PHC) providers in Georgia, utilizing a high response rate of 95.3% from participants in a state-funded continuous medical education (CME) training program on cancer screening. This engagement offers a representative view of practices within this group. Additionally, the use of a structured, self-administered questionnaire, adapted from

the International Agency for Research on Cancer (IARC) tool, adds methodological rigor and allows for a comprehensive evaluation of both provider-level and healthcare system-level factors affecting cancer screening practices.

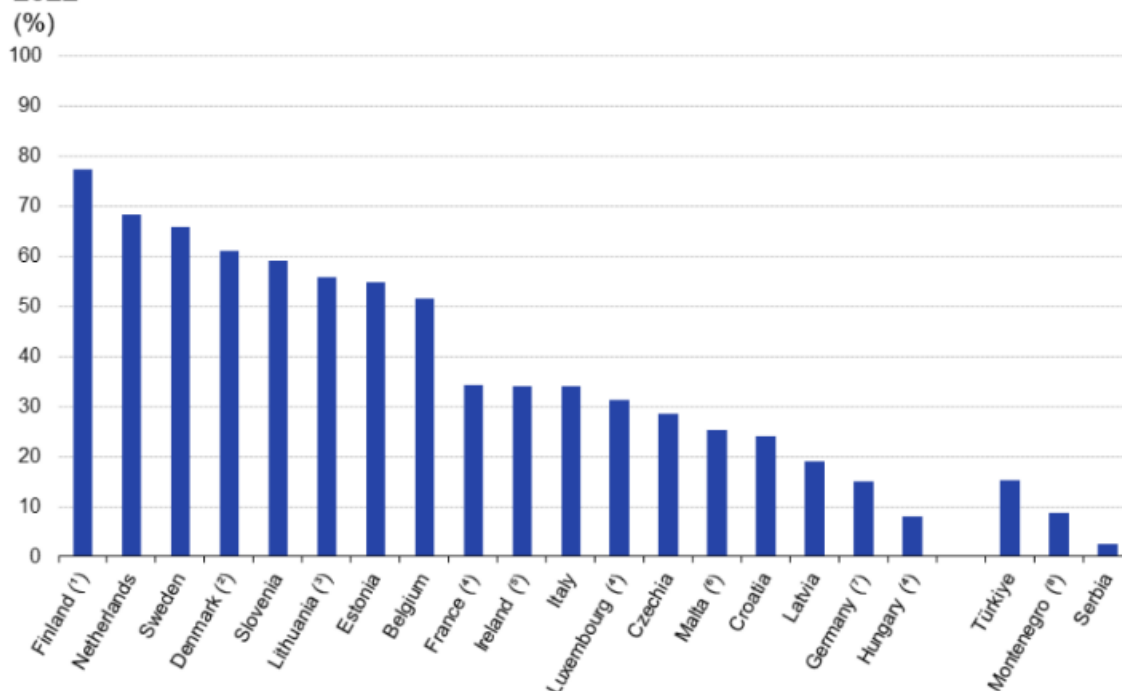
However, the study's limitations must also be acknowledged. The non-randomized sampling design limits the generalizability of the findings, as the results may not fully represent the broader population of PHC providers in Georgia. To mitigate this limitation, we emphasized the high response rate, which strengthens the relevance of our findings and reduces potential bias associated with self-selection. This engagement provides confidence that the findings reflect the experiences and practices of the targeted provider group.

RQ#3 What barriers do patients perceive in participating in cancer screening programs in Georgia?

The study's findings reveal significant gaps in cervical cancer screening practices among primary healthcare providers in Georgia, with only 57% having undergone screening at least once. This rate is notably lower than the European average, where countries like Switzerland and Austria report participation rates exceeding 89%, while Romania and Bulgaria have rates of 29% and 55.4%, respectively (Eurostat 2022). The low screening uptake in Georgia aligns with trends observed in Eastern Europe and Central Asia, regions characterized by high cervical cancer incidence and mortality rates (Marques et al. 2020a).

Figure 15. Cervical cancer screening rate, women aged 20 to 69 years, Europe, 2022 (%) (Eurostat 2022)

Colorectal cancer screening rate, people aged 50 to 74 years, 2022



Note: programme-based data. The rate shown is the proportion of people aged 50 to 74 years who have been screened for colorectal cancer within the previous 2 years (or according to the specific screening frequency recommended in each country). This is shown as a proportion of people eligible for an organised screening programme. Bulgaria, Greece, Spain, Cyprus, Austria, Poland, Portugal, Romania and Slovakia: not available.

(*) Estimate.

(*) 2021.

(*) Also includes people who underwent follow-up colorectal cancer tests based on the positive result of initial testing.

(*) Provisional.

(*) People aged 60–69 years. Provisional.

(*) People aged 55–73 years.

(*) People aged 50–55 years. Faecal occult blood test only. 2019. Estimate.

(*) 2020.

Source: Eurostat (online data code: hlth_ps_prev)

eurostat

The study identified several barriers to screening uptake among healthcare providers, including fear of a cancer diagnosis (26%) and lack of time due to busy schedules (12%). These findings align with research from Latvia (Marques et al. 2020b), where concerns about the procedure and prioritization of other health issues were significant barriers to cervical cancer screening. It is also consistent with research from Turkey, where embarrassment, fear of pain, and anxiety about the procedure were prominent obstacles to cervical cancer screening (Petersen et al. 2022a).

Additionally, the study found that 69% of respondents felt only somewhat informed about cancer screening procedures, and 54% believed they had sufficient information to make an informed decision about participating in cervical cancer screening. This highlights a need for enhanced education and training among healthcare providers to improve their

knowledge and confidence regarding screening. A study in Poland highlighted that primary healthcare physicians often perceive Pap smears as tasks for gynecologists, citing lack of training and time as barriers to conducting screenings themselves (Petersen et al. 2022a)

Additionally, knowledge gaps among healthcare providers were evident, with only 77% correctly identifying the target age for the national cervical cancer screening program and 53% unaware of the recommended screening frequency. This mirrors findings from a study in Georgia (Gulbiani et al. 2022), where only 55.1% of primary care workers were aware of the breast cancer screening frequency, and 61.1% knew the eligible age groups for colorectal cancer screening. . Such deficiencies in knowledge can impede effective patient education and referral practices.

Social and environmental factors also play a role in screening behaviors. The study revealed that 92% of respondents reported that their spouse or partner did not believe they should participate in regular cervical cancer screening, and 84% indicated the same for their family. Furthermore, 82% felt that cervical cancer screening is not widely supported in Georgia. These findings suggest that societal norms and lack of support from close social networks may hinder screening uptake. Addressing these social barriers through community engagement and public health campaigns could be crucial in improving screening rates.

Health system-related challenges were also identified, including indirect costs (54%), lack of a system to notify results and inform about follow-ups (60%), insufficient number of providers for the screening program (86%), inadequate infrastructure (78%), challenges in managing further treatment (87%), insufficient public promotion of the screening program (76%), and lack of awareness about the cancer screening visit registration system (73%). These systemic issues highlight the need for comprehensive health system strengthening to facilitate better access to screening services. These systemic issues are consistent with barriers identified in low- and middle-income countries, where limited resources and poor referral systems hinder effective screening services (Petersen et al. 2022b).

Addressing these multifaceted barriers requires comprehensive strategies, including enhancing provider education, improving public awareness, strengthening health

infrastructure, and fostering supportive social environments to increase cervical cancer screening uptake among healthcare providers and the general population in Georgia.

Strengths and Limitations

This study offers several notable strengths. The high response rate of 95.3% from a substantial sample of 3,097 primary healthcare (PHC) providers enhances the reliability and generalizability of the findings. By focusing on female medical personnel aged 25 to 60—the target demographic for Georgia's national cervical cancer screening program—the research ensures that the insights are directly applicable to the intended population. The use of a structured, self-administered questionnaire, grounded in the COM-B model and adapted from the International Agency for Research on Cancer (IARC) tool, provides a comprehensive framework for assessing factors influencing screening behaviors. Additionally, the study's integration into a state-funded continuous medical education (CME) training program underscores its relevance and potential impact on ongoing medical education and policy development.

However, certain limitations should be acknowledged. The cross-sectional design captures data at a single point in time, which may not reflect changes in behaviors or attitudes over time. The study's focus on PHC providers who participated in the CME training program could introduce selection bias, as these individuals might differ in motivation or awareness compared to non-participants. Furthermore, the reliance on self-reported data may be subject to recall bias or social desirability bias, potentially affecting the accuracy of the responses. Despite these limitations, the study provides valuable insights into cervical cancer screening behaviors among a critical segment of healthcare providers in Georgia, informing future interventions and policy decisions.

RQ#4 What determinants influence the adoption and implementation of tobacco control policies in Georgia?

This study supported some hypotheses (e.g., sociodemographic and tobacco use factors associated with policy support and perceived persuasiveness of messaging), but not others. Notably, while Armenians versus Georgians reported less support for policies (on average) in several settings, country of residence was not a significant correlate of policy support in multivariable analysis. In addition, Armenians versus Georgians generally indicated that both pro- and anti-policy messaging was more persuasive. Below, we further discuss, contextualize, and interpret these and other findings.

Current results indicate high levels of support for cigarette smoke-free policies in Armenia and Georgia, particularly for policies covering healthcare, religious, government, and workplace settings; public transport; schools; and vehicles carrying children. Given the high level of support for cigarette smoke-free policies, it is important to consider why tobacco control policies, specifically comprehensive smoke-free policies, have lagged in Armenia and Georgia. One explanation might be that constituents are insufficiently engaged with lawmakers, which is critical in advancing tobacco control legislation whether the influence comes from the public health community or the tobacco industry (Schmidt, Ranney, and Goldstein 2014a). Another explanation may stem from policymakers' misconceptions about the negative health impacts of SHSe or the economic and public health benefits of smoke-free policies (Brian S. Flynn et al. 1998; B. S. Flynn et al. 1997a; 1997b; Thrasher et al. 2015). These misconceptions can be addressed easily, as the literature is clear on the health impact of SHSe and health benefits of smoke-free policies [10] and largely indicates neutral or positive impact of such policies on businesses (with findings otherwise generally produced by the tobacco industry) (Center for Disease Control and Prevention 2024). Finally, policymakers' decisions may be influenced less by constituent sentiment and more by personal attitudes and interests (Songer et al. 1986; Hahn et al. 1999), perhaps influenced by tobacco industry role in the economy and culture of many countries, including Armenia and Georgia ("Cooperation of Philip Morris Armenia Company with YSU and NPUA Has Launched | WHO FCTC," n.d.; Bakhturidze, Peikrishvili, and Mittelmark 2016).

Several previously identified factors associated with support for tobacco control were documented with relation to cigarette smoke-free air policies, for example, being female, nonsmokers, or smokers who less frequently smoke and perceive quitting as more important (National Institute of Health 2022). However, fewer were found with relation to policies covering ENDS/HTPs, perhaps due to fewer people being aware of these products, the literature being less mature regarding their health risks, and limited public health campaigns communicating the risks of such products (WHO 2019; Dunbar et al. 2020; Getachew et al. 2018; Berg, Bar-Zeev, and Levine 2020).

Other important findings include the messaging strategies that might be most effective with these populations. Overall, pro-policy messaging strategies that were perceived as most persuasive were focused on individual rights to smoke-free air and negative SHSe health impact. The most compelling anti-policy message focused on using nonsmoking sections or consumer responsibility to guard against SHSe. These findings are similar to prior research in the US indicating the most effective pro-policy messages pertained to hospitality, health, and individual rights/responsibilities; the most persuasive anti-policy messages involved individual rights/responsibilities (Berg et al. 2015). Moreover, current findings indicated that the least compelling messages in support and opposition focused on impact on businesses; prior research in the US also indicated that pro- and anti-policy messages focusing on economic impact were not particularly compelling (Berg et al. 2015).

Not surprisingly, those younger and smokers who smoked less frequently and reported quitting as more important were perceived pro-policy messaging as more persuasive (National Institute of Health 2022). Interestingly, Armenians were more likely to perceive both pro- and anti-policy messaging as more persuasive; this may be related to the fact that Georgia had (and has) made more progress in advancing smoke-free policies, which involved public health campaigns to garner such support. Perhaps the information provided to Armenians was perceived as more novel and thus more persuasive (Petty and Cacioppo 2012), given a relative dearth of such public health campaigns.

Current findings have important implications for research and practice. Research should examine the processes impeding the adoption of comprehensive smoke-free policies in countries like Armenia and Georgia, particularly given their sociopolitical histories and

high tobacco use prevalence among men. Relatedly, studying how community engagement and coalition building can advance smoke-free policy legislation and use various messaging strategies to do so warrants research (Schmidt, Ranney, and Goldstein 2014b). Given high levels of support for smoke-free policies and evidence for promising strategies for garnering support, smoke-free policy advocacy efforts should focus campaign messaging on the positive health impact of smoke-free policies and such policies protecting vulnerable populations. Collectively, these findings provide a foundation to inform the activities of public health practitioners to further the agenda of public smoke-free policy adoption.

Strengths and Limitations

This sample may not represent the general adult populations of these countries. Additionally, the sampling/recruitment methods across countries differed by necessity and yielded different response rates and composition by sex and smoking status. Our results could also be biased due to several factors, such as unmeasured variables associated with differential participation. Finally, the cross-sectional nature and self-reported assessments limit the ability to make causal attributions or account for bias. Thus, these results must be cautiously interpreted.

Chapter VI: Conclusions and Policy Recommendations

In this chapter, is presentend the conclusions and policy recommendations derived from the research studies, which addressed the following key research questions of the PhD study:

RQ#1 - What is the impact of current tobacco control policies on smoking behaviors and related factors in Georgia?

RQ#2 - What is the impact of current tobacco control policies on smoking behaviors and related factors in Georgia?

RQ #3 - What barriers do patients perceive in participating in cancer screening programs in Georgia?

RQ#4 - What determinants influence the adoption and implementation of tobacco control policies in Georgia?

The subsequent sections summarize the key findings related to cancer control and prevention policies in Georgia, followed by actionable recommendations aimed at reducing cancer-related morbidity and mortality in the country and conclusion.

Key Findings

Smoke-Free Policy Relevant Findings

Smoking Behaviors and Perceptions:

- **Georgia's tobacco control** policies, including smoke-free restrictions, are **associated with positive outcomes** such as lower smoking prevalence in some contexts and increased cessation-related behaviors (e.g., more quit attempts, greater readiness and confidence to quit).
- **Home smoke-free restrictions** are **particularly impactful**, correlating with nonsmoking status and improved cessation indicators among smokers.
- **Socio-contextual Determinants:**
- Greater **perceived harm** of tobacco use, stronger **social norms** against smoking, and **restrictive environments** are critical in **shaping smoking behaviors and attitudes**. However, **unexpected findings** show that **smokers** may view social

influences and media messages in complex ways, possibly due to conflicting thoughts or resistance to change.

Media Exposure:

- Among nonsmokers, greater anti-tobacco and less pro-tobacco media exposure align with increased perceived harm of tobacco. However, among smokers, exposure to anti-tobacco media was paradoxically linked to lower readiness to quit, highlighting the need for nuanced messaging strategies.

Policy Impacts by Setting:

- Smoke-free restrictions in public spaces (e.g., restaurants, bars) are inconsistently associated with positive smoking outcomes, while restrictions in private spaces (homes, cars) appear more impactful in motivating behavior change.

Socio-demographic Correlates:

- Support for tobacco control policies is higher among females, nonsmokers, and smokers who smoke less frequently or prioritize quitting. Younger individuals are also more receptive to pro-policy messaging.

Policy Advocacy Strategies:

- Advocacy efforts should focus on highlighting the health benefits of smoke-free policies and protecting vulnerable populations, using targeted messaging strategies informed by local sociocultural contexts.

Cancer Screening Relevant Findings

System-Level Barriers:

- **Inadequate Infrastructure and Staffing:** Limited availability of facilities and insufficient staffing hinder providers' ability to recommend and facilitate cancer screenings effectively.
- **Lack of Recall and Coordination Systems:** The absence of notification systems and poor coordination between healthcare levels result in missed follow-ups and reduced engagement in screening programs.
- **Limited Access to Program Data:** Many providers lack access to performance data and awareness of digital registration systems for cancer screening, affecting their ability to track and improve patient participation.
- **Urban vs. Rural Disparities:** Providers in urban settings, particularly Tbilisi, were more likely to recommend screenings, indicating regional inequalities.

Provider-Level Barriers:

- **Knowledge Gaps:** Many PHC providers, particularly nurses, demonstrated inadequate knowledge of screening protocols, including target age groups and recommended frequencies for colorectal, cervical, and breast cancer screenings.
- **Training Deficits:** Comprehensive training significantly increased the likelihood of providers recommending screenings, emphasizing the need for ongoing education initiatives.
- **Role Perception:** Providers who viewed cancer screening as a core responsibility were more likely to recommend it. However, nurses were less confident and engaged than family doctors, reflecting a need to clarify roles and enhance nurse training.

Practice Gaps:

- **Limited Patient Referrals:** Despite providers perceiving themselves as recommending screenings, the number of actual referrals remained low, reflecting a disconnect between intentions and actions.

- **Specialty-Driven Disparities:** Family doctors were more proactive than nurses in recommending screenings, likely due to their broader training and stronger patient relationships.

Personal Barriers:

- **Fear and Anxiety:** Fear of cancer diagnosis (26%), pain, embarrassment, and anxiety about procedures were significant deterrents, consistent with trends in other LMICs. Lack of Time: Busy schedules (12%) and competing health priorities further reduced screening participation.
- **Low Awareness:** Many patients lacked sufficient information about screening benefits and procedures, with only 54% feeling confident in their knowledge.

Social and Cultural Barriers:

- **Insufficient Family Support:** Social norms discouraged screening, with 92% of respondents reporting that their spouse or family did not support regular screenings.
- **Lack of Community Awareness:** Screening was not widely perceived as a societal priority, undermining participation.

Health System Barriers:

- **Indirect Costs:** Screening-related costs, even if minimal, were a significant barrier for many participants.
- **Follow-Up Gaps:** Lack of systems to notify patients about results and follow-ups contributed to missed opportunities for early detection.
- **Provider Availability and Infrastructure:** Insufficient numbers of trained providers, inadequate infrastructure, and poor treatment management deterred participation.
- **Promotion Deficits:** Insufficient public promotion of screening programs left many unaware of available services.

Knowledge Gaps and Language Barriers:

- **Provider Communication:** Only 26% of women in Georgia reported learning about cervical cancer screening from healthcare providers, highlighting poor communication and low engagement from providers.

- **Language Barriers:** Participants facing language challenges were less likely to engage with screening programs.

Recommendations

Smoke-Free Policy related Recommendations

1. **Strengthen Home and Vehicle Smoke-Free Policies:** Given the observed association between smoke-free home and car environments with reduced smoking prevalence and positive cessation behaviors, policies should be reinforced to encourage households to adopt smoke-free practices. Public health campaigns should focus on educating families about the benefits of implementing smoke-free rules at home and in vehicles.
2. **Expand Public Smoke-Free Regulations:** Countries with comprehensive public smoke-free restrictions, such as Georgia, showed higher perceived harm of smoking among nonsmokers. Extending such regulations to more public spaces and ensuring rigorous enforcement could amplify their impact on smoking behavior, promoting cessation and reducing exposure to secondhand smoke.
3. **Enhance Communication Strategies:** Since social norms and perceived attitudes toward smoking influence cessation behaviors, public health initiatives should leverage targeted communication campaigns to shift social perceptions. Campaigns should emphasize the risks of smoking and promote smoke-free norms, particularly among influential social groups and communities.
4. **Promote Supportive Social Environments:** Findings indicate that social influences can both support and hinder smoking cessation. Policymakers should focus on creating support networks and community programs that provide resources and encouragement for quitting. Programs that include peer support, counseling, and community engagement can strengthen smokers' readiness and confidence to quit.
5. **Address Pro-Tobacco Media Exposure:** Given the complex roles of anti- and pro-tobacco media exposure, regulatory measures should be considered to limit pro-

tobacco content in media. Simultaneously, increasing the reach and effectiveness of anti-smoking campaigns can reinforce perceived harm and encourage cessation.

6. **Focus on High-Risk Groups:** As smoking prevalence remains significantly higher among men and certain social networks, targeted interventions should be designed to address these high-risk groups specifically. Educational programs and cessation resources tailored to the cultural and social context of men in Georgia could lead to more effective behavior change.
7. **Incorporate Behavioral Theory into Interventions:** Since key health behavior constructs like perceived risk and social norms were found to shape smoking behaviors, interventions should integrate these theoretical models. Tailored messaging that enhances perceived risk and reshapes social norms can be more effective in promoting smoking cessation.
8. **Leverage Public Support for Comprehensive Policies:** Emphasize high public approval as a key driver for advancing smoke-free laws across healthcare, workplaces, public transport, and schools.
9. **Develop Sociodemographic-Focused Campaigns:** Tailor public health initiatives that leverage higher policy support among women and nonsmokers, while addressing emerging product regulations through informative outreach.
10. **Utilize Effective Messaging Strategies:** Deploy messaging that highlights individual rights to clean air and health risks of SHSe, as these were found persuasive, avoiding overemphasis on economic arguments.
11. **Address Complex Social Norms with Cessation Support:** Integrate strategies into cessation programs that deconstruct rationalizations for smoking, fostering supportive quitting environments.
12. **Increase Knowledge on Emerging Products:** Design public health education focused on the risks of ENDS/HTPs to build informed public opinion and support comprehensive regulation.
13. **Continuously Monitor and Adjust Policies:** Implement feedback mechanisms for ongoing assessment of policies to ensure they meet current public health needs and adapt to emerging trends. Unanticipated findings, such as the relationship between perceived harm and smoke-free car restrictions, suggest the need for continuous

evaluation of existing policies. Regularly updating strategies based on current data will ensure that interventions remain effective and relevant to the target populations.

14. Recommendation: Integrate Behavioral and Cultural Insights into Tobacco Control

Policies: Based on the findings of my PhD research, it is evident that incorporating behavioral and cultural insights (BCI) into tobacco control policies is crucial for their success. My study revealed that cultural beliefs, social norms, and individual behaviors significantly influence smoking habits within communities. By tailoring interventions to align with these factors, policymakers can design strategies that resonate with the target population, thereby increasing policy adoption, compliance and support (“Measuring and Maximizing Public Support for Health Policies: Behavioural and Cultural Insights Policy Brief Series” 2024). For instance, recognizing cultural perceptions of smoking can inform the development of public health campaigns that address specific beliefs and attitudes, making anti-smoking messages more relatable and impactful. Additionally, BCI aids in identifying potential barriers to policy adoption, such as social stigmas or misconceptions about smoking cessation, allowing for the creation of targeted educational programs that effectively address these challenges. By leveraging BCI, tobacco control policies become more culturally sensitive and behaviorally informed, leading to higher rates of adoption and, ultimately, a reduction in smoking prevalence.

Cancer Screening related Recommendations

1. Strengthen Provider Training and Education

- **Develop Comprehensive Training Programs:** Implement targeted training modules focused on comprehensive cancer screening guidelines, with special emphasis on cancers with identified knowledge gaps (e.g., colorectal cancer) and interpersonal communication strategies.

- **Continuous Professional Development (CPD):** Integrate cancer screening education into CPD requirements for healthcare providers to ensure ongoing updates on best practices and new evidence in preventive care.

2. Improve Systemic Support and Infrastructure

- **Enhance Staffing and Resource Allocation:** Address system-level barriers by increasing the number of qualified staff to manage patient volume and support cancer screening services. This includes recruiting additional healthcare personnel and optimizing workload distribution to allow providers more time to recommend and facilitate screenings.
- **Develop and Implement Recall and Reminder Systems:** Establish electronic recall systems to remind both providers and patients of upcoming or missed cancer screenings. Automated reminders and coordinated follow-up systems can improve participation rates.
- **Integrate Digital Health Solutions:** Expand the use and awareness of digital tools for screening registration and performance tracking. Ensure that providers are trained to use electronic booking systems effectively to streamline referrals and monitor screening data.

3. Enhance Provider-Patient Communication

- **Communication Training Workshops:** Organize workshops that focus on enhancing communication skills, ensuring providers can clearly convey the importance of cancer screening and address patient concerns effectively. Role-playing and interactive methods can be used to simulate patient-provider interactions.
- **Develop Standardized Patient Education Materials:** Provide easily accessible educational brochures, flyers, and multimedia tools that providers can distribute to patients. These resources should explain the benefits, procedures, and importance of regular cancer screenings.

4. Facilitate Multilevel Coordination

- **Strengthen Coordination across various Healthcare Levels:** Facilitate collaboration between primary healthcare centers and specialty care providers to ensure a seamless referral process for patients who require follow-up after initial screening.
- **Regular Interdisciplinary Meetings:** Promote periodic meetings between PHC providers, specialists, and public health officials to discuss challenges and share best practices for improving cancer screening uptake and quality at central and regional level.

5. Implement Performance Monitoring and Feedback Mechanisms

- **Develop Key Performance Indicators (KPIs):** Establish clear KPIs for cancer screening referral and recommendation rates. Regularly review these metrics to identify areas requiring further support and improvement.
- **Feedback Loops for Providers:** Introduce structured feedback mechanisms where providers receive data on their screening recommendation and referral performance. This can motivate improvements and foster a sense of accountability.

15. Address Patient-Related Barriers

- **Community Outreach Initiatives:** Launch community-based outreach programs to increase public awareness of cancer screening, focusing on the importance of early detection and dispelling common myths or fears.
- **Reduce Access Barriers:** Work with policymakers to ensure that screening services are accessible, affordable, and geographically convenient for patients, especially in rural or underserved areas.
- **Engage Patient Advocates:** Collaborate with patient advocacy groups to encourage peer-led education and support programs that promote cancer screening within the community.
- **Integrate Behavioral and Cultural Insights into Health Intervention and Policy Evaluation Development and Evaluation:** research finding highlights the potential of incorporating behavioral and cultural insights into the development and

evaluation of health interventions, particularly in cancer screening initiatives. By examining local behaviors, cultural norms, and evolving challenges, healthcare programs can be tailored to address specific barriers and motivators within communities. This approach ensures that interventions are culturally sensitive and adaptable to the dynamic needs of the population, thereby improving participation rates and health outcomes. In addition to informing intervention design, behavioral and cultural insights are crucial for evaluating the impact of health policies. Incorporating robust evaluation frameworks allows policymakers to identify effective strategies, understand why certain cancer control policies and interventions succeed or fail, and make informed decisions to enhance future health initiatives (WHO 2024a).

Conclusions

This PhD research aimed to enhance cancer control policies in Georgia by assessing their impact on population behavior and identifying factors influencing their adoption, focusing on tobacco control and cancer screening. The study addressed four key research questions:

1. What is the impact of current tobacco control policies on smoking behaviors and related factors in Georgia?
2. What barriers do patients perceive in participating in cancer screening programs in Georgia?
3. What determinants influence the adoption and implementation of tobacco control policies in Georgia?
4. What are the implications of these findings for developing evidence-based cancer control policy recommendations?

Through comprehensive analysis, the research achieved its objectives by:

- **Evaluating the Impact of Tobacco Control Policies:** The study found that existing tobacco control measures have led to a reduction in smoking prevalence and a shift in public attitudes toward smoking. However, challenges remain in enforcement and addressing emerging tobacco products.
- **Assessing Cancer Screening Uptake Barriers:** Key barriers identified include limited public awareness, accessibility issues, and cultural perceptions. Addressing these barriers is crucial for improving participation rates in screening programs.
- **Identifying Determinants Influencing Policy Adoption:** Factors such as political will, public support, and the influence of the tobacco industry were found to significantly affect the adoption and implementation of tobacco control policies.
- **Developing Evidence-Based Policy Recommendations:** Based on the findings, actionable recommendations were formulated to strengthen tobacco control and enhance cancer screening initiatives, aiming to reduce cancer-related morbidity and mortality in Georgia.

Limitations

While this PhD research provides valuable insights into cancer control policies in Georgia, it is important to acknowledge certain limitations. The study's focus was specifically on tobacco control and cancer screening, which are critical components of cancer prevention and early detection. However, this narrow scope means that other essential aspects of cancer control, such as dietary interventions, physical activity promotion, vaccination programs, and environmental risk factors, were not explored. Consequently, the findings may not fully capture the multifaceted nature of cancer control strategies. Despite this limitation, the study's emphasis on tobacco control and cancer screening addresses significant areas of public health concern in Georgia. The insights gained can inform targeted interventions and policy enhancements in these domains, contributing to the overall reduction of cancer-related morbidity and mortality in the country.

In conclusion, this PhD research has successfully met its goals and objectives, providing a foundation for future efforts to strengthen cancer control policies in Georgia. By addressing identified barriers and leveraging the study's insights, there is potential to significantly reduce cancer-related morbidity and mortality in the country.

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Annex #1. Published paper #1

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Article

Psychosocial Factors, Smoke-Free Restrictions, and Media Exposure in Relation to Smoking-Related Attitudes and Behaviors among Adults in Armenia and Georgia

Christina N. Wysota ¹, Marina Topuridze ^{2,3}, Zhanna Sargsyan ⁴, Ana Dekanosidze ², Lela Sturua ^{2,5}, Michelle C. Kegler ^{6,7}, Varduhi Petrosyan ⁴, Arusyak Harutyunyan ⁴, Varduhi Hayrumyan ⁴ and Carla J. Berg ^{1,8,*}

¹ Department of Prevention and Community Health, Milken Institute School of Public Health, George Washington University, Washington, DC 20052, USA; cwysota@gwu.edu

² Non-Communicable Diseases Department, National Center for Disease Control and Public Health, 0198 Tbilisi, Georgia; topuridzamarina@gmail.com (M.T.); ani.dekanosidze@gmail.com (A.D.); lela.sturua@ncdc.ge (L.S.)

³ School of Natural Sciences and Medicine, Ilia State University, 0162 Tbilisi, Georgia

⁴ Turpanjian School of Public Health, American University of Armenia, Yerevan 0019, Armenia; zhsargsyan@aau.am (Z.S.); vpetrosi@aau.am (V.P.); aharutyunyan@aau.am (A.H.); vhayrumyan@aau.am (V.H.)

⁵ Public Health Department, Petre Shotadze Tbilisi Medical Academy, 0144 Tbilisi, Georgia

⁶ Department of Behavioral, Social, and Health Education Sciences, Rollins School of Public Health, Emory University, Atlanta, GA 30322, USA; mkegler@emory.edu

⁷ Winship Cancer Institute, Emory University, Atlanta, GA 30322, USA

⁸ George Washington Cancer Center, George Washington University, Washington, DC 20052, USA

* Correspondence: carlaberg@gwu.edu; Tel.: +1-404-558-5395



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Abstract: Background: Perceived harm, social influences, smoke-free policies, and media exposure have been understudied in relation to tobacco-related attitudes/behaviors in aggregate or in low and middle-income countries; thus, this study examined these factors collectively in relation to smoking-related outcomes among Armenian and Georgian adults. Methods: Using 2018 cross-sectional survey data (n = 1456), multivariable regression analyses examined these factors in relation to smoking status, perceived harm among nonsmokers, and readiness to quit and past-year quit attempts among smokers. Results: Significant predictors ($p < 0.05$) of current smoking (27.3%) included lower perceived harm, more smoking friends, and fewer home and vehicle restrictions. Among nonsmokers, more home and restaurant/bar restrictions, fewer vehicle restrictions, greater anti-tobacco media exposure, and less pro-tobacco media exposure predicted greater perceived harm. Among smokers, greater perceived social acceptability of smoking, less anti-tobacco media exposure, and greater pro-tobacco media exposure predicted readiness to quit (12.7% of smokers). More smoking friends, more home restrictions, less anti-tobacco media exposure, and greater pro-tobacco media exposure predicted past-year quit attempts (19.2%). Conclusions: Findings support the importance of smoke-free policies but were counterintuitive regarding the roles of social and media influences, underscoring the need to better understand how to address these influences, particularly in countries with high smoking rates.

Keywords: tobacco control; policy; smoke-free air policy; secondhand smoke exposure; perceived harm; social influences; media exposure

1. Introduction

Cigarette smoking remains a leading cause of preventable death, and those living in low-and middle-income countries (LMICs) are at disproportionate risk for tobacco-related diseases and deaths [1]. Armenia and Georgia represent two LMICs with the

highest smoking prevalence among men (11th and 6th highest in the world; 52.3% and 57.7%, respectively), albeit lower among women (1.5% and 5.7%, respectively) [2]. In these countries—and globally—differences in tobacco use profiles are seen with regard to sex and developmental phase (e.g., age, establishing careers, marriage, having children) [1,2].

In countries with high smoking prevalence, it is particularly crucial to identify risk factors for smoking and—among smokers—the likelihood of continuing to smoke. With regard to the latter, most behavior theories (e.g., social cognitive theory, theory of planned behavior, health belief model) [3–9] emphasize the importance of motivation (or readiness) to quit and self-efficacy (or confidence in one's ability) to quit as key drivers of cessation attempts and successful cessation. Moreover, determinants of smoking and the likelihood of continued smoking among smokers include perceived risk, social influences, exposure to constraining environments (e.g., places with smoke-free policies), and tobacco-related media exposure. To elaborate, risk perceptions (including perceptions of harm to health) have been shown to predict behavior [10], including smoking [11] and cessation [12] across populations [13].

Regarding social influences, social norms theory suggests that perceptions about the beliefs and behaviors of others may influence personal attitude and substance use [14,15]. Injunctive norms are beliefs that others approve or positively appraise a behavior, while descriptive norms are beliefs that others engage in a behavior [14]. Previous studies have found that both injunctive and descriptive norms are associated with increased tobacco use across populations [16]. Thus, key targets for smoking prevention and cessation among those living in LMICs may include social norms.

A key tobacco control strategy globally is implementing smoke-free policies [17,18]. Secondhand smoke exposure (SHSe) poses an additional risk to both smokers and non-smokers [1] and is particularly prominent in LMICs [19,20]. The recognition of SHSe as a public health risk and the implementation of smoke-free air policies have increased over the years, further driving social influences toward smoking prevention, reduction, and cessation—both in private spaces (e.g., homes, cars) and in public spaces [21].

In addition, media communications—both by tobacco control efforts and by the tobacco industry—play a key role in shaping tobacco-related knowledge, opinions, attitudes, and behaviors among individuals and within communities [18,22]. With regard to tobacco control, mass media campaigns are a critical part of comprehensive tobacco control programs in educating about the harms of smoking and SHSe, changing smoking attitudes and social norms, increasing quitting intentions and quit attempts among smokers, reducing overall smoking prevalence, and driving policy change [23]. Key industry strategies include advertising, promotion, and sponsorship, among others [22]. News coverage and public relations may involve either (or both) pro- and anti-tobacco media [22]. Within this context, individuals are differentially impacted by such media for various reasons, including one's own characteristics (e.g., behavior, perceived risk, and social norms) and how the information is conveyed [24].

Despite the broad recognition of these sociocontextual influences on tobacco use, limited research has examined the aggregate influence of perceived risk, social influences, smoke-free policies, and tobacco-related media exposure on smoking behavior, and cessation-related factors among smokers [25], particularly those living in LMICs with large disparities in smoking prevalence between men and women, as in Armenia and Georgia. Moreover, these countries have shown progressive change with respect to tobacco control. The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) was ratified in 2004 and 2006 in Armenia and Georgia, respectively; however, few FCTC-recommended policies had been implemented until recently. For example, regarding smoke-free air policies, in 2004, Armenia banned tobacco use in educational, cultural, healthcare, public transportation, and other public settings (except cafes/restaurants) [26], which was extended in 2020 to apply to alternative tobacco products (e.g., e-cigarettes, hookah) and to all public places (including cafes/restaurants) by 2023. In Georgia, new progressive tobacco control laws were implemented in 2017–2018, including a comprehen-

sive smoke-free air policy that similarly covers all alternative tobacco products across a broad range of indoor and outdoor areas.

Given the gaps in the literature and the nuances of the tobacco-related environments in Armenia and Georgia, the current study examined tobacco use behaviors and attitudes among Armenian and Georgian adults in relation to sociocontextual factors, specifically perceived harm of tobacco use; social influences (e.g., both injunctive and descriptive norms); smoke-free policies in private spaces (i.e., home, car), at the workplace, and in the community (i.e., restaurants, bars); and tobacco-related media exposure (both anti-tobacco and pro-tobacco). We hypothesized that greater perceived harm of tobacco use, fewer social influences who use or support tobacco, more restrictive environments, more anti-tobacco media exposure, and less pro-tobacco media exposure would predict the lower likelihood of tobacco use, less likelihood of future use among nonsmokers, and better indicators of cessation among smokers (e.g., more recent quit attempts, greater readiness, motivation, confidence to quit).

2. Materials and Methods

2.1. Ongoing Study Overview

This study used a matched-pairs community-randomized controlled trial to examine the effectiveness of local coalitions in promoting smoke-free air among 28 communities in Armenia and Georgia (matched and randomized by key characteristics, e.g., population). The ongoing parent study is more fully described elsewhere [27,28].

2.2. Data Collection

Among all 28 intervention and control communities, population-level surveys (i.e., of community members) were conducted before the launch of the coalition member training (October–November 2018) [28] and will then be conducted at the culmination of coalition activity. Current analyses focused on baseline population-level surveys conducted in October–November 2018. We aimed to obtain 50 completed surveys/community and obtained census data for all households within the municipality limits from their national Bureau of Statistics. Sampling strategies were different in the two countries because of the nature of the data available from their national Bureaus of Statistics. In Armenia, household census data are available; however, in Georgia, household data are not available but instead, data on “clusters” (i.e., geographically-defined areas of 150 households) are available. In each household, the Kish method [29] was used to identify target participants, who were approached in person at their homes, provided a study description, taken through informed consent, and administered the survey (~20 min) via electronic tablets.

In Armenia, addresses in each city were randomly ordered; assessments began at the beginning of the list and continued until the target recruitment in each city ($n = 50$) was reached. Overall, 1128 households were visited, of which 27.4% ($n = 309$) were ineligible (9.3% no household member eligible, 10.6% closed door/not home/did not live there anymore, 6.6% non-existing address). Among the 819 eligible, 705 (86.1%) participated.

In Georgia, multistage cluster sampling was used to select study participants. In step 1, 5 clusters per city were identified. In step 2, 15 households per cluster were selected using a random walking method: the total number of households was divided by “15” (assuming ~75% response rate) to determine how many households needed to be skipped before arriving at the next designated household (e.g., if the municipality included 150 households, the data collector would go from the first selected household to the 10th). Overall, 958 households were visited, of which 5.0% ($n = 48$) were ineligible (no household member reachable or eligible). Among the 910 eligible, 751 (82.5%) participated.

2.3. Ethical Considerations

This study was approved by the Institutional Review Boards of Emory University (#IRB00097093), the National Academy of Sciences of the Republic of Armenia (#IRB00004079), the American University of Armenia (#AUA-2017-013), and the National Center for Disease

Control and Public Health of Georgia (#IRB00002150). Before enrollment in the study and collection of data, all participants completed an informed consent. Potential participants were informed that their participation was strictly voluntary and that, if they agreed to participate, they could decline to answer any question or withdraw from the study at any time. To maintain confidentiality, only verbal consent was provided, and only participant IDs were assigned to the address indicated on the data lists. This linked data were subsequently maintained in a secure server to which only key research staff were allowed access as necessary.

2.4. Measures

Dependent Variables. Outcomes of interest were current smoking status, cessation-related attitudes and behaviors among smokers (i.e., readiness to quit, past-year quit attempts, quitting importance and confidence), and perceived harm of tobacco use among nonsmokers. Regarding smoking characteristics, we assessed past 30-day cigarette smoking and created a dichotomous outcome of current (past 30-day) smokers versus nonsmokers. Among past 30-day smokers, we assessed: (1) readiness to quit (e.g., in the next 30 days, in the next 6 months), which was used to create a dichotomous outcome of ready to quit in the next 6 months versus not ready; (2) number of past-year quit attempts, which was used to create a dichotomous outcome of any past-year quit attempt versus none; and (3) importance and confidence in quitting (0 = not at all to 10 = extremely), respectively, which were conceptualized as continuous outcomes. Perceived harm was assessed by asking, "How harmful to your health do you think the use of each of the following tobacco products is, on a scale of 1 = not at all harmful to 7 = extremely harmful: regular cigarettes; large or little cigars; electronic cigarettes or vaporizers; heat-not-burn tobacco, such as IQOS; and hookah, waterpipe, or nargila." We created a perceived harm index score (continuous variable) by calculating the average rating across items (i.e., products assessed; range: 1–7; Cronbach's $\alpha = 0.94$). This variable was conceptualized as an outcome among nonsmokers (as a proxy for likelihood of use), as well as a predictor for all other outcomes.

Independent Variables. Predictors of interest included other tobacco use characteristics, social influences, smoking restrictions, and tobacco-related media exposure. To further characterize tobacco use behaviors among past 30-day smokers, we assessed the number of days smoked (categorized as every day vs. some days) and cigarettes smoked per day (CPD).

To assess social influences, participants were asked, "How many of your closest friends (who might include relatives and co-workers) smoke cigarettes? 0 = none; 1 = almost none; 2 = less than half; 3 = about half; 4 = more than half; 5 = almost all; 6 = all." This item was operationalized as a continuous variable for analysis (range: 0 = 6). We also asked current smokers, "What do people who are important to you, like your friends and family, think about you smoking cigarettes?" and "What do you think the general public's attitude is towards smoking cigarettes?" with response options of: "0 = all or nearly all disapprove; 1 = most disapprove; 2 = about half approve and half disapprove; 3 = most approve; 4 = all or nearly all approve." These two items were operationalized as a friend/family/public attitude index score by calculating the average rating across items (range: 0–4; Cronbach's $\alpha = 0.59$).

Regarding smoking restrictions, we assessed restrictions in personal settings by asking, "Which of the following statements best describes the smoking rules in your home: smoking in your home is allowed, smoking in your home is generally not allowed with certain exceptions, smoking in your home is never allowed, or there are no rules about smoking in your home? allowed; not allowed but with exceptions; never allowed; no rules." To assess restrictions in cars, participants were asked, "Which statement best describes the rules about smoking in your household vehicles (cars or trucks)? allowed in all vehicles; sometimes allowed in some vehicles; never allowed in any vehicle; no rules about smoking in the vehicles; don't own a vehicle." For each of these items, we created a 3-level restrictions "dose" variable (0 = allowed/no rules, 1 = partial restrictions, 2 = complete restrictions).

We recoded “don’t own a vehicle” ($n = 790$) as “allowed/no rules”, as this represents the lack of a setting with smoking restrictions.

To assess smoke-free restrictions at work, we first asked participants if they worked outside of the home, and if so, whether their workplace included an indoor setting. Among those indicating that their workplace included an indoor setting, we asked, “Which of the following best describes the policy regarding smoking in indoor areas at your work: smoking is permitted everywhere, smoking is permitted only in certain indoor areas, smoking prohibited in all indoor areas, or there is no policy?” permitted everywhere; permitted only in certain indoor areas; prohibited in all indoor areas; there is no policy.” We created a 3-level restriction “dose” variable (0 = allowed/no rules, 1 = partial restrictions, 2 = complete restrictions). We recoded those who were unemployed ($n = 743$) or employed without indoor settings ($n = 31$) as “allowed/no rules”, as this represents the lack of a setting with smoking restrictions or related social norms.

Regarding public smoke-free policies, country serves as an indicator of what the actual policy context was during survey administration, as Armenia had limited public smoke-free policies, which did not include restaurants and bars, and Georgia had complete smoke-free policies, which did include restaurants and bars. However, enforcement of and compliance with these policies have been challenges historically [19,30]. Thus, we assessed participants’ perceptions about restrictions in restaurants and bars in their communities by asking, “Which of the following best describes the rules about smoking in (1) restaurants in the community where you live? and (2) drinking establishments, such as a pub or bar, in the community where you live?” Response options include: smoking is allowed in all indoor areas; smoking is allowed only in some indoor areas; smoking is not allowed in any indoor area; every [restaurant/bar] has its own rules.” (Note that the percent reporting complete restaurant restrictions in each country were 5.0% and 77.2% in Armenia and Georgia, respectively, indicating that community members’ experiences did not align fully with actual policy context.) Each of these items was converted to single 3-level restrictions “dose” variables (0 = allowed/no rules, 1 = partial restrictions/each has its own rules, 2 = complete restrictions). We then created a single 3-level restriction for both restaurants and bars (Cronbach’s $\alpha = 0.94$).

To assess media exposure, participants were asked, “In the past 6 months, how often have you noticed (e.g., on the internet, in social media, in newspapers, in magazines, on TV, on the radio, on signs, or in leaflets): (1) information about the dangers of smoking cigarettes or information that encourages quitting smoking? (2) information about the dangers of being exposed to the smoke of others? (3) any signs in public places indicating that “no smoking is allowed”? (4) any news stories talking about the harms of secondhand smoke or the importance of public smoke-free air policies in your community? (5) any advertisements or signs promoting cigarettes? and (6) any news stories talking about the negative aspects of public smoke-free air policies?” Response options were: 0 = never, 1 = rarely, 2 = sometimes, 3 = frequently. The first 4 questions were summarized as an index (i.e., average) of anti-tobacco media exposure (Cronbach’s $\alpha = 0.72$); the last 2 were summarized as an index score (i.e., average) of pro-tobacco media exposure (Cronbach’s $\alpha = 0.32$; ranges for both: 0–3).

Covariates. Covariates included sociodemographics, specifically age, sex, education level, employment status, monthly household income, marital status, and children under the age of 18 in the home.

2.5. Data Analysis

We first conducted descriptive analyses to characterize participants. Then, we conducted bivariate analyses to examine differences in sociodemographics, smoking-related characteristics, and our primary predictors of interest (i.e., perceived harm, social influences, smoke-free restrictions, media exposure) to the dependent outcomes of: (1) between smokers and nonsmokers; (2) among smokers, in relation to (a) readiness to quit in the next 6 months, (b) past-year quit attempts, (c) importance of quitting, and (d) confidence in

quitting; and (3) among nonsmokers, in relation to perceived harm (excluding perceived harm as predictor).

We then built 6 multivariable regression models for these 6 comparisons (i.e., binary logistic regression for smoking status and, among smokers, readiness to quit and past-year quit attempts; linear regression for importance and confidence to quit among smokers and perceived harm among nonsmokers). The models included country, sociodemographics (age, sex, employment status), perceived harm, number of friends who smoke, smoking restrictions (in the home, household vehicle, workplace, and restaurants/bars), and media exposure (anti- and pro-tobacco); among smokers, models also included smoking level (every day vs. some days) and friend/family/public attitude toward smoking. (Regression analyses were also conducted using multilevel modeling to account for the hierarchical structure of the data (i.e., participants at the individual level nested in communities) [31–33]; all intra-class correlations ranged from 0 to 0.01, and findings were not significantly different. Thus, we chose to present the simpler models accounting for country). Sub-analyses by country were also conducted to identify differences in predictors in multivariable regression analyses. All analyses were conducted in SPSS v. 26 (IBM Corporation, Armonk, NY, USA), and alpha was set at 0.05.

3. Results

3.1. Participant Characteristics

Participants were an average age of 43.45 years old, 60.5% female, 32.1% with $\geq$ Bachelor's degree, and 49.0% employed (Table 1). Overall, 27.3% reported smoking on some days or every day. Among smokers, 12.7% indicated that they would quit in the next 6 months (including 4.2% indicating within the next month), and 43.5% of smokers never tried to quit, with only 19.2% reporting a past-year quit attempt. Table 1 also presents data by smoking status and by country to characterize differences across the samples.

Table 1. Participant characteristics and bivariate comparisons of nonsmokers vs. smokers and those in Armenia vs. Georgia.

Variable	Total n = 1456 (100%)	Nonsmokers n = 1058 (72.7%)	Smokers n = 398 (27.3%)	p	Armenia n = 705	Georgia n = 751	p
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Country, n (%)				<0.001			–
Armenia	705 (48.4)	561 (53.0)	144 (36.2)		–	–	
Georgia	751 (51.6)	497 (47.0)	254 (63.8)		–	–	
Sociodemographics							
Age, M (SD)	43.45 (13.49)	43.34 (13.59)	43.38 (13.24)	0.957	42.56 (13.41)	44.08 (13.53)	0.032
Male, n (%)	575 (39.5)	207 (19.6)	368 (92.5)	<0.001	210 (29.8)	365 (48.6)	<0.001
Education, n (%)				0.164			
<High school	233 (15.3)	157 (14.8)	66 (16.6)		161 (22.8)	62 (8.3)	<0.001
High school to some college	765 (52.5)	546 (51.6)	219 (55.0)		327 (45.1)	447 (59.6)	
$\geq$ College degree	468 (32.1)	355 (33.6)	113 (28.4)		226 (32.1)	242 (32.2)	
Employed, n (%)	713 (49.0)	438 (41.4)	275 (69.1)	<0.001	311 (44.1)	402 (53.5)	<0.001
Married/cohabitating, n (%)	1061 (72.9)	784 (74.1)	277 (69.6)	0.085	534 (75.7)	527 (70.2)	0.017
Children under 18 in the home, n (%)	731 (51.0)	541 (52.1)	190 (48.1)	0.174	386 (56.6)	345 (45.9)	<0.001
Smoking Characteristics (for smokers)							
Number of days smoked, past 30, n (%)				–			0.448

Table 1. Cont.

Variable	Total n = 1456 (100%)	Nonsmokers n = 1058 (72.7%)	Smokers n = 398 (27.3%)	p	Armenia n = 705	Georgia n = 751	p
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Every day	-	-	350 (87.9)		129 (89.6)	221 (87.0)	
Some days	-	-	48 (12.1)		15 (10.4)	33 (13.0)	
CPD, M (SD)	-	-	22.09 (12.6)	-	21.72 (11.12)	21.02 (10.62)	0.548
Readiness to quit, next 6 months, n (%)			48 (12.7)	-	23 (21.7)	25 (13.7)	0.080
Lifetime quit attempt, n (%)			216 (56.5)	-	100 (74.1)	114 (46.5)	0.001
Past-year quit attempt, n (%)			73 (19.2)	-	42 (29.2)	31 (12.2)	<0.001
Importance of quitting, M (SD)	-	-	5.75 (3.23)	-	6.47 (3.71)	5.33 (2.86)	0.001
Confidence in quitting, M (SD)	-	-	4.80 (3.18)	-	4.78 (3.88)	4.79 (2.73)	0.967
Perceived Harm, M (SD)							
Regular cigarettes	5.92 (1.96)	6.14 (1.91)	5.36 (1.97)	<0.001	5.74 (2.18)	6.09 (1.71)	0.001
Large or little cigars	5.83 (1.98)	6.10 (1.87)	5.14 (2.07)	<0.001	5.69 (2.12)	5.97 (1.82)	0.007
Electronic cigarettes or vaporizers	5.33 (2.09)	5.66 (1.96)	4.47 (2.21)	<0.001	5.32 (2.13)	5.35 (2.07)	0.793
Heat-not-burn (IQOS)	5.23 (2.11)	5.55 (1.97)	4.37 (2.21)	<0.001	5.20 (2.14)	5.25 (2.08)	0.644
Hookah/waterpipe/nargila	4.91 (2.22)	5.27 (2.11)	3.96 (2.23)	<0.001	4.78 (2.29)	5.04 (2.15)	0.026
Perceived harm score, M (SD)	5.45 (1.86)	5.74 (1.77)	4.66 (1.87)	<0.001	5.35 (1.92)	5.54 (1.80)	0.047
Social Influences							
Number of friends who smoke, n (%)				<0.001			<0.001
None	143 (9.8)	143 (13.5)	0 (0.0)		28 (4.0)	115 (15.5)	
Almost none	175 (12.0)	169 (16.0)	6 (1.5)		84 (12.0)	91 (12.3)	
Less than half	390 (26.8)	310 (29.3)	80 (20.1)		158 (22.6)	232 (31.3)	
About half/Don't know	324 (22.3)	190 (18.0)	134 (33.7)		170 (24.3)	139 (18.7)	
More than half	310 (21.3)	178 (16.8)	132 (33.2)		166 (23.7)	144 (19.4)	
Almost all	99 (6.8)	61 (5.8)	38 (9.6)		78 (11.2)	21 (2.8)	
All	15 (1.03)	7 (0.7)	8 (2.0)		15 (2.1)	0 (0.0)	
Number friends who smoke score, M (SD)	2.58 (1.43)	2.29 (1.45)	3.35 (1.02)	<0.001	2.94 (1.39)	2.23 (1.38)	<0.001
Friends/family attitude of smoking, n (%)				-			<0.001
All or nearly all disapprove	-	-	105 (27.5)		59 (43.1)	46 (18.8)	
Most disapprove	-	-	181 (47.4)		49 (35.8)	132 (53.9)	
About half approve, half disapprove	-	-	81 (21.2)		24 (17.5)	57 (23.3)	
Most approve	-	-	13 (3.4)		4 (2.9)	9 (3.7)	
All or nearly all approve	-	-	2 (0.5)		1 (0.7)	1 (0.4)	

Table 1. Cont.

Variable	Total n = 1456 (100%)	Nonsmokers n = 1058 (72.7%)	Smokers n = 398 (27.3%)	p	Armenia n = 705	Georgia n = 751	p
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
General public attitude of smoking, n (%)				-			0.001
All or nearly all disapprove	-	-	100 (26.2)		52 (38.0)	48 (19.6)	
Most disapprove	-	-	125 (32.7)		38 (27.7)	87 (35.5)	
About half approve, half disapprove	-	-	148 (38.7)		41 (29.9)	107 (43.7)	
Most approve	-	-	3 (0.9)		2 (1.5)	1 (0.4)	
All or nearly all approve	-	-	6 (1.6)		4 (2.9)	2 (0.8)	
Friend/family/public attitude, M (SD)	-	-	1.10 (0.72)	-	0.93 (0.83)	1.20 (0.63)	<0.001
Smoke-free Restrictions							
Home restrictions, n (%)				<0.001			<0.001
Allowed/no rules	507 (34.9)	348 (32.9)	159 (40.1)		381 (54.2)	126 (16.8)	
Partial restrictions	386 (26.6)	250 (23.7)	136 (34.3)		154 (21.9)	232 (30.9)	
Complete restrictions	561 (38.6)	459 (43.4)	102 (25.7)		168 (23.9)	393 (52.3)	
Dose, M (SD)	1.04 (0.86)	1.11 (0.87)	0.86 (0.80)	<0.001	0.93 (0.83)	1.20 (0.63)	<0.001
Household vehicle restrictions, n (%)				<0.001			<0.001
Allowed/no rules/no car	1044 (71.8)	728 (68.9)	316 (79.6)		533 (75.8)	511 (68.0)	
Partial restrictions	120 (8.3)	73 (6.9)	47 (11.8)		32 (4.6)	88 (11.7)	
Complete restrictions	290 (19.9)	256 (24.2)	34 (27.3)		138 (19.6)	152 (20.2)	
Dose, M (SD)	0.48 (0.81)	0.55 (0.86)	0.29 (0.61)	<0.001	0.44 (0.80)	0.52 (0.81)	0.047
Workplace smoking restrictions, n (%)				<0.001			0.002
Allowed/unemployed/no indoors	987 (67.8)	724 (68.4)	263 (66.1)		505 (71.6)	482 (64.2)	
Partial restrictions	79 (12.0)	41 (10.0)	38 (15.2)		41 (5.8)	38 (5.1)	
Complete restrictions	390 (59.0)	293 (71.3)	97 (38.8)		159 (22.6)	231 (30.8)	
Dose, M (SD)	0.59 (0.88)	0.60 (0.89)	0.58 (0.86)	0.852	0.51 (0.84)	0.67 (0.92)	0.001
Restaurants in your community, n (%)				<0.001			<0.001
Allowed/no rules/don't know	391 (26.9)	321 (30.5)	70 (17.6)		277 (39.5)	114 (15.2)	
Partial restrictions/each has own rules	441 (30.4)	331 (31.4)	110 (27.7)		389 (55.5)	52 (6.9)	
Complete restrictions	619 (42.7)	402 (38.1)	217 (54.7)		35 (5.0)	584 (77.9)	
Dose, M (SD)	1.16 (0.82)	1.08 (0.83)	1.37 (0.77)	<0.001	0.65 (0.57)	1.63 (0.73)	<0.001
Bars in your community, n (%)				<0.001			<0.001
Allowed/no rules	488 (33.6)	396 (37.6)	92 (23.2)		341 (48.6)	147 (19.6)	

Table 1. Cont.

Variable	Total n = 1456 (100%)	Nonsmokers n = 1058 (72.7%)	Smokers n = 398 (27.3%)	p	Armenia n = 705	Georgia n = 751	p
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)		n (%) or M (SD)	n (%) or M (SD)	
Partial restrictions/each has own rules	371 (25.6)	280 (26.6)	91 (22.9)		334 (47.6)	37 (4.9)	
Complete restrictions	592 (40.8)	378 (35.9)	214 (53.9)		26 (3.7)	566 (75.5)	
Dose, M (SD)	1.07 (0.86)	0.98 (0.86)	1.31 (0.82)	<0.001	0.55 (0.57)	1.56 (0.80)	<0.001
Restaurant/bar restrictions dose, M (SD)	2.23 (1.63)	2.06 (1.63)	2.68 (1.54)	<0.001	1.21 (1.05)	3.19 (1.49)	<0.001
Media Exposure, M (SD)							
Anti-tobacco media							
Dangers of smoking cigarettes	1.84 (1.14)	1.89 (1.12)	1.69 (1.19)	0.003	1.92 (1.09)	1.76 (1.19)	0.010
Dangers of SHSe	1.50 (1.20)	1.55 (1.18)	1.36 (1.23)	0.007	1.54 (1.15)	1.46 (1.24)	0.190
"No smoking is allowed" sign	2.27 (0.99)	2.23 (1.00)	2.38 (0.95)	0.012	1.99 (1.01)	2.54 (0.89)	<0.001
News on SHSe	0.69 (0.98)	0.71 (0.98)	0.64 (0.99)	0.126	0.66 (0.90)	0.72 (1.05)	0.264
Anti-tobacco media exposure score	1.58 (0.80)	1.60 (0.80)	1.52 (0.81)	0.094	1.53 (0.75)	1.62 (0.85)	0.031
Pro-tobacco media							
Advertisements promoting cigarettes	0.31 (0.73)	0.33 (0.76)	0.24 (0.64)	0.030	0.40 (0.84)	0.22 (0.60)	<0.001
Anti-smoke-free policy media	0.69 (0.98)	0.55 (0.92)	0.45 (0.85)	0.073	0.65 (0.96)	0.40 (0.84)	<0.001
Pro-tobacco media exposure score	0.42 (0.64)	0.44 (0.66)	0.35 (0.57)	0.012	0.53 (0.72)	0.31 (0.52)	<0.001

Notes: M = Mean; SD = Standard Deviation; n = Number; p = p-value. M and SD reported to hundredths; % reported to tenths; p-values reported to thousandths.

3.2. Smoking Status

Multivariable analysis (Table 2) indicated that predictors of being a current smoker included: residing in Georgia (vs. Armenia; $p = 0.015$), being male ($p < 0.001$), being employed (vs. unemployed/other; $p < 0.001$), lower perceived harm ($p < 0.001$), more friends who smoke ($p < 0.001$), and fewer smoke-free home and vehicle restrictions ($p < 0.001$). (In subanalyses in which multivariable regression models were constructed among Armenian and Georgian participants, respectively, results indicated that predictors of current smoking included being male and having more friends who smoke in both countries; among Armenian participants, predictors also included having more restaurant/bar restrictions; among Georgian participants, predictors also included being employed, perceiving less harm, and having fewer home and vehicle restrictions.)

3.3. Readiness to Quit among Smokers

Supplementary Table S1 provides bivariate results regarding readiness to quit. Multivariable analysis (Table 2) indicated that predictors of readiness to quit included: being unemployed (vs. employed; $p = 0.005$), smoking some days (vs. every day; $p = 0.002$), more favorable attitudes toward smoking among friends/family/general public ($p = 0.007$), less anti-tobacco media exposure ($p = 0.001$), and greater pro-tobacco media exposure ($p = 0.015$). (Subanalysis by country precluded by small cell sizes of those ready to quit.)

Appendix 2 Published paper #2

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Article

Smokers' and Nonsmokers' Receptivity to Smoke-Free Policies and Pro- and Anti-Policy Messaging in Armenia and Georgia

Marina Topuridze ^{1,2}, Carla J. Berg ^{3,*}, Ana Dekanosidze ¹, Arevik Torosyan ⁴, Lilit Grigoryan ⁴, Alexander Bazarchyan ⁴, Zhanna Sargsyan ⁵, Varduhi Hayrumyan ⁵, Nino Maglakelidze ¹, Lela Sturua ^{1,6}, Regine Haardörfer ⁷ and Michelle C. Kegler ^{7,8}

¹ Non-Communicable Diseases Department, National Center for Disease Control and Public Health, Tbilisi 0198, Georgia; topuridzamarina@gmail.com (M.T.); ani.dekanosidze@gmail.com (A.D.); nmaglakelidze@yahoo.com (N.M.); lela.sturua@ncdc.ge (L.S.)

² School of Natural Sciences and Medicine, Ilia State University, Tbilisi 0162, Georgia

³ Department of Prevention and Community Health, Milken Institute School of Public Health, George Washington Cancer Center, George Washington University, Washington, DC 20052, USA

⁴ National Institute of Health Named after Academician S. Avdalbekyan, MoH, Yerevan 0051, Armenia; torossianarevik@gmail.com (A.T.); lilitgri@yahoo.com (L.G.); bazarchyan@gmail.com (A.B.)

⁵ Turpanjian School of Public Health, American University of Armenia, Yerevan 0019, Armenia; zhsargsyan@aau.am (Z.S.); vhayrumyan@aau.am (V.H.)

⁶ Public Health Department Petre Shotadze Tbilisi Medical Academy, Tbilisi 0144, Georgia

⁷ Department of Behavioral, Social, and Health Education Sciences, Rollins School of Public Health, Emory University, Atlanta, GA 30322, USA; regine.haardorfer@emory.edu (R.H.); mkegler@emory.edu (M.C.K.)

⁸ Winship Cancer Institute, Emory University, Atlanta, GA 30322, USA

* Correspondence: carlaberg@gwu.edu

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Abstract: Garnering support for smoke-free policies is critical for their successful adoption, particularly in countries with high smoking prevalence, such as Armenia and Georgia. In 2018, we surveyed 1456 residents (ages 18–64) of 28 cities in Armenia ($n = 705$) and Georgia ($n = 751$). We examined support for cigarette and electronic nicotine delivery systems (ENDS)/heated tobacco product (HTP) smoke-free policies in various locations and persuasiveness of pro- and anti-policy messaging. Participants were an average age of 43.35, 60.5% female, and 27.3% current smokers. Nonsmokers versus smokers indicated greater policy support for cigarette and ENDS/HTP and greater persuasiveness of pro-policy messaging. Armenians versus Georgians generally perceived pro- and anti-policy messaging more persuasive. In multilevel linear regression, sociodemographics (e.g., female) and tobacco use characteristics (e.g., smoking less frequently, higher quitting importance) correlated with more policy support. Greatest policy support was for healthcare, religious, government, and workplace settings; public transport; schools; and vehicles carrying children. Least policy support was for bar/restaurant outdoor areas. The most compelling pro-policy message focused on the right to clean air; the most compelling anti-policy message focused on using nonsmoking sections. Specific settings may present challenges for advancing smoke-free policies. Messaging focusing on individual rights to clean air and health may garner support.

Keywords: tobacco control; policy; smoke-free air policy; secondhand smoke exposure

levels of support for smoke-free policies and evidence for promising strategies for garnering support, smoke-free policy advocacy efforts should focus campaign messaging on the positive health impact of smoke-free policies and such policies protecting vulnerable populations. Collectively, these findings provide a foundation to inform the activities of public health practitioners to further the agenda of public smoke-free policy adoption.

This study has limitations. This sample may not represent the general adult populations of these countries. Additionally, the sampling/recruitment methods across countries differed by necessity and yielded different response rates and composition by sex and smoking status. Our results could also be biased due to several factors, such as unmeasured variables associated with differential participation. Finally, the cross-sectional nature and self-reported assessments limit the ability to make causal attributions or account for bias. Thus, these results must be cautiously interpreted.

5. Conclusions

Armenians and Georgians are highly supportive of cigarette smoke-free air policies and in healthcare, religious, government, and workplace settings; public transportation; schools; and vehicles carrying children. However, there was less support for such policies regarding other locations, particularly outdoor areas of bars and restaurants, and regarding ENDS/HTPs. This underscores the need to address what is known about the risks of secondhand exposure to the byproducts of ENDS/HTPs and to SHSe in a broad range of settings, including outdoor settings. Moreover, campaigns to garner support for smoke-free policies should emphasize individual rights to clean air and health and combat using nonsmoking sections by highlighting the relative ineffectiveness of such strategies.

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4. Discussion

This study supported some hypotheses (e.g., sociodemographic and tobacco use factors associated with policy support and perceived persuasiveness of messaging), but not others. Notably, while Armenians versus Georgians reported less support for policies (on average) in several settings, country of residence was not a significant correlate of policy support in multivariable analysis. In addition, Armenians versus Georgians generally indicated that both pro- and anti-policy messaging was more persuasive. Below, we further discuss, contextualize, and interpret these and other findings.

Current results indicate high levels of support for cigarette smoke-free policies in Armenia and Georgia, particularly for policies covering healthcare, religious, government, and workplace settings; public transport; schools; and vehicles carrying children. Given the high level of support for cigarette smoke-free policies, it is important to consider why tobacco control policies, specifically comprehensive smoke-free policies, have lagged in Armenia and Georgia. One explanation might be that constituents are insufficiently engaged with lawmakers, which is critical in advancing tobacco control legislation whether the influence comes from the public health community or the tobacco industry [30]. Another explanation may stem from policymakers' misconceptions about the negative health impacts of SHSe or the economic and public health benefits of smoke-free policies [12,31,32]. These misconceptions can be addressed easily, as the literature is clear on the health impact of SHSe and health benefits of smoke-free policies [10] and largely indicates neutral or positive impact of such policies on businesses (with findings otherwise generally produced by the tobacco industry) [10]. Finally, policymakers' decisions may be influenced less by constituent sentiment and more by personal attitudes and interests [33,34], perhaps influenced by tobacco industry role in the economy and culture of many countries, including Armenia and Georgia [35,36].

Several previously identified factors associated with support for tobacco control were documented with relation to cigarette smoke-free air policies, for example, being female, nonsmokers, or smokers who less frequently smoke and perceive quitting as more important [18]. However, fewer were found with relation to policies covering ENDS/HTPs, perhaps due to fewer people being aware of these products, the literature being less mature regarding their health risks, and limited public health campaigns communicating the risks of such products [1,8,37,38].

Other important findings include the messaging strategies that might be most effective with these populations. Overall, pro-policy messaging strategies that were perceived as most persuasive were focused on individual rights to smoke-free air and negative SHSe health impact. The most compelling anti-policy message focused on using nonsmoking sections or consumer responsibility to guard against SHSe. These findings are similar to prior research in the US indicating the most effective pro-policy messages pertained to hospitality, health, and individual rights/responsibilities; the most persuasive anti-policy messages involved individual rights/responsibilities [24]. Moreover, current findings indicated that the least compelling messages in support and opposition focused on impact on businesses; prior research in the US also indicated that pro- and anti-policy messages focusing on economic impact were not particularly compelling [24].

Not surprisingly, those younger and smokers who smoked less frequently and reported quitting as more important were perceived pro-policy messaging as more persuasive [18]. Interestingly, Armenians were more likely to perceive both pro- and anti-policy messaging as more persuasive; this may be related to the fact that Georgia had (and has) made more progress in advancing smoke-free policies, which involved public health campaigns to garner such support. Perhaps the information provided to Armenians was perceived as more novel and thus more persuasive [39], given a relative dearth of such public health campaigns.

Current findings have important implications for research and practice. Research should examine the processes impeding the adoption of comprehensive smoke-free policies in countries like Armenia and Georgia, particularly given their sociopolitical histories and high tobacco use prevalence among men. Relatedly, studying how community engagement and coalition building can advance smoke-free policy legislation and use various messaging strategies to do so warrants research [30]. Given high

Table 3. Nonsmokers' and smokers' support for use bans of cigarettes and ENDS/HTPs and rated persuasiveness of smoke-free policy messages.

(a) Nonsmokers' and Smokers' Support for Use Bans of Cigarettes and ENDS/HTPs	Nonsmokers				Smokers			
	Cigarettes, <i>n</i> = 1019		ENDS/HTPs, <i>n</i> = 1015		Cigarettes, <i>n</i> = 372		ENDS/HTPs, <i>n</i> = 376	
	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>
Intercept	4.14 (3.95, 4.33)	<0.001	4.38 (4.04, 4.71)	<0.001	3.31 (2.93, 3.68)	<0.001	3.97 (3.40, 4.54)	<0.001
Georgia (vs. Armenia)	0.11 (−0.06, 0.28)	0.198	0.00 (−0.32, 0.32)	0.977	−0.17 (−0.40, 0.06)	0.141	−0.18 (−0.57, 0.20)	0.350
<i>Sociodemographics</i>								
Age	0.001 (−0.001, 0.001)	0.380	0.00 (0.00, 0.00)	0.507	0.00 (0.00, 0.01)	0.324	0.00 (−0.01, 0.01)	0.795
Female (vs. male)	0.19 (0.08, 0.23)	<0.001	0.02 (−0.15, 0.18)	0.845	0.13 (−0.12, 0.38)	0.309	0.07 (−0.31, 0.44)	0.730
Unemployed/other (vs. employed)	0.02 (−0.04, 0.08)	0.544	0.00 (−0.10, 0.10)	0.982	−0.07 (−0.21, 0.06)	0.286	0.06 (−0.15, 0.26)	0.589
Other (vs. married/cohabitating)	−0.01 (−0.09, 0.06)	0.714	−0.09 (−0.22, 0.03)	0.126	−0.04 (−0.20, 0.12)	0.619	−0.11 (−0.34, 0.13)	0.367
Children <18 in home (vs. no)	0.01 (−0.05, 0.08)	0.677	0.07 (−0.04, 0.18)	0.227	0.01 (−0.12, 0.15)	0.872	0.04 (−0.16, 0.24)	0.675
<i>Smoking Characteristics</i>								
Former smoker (vs. never)	−0.21 (−0.35, −0.08)	0.002	−0.03 (−0.24, 0.18)	0.763	-	-	-	-
Smoking some days (vs. every)	-	-	-	-	0.36 (0.14, 0.57)	0.001	0.23 (−0.08, 0.55)	0.151
Importance of quitting	-	-	-	-	0.07 (0.05, 0.09)	<0.001	0.03 (0.00, 0.06)	0.047
Confidence in quitting	-	-	-	-	−0.01 (−0.03, 0.01)	0.517	−0.01 (−0.04, 0.02)	0.494
Unconditional Model ICC	16.83%		19.58%		11.00%		21.18%	
Full Model ICC	15.79%		21.42%		15.31%		21.12%	
(b) Nonsmokers' and Smokers' Rated Persuasiveness of Smoke-free Policy Messages	Nonsmokers				Smokers			
	Support, <i>n</i> = 1023		Opposition, <i>n</i> = 1016		Support, <i>n</i> = 375		Opposition, <i>n</i> = 373	
	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>	B (95% CI)	<i>p</i>
Intercept	3.31 (3.11, 3.52)	<0.001	2.66 (2.36, 2.95)	<0.001	3.41 (2.98, 3.84)	<0.001	2.83 (2.34, 3.33)	<0.001
Georgia (vs. Armenia)	−0.13 (−0.32, 0.06)	0.187	−0.95 (−1.21, −0.69)	<0.001	−0.46 (−0.66, −0.27)	<0.001	−0.82 (−1.06, −0.58)	<0.001
<i>Sociodemographics</i>								
Age	0.002 (−0.001, 0.004)	0.176	0.001 (−0.003, 0.005)	0.678	−0.01 (−0.01, −0.001)	0.026	0.00 (0.00, 0.01)	0.639
Female (vs. male)	0.06 (−0.05, 0.16)	0.289	0.14 (−0.01, 0.29)	0.074	−0.02 (−0.32, 0.29)	0.900	−0.29 (−0.64, 0.06)	0.105
Unemployed/other (vs. employed)	0.03 (−0.04, 0.10)	0.379	0.001 (−0.09, 0.10)	0.980	0.04 (−0.13, 0.21)	0.630	−0.01 (−0.20, 0.18)	0.929
Other (vs. married/cohabitating)	−0.05 (−0.12, 0.03)	0.262	−0.11 (−0.22, 0.01)	0.065	−0.09 (−0.29, 0.10)	0.340	0.16 (−0.06, 0.38)	0.150
Children <18 in home (vs. no)	0.06 (−0.1, 0.13)	0.118	0.02 (−0.08, 0.13)	0.647	−0.13 (−0.3, 0.03)	0.112	0.00 (−0.19, 0.19)	0.986
<i>Smoking Characteristics</i>								
Former smoker (vs. never)	−0.01 (−0.15, 0.13)	0.846	−0.05 (−0.25, 0.15)	0.622	-	-	-	-
Smoking some days (vs. every)	-	-	-	-	0.31 (0.04, 0.58)	0.022	0.51 (0.21, 0.81)	0.001
Importance of quitting	-	-	-	-	0.05 (0.02, 0.07)	<0.001	0.01 (−0.01, 0.04)	0.345
Confidence in quitting	-	-	-	-	−0.01 (−0.03, 0.02)	0.462	−0.02 (−0.05, 0.01)	0.117
Unconditional model ICC	17.79%		39.73%		13.90%		25.5%	
full model ICC	17.93%		16.49%		3.82%		5.7%	

In multilevel linear regression analyses (Table 3b), among nonsmokers, there were no significant correlates of perceiving pro-policy messaging as more persuasive; the only correlate of rating anti-policy messaging as more persuasive was living in Armenia ($B = -0.95$, $CI: -1.21, -0.69$, $p < 0.001$). Among smokers, correlates of rating pro-policy messaging as more persuasive included being Armenian ($B = -0.46$, $CI: -0.66, -0.27$, $p < 0.001$), being younger ($B = -0.01$, $CI: -0.01, -0.002$, $p = 0.026$), smoking less than daily (vs. daily; $B = 0.31$, $CI: 0.04, 0.58$, $p = 0.022$), and reporting quitting as more important ($B = 0.05$, $CI: 0.02, 0.07$, $p < 0.000$). Correlates of rating anti-policy messaging as more persuasive among smokers included being Armenia ($B = -0.82$, $CI: -1.06, -0.58$, $p < 0.001$) and smoking less than daily (vs. daily; $B = 0.51$, $CI: 0.21, 0.81$, $p = 0.001$).

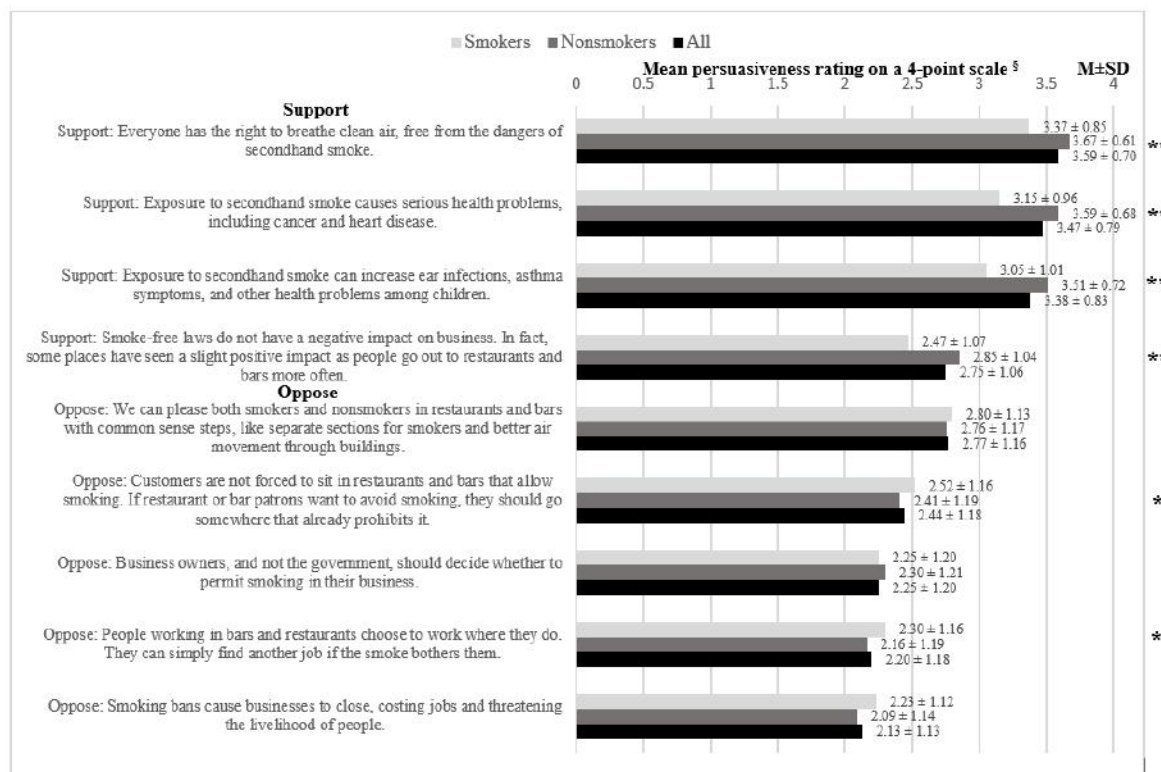


Figure 2. Nonsmokers' and smokers' rated persuasiveness of smoke-free policy messages. § 1 = Not at all, 2 = Don't know, 3 = Moderately, 4 = Extremely; ** $p < 0.001$; * $p < 0.05$.

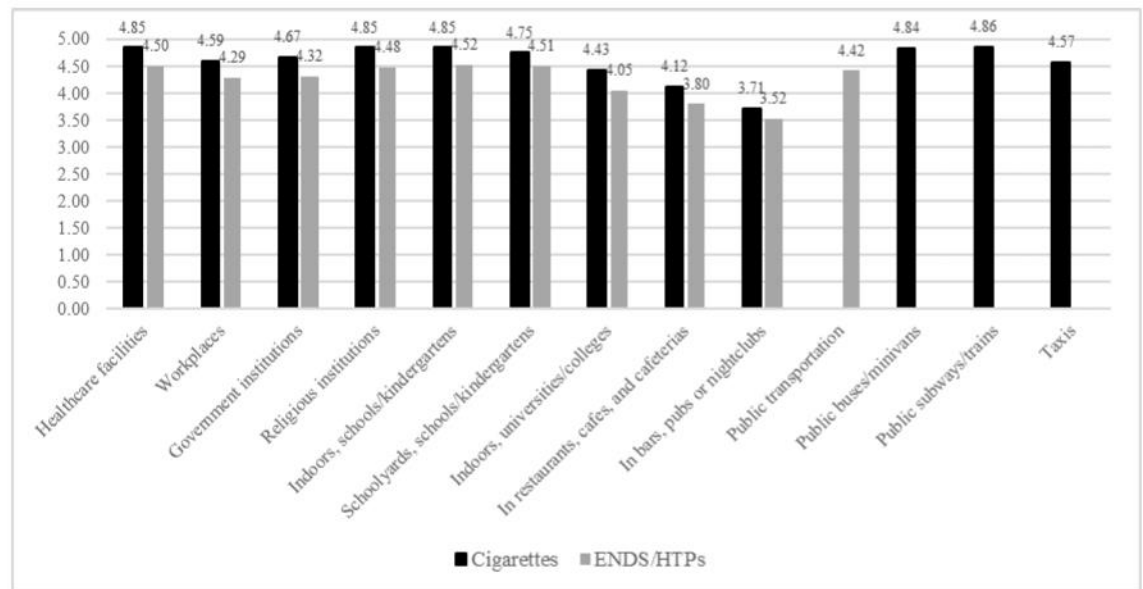


Figure 1. Support for cigarette smoking bans and bans on use of ENDS/HTPs in select settings. 1 = Strongly oppose, 2 = Somewhat oppose, 3 = Don't know, 4 = Somewhat support, 5 = Strongly support. Note: All comparisons of cigarette vs. ENDS/HTPs policy support indicated significant differences.

There were also differences across countries in relation to support for cigarette and ENDS/HTPs smoke-free policies (Table 2). Participants from Georgia versus Armenia reported greater support for cigarette smoke-free policies in healthcare facilities; religious institutions; schoolyards; outdoor areas of university or college campuses; bars, pubs and nightclubs; public transportation; and near public building entrances. However, participants from Armenia versus Georgia reported greater support for cigarette smoke-free policies in indoor areas of universities, institutes, colleges; outdoor terrace of restaurants, cafes, bars, and nightclubs; individual apt/condo units; public transportation stops and taxis; private vehicles with children present; and outdoor areas (e.g., playgrounds, parks, beaches, open stadiums). Finally, Georgian versus Armenian participants reported higher support for ENDS/HTP-related policies in universities/colleges indoor places.

In multilevel linear regression (Table 3a), among nonsmokers, correlates indicating greater support for cigarette smoke-free air policies included being female ($B = 0.19$, $CI: 0.08, 0.23$, $p < 0.001$) and not being former smokers ($B = -0.21$, $CI: -0.35, -0.08$, $p = 0.002$); there were no significant correlates of ENDS/HTP-related policy support. Among smokers, correlates of greater support for cigarette smoke-free air policies included smoking less than daily (vs. daily; $B = 0.36$, $CI: 0.14, 0.57$, $p = 0.001$) and reporting quitting as more important ($B = 0.07$, $CI: 0.05, 0.09$, $p < 0.001$); greater support for ENDS/HTPs policies was correlated with participants' reporting quitting as more important ($B = 0.03$, $CI: 0.00, 0.06$, $p = 0.047$).

3.2. Persuasiveness of Messaging Strategies

Each pro-policy message was perceived as more persuasive among nonsmokers versus smokers (p 's < 0.001 ; Figure 2). The most compelling messaging strategy among nonsmokers and smokers focused on the right to breathe clean air ($M \pm SD: 3.67 \pm 0.61$ vs. 3.37 ± 0.85 , $p < 0.001$), followed by SHSe health consequences ($M \pm SD: 3.59 \pm 0.68$ vs. 3.15 ± 0.96 , $p < 0.001$); the least compelling messages focused on negligible policy impact on businesses ($M \pm SD: 2.85 \pm 1.04$ vs. 2.47 ± 1.07 , $p < 0.001$). The most compelling anti-policy messaging focused on using smoking/nonsmoking sections ($M \pm SD: 2.76 \pm 1.17$ vs. 2.80 ± 1.13 , $p = 0.610$), followed by consumers' responsibility to guard against SHSe ($M \pm SD: 2.41 \pm 1.19$ vs. 2.52 ± 1.16 , $p = 0.034$); the least compelling was negative impact on businesses ($M \pm SD: 2.09 \pm 1.14$ vs. 2.23 ± 1.12 , $p = 0.293$).

Table 2. Nonsmokers and smokers support for smoke-free air policies in various settings (Means, Standard Deviations).

Cigarettes	All, N = 1456	Nonsmokers, n = 1058	Smokers, n = 398	p	Georgia, n = 751	Armenia, n = 705	p
Healthcare facilities	4.85 (0.62)	4.89 (0.54)	4.74 (0.78)	<0.001	4.89 (0.46) *	4.81 (0.76) *	0.019
Workplaces	4.59 (0.90)	4.76 (0.66)	4.11 (1.23)	<0.001	4.57 (0.91) **	4.60 (0.90) **	0.595
Government institutions	4.67 (0.78)	4.79 (0.61)	4.34 (1.03)	<0.001	4.66 (0.75) **	4.68 (0.81) **	0.612
Religious institutions	4.85 (0.60)	4.88 (0.53)	4.77 (0.75)	0.002	4.93 (0.35) **	4.77 (0.77) **	<0.001
Indoor areas of schools, kindergartens	4.85 (0.60)	4.88 (0.55)	4.79 (0.71)	0.018	4.86 (0.49) *	4.85 (0.69) *	0.772
Schoolyards of schools, kindergartens	4.75 (0.78)	4.77 (0.73)	4.66 (0.89)	0.015	4.87 (0.44) *	4.60 (1.00) ***	<0.001
Indoor areas of universities, institutes, colleges	4.43 (1.14)	4.56 (1.02)	4.09 (1.36)	<0.001	4.07 (1.33) *	4.81 (0.73) *	<0.001
In outdoor areas of university, college campuses	4.42 (1.09)	4.46 (1.05)	4.32 (1.21)	0.025	4.82 (0.53) *	4.00 (1.35) ***	<0.001
In restaurants, cafes, cafeterias	4.12 (1.30)	4.41 (1.04)	3.34 (1.55)	<0.001	4.17 (1.27) *	4.05 (1.32) ***	0.075
Outdoor terrace of restaurants, cafes, cafeterias	2.98 (1.60)	3.35 (1.53)	2.01 (1.35)	<0.001	2.78 (1.63) ***	3.19 (1.54) ***	<0.001
In bars, pubs, or nightclubs	3.71 (1.48)	4.02 (1.31)	2.90 (1.48)	<0.001	3.85 (1.43) *	3.57 (1.52) ***	<0.001
Outdoor terrace of bars, pubs, nightclubs	2.88 (1.60)	3.23 (1.54)	1.94 (1.32)	<0.001	2.72 (1.63) ***	3.04 (1.54) ***	<0.001
Indoor common areas of apts, condos	3.99 (1.38)	4.30 (1.16)	3.16 (1.56)	<0.001	3.98 (1.33) *	4.00 (1.43) ***	0.783
Outdoor common areas of apts, condos	3.76 (1.43)	4.06 (1.24)	2.96 (1.57)	<0.001	3.74 (1.43) ***	3.77 (1.42) ***	0.697
Within individual apt/condo units	3.79 (1.47)	4.10 (1.27)	3.00 (1.64)	<0.001	3.63 (1.52) ***	3.96 (1.39) ***	<0.001
Public bus or minivan stops	4.10 (1.29)	4.30 (1.12)	3.58 (1.54)	<0.001	4.03 (1.32) ***	4.18 (1.25) ***	0.023
In public buses, minivans	4.84 (0.62)	4.88 (0.54)	4.73 (0.78)	<0.001	4.85 (0.49) *	4.82 (0.73) *	0.367
Public subway, train stations	4.53 (0.96)	4.62 (0.85)	4.29 (1.19)	<0.001	4.62 (0.84) *	4.44 (1.08) *	<0.001
In public subways, trains	4.86 (0.60)	4.89 (0.53)	4.77 (0.75)	0.001	4.88 (0.45) *	4.83 (0.73) *	0.142
Taxis	4.57 (1.01)	4.77 (0.72)	4.05 (1.40)	<0.001	4.37 (1.15) ***	4.79 (0.78) ***	<0.001
Within 5 m public building entrances	3.33 (1.50)	3.62 (1.41)	2.56 (1.48)	<0.001	3.45 (1.39) ***	3.20 (1.61) ***	0.002
Private vehicles with children <18	4.75 (0.72)	4.83 (0.62)	4.55 (0.93)	<0.001	4.70 (0.68) ***	4.81 (0.77) ***	0.004
Playgrounds	4.37 (1.10)	4.55 (0.88)	3.89 (1.43)	<0.001	4.21 (1.18) **	4.54 (0.98) ***	<0.001
Parks, beaches	3.53 (1.47)	3.83 (1.35)	2.73 (1.49)	<0.001	3.21 (1.48) ***	3.88 (1.39) ***	<0.001
Other public outdoor areas (e.g., open stadiums)	3.41 (1.56)	3.72 (1.43)	2.59 (1.58)	<0.001	3.00 (1.61) ***	3.84 (1.38) ***	<0.001
ENDS/HTPs							
Healthcare facilities	4.50 (1.03)	4.53 (0.99)	4.42 (1.11)	0.077	4.49 (0.97) *	4.51 (1.09) ***	0.737
Workplaces	4.29 (1.13)	4.37 (1.07)	4.09 (1.26)	<0.001	4.29 (1.09) *	4.30 (1.19) ***	0.860
Government institutions	4.32 (1.09)	4.39 (1.02)	4.12 (1.22)	<0.001	4.30 (1.07) *	4.35 (1.11) ***	0.471
Religious institutions	4.47 (1.03)	4.50 (1.00)	4.41 (1.13)	0.174	4.53 (0.95) *	4.43 (1.12) ***	0.076
Indoors of schools, kindergartens	4.51 (1.00)	4.55 (0.95)	4.42 (1.13)	0.033	4.49 (0.99) *	4.55 (1.03) ***	0.238
Schoolyards of schools, kindergartens	4.51 (1.00)	4.53 (0.96)	4.44 (1.08)	0.131	4.50 (0.98) *	4.53 (1.03) ***	0.536
Indoors of universities, colleges	4.04 (1.34)	4.18 (1.24)	3.68 (1.52)	<0.001	3.63 (1.45) *	4.49 (1.05) ***	<0.001
In restaurants, cafes, cafeterias	3.80 (1.38)	4.05 (1.20)	3.13 (1.59)	<0.001	3.67 (1.37)	3.95 (1.38) ***	<0.001
In bars, pubs, nightclubs	3.51 (1.48)	3.77 (1.35)	2.84 (1.59)	<0.001	3.48 (1.45)	3.56 (1.52) ***	0.261
Public transportation	4.42 (1.08)	4.46 (1.03)	4.32 (1.18)	0.031	4.42 (1.04)	4.43 (1.13) ***	0.862

* Total ban implemented in the country; ** Partial restrictions implemented in the country; *** No restrictions implemented in the country.

Table 1. Cont.

Variable	All Participants, N = 1456 n (%) or M (SD)	Nonsmokers, n = 1058 (72.7%) n (%) or M (SD)	Smokers, n = 398 (27.3%) n (%) or M (SD)	p
Employment, N (%)				<0.001
Employed	713 (49.0)	438 (41.4)	275 (69.1)	
Unemployed/other	743 (51.0)	620 (58.6)	123 (30.9)	
Income per month, N (%)				0.111
≤500 GEL/100,000 AMD	563 (45.1)	423 (47.7)	140 (42.3)	
>500 GEL/100,000 AMD	685 (54.9)	463 (52.3)	191 (57.7)	
Marital status, N (%)				0.050
Married/cohabitating	1061 (72.9)	784 (74.1)	277 (69.6)	
Other	395 (27.1)	274 (25.9)	121 (30.4)	
Children under 18 in the home, N (%)				0.097
No	702 (49.0)	497 (47.9)	205 (51.9)	
Yes	731 (51.0)	541 (52.1)	190 (48.1)	
Smoking characteristics				
Former smoker, N (%)				-
No	-	956 (90.4)	-	
Yes	-	102 (9.6)	-	
Number of days smoked, past 30, N (%)				-
Every day	-	-	350 (87.9)	
Some days	-	-	48 (12.1)	
CPD, M (SD)	-	-	21.27 (10.79)	-
Readiness to quit, next 6 months, N (%)				-
No	-	-	242 (83.4)	
Yes	-	-	48 (16.6)	
Lifetime quit attempt, N (%)				-
No	-	-	166 (43.7)	
Yes	-	-	214 (56.3)	
Importance of quitting, M (SD)	-	-	5.74 (3.23)	-
Confidence in quitting, M (SD)	-	-	4.79 (3.18)	-
Support for bans index scores, M (SD)				
Cigarettes	4.20 (0.66)	4.38 (0.56)	3.72 (0.66)	<0.001
ENDS/HTPs	4.24 (0.92)	4.34 (0.89)	3.99 (0.94)	<0.001
Both	4.21 (0.63)	4.37 (0.56)	3.80 (0.65)	<0.001
Messaging persuasiveness index scores, M (SD)				
Support	3.30 (0.66)	3.41 (0.57)	3.01 (0.79)	<0.001
Opposition	2.36 (0.94)	2.33 (0.93)	2.43 (0.94)	0.081

Across settings, nonsmokers reported greater support for both cigarette and ENDS/HTPs smoke-free policies (p 's < 0.05; Table 2). The support for cigarette smoke-free policy across all settings was relatively higher compared to ENDS/HTPs policy (Figure 1).

The greatest support (ave. > 4/5) was for policies in healthcare, religious, government, and workplace settings; public transport; schools; and vehicles with children present. The least support (ave. < 3/5) was for policies in outdoor areas of bars or restaurants. Support was mixed (ave. 3–4/5)—and higher in nonsmokers versus smokers (ave. > 1 point)—regarding indoor and outdoor areas of bars or restaurants, multiunit housing (common indoor/outdoor areas, individual units), and outdoor public areas (e.g., playgrounds, public transportation stops).

messaging were 0.78 and 0.86, respectively. The correlation between the index scores for pro-policy messaging and anti-policy messaging was 0.18 ($p < 0.001$).

2.4. Data Analysis

We first conducted descriptive analyses to characterize participants. Then, we conducted bivariate analyses to examine differences between smokers and nonsmokers in relation to (a) sociodemographics, (b) support for smoke-free policies in various settings, and (c) perceived persuasiveness of pro-policy and anti-policy messaging, respectively.

Using as outcomes the index scores created to summarize support for bans on cigarettes and bans on END/HTPs, respectively, we conducted smoking status stratified analyses. We used random intercept multilevel linear regression analyses accounting for the random effect of municipality using GenLinMixed with an identity link function in SPSS. We first ran unconditional models to estimate the unconditional intra-class correlation (ICC) and then expanded the full model, by including the random effect of municipality and by adding fixed effects for country, age, sex, employment status, relationship status, and children in the home together in one step. Additionally, analyses included fixed effects for tobacco use characteristics (i.e., former smoker status among nonsmokers; smoking frequency and quitting importance/confidence among smokers). We modeled an unstructured covariance matrix and excluded cases with missing data on covariates (ranging from 3–5%). Full Model ICCs were calculated for all full models. Similarly, we conducted multilevel linear regression analyses using as outcomes index scores for perceived persuasiveness of pro- and anti-policy messaging, respectively. All analyses were conducted in SPSS v. 26 (IBM, Armonk, New York, USA), and alpha was set at 0.05.

3. Results

3.1. Participant Characteristics

Participants were an average age of 43.35 years old, 60.5% female, 32.1% with a college education, and 49.0% employed (Table 1). Overall, 27.3% reported to smoking on some days or every day. Only 3.3% and 1.0% indicated lifetime use of ENDS and HTPs, respectively, with past 30-day use showing extremely low prevalence (ENDS, $n = 9$; HTPs, $n = 4$). Among smokers, 83.4% were not ready to quit in the next six months and 43.7% never tried to quit. Former smokers represented 9.6% of current nonsmokers. Compared to smokers, nonsmokers were more supportive of public policies banning cigarette and ENDS/HTPs use and reported pro-policy messaging as more persuasive (p 's < 0.001).

Table 1. Participant characteristics and bivariate comparisons of nonsmokers' vs. smokers' support for smoke-free air policies.

Variable	All Participants, N = 1456 n (%) or M (SD)	Nonsmokers, n = 1058 (72.7%) n (%) or M (SD)	Smokers, n = 398 (27.3%) n (%) or M (SD)	p
Country, N (%)				<0.001
Armenia	705 (48.4)	561 (53.0)	144 (36.2)	
Georgia	751 (51.6)	497 (47.0)	254 (63.8)	
Sociodemographics				
Age, M (SD)	43.35 (13.49)	43.34 (13.59)	43.38 (13.26)	0.957
Sex, N (%)				<0.001
Male	575 (39.5)	207 (19.6)	368 (92.5)	
Female	881 (60.5)	851 (80.4)	30 (7.5)	
Education, N (%)				0.027
Less than high school	223 (15.3)	157 (14.8)	66 (16.6)	
High school	260 (17.9)	175 (16.5)	85 (21.4)	
Vocational school	407 (28.0)	307 (29.0)	100 (25.1)	
Some college	98 (6.7)	64 (6.0)	34 (8.5)	
College degree or more	468 (32.1)	355 (33.6)	113 (38.4)	

limits from the Bureau of Statistics. In each household, the KISH method [29] was used to identify target participants, who we approached in person at their homes, provided a study description, taken through informed consent, and administered the survey via electronic tablets.

In Armenia, addresses in each city were randomly ordered; assessments began at the beginning of the list and continued until the target recruitment in each city ($n = 50$) was reached. Overall, 1128 households were visited, of which 27.4% ($n = 309$) were ineligible (9.3% no household member eligible, 10.6% closed door/not home/do not live there anymore, 6.6% non-existing address). Among the 819 eligible, 705 (86.1%) participated.

In Georgia, multistage cluster sampling was used to select study participants. In step 1, five clusters per city were identified. In step 2, 15 households per cluster were selected using a random walking method: the total number of households was divided by $\times 15$ (assuming ~75% response rate) to determine how many households needed to be skipped before arriving at the next designated household (e.g., if the municipality included 150 households, the data collector would go from the first selected household to the 10th). Overall, 958 households were visited, of which 5.0% ($n = 48$) were ineligible (no household member reachable or eligible). Among the 910 eligible, 751 (82.5%) participated.

2.3. Measures

Sociodemographics. Current analyses included age, sex, education level, employment status, monthly household income, marital status, and children under the age of 18 in the home.

Smoking Characteristics. We assessed lifetime use of cigarettes (as well as ENDS and HTPs) among all participants; among lifetime users, we assessed past 30-day use. Among past 30-day smokers, we assessed number of days smoked, cigarettes smoked per day (CPD), readiness to quit in the next 30 days and 6 months, and number of quit attempts in the past year (categorized as any vs. none). We also assessed the importance of quitting ("On a scale of 0 to 10, with 0 being not at all and 10 being extremely, how important is quitting smoking to you?"); a parallel item was used to assess confidence in quitting.

Reactions to Smoke-Free Policy. We asked, "To what extent do you support or oppose a complete cigarette smoking ban in the following settings?" and "To what extent do you support or oppose a ban on using e-cigarettes or heat-not-burn tobacco such as IQOS in the following settings?" The settings assessed in relation to cigarette smoking are listed in Table 2, with a subset (indicated in Figure 1) also being assessed in relation to ENDS/HTPs. The response options included: Strongly oppose, somewhat oppose, Somewhat support, Strongly support, (Don't know), and (Refuse). Given a sizeable proportion of participants indicating responses of "don't know" (6 with 5–10% indicating "don't know"; 10 with 10–15% indicating "don't know"), "don't know" was coded as the middle response (i.e., 1 = Strongly oppose, 2 = Somewhat oppose, 3 = Don't know, 4 = Somewhat support, 5 = Strongly support). Composite index scores were created for items regarding cigarettes, ENDS/HTPs, and both by totaling the responses and dividing by the number of items in each index. Cronbach's alpha for responses related to cigarettes, ENDS/HTPs, and both were 0.91, 0.93, and 0.93, respectively. The correlation between the cigarette index score and ENDS/HTPs index score was 0.46 ($p < 0.001$).

Persuasiveness of Policy-Related Messaging. We asked, "For each of the following statements, indicate the extent to which each statement is convincing or persuasive. We are not asking if you agree with them, but rather if you feel that the information given would convince or persuade you to support or oppose a smoke-free air policy." The items are listed in Figure 2, and response options included: Not at all persuasive, moderately persuasive, extremely persuasive, (Don't know), and (Refuse). Given a sizeable proportion of participants indicating responses of "don't know" (3 with 5–10% indicating "don't know"; 4 with 10–15% indicating "don't know"), "don't know" was coded as a middle response (i.e., 1 = Not at all persuasive, 2 = Don't know, 3 = Moderately persuasive, 4 = Extremely persuasive). A composite index score was created for persuasiveness ratings for pro- and anti-policy messages by totaling the responses and dividing by the number of items in each index, respectively. Cronbach's alpha for responses related to pro-policy messaging and anti-policy

of different populations across the US [23,24]; southeasterners (vs. others) were more persuaded by pro-tobacco tax messaging involving hospitality and protecting youth [23] and pro-smoke-free policy messaging involving economic impact, religion/morality, and hospitality [24].

Future efforts to garner support for and compliance with smoke-free policies in Armenia and Georgia could involve public health campaigns using messages reflecting the cultures and values of these countries. Given the sociopolitical histories in Armenia and Georgia and the prominence of religion and family in these cultures [25,26], messages appealing to ideals of individual freedom, rights, and responsibilities; fellowship and hospitality; religion and morality; and/or protecting youth might be particularly effective in this region. Moreover, such campaigns could involve messages aimed at addressing individuals' concerns about such policies. One prior study in Georgia documented that, while SHSe was perceived to be dangerous, many individuals had misconceptions about how to protect others from SHSe (e.g., nonsmoking sections) and were concerned about smoke-free policies with regard to economic impact [27].

Given the gaps in the literature and the need to advance tobacco control in Armenia and Georgia, this study examined (1) support for smoke-free policies, both with regard to cigarettes and ENDS/HTPs, across various locations; (2) persuasiveness of messaging in support and opposition of such policies; and (3) correlates of these outcomes, using 2018 survey data from adults in 28 cities in Armenia and Georgia (14/country). Given the recent progressiveness of tobacco control in Georgia relative to Armenia, we anticipate greater support for such policies and persuasiveness of pro-policy messaging among Georgians versus Armenians. Additionally, we hypothesize that previously identified correlates of support for smoke-free policies and related messaging (e.g., female, nonsmoker) will hold in these populations, that policies in certain contexts (e.g., healthcare settings) will receive more support than in other settings (e.g., outdoor areas), and that some messaging strategies (e.g., health, individual rights) will be particularly persuasive. Given that we anticipate striking differences in policy support between smokers and nonsmokers, we first compare these groups in relation to our outcomes and then conduct our primary (multivariable) analyses among these groups separately.

2. Materials and Methods

2.1. Ongoing Study Overview

This study was approved by the Institutional Review Boards of Emory University (#IRB00097093), the National Academy of Sciences of the Republic of Armenia (#IRB00004079), the American University of Armenia (#AUA-2017-013), and the National Center for Disease Control and Public Health of Georgia (#IRB00002150). The ongoing parent study is more fully described elsewhere [28] and briefly described here. This study uses a matched-pairs community-randomized controlled trial to examine the effectiveness of local coalitions in promoting smoke-free air in Armenia and Georgia. We purposively selected 14 "communities" (i.e., municipalities) per country with small to medium populations. Communities were paired in each country based on region (and distance from Yerevan or Tbilisi), population size, and local public health branch/center budget, then randomly assigned to intervention versus control conditions.

2.2. Data Collection

Among all 28 intervention and control communities, population-level surveys (i.e., of community member) were conducted before the launch of the coalition member trainings (October–November 2018) and then will be conducted at the culmination of coalition activity. Current analyses focus on baseline population-level surveys conducted in October–November 2018. We aimed to complete 50 surveys of eligible participants (i.e., ≥18 years old) in each community. Sampling strategies were different in the two countries because of availability of household data in Armenia (but not in Georgia) and the utility of "clusters" (i.e., geographically defined areas of 150 households) in Georgia (but not in Armenia). In both countries, we obtained census data for all households within the municipality

1. Introduction

Low- and middle-income countries (LMICs) are disproportionately affected by tobacco-related diseases and deaths [1] including those attributed to secondhand smoke exposure (SHSe) [2]. One high-risk region for tobacco use is the area of the former Soviet Union [3]. Armenia and Georgia are two LMICs in this region that represent among the highest smoking prevalence among men (11th and 6th highest in the world; 52.3% and 57.7%, respectively), albeit lower prevalence among women (1.5% and 5.7%, respectively) [4]. Moreover, recent data indicate high SHSe in these countries [5,6], even in places where smoking is banned [5]. For example, 2014 data indicated that 42.2% of Georgian adults reported daily SHSe, with past-week SHSe being 54.2% in the home, 29.9% in indoor public places, and 33.0% in outdoor public places [6]. In Armenia, the 2016–2017 STEPS data indicated that 26.6% and 56.4% of adults reported past 30-day SHSe in the home and workplace, respectively [7]. Moreover, alternative tobacco products, such as electronic nicotine delivery systems (ENDS) and heated tobacco products (HTPs), have become increasingly prevalent in Armenia and Georgia [1,8]. For example, 2017 data indicate that 13.2% of Georgian youth (17.3% of boys, 7.7% of girls) reported past 30-day ENDS use [9]; reliable estimates of use among adults in Armenia and Georgia are not available. These data underscore an urgent need reduce SHSe due to cigarettes and ENDS/HTPs in these countries.

The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) mandates that nations that ratify the FCTC implement specific evidence-based tobacco control policies, including comprehensive public smoke-free legislation. Public smoke-free policies are effective in reducing SHSe, youth tobacco use, overall use prevalence, and tobacco-related morbidity and mortality [10], as well as promoting cessation and harm reduction in smokers [10]. The FCTC was ratified in 2004 and 2006 in Armenia and Georgia, respectively; however, few FCTC-recommended policies had been implemented until recently.

In 2004, Armenia banned the consumption of tobacco in educational, cultural, healthcare, public transportation, and other public settings except dining facilities (e.g., restaurants, bars). In February 2020, Armenia adopted new legislation so that existing tobacco policies apply to alternative tobacco products (e.g., e-cigarettes, hookah) and extends smoke-free policies to all public places (including cafes/restaurants). In Georgia, new progressive tobacco control laws were implemented in 2017–2018, including a comprehensive smoke-free air policy that similarly covers all alternative tobacco products across a broad range of indoor and outdoor areas.

While policy progress is promising, data indicate that compliance with such smoke-free policies is poor [5,11], perhaps due to limited policy support. This may be in part due to “top-down approaches” in which national governments might adopt policies without full consideration of public sentiment surrounding tobacco use and related policies. Favorable attitudes towards tobacco control can contribute to effective policy adoption [12], implementation [13], and tobacco-related attitude and behavior change [14,15].

Understanding groups that differentially support these policies can inform targeted campaigns to encourage support for and compliance with new policies [16,17]. This is particularly crucial as policy progress is being made and as policies targeting novel products, such as ENDS and HTPs, are being considered and/or implemented. Past research has found that nonsmokers (vs. smokers), women (vs. men), and older individuals are more supportive [18]; there have been mixed findings regarding educational attainment and policy support [18]. Despite this literature, little research has focused on countries such as Armenia and Georgia. A 2014 study documented similar findings in Georgia, such that nonsmokers, women, and those older showed more smoke-free policy support [6]; however, this study did not assess attitudes toward ENDS/HTP policies.

Public health efforts to shift social norms and build policy support and compliance have included various strategies, particularly media campaigns and advocacy [19,20]. A range of arguments related to the impact of such policies on health, economic issues, youth prevention, individual rights, and morality have been used both to bolster support and opposition to such policies [21,22]. Prior research examined differences in perceptions in policies and messaging strategies with regard to the values and cultures

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Appendix 3. Tobacco-Free Air Coalitions in Georgia and Armenia: A Randomized-Controlled Survey (2017-2021) – population survey questionnaire



SECTIONS:

- 1. SOCIODEMOGRAPHICS
- 2. KNOWLEDGE, ATTITUDES & BELIEFS TOWARD TOBACCO
- 3. TOBACCO USE
 - **ADDED: AGE VERIFICATION (CIGS, ECIGS, HTPS)**
 - **ADDED: HOW FIRST LEARNED OF PRODUCT, ADVERTISING EXPOSURE, PRODUCT SOURCE FOR ECIGS & HTPS**
- 4. GENERAL SHSe
- 5. PERSONAL HOME & CAR – SHSe & SMOKE-FREE AIR POLICIES – **EXPANDED**
- 6. WORK – SHSe & SMOKE-FREE AIR POLICIES
- 7. PUBLIC PLACES – SMOKE-FREE AIR POLICIES & PUBLIC SMOKING
- 8. ATTITUDES & BELIEFS TOWARD SMOKE-FREE POLICIES
- 9. EXPOSURE TO MESSAGING – **EXPANDED**
- **10. ADDED: CANNABIS USE**
- 11. PERCEPTIONS OF ALTERNATIVE TOBACCO PRODUCTS – **EXPANDED**
- 12. ALCOHOL USE
- ***SECTIONS DELETED: MESSAGING STRATEGIES AND COUNTRY-SPECIFIC QUESTIONS***

INSTRUCTIONS:

1. This is an interviewer-completed survey, not a self-completion survey. To facilitate administration of the survey, the interviewer should give the participant an empty form before asking questions and explain that he/she can follow the flow of questions more easily by reading along but that he/she should not fill out the answers.
2. In the online program, indicate your interview ID number and the city in which you are recording data. For each item, please indicate a response, with the exceptions of sections marked specifically for certain groups of participants (skip patterns).
3. The survey has 13 sections. Before starting each section, read the corresponding introduction to the participant.

Country:

- Armenia
- Georgia

[**Condition:** Country is Armenia]

City – Armenia:

- Ararat
- Masis
- Goris
- Sisian
- Yeghegnadzor
- Vayk
- Hrzadan
- Abovyan
- Sevan

- Gavar
- Stepanavan
- Spitak
- Ijevan
- Dilijan

[**Condition:** Country is Georgia]

City – Georgia:

- Shuakhevi
- Khulo
- Tsalenjkha
- Martvili
- Vani
- Chiatura
- Gori (city)
- Khashuri
- Dedoplistskaro
- Kvareli
- Tetri Tskaro
- Dmanisi
- Borjomi (city)
- Akhaltsikhe (city)

[**Condition:** Country is Armenia]

Interviewer Number – Armenia:

101 to 115 in Armenia

[**Condition:** Country is Georgia]

Interviewer Number – Georgia:

201 to 215 in Georgia

Introduction for the Participant:

I'd like to begin by reading the statement of consent form with you so that you understand the scope of this study and will have everything you need to think about before you agree to be in the study. You will be provided a copy of this consent form to keep.

This study is being led by Carla J. Berg, PhD, and Michelle Kegler, DrPH, Department of Behavioral Sciences and Health Education, Emory University School of Public Health in the United States. In Georgia, this study is led by Lela Sturua, PhD, at the National Center for Disease Control and Public Health. In Armenia, this study is led by Arevik Torossian, MPH, at the National Institutes of Health.

The scientific purpose of this study is to examine the attitudes to tobacco and tobacco-related policies among individuals living in Armenia and Georgia.

If you agree to be in this study, we would ask you to complete a 30-minute survey assessing your attitudes toward tobacco and tobacco-related issues, as well as your own use of tobacco. We anticipate roughly 2,000 individuals throughout the two countries will complete the survey.

The major risk of this study is loss of privacy and confidentiality of the information. We will collect your data using a secure, encrypted electronic platform, which is HIPAA-compliant. To help protect your identity, the link of any identifying information to the non-identifying study ID will be stored on a secure server at Emory University, the Armenia National Institute of Health, or the Georgia National Center for Disease Control and Public Health and/or secure servers of SurveyGizmo. There are many efforts put in place to help protect information about you from loss, theft, misuse and unauthorized access, disclosure, alteration, and destruction.

SurveyGizmo maintains reasonable operational, physical, and technical safeguards for protection of the confidentiality, integrity, and availability of the response data and the content.

There are no anticipated benefits to participation and there is no incentive, but we may learn valuable information that can be used to improve the health of others.

People other than those doing the study may look at study records. Agencies that make rules and policy about how research is done have the right to review the study records. So do agencies that pay for the study. Those with the right to look at your study records include the Institutional Review Boards of at Emory University, the Armenia National Institute of Health, or the Georgia National Center for Disease Control and Public Health, as well as the United States Office for Human Research Protections. Records can also be opened by court order. We will keep your records private to the extent allowed by law. We will do this even if outside review occurs. We will use a study number rather than your name on study records unless you agree to provide your name for quality control and monitoring purposes. We plan to submit the results for publication and present them at research and educational conferences. Your name and other facts that might point to you will not appear when we present this study or publish its results.

If you decide to take part, you can change your mind later on and withdraw from the research study. You may also refuse to answer any questions that you do not wish to answer. The decision to join or not join the research study will not cause you to lose any benefits, nor will you give up any legal rights.

The researchers and funder also have the right to stop your participation in this study without your consent if: they believe it is in your best interest; you were to object to any future changes that may be made in the study plan; or for any other reason.

If you have any questions or concerns regarding this survey, the contact information of the appropriate people are listed on the consent form.

So to summarize:

- This survey asks about tobacco use in general and your attitudes about smoking and about secondhand smoke.
- The information you provide will be kept confidential.
- Participation in the survey is voluntary, and if you do participate, you can stop at any time during the survey.
- If you are unwilling to participate, this will not have any negative consequences for you.
- If you have any questions, you can ask me at any time. Do you have any questions about this survey?

E.1. Are you at least 18 years of age **and** consent to participating in this survey?

- ☐ No
- ☐ Yes

[Condition: If E.1 is No]

Thank you for considering this request.

[Condition: If E.1 is Yes]

Thank you so much for agreeing to participate. This survey has questions about smoking and about your basic demographic information. I will read the questions one at a time and ask that you provide the answer you consider appropriate. There are no 'right' or 'wrong' answers, so don't worry that you may get things wrong. Do you have questions about the survey you would like to ask me now?

SECTION 1: SOCIODEMOGRAPHIC QUESTIONS

First, we'd like to ask some questions about you.

1.1. How old are you?

___ years old

1.2. What is your gender?

- ☐ Male
- ☐ Female
- ☐ [refuse]

1.3. What best describes your current relationship situation? (Check ONE answer.)

- ☐ Single/Never married
- ☐ Married
- ☐ Separated
- ☐ Divorced
- ☐ Living with a partner (cohabitating)
- ☐ Widowed
- ☐ Other – Specify: _____
- ☐ [refuse]

1.4. What is your educational background?

- ☐ No formal education
- ☐ Primary school (grades 1-4)
- ☐ Middle school (grades 5-8)
- ☐ Some high school (some parts of grades 8-12)
- ☐ High school (grades 8-12)
- ☐ Vocational school/trade school
- ☐ Some college
- ☐ College
- ☐ Advanced degree
- ☐ [refuse]

1.5. How many people older than 18 years old, including yourself, live in your household?

___ people

1.6. How many children under the age of 18 live in your home?

___ children

1.7. How many children under the age of 5 live in your home?

___ children

1.8. Which of the following categories best describes your primary employment during the last 12 months?

Government employee, employed in the non-government sector, self-employed, student, housewife, retired, unemployed-able to work, or unemployed-unable to work?

INTERVIEWER: Consider individual farming as self-employed.

- ☐ Government employee
- ☐ Employed in the non-government sector
- ☐ Self-employed (own business)
- ☐ Student
- ☐ Housewife
- ☐ Retired
- ☐ Unemployed, able to work
- ☐ Unemployed, unable to work
- ☐ [don't know]
- ☐ [refuse]

[**Condition:** Based on country]

1.9. Can you give an **estimate** of the monthly household income if I read some options to you? Is it

[Armenia]

- ☐ < 100 000 AMD (Armenian Dram)
- ☐ 101 000-200 000 AMD
- ☐ 201 000-300 000 AMD
- ☐ 301 000-400 000 AMD
- ☐ >401 000 AMD
- ☐ [don't know]
- ☐ [refuse]

[Georgia]

- ☐ ≤ 250 GeL
- ☐ 251 – 500 GeL
- ☐ 501 – 1000 GeL
- ☐ 1001 – 1500 GeL
- ☐ >1500 GeL
- ☐ [don't know]
- ☐ [refuse]

SECTION 2: KNOWLEDGE, ATTITUDES & BELIEFS ABOUT TOBACCO

Now, we'd like to ask you about your attitudes about smoking and secondhand smoke.

2.1. Do you think or know that **smoking** is the cause of the following diseases and conditions... (Check if YES.)

- ☐ Stroke (brain hemorrhage)?
- ☐ Heart attack?
- ☐ Cervical cancer?
- ☐ Lung cancer?
- ☐ Mouth cancer?
- ☐ Addiction?
- ☐ Parkinson's disease?
- ☐ Bronchitis?
- ☐ Tuberculosis?
- ☐ Obesity?
- ☐ None of these.
- ☐ [don't know]
- ☐ [refuse]

2.2. Do you think or know that **exposure to secondhand smoke** is the cause of the following diseases... (Check if YES.)

- ☐ Lung cancer in non-smokers?
- ☐ Heart attack in non-smokers?
- ☐ Asthma in children?
- ☐ Middle ear infection in children?
- ☐ None of these.
- ☐ [don't know]
- ☐ [refuse]

2.3. Based on what you know or believe, to what extent does breathing other people's smoke **cause serious illness in non-smokers?**

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ A lot

- [don't know]
- [refuse]

2.4. To what extent do you think inhaling tobacco smoke when somebody else is ***smoking is harmful to you?***

- Not at all harmful
- A little harmful
- Somewhat harmful
- Extremely harmful
- [don't know]
- [refuse]

2.5. To what extent do you agree with this statement: After someone smokes in a room, dangerous particles are left behind in the dust, air, and surfaces in the room.

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- [don't know]
- [refuse]

SECTION 3: TOBACCO USE

The following questions are about your use of various tobacco products; please respond based on your actual situation.

In your lifetime, have you used:	Lifetime (Check if used in the lifetime.)	[Condition: If yes:] In the past 30 days, on how many days did you use [this product]?
3.1. Traditional cigarettes (commercial or hand-rolled)?	3.1.a. ☐ No ☐ Yes	3.1.b. Dropdown box of: 0-30; [don't know]; [refuse]
3.2. Large or little cigars, which are rolled bundles of dried and fermented tobacco leaves to be smoked, such as the products pictured below? 	3.2.a. ☐ No ☐ Yes	3.2.b. Dropdown box of: 0-30; [don't know]; [refuse]
3.3. Pipe with tobacco, such as the device and tobacco below? 	3.3.a. ☐ No ☐ Yes	3.3.b. Dropdown box of: 0-30; [don't know]; [refuse]

3.4. E-cigarettes or other electronic nicotine delivery devices, which are devices that vaporize liquids that may contain nicotine, such as the devices below? (Do not include IQOS or other similar products.) 	3.4.a. ☐ No ☐ Yes	3.4.b. _____ days
3.5. Heat-not-burn products, which are devices that heat tobacco but do not burn tobacco or create smoke, such as IQOS? 	3.5.a. ☐ No ☐ Yes	3.5.b. Dropdown box of: 0-30; [don't know]; [refuse]
3.6. Hookah, waterpipe, or nargila, which are devices that vaporize tobacco through a water basin, such as the devices shown below? 	3.6.a. ☐ No ☐ Yes	3.6.b. Dropdown box of: 0-30; [don't know]; [refuse]

LIFETIME CIGARETTE SMOKERS

[Condition: If yes to 3.1.a]

You've mentioned that you smoked cigarettes at some point in your life. We'd like to ask you a bit more about that.

3.1.a.1. Have you smoked at least 100 cigarettes in your life?

- ☐ No
- ☐ Yes
- ☐ [don't know]
- ☐ [refuse]

3.1.a.2. Do you **presently** smoke tobacco every day, less frequently than every day, or not at all?

- ☐ Every day
- ☐ Less than every day

- Not at all
- [don't know]
- [refuse]

3.1.a.3. In the ***past***, did you smoke tobacco every day, less frequently than every day, or didn't smoke at all?

- Every day
- Less than every day
- Not at all
- [don't know]
- [refuse]

3.1.a.4. At what age did you first smoke your first whole cigarette?

Dropdown box of: 0-30 or older; [don't know]; [refuse]

3.1.a.5. How old were you when you first started smoking tobacco ***every day***?

Dropdown box of: I have never smoked every day; 0-30 or older; [don't know]; [refuse]

CURRENT (PAST 30 DAY) SMOKERS

[Condition: If 3.1.b > 0 days of past 30 day use]

You've mentioned that you smoked cigarettes in the past 30 days. We'd like to ask you a bit more about that.

3.1.b.1. On average, how many cigarettes do you currently smoke each day?

INTERVIEWER: If not daily smoker, ask about number smoked each week.

Dropdown box of: Not a daily smoker; 1-40 or more; [don't know]; [refuse]

(Note: included "half of a pack" with 10; "a pack" with 20; "pack and a half" with 30; and "2 packs or more" with 40 or more)

[Condition: If not daily smoker]

3.1.b.1.a. On average, how many cigarettes do you currently smoke each week? (Note: There are 20 cigarettes in a pack.)

Dropdown box of: Less than 1 cigarette per week; 1-40 or more; [don't know]; [refuse]

(Note: included "half of a pack" with 10; "a pack" with 20; "pack and a half" with 30; and "2 packs or more" with 40 or more)

3.1.b.2. How soon after you wake up do you usually take your first smoke? Would you say within 5 minutes, 6 to 30 minutes, 31 to 60 minutes, or more than 60 minutes?

- Within 5 minutes
- 6 to 30 minutes
- 31 to 60 minutes
- More than 60 minutes
- [don't know]
- [refuse]

3.1.b.3. In the past 30 days, did you smoke: (Check ONE answer.)

- Mainly when you are with people
- Mainly when you are alone
- As often by yourself as with others
- Not at all in the past 30 days
- [don't know]
- [refuse]

3.1.b.4. What do *people who are important to you, like your friends and family*, think about you smoking cigarettes?

- ☐ All or nearly all disapprove
- ☐ Most disapprove
- ☐ About half approve and half disapprove
- ☐ Most approve
- ☐ All or nearly all approve
- ☐ [don't know]
- ☐ [refuse]

3.1.b.5. What do you think the *general public's attitude* is towards smoking cigarettes?

- ☐ Strongly disapproves
- ☐ Somewhat disapproves
- ☐ Neither approves nor disapproves
- ☐ Somewhat approves
- ☐ Strongly approves
- ☐ [don't know]
- ☐ [refuse]

3.1.b.6. How much do you try to *minimize the amount that non-smokers are exposed* to your cigarette smoke?

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ A lot
- ☐ [don't know]
- ☐ [refuse]

3.1.b.7. On a scale of 0 to 10, how important is it that you quit smoking with 0 being not at all important and 10 absolutely important? (Circle ONE number.)

0 = not at all important	1	2	3	4	5	6	7	8	9	10 = absolutely important
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3.1.b.8. On a scale of 0 to 10, how confident are you that you could quit smoking if you wanted to, with 0 being not at all confident and 10 absolutely confident? (Circle ONE number.)

0 = not at all confident	1	2	3	4	5	6	7	8	9	10 = absolutely confident
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3.1.b.9. In your lifetime, have you ever tried stopping smoking for one day or longer because you were trying to quit smoking?

- ☐ No
- ☐ Yes

[Condition: If Yes to 3.1.b.9]

3.1.b.10. In your lifetime, how many times have you stopped smoking for one day or longer because you were trying to quit smoking? (Please state your best estimate.)

Dropdown box of: 0-30 or more; [don't know]; [refuse]

[Condition: If Yes to 3.1.b.9]

3.1.b.11. During the past 12 months, how many times have you stopped smoking for one day or longer because you were trying to quit smoking? (Please state your best estimate.)

Dropdown box of: 0-30 or more; [don't know]; [refuse]

3.1.b.12. What best describes your intentions regarding quitting? (Check ONE answer.)

- ☐ Never expect to quit
- ☐ May quit in the future, but not in the next 6 months

- Will quit in the next 6 months
- Will quit in the next month
- [don't know]
- [refuse]

3.1.b.13. To what extent do you agree or disagree with this statement? If you had to do it over again, you would not have started smoking?

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree
- [don't know]
- [refuse]

3.1.b.14. If you were going to try to quit smoking, which of the following might you be interested in? (Check all that apply.)

- Electronic cigarettes or vaporizers
- Heat-not-burn tobacco products, such as IQOS
- Talking with a doctor or nurse
- Talking to a counselor
- Attending a class or group program
- Telephone counseling or quitline
- A smoking cessation website or online program
- A smoking cessation smartphone app
- Nicotine patch
- Nicotine gum
- Nicotine lozenge
- Other medications containing nicotine (inhaler, nasal spray)
- Oral medications such as Tabex or Cytisine
- Nonmedical therapy, such as reflexology, acupuncture, or kineaotherapy
- Psychotherapy, such as coding or hypnosis
- Other – Specify: _____
- None of these.
- [don't know]
- [refuse]

3.1.b.15. During the past 30 days, on how many days did you smoke tobacco products in ***your home?***

Dropdown box of: 0-30; [don't know]; [refuse]

3.1.b.16. During the past 30 days, on how many days did you smoke tobacco products in ***your car?***

Dropdown box of: 0-30; I don't own a car; [don't know]; [refuse]

3.1.b.17. During the past 30 days, on how many days did you smoke tobacco products in the ***indoor area where you work?***

Dropdown box of: 0-30; Don't work outside the home OR No indoor areas at my work; [don't know]; [refuse]

3.1.b.18. During the **past 30 days**, on how many days did you smoke tobacco products in an ***indoor public place?*** Examples of indoor public places are school buildings, stores, restaurants, and sports arenas?

Dropdown box of: 0-30; [don't know]; [refuse]

3.1.b.19. During the **past 30 days**, on how many days did you smoke tobacco products in an ***outdoor public place?*** Examples of outdoor public places are school grounds, parking lots, stadiums, and parks?

Dropdown box of: 0-30; [don't know]; [refuse]

3.1.b.20. If someone around you asked you to put out your cigarette in a place where smoking is ***allowed***, how likely would you be to put out your cigarette?

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ Very
- ☐ [don't know]
- ☐ [refuse]

3.1.b.21. If someone around you asked you to put out your cigarette in a place where smoking is ***prohibited***, how likely would you be to put out your cigarette?

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ Very
- ☐ [don't know]
- ☐ [refuse]

3.1.b.22. If there were ***small children around you in a public place***, how likely would you be to put out your cigarette?

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ Very
- ☐ [don't know]
- ☐ [refuse]

3.1.b.23. In the past 6 months, how often have you been ***asked to put out your cigarette*** in a public place?

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Frequently
- ☐ [don't know]
- ☐ [refuse]

3.1.b.24. In the past 30 days, how often did ***you smoke*** in the following locations? You can indicate that you have not been to these locations if that is the case.

	Have not been	Never	Almost never or rarely	Several times a month	Several times a week	Almost daily	Regularly, several hours a day	[don't know]	[refuse]
a. Any government institutions or offices?									
b. Any healthcare facilities, including hospitals and clinics?									
c. Any schools, including kindergartens, primary, and secondary schools?									
d. Any colleges, universities, or vocational schools?									

e. Any private place of employment?									
f. Any restaurants, cafes or cafeterias?									
g. Any pubs, bars, or night clubs?									
h. Used public transportation, such as trains, buses, or mini-vans?									
i. Any grocery stores?									
j. Any theaters?									
k. Any shopping malls?									
l. Beaches, parks, playgrounds?									
m. The homes of others?									
n. The private cars of others?									

When you buy cigarettes, how frequently are you asked to provide an ID to verify your age?

Never = 0

Rarely = 1

Sometimes = 2

Often = 3

Almost always = 4

Current E-cigarette Users

How did you first learn about e-cigarettes or vaping products?

1. Saw advertisements
2. Saw product at store
3. Friends or family or colleagues
4. Saw their use on TV, movies, etc.
5. Saw posts on social media (not ads)
6. Other; please specify:
7. Don't know/remember
8. Prefer not to answer

This item asks about **advertisements**, meaning ads made and paid for by companies who make the products. In the last 30 days, have you noticed e-cigarette or vaping product **advertisements** in any of the following places? (Check all that apply.)

- ☐ On websites (for example, pop-up ads)
- ☐ On social media sites, like Facebook, Instagram or Twitter
- ☐ Inside stores that sell cigarettes and other tobacco products
- ☐ Outside stores that sell cigarettes and other tobacco products (including on signs in windows, visible from the outside)
- ☐ Seeing specialty stores that sell vaping products

- ☐ On television
- ☐ On the radio
- ☐ On posters, billboards, etc.
- ☐ In newspapers or magazines
- ☐ Direct mail
- ☐ Email
- ☐ Other; please specify:
- ☐ None of the above.
- ☐ Don't know
- ☐ Prefer not to answer.

Where do you **most commonly purchase** e-cigarettes, e-liquids, and/or vape products?

1. Vape shop
2. Online via a site connected to a local vape shop
3. Online via a vendor not connected to a local vape shop
4. Gas station
5. Convenience store
6. Grocery store
7. Pharmacy
8. Tobacco specialty store (for example, smoke shop)
9. Liquor store
10. A mall kiosk
11. A bar, pub, restaurant, or casino
12. Outside the country
13. A duty free shop or military commissary
14. Somewhere else; please specify:
15. I don't know where
16. I don't buy the vape products I use
17. Prefer not to answer

How frequently have you been required to show your ID when you have purchased e-cigarettes or vaping products?

- Never = 0
- Rarely = 1
- Sometimes = 2
- Often = 3
- Almost always = 4
- Every time=5
- I haven't bought vape products = 6

Current HTP Users

How did you first learn about heated tobacco products, such as IQOS?

1. Saw advertisements
2. Saw product at store
3. Friends or family or colleagues
4. Saw their use on TV, movies, etc.
5. Saw posts on social media (not ads)
6. Other; please specify:
7. Don't know/remember
8. Prefer not to answer

This item asks about **advertisements**, meaning ads made and paid for by companies who make the products. In the last 30 days, have you noticed heated tobacco product (like IQOS) **advertisements** in any of the following places? (Check all that apply.)

- ☐ On websites (for example, pop-up ads)
- ☐ On social media sites, like Facebook, Instagram or Twitter
- ☐ Inside or outside stores that sell cigarettes and other tobacco products
- ☐ Seeing specialty stores that sell heated tobacco products
- ☐ On television
- ☐ On the radio
- ☐ On posters, billboards, etc.
- ☐ In newspapers or magazines
- ☐ Direct mail
- ☐ Email
- ☐ Other; please specify:
- ☐ None of the above.
- ☐ Don't know
- ☐ Prefer not to answer.

The last time you purchased IQOS or its tobacco sticks, where did you make this last purchase?

1. I have not purchase IQOS or its tobacco sticks
2. Online via a Philip Morris, IQOS, Altria, RJ Reynolds, or Eclipse website
3. Online via a vendor not connected to Philip Morris, IQOS, Altria, RJ Reynolds, or Eclipse
4. IQOS store
5. Vape shop
6. Tobacco specialty store
7. Pharmacy
8. Convenience store
9. Gas station
10. Temporary or mobile sales location (for example, pop-up store or booth)
11. Liquor store
12. A mall kiosk
13. A bar, pub, restaurant, or casino
14. A duty free shop or military commissary
15. Outside the country
16. Somewhere else; please specify:
17. I don't know where
18. I don't buy the tobacco sticks I use
19. Prefer not to answer

How frequently have you been required to show your ID when you have purchased heated tobacco products like IQOS?

- Never = 0
- Rarely = 1
- Sometimes = 2
- Often = 3
- Almost always = 4
- Every time=5
- I haven't bought heated tobacco products = 6

SECTION 4: GENERAL SHSe

Now, we'd like to ask you more about your personal exposure and experiences with secondhand smoke.

4.1. How many of your closest friends (who might include relatives and co-workers) smoke cigarettes? (If necessary, specify that we are talking about any cigarette but not other types of tobacco products.)

- ☐ None
- ☐ Almost none
- ☐ Less than half
- ☐ About half
- ☐ More than half
- ☐ Almost all
- ☐ All
- ☐ [don't know]
- ☐ [refuse]

4.2. How often do you happen to *inhale other people's smoke*?

- ☐ Never
- ☐ Almost never or rarely
- ☐ Several times a month
- ☐ Several times a week
- ☐ Almost daily
- ☐ Regularly, several hours a day
- ☐ [don't know]
- ☐ [refuse]

4.3. In the past 30 days, on how many days did *you breathe the smoke* from someone else's smoking?

Dropdown box of: 0-30; [don't know]; [refuse]

[**Condition** per item above: If between 1 and 30 days]

4.4. On a *typical day* that you breathed someone else's smoke, for *how long* do you think you were exposed?

(Select Hours if 60 minutes or more and enter estimated hours. Select Minutes if less than 60 minutes and enter estimated minutes.)

_____ hours

_____ minutes

- ☐ [don't know]
- ☐ [refuse]

4.5. Who are *the primary* sources of secondhand smoke you inhale? (Check up to 3.)

- ☐ Spouse/partner/significant other
- ☐ Parents
- ☐ Siblings
- ☐ Children
- ☐ Extended family
- ☐ Friends
- ☐ People at work
- ☐ Other
- ☐ [don't know]
- ☐ [refuse]

SECTION 5: PERSONAL HOME & CAR – SHSe & SMOKE-FREE AIR POLICIES

What type of housing do you live in?

A single unit/detached home

Townhome/duplex

Apartment/condo/multi-unit complex

Other (specify_____)

Do you own or rent your home? Would you say you...

Own

Rent

*Other (specify)

*Other arrangement" may include group home or staying with friends or family without paying rent.

[If "renting"]

Which statement best describes the landlord's or property manager's rules about smoking. Would you say the landlord or property manager...

Has no rules about smoking

Allows smoking only in designated areas

Doesn't allow smoking anywhere

[If "renting"]

Can you sometimes smell smoke from another apartment or unit in your own unit?

Yes/no? or frequency (never to always)

[If "renting"]

Would you like to live in a smoke-free building where no one is allowed to smoke inside the building at all, including inside their own apartment or unit?

Yes/no? or likelihood (not at all to very)

[If "renting"]

Would you choose to move if your building became smoke-free?

Yes/no? or likelihood (not at all to very)

5.1. How *often does anybody smoke in your home?*

- ☐ Never
- ☐ Less than monthly
- ☐ Monthly
- ☐ Every week
- ☐ Every day
- ☐ [don't know]
- ☐ [refuse]

5.2. In the past 30 days, on how many days did *someone smoke in your home?*

Dropdown box of: 0-30; [don't know]; [refuse]

5.3. During the past 30 days, on how many days did *you breathe the smoke* from someone smoking tobacco products in *your home?*

Dropdown box of: 0-30; [don't know]; [refuse]

5.4. Which of the following statements best describes the *smoking rules in your home*: smoking in your home is allowed, smoking in your home is generally not allowed with certain exceptions, smoking in your home is never allowed, or there are no rules about smoking in your home?

- ☐ Allowed
- ☐ Not allowed but with exceptions
- ☐ Never allowed
- ☐ No rules
- ☐ [don't know]
- ☐ [refuse]

If not allow but exceptions, never allowed:

Does this rule also ban the use of: (Check all that apply.)

E-cigarettes

Heated tobacco products like IQOS
Cannabis

5.5. How much do the people you live with **help to enforce the rules** regarding smoking in the home?

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ A lot
- ☐ We don't have rules about smoking in the home
- ☐ [don't know]
- ☐ [refuse]

5.6. We want to ask about some specific areas in the home. In what room or rooms **is smoking allowed?**

		No	Yes	N/A
a.	Family/living room	0	1	
b.	Kitchen	0	1	
c.	Bathroom(s)	0	1	
d.	Participant's bedroom	0	1	
e.	Other adult's bedroom(s)	0	1	
f.	Children's bedroom(s)	0	1	
g.	Balcony	0	1	
h.	Staircases	0	1	
i.	Other, specify: _____	0	1	

5.7. Which statement best describes the rules about smoking in **your household vehicles** (cars or trucks)?

- ☐ Allowed in all vehicles
- ☐ Smoking is sometimes allowed in some vehicles
- ☐ Smoking is never allowed in any vehicle
- ☐ There are no rules about smoking in the vehicles
- ☐ We don't own a vehicle
- ☐ [don't know]
- ☐ [refuse]

5.8. In the past 30 days, on how many days did **someone smoke in your car?**

Dropdown box of: 0-30; I don't own a car; [don't know]; [refuse]

5.9. During the past 30 days, on how many days did **you breathe the smoke** from someone smoking tobacco products **in your car?**

Dropdown box of: 0-30; I don't own a car; [don't know]; [refuse]

SMOKE-FREE HOMES

Are you thinking about making a rule that your home is smoke-free within the next six months? By smoke-free, we mean that no one is allowed to smoke anywhere in your home.

No
Yes

Are you thinking about making a rule that your home is smoke-free within the next 30 days?

No
Yes

In the last 3 months, has anyone tried to establish a smoke-free rule in your current home? By smoke-free, we mean that smoking is not allowed at any time or anyplace within your home.

No

Yes

Don't know

In the next year, how likely are you to implement a rule in your home banning indoor use of: (1=not at all likely to 7=extremely likely)

Cigarettes?

E-cigarettes?

Heated tobacco products like IQOS?

Cannabis?

To what extent are the following reasons you have considered or would consider making your home smoke-free? (1=not at all to 5=very much)

- a. Health of children and grandchildren in the household
- b. Health of elderly in the household
- c. Health of those in the household who are ill
- d. Serve as a role model for children in the household
- e. Reduce smoking among smokers who enter my household
- f. Reduce likelihood of children becoming smokers
- g. Show others that I pride myself as a parent
- h. Health of pets
- i. Preserve the value of my home
- j. Reduce smell and mess in my home caused by smoking
- k. For smokers:**
- l. Avoid arguing about my smoking with my partner/spouse
- m. Avoid arguing about my smoking with others in the household
- n. Improve my own health
- o. Reduce my own smoking
- p. Save money on cigarettes
- q. Make my family happy or proud of me by not smoking in the home

To what extent do (or would) the following issues pose challenges for you in making your home smoke-free? (1=not at all to 5=very much)

- a. You smoke
- b. Another member of your household smokes
- c. A smoker in the home (you or someone else) doesn't want a ban
- d. You or the smoker are not ready to make your home smoke-free right now (e.g. no motivation, resistant smoker, busy/no time, etc.)
- e. You or the smoker in the home doesn't like the rule and sometimes ignores it
- f. A smoker 'forgets' the rule
- g. You or another smoker does not want to quit smoking now
- h.**
- i. Too hard to comply with a ban
- j. You or the smoker are worried it will be hard to smoke outside in bad weather or at night
- k. You have friends, family, or visitors who want to smoke inside
- l. Smoking inside is a habit that's hard to break
- m. You or the smoker think it's okay to smoke in a separate room with the door closed
- n. You or the smoker are having trouble dealing with your cravings to smoke
- o. Smoking relieves stress
- p. You can't go outside to smoke because you have young children
- q. There is no good place to smoke outside
- r. Smoking outside is not convenient or comfortable (e.g. bugs, physical limitations, safety, etc.)
- s. It's unsafe to smoke outside

- t.
- u. You are not head of the household and you can't make rules for the home
- v. Someone else pays the bills and you can't make rules for the home
- w.
- x. We haven't thought about banning smoking in the home
- y.
- z. Other; specify:

For the next set of questions, we are interested in how effective this information is in convincing or persuading you to make your home smoke-free. We are not asking if you agree with them, but rather if you feel that the information given would convince or persuade you to implement rules banning smoking in your home.

For each of the following statements, indicate the extent to which each statement is convincing or persuasive.

- ☐ 1 – Not at all persuasive
- ☐ 2 – Moderately persuasive
- ☐ 3 – Extremely persuasive
- ☐ [don't know]
- ☐ [refuse]

Smoke-free home rules lead to reduced secondhand smoke exposure and reduced smoking.

Cigarettes are a major cause of residential fires and related deaths.

Youth who live in places that allow smoking in the home are more likely to become smokers.

Smokers' residences are harder to sell than nonsmokers' residences.

Renovating smokers' units is much more expensive than renovating nonsmoking units.

You have the right to breathe clean air in your home.

Your loved ones have the right to breathe smoke-free air in your home.

SECTION 6: WORK – SHSe & SMOKE-FREE AIR POLICIES

6.1. Do you presently work outside of your home?

- ☐ No; I am not employed
- ☐ Yes

[CONDITION: FOR THOSE EMPLOYED OUTSIDE OF HOME; if 6.1. is yes]

We'd like to get some more information about your workplace.

6.2. Do you usually work indoors, outdoors, or both?

- ☐ Indoors
- ☐ Outdoors
- ☐ Both

6.3. Are there indoor areas in your workplace?

- ☐ No
- ☐ Yes

6.4. Which of the following best describes ***the policy regarding smoking in indoor areas at your work***: smoking is permitted everywhere, smoking is permitted only in certain indoor areas, smoking prohibited in all indoor areas, or there is no policy?

- ☐ Permitted everywhere
- ☐ Permitted only in certain indoor areas

- Prohibited in all indoor areas
- There is no policy
- [don't know]
- [refuse]

6.5. During the past 30 days, on how many days **has anyone smoked** in the **indoor area where you work**?
Dropdown box of: 0-30; No indoor areas in my workplace; [don't know]; [refuse]

SECTION 7: PUBLIC PLACES – SMOKE-FREE AIR POLICIES & PUBLIC SMOKING

Now, we'd like to ask you about your experiences with secondhand smoke in public places.

7.1. During the **past 30 days**, on how many days **did you breathe the smoke** from someone who was smoking tobacco products in an **indoor public place**? Examples of indoor public places are school buildings, stores, restaurants, and sports arenas. (Do not include your own smoking.)
Dropdown box of: 0-30; [don't know]; [refuse]

7.2. During the **past 30 days**, on how many days **did you breathe the smoke** from someone who was smoking tobacco products in an **outdoor public place**? Examples of outdoor public places are school grounds, parking lots, stadiums, and parks. (Do not include your own smoking.)
Dropdown box of: 0-30; [don't know]; [refuse]

7.3. Which of the following best describes the **rules** about smoking in **restaurants in the community where you live**?

- Smoking is allowed in all indoor areas
- Smoking is allowed only in some indoor areas
- Smoking is not allowed in any indoor area
- Every restaurant has its own rules
- [don't know]
- [refuse]

7.4. Which of the following best describes the **rules** about smoking **in drinking establishments such as a pub or bar in the community where you live**?

- Smoking is allowed in all indoor areas
- Smoking is allowed only in some indoor areas
- Smoking is not allowed in any indoor area
- Every pub or bar has its own rules
- [don't know]
- [refuse]

7.5. In the past 30 days, how often did **you see anyone** smoke in the following locations? You can indicate that you have not been to these locations if that is the case. (Do not include your own smoking.)

	Have not been	Never	Almost never or rarely	Several times a month	Several times a week	Almost daily	Regularly, several hours a day	[don't know]	[refuse]
a. Any government institutions or offices?									
b. Any healthcare facilities, including hospitals and clinics?									

c. Any schools, including kindergartens, primary, and secondary schools?									
d. Any colleges, universities, or vocational schools?									
e. Any private place of employment?									
f. Any restaurants, cafes or cafeterias?									
g. Any pubs, bars, or night clubs?									
h. Used public transportation, such as trains, buses, or mini-vans?									
i. Any grocery stores?									
j. Any theaters?									
k. Any shopping malls?									
l. Beaches, parks, playgrounds?									
m. The homes of others?									
n. The private cars of others?									

7.6. Assuming you wanted someone who was smoking around you to put out their cigarette, how likely would you be to ask them to do so in an area where smoking is ***allowed?***

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ Very
- ☐ [don't know]
- ☐ [refuse]

7.7. Assuming you wanted someone who was smoking around you to put out their cigarette, how likely would you be to ask them to do so in an area where smoking is ***prohibited?***

- ☐ Not at all
- ☐ A little
- ☐ Somewhat
- ☐ Very
- ☐ [don't know]
- ☐ [refuse]

7.8. In the past 6 months, how often have you ***witnessed*** any one being asked to put out their cigarette in an area where smoking is not allowed?

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Frequently

- [don't know]
- [refuse]

7.9. To what extent do you agree that there should be ***fines*** for smokers violating smoking bans?

- Not at all
- A little
- Somewhat
- Very much
- [don't know]
- [refuse]

SECTION 8: ATTITUDES & BELIEFS TOWARD SMOKE-FREE POLICIES

Now, we'd like to ask you about how you feel about smoke-free air policies in different areas.

8.1. To what extent do you support or oppose a ***complete cigarette smoking ban*** in the following settings:

	1 = Strongly oppose	2 = Somewhat oppose	3 = Somewhat support	4 = Strongly support	[88 = Don't know]	[99 = Refuse]
a) Healthcare facilities?						
b) Workplaces?						
c) Government institutions?						
d) Religious institutions?						
e) Indoor areas of primary/secondary schools or kindergartens?						
f) In schoolyards of primary/secondary schools or kindergartens?						
g) Indoor areas of universities, institutes, colleges?						
h) In outdoor areas of university or college campuses?						
i) In restaurants, cafes, and cafeterias?						
j) On the outdoor terrace of restaurants, cafes, and cafeterias?						
k) In bars, pubs, or nightclubs?						
l) On the outdoor terrace of bars, pubs, or nightclubs?						
m) Indoor common areas of apartment or condominium complexes like hallways, lobbies, and stairwells?						
n) Outdoor common areas of apartment or condominium complexes (playgrounds, park benches, etc.)?						
o) Within individual apartment or condo units within a complex?						
p) Public bus or minivan stops?						
q) In public buses or minivans?						
r) Public subway and train stations?						
s) In public subways and trains?						
t) Taxis?						
u) Within 5 meters of the entrance to public buildings?						

v) Private vehicles when children under age 18 are present?						
w) Playgrounds?						
x) Parks and beaches?						
y) Other public outdoor areas, such as open stadiums?						

8.2. To what extent do you support or oppose a ban on *using electronic cigarettes or heat-not-burn tobacco such as IQOS* in the following settings:

	1 = Strongly oppose	2 = Somewhat oppose	3 = Somewhat support	4 = Strongly support	[88 = Don't know]	[99 = Refuse]
a) Healthcare facilities?						
b) Workplaces?						
c) Government institutions?						
d) Religious institutions?						
e) Indoor areas of primary/secondary schools or kindergartens?						
f) In schoolyards of primary/secondary schools or kindergartens?						
g) Indoor areas of universities, institutes, colleges?						
h) In restaurants, cafes, and cafeterias?						
i) In bars, pubs, or nightclubs?						
j) In public transportation?						

SECTION 9: EXPOSURE TO MESSAGING

9.1. In the past 6 months, how often have you seen any *advertisements or signs promoting cigarettes*, for example on the internet, in social media (such as Facebook), in newspapers, in magazines, on TV, on the radio, on signs, or in leaflets?

- Never
- Rarely
- Sometimes
- Frequently
- [don't know]
- [refuse]

9.2. In the past 6 months, how often have you noticed information about *the dangers of smoking cigarettes or information that encourages quitting smoking*, for example on the internet, in social media (such as Facebook), in newspapers, in magazines, on TV, on the radio, on signs, or in leaflets?

- Never
- Rarely
- Sometimes
- Frequently
- [don't know]
- [refuse]

9.3. In the past 6 months, how often have you noticed information about the *dangers of being exposed to the smoke of others*, for example on the internet, in social media (such as Facebook), in newspapers, in magazines, on TV, on the radio, on signs, or in leaflets?

- Never
- Rarely
- Sometimes
- Frequently
- [don't know]
- [refuse]

9.4. In the past 6 months, how often have you noticed any ***signs*** in public places indicating that “no smoking is allowed”?

- Never
- Rarely
- Sometimes
- Frequently
- [don't know]
- [refuse]

9.5. In the past 6 months, how often have you noticed ***any news stories talking about the harms of secondhand smoke or the importance of public smoke-free air policies in your community***, for example on the internet, in social media (such as Facebook), in newspapers, in magazines, on TV, on the radio, on signs, or in leaflets?

- Never
- Rarely
- Sometimes
- Frequently
- [don't know]
- [refuse]

9.6. In the past 6 months, how often have you noticed ***any news stories talking about the negative aspects of public smoke-free air policies***, for example on the internet, in social media (such as Facebook), in newspapers, in magazines, on TV, on the radio, on signs, or in leaflets?

- Never
- Rarely
- Sometimes
- Frequently
- [don't know]
- [refuse]

Have you heard of a coalition – or group of people working together on issues related to smoking, reducing secondhand smoke exposure, and promoting smoke-free air in your community?

- a. No
- b. Yes

Over the past 2 years, there have been community groups holding events related to tobacco use, secondhand smoke, and smoke-free policies in some communities. Below, we are asking if you have seen or heard of any of these types of events in your community in the last 2 years.

Have you seen any of the following in **school settings**? (Check all that apply.)

- ☐ School-based activities to educate youth on the dangers of tobacco to prevent initiation (e.g., lectures)
- ☐ School-based activities to educate youth on the harms of SHS
- ☐ School-based activities targeting families on harms of SHS exposure & importance of smoke-free homes
- ☐ School-based competitions for winning designs for no smoking messages (e.g., posters, t-shirts, essays)
- ☐ Other; please specify:
- ☐ Don't know
- ☐ None of the above

Have you seen any of the following activities related to **signage or distributing stickers and posters to promote smoke-free spaces?** (Check all that apply.)

- ☐ Giving smoke-free home signs/stickers to families/parents
- ☐ Giving smoke-free signs/stickers to specific settings (e.g., taxis, hotels)
- ☐ Hanging posters about dangers of SHS (e.g., public transport)
- ☐ Billboards/banners on dangers of tobacco and SHS placed on major streets
- ☐ Other; please specify:
- ☐ Don't know
- ☐ None of the above

Have you seen or heard of any of the following activities that encourage **specific settings to adopt and/or enforce a smoke-free policy?** (Check all that apply.)

- ☐ Meeting with owners/managers/administrators to gain commitment for a smoke-free policy (e.g., universities, hotels, parks, factories, restaurant owners/managers, hospitals, schools)
- ☐ Drafting and sharing sample policies for different settings (e.g., university, vocational college)
- ☐ Recognizing/rewarding settings that create a smoke-free policy
- ☐ Conducting surveys/interviews in specific locations to document support for smoke-free policies (e.g., parks)
- ☐ Cleaning up parks or stadiums to remove cigarette butts and build support for smoke-free policies
- ☐ Other; please specify:
- ☐ Don't know
- ☐ None of the above

Have you seen or heard of any of the following activities that integrate **education on secondhand smoke into health care settings and/or to educate the public about the links between tobacco and COVID?** (Check all that apply.)

- ☐ Education on SHS harms in health care settings (e.g., hospitals, clinics, mothers' schools)
- ☐ Distributing printed materials on tobacco harms in COVID-related settings (e.g., COVID hotels, testing sites)
- ☐ Distributing COVID-related face shields/masks with anti-tobacco messages (e.g., taxi drivers, police)
- ☐ Hanging posters about COVID and tobacco in public locations
- ☐ Other; please specify:
- ☐ Don't know
- ☐ None of the above

Have you seen or heard of any of the following activities in the **general community to build support for smoke-free policies and to increase awareness of cessation resources?** (Check all that apply.)

- ☐ Student (pupil) flash mobs in community settings to promote awareness of SHS harms
- ☐ Sporting events with education on tobacco harms (e.g., wrestling)
- ☐ Distributing "give-aways" at community events to promote smoke-free policies
- ☐ Distributing information about the national smoke-free law
- ☐ Distributing information on smoking cessation support (e.g., Quitline, self-help information)
- ☐ Other; please specify:
- ☐ Don't know
- ☐ None of the above

SECTION 10: CANNABIS USE QUESTIONS

1. Have you ever tried cannabis?
 - a. Yes
 - b. No
2. How old were you when you first tried cannabis?

Please indicate _____

3. When was the last time you used cannabis?
 - a. Couple of days ago
 - b. Last month
 - c. Several months ago
 - d. Couple of months ago
 - e. Several years ago
 4. In the past 30 days, on how many of those days did you use cannabis? (Please indicate 0 to 30 days.)

 5. On days you use cannabis, how many times per day do you use cannabis?
 - a. Once
 - b. 3 - 5 times
 - c. 5 - 10 times
 - d. Please indicate _____
 6. Where you get cannabis?
 - a. I have cannabis plant at home
 - b. My friend(s) have cannabis plant at home
 - c. By online vendors (local "market")
 - d. By online vendors (not local "market")
 - e. Other (please specify) _____
 7. How easy is it for you to get cannabis?
 - a. Very easy
 - b. Fairly easy
 - c. Neither easy nor difficult
 - d. Fairly difficult
 - e. Very difficult
 - f. Refuse to answer
-

SECTION 11: PERCEPTIONS OF ALTERNATIVE TOBACCO PRODUCTS

Now, we would like to ask you about your attitudes and perceptions about various tobacco products. Note the description/image of each type of product.

Cigars or little cigars, which are rolled bundles of dried and fermented tobacco leaves to be smoked, such as the products pictured below.



E-cigarettes, vaporizers, or other electronic nicotine delivery devices, such as JUUL or Blu, are devices that vaporizes liquids that may contain nicotine, such as the devices below.



Heat-not-burn products, such as IQOS, are devices that heat tobacco but do not burn tobacco or create smoke.



Hookah, waterpipe, or nargila are devices that vaporize tobacco through a water basin, such as the devices shown below.



11.1. How **likely are you to try or continue to use** the following products in the next year, on a scale of 1 is Not at all likely to 7 is Extremely likely?

1=Not at all likely

To

7=Extremely likely

- a) Regular cigarettes
- b) Large or little cigars
- c) Electronic cigarettes or vaporizers
- d) Heat-not-burn tobacco, such as IQOS
- e) Hookah/waterpipe/nargila
- f) Cannabis/marijuana

11.2. How **harmful to your health do you think the use** of the following products are, on a scale of 1 is Not at all harmful to 7 is Extremely harmful?

1=Not at all harmful

To

7=Extremely harmful

- a) Regular cigarettes
- b) Large or little cigars
- c) Electronic cigarettes or vaporizers
- d) Heat-not-burn tobacco, such as IQOS
- e) Hookah/waterpipe/nargila
- f) Cannabis/marijuana

11.2. How **addictive do you think the use** of the following products are, on a scale of 1 is Not at all addictive to 7 is Extremely addictive?

1=Not at all harmful

To

7=Extremely harmful

- g) Regular cigarettes
- h) Large or little cigars
- i) Electronic cigarettes or vaporizers
- j) Heat-not-burn tobacco, such as IQOS
- k) Hookah/waterpipe/nargila
- l) Cannabis/marijuana

How socially acceptable among your peers do you think the following products are, on a scale of 1 is Not at all acceptable to 7 is Extremely acceptable?

1=Not at all acceptable

To

7=Extremely acceptable

- m) Regular cigarettes
- n) Large or little cigars
- o) Electronic cigarettes or vaporizers
- p) Heat-not-burn tobacco, such as IQOS
- q) Hookah/waterpipe/nargila
- r) Cannabis/marijuana

People have many reasons for using or considering trying e-cigarettes and/or heated tobacco products, like IQOS. On a scale of 1 to 7, with **1 being "not at all true for me"** and **7 being "extremely true for me"**, for each of the possible reasons below, indicate the extent to which each is true to you.

- a. E-cigarettes and heated tobacco products come in appealing flavors.
- b. E-cigarettes and heated tobacco products are more acceptable to nonsmokers.
- c. I like or would like socializing with other e-cigarette and heated tobacco product users.
- d. E-cigarettes and heated tobacco products might be less harmful than regular cigarettes.
- e. E-cigarettes and heated tobacco products help people to quit smoking regular cigarettes.
- f. Using e-cigarettes and heated tobacco products could be allowed where smoking regular cigarettes isn't allowed.
- g. E-cigarettes and heated tobacco products cost less than regular cigarettes.
- h. E-cigarettes and heated tobacco products don't smell badly.
- i. I would not be interested in trying e-cigarettes or heated tobacco products.

Policy-related questions:

Please rate below mentioned the extent to which you agree with the following statements: (1=Strongly disagree to 5=Strongly agree)

- a. I think raising taxes on cigarettes would prevent young people from smoking.
- b. I support the law that prohibits using any tobacco products (including e-cigarettes, IQOS) in indoor workplaces and public places.
- c. I would support a policy that would prohibit smoking in cars with children in them.
- d. I frequently notice large tobacco displays and/or advertisements at convenience stores.
- e. I frequently notice tobacco specialty stores, like vape shops, smoke shops, or IQOS stores, in my community.
- f. Tobacco specialty stores, like vape shops, smoke shops, or IQOS stores, are appealing to me.
- g. I think that eliminating flavors (e.g., mint/menthol, fruit) in tobacco products would reduce tobacco use among young people in Georgia.
- h. I think that the legal age to buy tobacco products should be increased to 21 years old.

- i. I support the legalization of cannabis for medical use.
 - j. I support the legalization of cannabis for recreational use
 - k. Edibles are a safe way to use cannabis.
 - l. Driving after using cannabis not as risky as driving after drinking alcohol.
-

SECTION 12: ALCOHOL USE

We are almost finished with this survey. We have two questions about alcohol use. By a “drink,” we mean a can or bottle of beer, a glass of wine or a wine cooler, a shot of liquor, or a mixed drink with liquor in it. We are not asking about times when you only had a sip or two from a drink.

12.1. In the past 30 days, on how many of those days did you drink alcohol?

Dropdown box of: 0-30; [don't know]; [refuse]

[**Condition:** Based on gender]

12.2. In the past 30 days, on how many of those days did you drink more than [4 (women) or 5 (men)] alcoholic drinks on one occasion?

____ days

- [don't know]
- [refuse]

SECTION 14: CONCLUSION

Thank you so much for participating in this survey. The results of this survey are critical to our work.

Appendix 4. Cancer Screening Barrier Survey 2023 Questionnaire



სსიპ ლ. საყვარელიძის სახ. დაავადებათა
კონტროლისა და საზოგადოებრივი
ჯანმრთელობის ეროვნული ცენტრი

უწყვეტი სამედიცინო განათლების პროგრამა „ონკოლოგიური დაავადებების სკრინინგი“

განმახორციელებელი: საქართველოს ოჯახის ექიმთა ასოციაცია

საიდენტიფიკაციო მომაცემები ტრენინგისთვის, კითხვები წინასწარი (პრე-ტესტი) და
დასკვნითი შეფასებისთვის (პოსტ-ტესტი)

ბარიერების კვლევა - კითხვარის დემოგრაფიული ნაწილი

თარიღი (დღე/თვე/წელი)		
სახელი და გვარი		
ჩაწერეთ ელექტრონული ფოსტა		
ჩაწერეთ პირადი ნომერი		
ჩაწერეთ ლიცენზიის ნომერი		
აირჩიეთ სქესი	☐ მამაკაცი	☐ ქალი
ჩაწერეთ თქვენი რაიონი		
ჩაწერეთ რეგიონი		
მონიშნეთ დაწესებულების ტიპი	☐ სოფლის ამბულატორია	☐ საზ. ჯანდაცვის ცენტრი
	☐ პუდ/ ამბ. კლინიკა	☐ სტაციონარი
აირჩიეთ თქვენი სპეციალობა	☐ ოჯახის ექიმი	☐ პედიატრი
	☐ თერაპევტი	☐ საზ. ჯანდაცვის მუშაკი
	☐ გინეკოლოგი	☐ სხვა

	ხელმისაწვდომ სკრინინგულ პროგრამებში მონაწილეობის მიღება	☐ არ ვფიქრობ, რომ სასკრინინგო ღონისძიებების ჩატარება საჭიროა შშმ პირებისათვის ☐ მიჭირს პასუხის გაცემა.
47.	თუ უკითხავთ თქვენთვის შშმ პაციენტებს სკრინინგული პროგრამების შესახებ?	☐ ხშირად უკითხავთ ☐ არ უკითხავთ ☐ ვერ ვიხსენებ ☐ მიჭირს პასუხის გაცემა
48.	კონსულტაციისათვის დათმობილი დრო, საკმარისია შშმ პირებისათვის სკრინინგული ღონისძიებების ჩატარების თაობაზე რეკომენდაციების მისაწოდებლად	(1) სრულიად არ ვეთანხმები (2) გარკვეულწილად არ ვეთანხმები (3) არც ვეთანხმები და არც უარვყოფ (4) გარკვეულწილად ვეთანხმები (5) სრულიად ვეთანხმები
49.	როგორ ფიქრობთ, როგორი სიხშირით მიმართავენ პრევენციული სერვისებით სარგებლობისთვის შშმ პირები?	☐ რეგულარულად ☐ იშვიათად ☐ ალბათ თითქმის არ მიმართავენ ☐ მიჭირს პასუხის გაცემა
50.	როგორ ფიქრობთ, რა შეიძლება იყოს ძირითადი ბარიერი/ბარიერები შშმ პირებისათვის პრევენციული სერვისების მიღების დროს?	☐ ფიზიკური ბარიერები (სათანადო აღჭურვილობა, ტრანსპორტირება, ტერიტორიული ხელმისაწვდომობა...) ☐ სამედიცინო პერსონალის მხრიდან სათანადო უნარ-ჩვევების არ ქონა ☐ დამოკიდებულება სამედიცინო პერსონალის მხრიდან ☐ სხვა (დააკონკრეტეთ).....
51.	მონიშნეთ თუ რომელია (თქვენი აზრით) ყველაზე ხშირი მიზეზი რის გამოც თქვენი შშმ პაციენტები არ იტარებენ კიბოს სკრინინგს (შეაფასეთ 1-დან 5 ქულით, ამასთან მეტად მნიშვნელოვანს მიაწიქეთ - 5 ქ, ნაკლებ მნიშვნელოვანს - 1 ქ.)	☐ სათანადო აღჭურვილობის არ ქონა (მაგ. მამოგრაფი ეტლში მჯდომი ქალბატონისთვის...) ☐ ტრანსპორტირების პრობლემა ☐ ტერიტორიული ხელმისაწვდომობა ☐ ფინანსები (ტრანსპორტირების საფასური და ა.შ) ☐ შშმ პირები უმეტესობამ არ იცის ან არ არის ინფორმირებული კიბოს სკრინინგის შესახებ.

		☐ საკმარის ინფორმაციას ვფლობ იმისთვის, რომ მივიღო ინფორმირებული გადაწყვეტილება საშვილოსნოს ყელის კიბოს სკრინინგში მონაწილეობის შესახებ. ☐ ზოგადად, ადამიანები საქართველოში მხარს უჭერენ საშვილოსნოს ყელის კიბოს სკრინინგს. ☐ ვთვლი, რომ საშვილოსნოს ყელის კიბოს სკრინინგი სათაკილო ან სამარცხვინოა. ☐ ჯანდაცვის პროფესიონალებმა მირჩიეს მონაწილეობის მიღება საშვილოსნოს ყელის კიბოს სკრინინგში. ☐ ვიცი, სხვა ქალბატონებს, რომლებმაც საშვილოსნოს ყელის კიბოს სკრინინგი ჩაიტარეს.
43.	შემდგომი კითხვები შშმ პირებისათვის სასკრინინგო ჩარევების ხელმისაწვდომობას ეხება: რომელი შესაძლებლობების შეზღუდვებს ხვდებით თქვენს ბენეფიციარებს შორის? <i>(მონიშნეთ რამდენიმე პასუხი)</i>	☐ სმენის დაქვეითებით ან სიყრუიით გამოწვეული ☐ მხედველობის დაქვეითებით ან სიბრმავეთ გამოწვეული ☐ ფიზიკური შესაძლებლობების შეზღუდვით გამოწვეული ☐ მეტყველების პრობლემასთან დაკავშირებული ☐ ინტელექტუალური ან აღქმის შეზღუდულობის მქონე პირი ☐ ემოციური, ქცევითი შეზღუდულობა ან ფსიქიატრიული შეზღუდულობის მქონე პირი ☐ რამდენიმე ჯანმრთელობის პრობლემით გამოწვეული შესაძლებლობების შეზღუდვის მქონე პირი
44.	როგორია შშმ პირების დაახლოებით რაოდენობა თქვენს ბენეფიციარებს შორის?	☐ არ მყავს ასეთ ბენეფიციარები ☐ 1-4 ☐ 5-9 ☐ 10-14 ☐ 15 და მეტი
45.	როგორია შშმ პირების მომართვიანობის სიხშირე ჯანმრთელობის ზოგადი პრობლემების შეფასებისათვის?	☐ ყოველკვირეული ☐ ყოველ თვეში ☐ 3 თვიანი ინტერვალებით ☐ >6 თვეზე ინტერვალებით ☐ >1 წელზე ინტერვალებით
46.	შეგითავაზებიათ თუ არა შშმ პირებისათვის კონსულტაციის ფარგლებში რეკომენდებულ და	☐ ყოველთვის ვთავაზობ ☐ თითქმის არ ვთავაზობ

		☐ ვიზიტის დანიშნულება ჩემთვის სასურველ დროს არ იყო შესაძლებელი ☐ ძალზე დაკავებული ვარ/მოუხერხებელია ☐ მე ამოღებული მაქვს საშვილოსნოს ყელი ქირურგიული ოპერაციით ☐ გინეკოლოგიურ კიბოზე მაქვს ჩატარებული მკურნალობა ☐ მე ჯერ კიდევ არ ვიყავი 25 წლის ☐ არ ვიცი/არ არის რელევანტური
37.	თუ აცრილხართ როდესმე ადამიანის პაპილომავირუსის (HPV) საწინააღმდეგო ვაქცინით?	☐ დიახ ☐ არა ☐ არ ვიცი
38.	თუ გეკუთვნით, აპირებთ თუ არა ჩაიტაროთ საშვილოსნოს ყელის კიბოს სკრინინგი	(1) ნამდვილად არა (2) ალბათ არა (3) მიჭირს გადაწყვეტილების მიღება (4) დიახ, ალბათ (5) დიახ აუცილებლად
39.	დარწმუნებული ვარ, სურვილის შემთხვევაში, მეცოდინებოდა სად და როგორ ჩამეტარებინა საშვილოსნოს ყელის კიბოს სკრინინგი.	(1) სრულიად არ ვეთანხმები (2) გარკვეულწილად არ ვეთანხმები (3) არც ვეთანხმები და არც უარვყოფ (4) გარკვეულწილად ვეთანხმები (5) სრულიად ვეთანხმები
40.	საშვილოსნოს ყელის კიბოს სკრინინგი მნიშვნელოვანია ჩემი ჯანმრთელობის დაცვისთვის	(1) სრულიად არ ვეთანხმები (2) გარკვეულწილად არ ვეთანხმები (3) არც ვეთანხმები და არც უარვყოფ (4) გარკვეულწილად ვეთანხმები (5) სრულიად ვეთანხმები
41.	ფეიქრობ, საშვილოსნოს ყელის კიბო შეიძლება იყოს უკიდურესად საშიში.	(1) სრულიად არ ვეთანხმები (2) გარკვეულწილად არ ვეთანხმები (3) არც ვეთანხმები და არც უარვყოფ (4) გარკვეულწილად ვეთანხმები (5) სრულიად ვეთანხმები
42.	მომდევნო კითხვები საშვილოსნოს ყელის კიბოს სკრინინგზე თქვენს შეხედულებებს და გამოცდილებებს ეხება	☐ ჩემი მეუღლე ან პარტნიორი მიიჩნევს, რომ მე რეგულარულად უნდა მივიღო მონაწილეობა საშვილოსნოს ყელის კიბოს სკრინინგში ☐ ჩემი ოჯახი მიიჩნევს, რომ მე რეგულარულად უნდა ვიღებდე მონაწილეობას საშვილოსნოს ყელის კიბოს სკრინინგში

	მსხვილი ნაწლავის კიბოს სკრინინგი							
32.	ჩამიტარდა ტრენინგი, თუ როგორ ვურჩიო ადამიანებს სკრინინგის ჩატარება, ასევე სარგებელსა და რისკებზე.	1. კატეგორიულად არ ვეთანხმები	2. არ ვეთანხმები	3. არც ვეთანხმები და არც უარყოფ	4. ვეთანხმები	5. სრულიად ვეთანხმები	6. არ ვიცი	7. მირჩევნია არ ვთქვა
	საშვილოსნოს ყელის კიბოს სკრინინგი							
	ბუბუს კიბოს სკრინინგი							
	მსხვილი ნაწლავის კიბოს სკრინინგი							
საშვილოსნოს ყელის კიბოს სკრინინგის სერვისის გამოყენება სამედიცინო პერსონალში ქალები 25-60 წლის								
33.	თუ ჩაგიტარებიათ როდესმე საშვილოსნოს ყელის კიბოს სკრინინგი?	☐ დიახ ☐ არა ☐ არ ვიცი ☐ ჯერ არ ვარ 25 წლის						
34.	თუ კი, სიცოცხლის განმავლობაში რამდენჯერ გაქვთ ჩატარებული საშვილოსნოს ყელის კიბოს სკრინინგი?	☐ ერთხელ ☐ ორჯერ ☐ სამჯერ ან მეტჯერ ☐ არ ვიცი						
35.	ბოლოს როდის ჩაიტარეთ საშვილოსნოს ყელის კიბოს სკრინინგი?	☐ ბოლო 0-3 წლის განმავლობაში ☐ ბოლო 4-5 წლის განმავლობაში ☐ უფრო დიდი ხნის წინ ☐ არასდროს ☐ არ ვიცი						
36.	თუ არასოდეს ჩაგიტარებიათ საშვილოსნოს ყელის კიბოს სკრინინგი ან არ მიხვედით თქვენს ბოლო სკრინინგზე, მიუთითეთ მიზეზი (შეგიძლიათ მონიშნოთ ერთზე მეტი პასუხი)	☐ არ ვიცოდი საშვილოსნოს ყელის კიბოს სკრინინგის შესახებ ☐ არ ვთვლი, რომ ტესტი საჭიროა ☐ ვთვლიდი, რომ ტესტი ფასიანი იქნებოდა ☐ მაშინებს მკურნალობის პოტენციური ხარჯები კიბოს აღმოჩენის შემთხვევაში ☐ ვწერვილობდი, რომ საშვილოსნოს ყელის კიბოს სკრინინგი შეიძლება მტკივნეული ყოფილიყო ☐ ჩემი ოჯახის წევრები მხარს არ უჭერდნენ ☐ ცუდი პასუხის შიში ☐ წარსულში საშვილოსნოს ყელის კიბოს სკრინინგის ნეგატიური გამოცდილება ☐ არ ვარ დარწმუნებული, რომ ტესტი სანდოდ კეთდება ☐ სირცხვილის გრძნობა ☐ არ მსურდა, რომ ტესტი მამაკაცს ჩაეტარებინა ☐ ტესტი კულტურის/რელიგიის თვალსაზრისით მიუღებელია						

	სიკვდილიანობის შემცირებაში? (მონიშნეთ ყველა, რომელიც შესაბამისია)	☐ ფილტვის კიბო ☐ კუჭის კიბო ☐ პროსტატის კიბო ☐ სხვა: _____						
26.	აქტიურად უწევთ რეკომენდაციას კიბოს სკრინინგს თქვენს პაციენტებთან?	☐ დიახ (გადადით შემდეგ კითხვაზე) ☐ არა (გამოტოვეთ შემდეგი კითხვა)						
27.	კვირის განმავლობაში რამდენ პაციენტთან უწევთ რეკომენდაციას კიბოს სკრინინგს?							
28.	კიბოს სკრინინგის რომელ მიმართულებას უწევთ აქტიურ რეკომენდაციას პაციენტებში? (მონიშნეთ ყველა, რომელიც შესაბამისია)	☐ საშვილოსნოს ყელი კიბო ☐ ტუბუს კიბო ☐ კოლორექტული კიბო ☐ ფილტვის კიბო ☐ კუჭის კიბო ☐ პროსტატის კიბო ☐ სხვა: _____						
რამდენად ეთანხმებით ქვემოთ ჩამოთვლილ დებულებებს?								
29.	ჩემი სამუშაოს ნაწილია დავებმარო ადამიანებს მიიღონ ინფორმირებული გადაწყვეტილება ჩაიტარონ	1. კატეგორიულად არ ვეთანხმები	2. არ ვეთანხმები	3. არც ვეთანხმები და არც უარყოფ	4. ვეთანხმები	5. სრულიად ვეთანხმები	6. არ ვიცი	7. მირჩევნია არ ვთქვა
	საშვილოსნოს ყელის კიბოს სკრინინგი							
	ტუბუს კიბოს სკრინინგი							
	მსხვილი ნაწლავის კიბოს სკრინინგი							
30.	დარწმუნებული ვარ, რომ ვებმარები ადამიანებს ინფორმირებული გადაწყვეტილების მიღებაში ჩაიტარონ	1. კატეგორიულად არ ვეთანხმები	2. არ ვეთანხმები	3. არც ვეთანხმები და არც უარყოფ	4. ვეთანხმები	5. სრულიად ვეთანხმები	6. არ ვიცი	7. მირჩევნია არ ვთქვა
	საშვილოსნოს ყელის კიბოს სკრინინგი							
	ტუბუს კიბოს სკრინინგი							
	მსხვილი ნაწლავის კიბოს სკრინინგი							
31.	ფიქრობ, რომ მაქვს საჭირო ცოდნა, რომ დავებმარო ადამიანებს ინფორმირებული გადაწყვეტილების მიღებაში ჩაიტარონ	1. კატეგორიულად არ ვეთანხმები	2. არ ვეთანხმები	3. არც ვეთანხმები და არც უარყოფ	4. ვეთანხმები	5. სრულიად ვეთანხმები	6. არ ვიცი	7. მირჩევნია არ ვთქვა
	საშვილოსნოს ყელის კიბოს სკრინინგი							
	ტუბუს კიბოს სკრინინგი							

		☐ არსებობს სისტემა, რომელიც უზრუნველყოფს საპასუხო შეტყობინებას უარყოფითი პასუხის მქონე ინდივიდებს. ☐ არსებობს პროგრამის საქმიანობის შეფასება, რომელიც გამოქვეყნდება და ხელმისაწვდომია სამედიცინო პერსონალისათვის. ☐ მუნიციპალიტეტში არსებობს პროვაიდერების საკმარისი რაოდენობა სკრინინგის პროგრამის უზრუნველყოფისთვის. ☐ აღინიშნება პერსონალის ბრუნვის მაღალი მაჩვენებელი, რაც ხელს უშლის პროგრამის სათანადოდ მიმდინარეობას. ☐ არსებობს სკრინინგისათვის საჭირო ადექვატური ინფრასტრუქტურა. ☐ არსებობს შემდგომი მართვისთვის საჭირო ადექვატური ინფრასტრუქტურა. ☐ არსებობს სკრინინგის ხანგრძლივი მოლოდინის სიები. ☐ არსებობს ხანგრძლივი მოლოდინის სიები დადებითი პასუხის შემთხვევაში შემდგომი მართვისთვის. ☐ არსებობს ადექვატური კოორდინაცია ჯანდაცვის სხვადასხვა დონეებს შორის. ☐ მოსახლეობაში მიმდინარეობს სკრინინგის პროგრამის სათანადო პოპულარიზაცია. ☐ არსებობს პაციენტთა რეგისტრაციის ონლაინ სისტემა?
სამედიცინო პერსონალის შეხედულება, ცოდნა და დამოკიდებულება კიბოს სკრინინგთან დაკავშირებით.		
22.	გვერათ თუ არა, რომ კიბოს სკრინინგი ეფექტურია კიბოთი ავადობის შემცირებაში?	☐ დიახ (გადადით შემდეგ კითხვაზე) ☐ არა (გამოტოვეთ შემდეგი კითხვა)
23.	თქვენი აზრით, კიბოს რა სახეობებისთვისაა სკრინინგი ეფექტური კიბოთი ავადობის შემცირებაში? (მოწიშეთ ყველა, რომელიც შესაბამისია)	☐ საშვილოსნოს ყელი კიბო ☐ ძუძუს კიბო ☐ კოლორექტული კიბო ☐ ფილტვის კიბო ☐ კუჭის კიბო ☐ პროსტატის კიბო ☐ სხვა: ____
24.	გვერათ თუ არა, რომ კიბოს სკრინინგი ეფექტურია კიბოთი გამოწვეული სიკვდილიანობის შემცირებაში?	☐ დიახ (გადადით შემდეგ კითხვაზე) ☐ არა (გამოტოვეთ შემდეგი კითხვა)
25.	თქვენი აზრით, კიბოს რა სახეობებისთვისაა სკრინინგი ეფექტური კიბოთი გამოწვეული	☐ საშვილოსნოს ყელი კიბო ☐ მკერდის კიბო ☐ კოლორექტული კიბო

		☐ ჩემს პაციენტებს არ შეუძლიათ კიბოს მკურნალობა ღირებულების გადახდა ☐ ჩემი პაციენტის ეთნიკური წარმომავლობა (კულტურული წესჩვეულებები) ან რელიგია გავლენა ახდენს მათ გადაწყვეტილებაზე სკრინინგის ტესტის ჩატარებასთან დაკავშირებით ☐ ჩემი მდებარეობითი სქესის პაციენტების მიერ სკრინინგის ტესტის ჩატარების შანსი ნაკლებია, თუ ტესტს ატარებს მამაკაცი.
16.	ჩემს პაციენტებს უჭირთ სკრინინგის პროვაიდერ ჯანდაცვის დაწესებულებებში წვდომა შემდეგი მიზეზით (შეგიძლიათ მონიშნოთ რამდენიმე პასუხი)	☐ შორი მანძილი ☐ არახელმისაწვდომი არაპირდაპირი ხარჯები (მოგზაურობის ღირებულება, სამუშაო დღის ხელფასის დაკარგვა და ა.შ.) ☐ კონკურენტული პრიორიტეტები (მაგ., ოჯახის წევრებზე ზრუნვა, სამსახური, სხვ.) ☐ ფიზიკური ბარიერები (მაგ. ინვალიდობა) ☐ ენობრივი ბარიერები
ჯანდაცვის სისტემის დონის ბარიერები შეესაბამება თუ არა მოცემული განცხადებები საქართველოში არსებული კიბოს სკრინინგის პროგრამას?		
17.	კიბოს სკრინინგის გეგმა განსაზღვრულია ჯანდაცვის სამინისტროს მიერ მოწოდებული სამოქმედო გეგმით.	☐ დიახ ☐ არა ☐ არ ვიცი
18.	კიბოს სკრინინგზე არსებობს პროტოკოლი/გაიდლაინი.	☐ დიახ (გააგრძელებთ შემდეგი კითხვიდან) ☐ არა (გამოტოვებთ შემდეგი კითხვა და გადადით კითხვაზე 19) ☐ არ ვიცი (გამოტოვებთ შემდეგი კითხვა და გადადით კითხვაზე 19)
19.	რა ინფორმაციაა შესული პროტოკოლი/გაიდლაინში? (შეგიძლიათ მონიშნოთ რამდენიმე პასუხი)	☐ პროტოკოლი/გაიდლაინი აღწერს სამიზნე პოპულაციას. ☐ პროტოკოლი/გაიდლაინი აღწერს სკრინინგის ინტერვალს. ☐ პროტოკოლი/გაიდლაინი აღწერს სკრინინგის ტესტს. ☐ პროტოკოლი/გაიდლაინი აღწერს დადასტურებული შემთხვევების მიმართულების გზას და მართვას. ☐ პროტოკოლი/გაიდლაინი აღწერს პროგრამის მონიტორინგსა და შეფასებას. ☐ პროტოკოლი/გაიდლაინი ახლდება პერიოდულად.
20.	ჩავიტარდა ტრენინგი კიბოს სკრინინგზე, მ.შ. თუ როგორ ვურჩიო ადამიანებს სკრინინგის ჩატარება, ასევე სარგებელსა და რისკებზე.	☐ დიახ ☐ არა ☐ არ ვიცი
21.	მონიშნეთ რაა ხელმისაწვდომი სკრინინგის სახელმწიფო პროგრამის ფარგლებში?	☐ არსებობს სამიზნე პოპულაციის განსაზღვრის სისტემა ☐ არსებობს შესაბამისი ინდივიდების სკრინინგზე მოწვევის სისტემა. ☐ არსებობს პასუხების შეტყობინების და შემდგომ ღონისძიებებზე ინფორმირების სისტემა.

		4. ვეთანხმები 5. სრულიად ვეთანხმები 6. არ ვიცი 7. მირჩევნია არ ვთქვა
13.	საკმარისი დრო მაქვს იმისთვის, რომ ვაგნობო ან განვიხილო პაციენტებთან კიბოს სკრინინგ პროგრამები?	1. კატეგორიულად არ ვეთანხმები 2. არ ვეთანხმები 3. არც ვეთანხმები და უარვყოფ 4. ვეთანხმები 5. სრულიად ვეთანხმები 6. არ ვიცი 7. მირჩევნია არ ვთქვა
14.	კიბოს სკრინინგი მეტად პრიორიტეტულია ჯანმრთელობის სხვა საკითხებთან შედარებით?	1. კატეგორიულად არ ვეთანხმები 2. არ ვეთანხმები 3. არც ვეთანხმები და უარვყოფ 4. ვეთანხმები 5. სრულიად ვეთანხმები 6. არ ვიცი 7. მირჩევნია არ ვთქვა
პაციენტის დონის ბარიერები		
15.	მოწიშნეთ თუ რომელია (თქვენი აზრით) ყველაზე ხშირი მიზეზი რის გამოც თქვენი პაციენტები არ იტარებენ კიბოს სკრინინგს <i>(მოწიშნეთ რამდენიმე პასუხი)</i>	☐ ჩემი პაციენტების უმეტესობამ არ იცის ან არ არის ინფორმირებული კიბოს სკრინინგის შესახებ. ☐ ჩემი პაციენტების უმრავლესობა კიბოს ჯანმრთელობის სერიოზულ საფრთხედ არ აღიქვამს. ☐ ჩემს პაციენტებს უჭირთ ინფორმაციის ან ინსტრუქციების გაგება. ☐ ჩემი პაციენტები პრიორიტეტს ანიჭებენ ჯანმრთელობის სხვა საკითხებს, ვიდრე პრევენციულ აქტივობებს (მაგ., კიბოს სკრინინგი). ☐ ჩემი პაციენტები არ ენდობიან სამედიცინო პერსონალს, სკრინინგის პროვაიდერ სამედიცინო დაწესებულებას ან ჯანდაცვის სისტემას. ☐ ჩემი პაციენტები გრძნობენ შფოთვის, შიშს ან სირცხვილს სკრინინგის პროცედურის გამო. ☐ ჩემი პაციენტები გრძნობენ შფოთვის, შიშს ან სირცხვილს დიაგნოზის გამო. ☐ ჩემი პაციენტები გრძნობენ შფოთვის, შიშს ან სირცხვილს მკურნალობის გამო. ☐ ჩემს პაციენტებს უმეტესობამ არ იცის, რომ სკრინინგ ტესტი უფასოა. ☐ ჩემს პაციენტებს არ შეუძლიათ დამატებითი კვლევების ჩატარება, თუ სკრინინგის ტესტის შედეგი დადებითია.

5.	პირველად ჯანდაცვის სექტორში სამუშაო გამოცდილება	-----წ.
6.	სქესი	☐ ქალი ☐ კაცი
7.	ასაკი	----წ.
8.	თქვენი ოჯახური მდგომარეობა?	☐ დაქორწინებული ☐ პარტნიორთან ერთად მცხოვრები (ვეზოვრობთ როგორც წყვილი) ☐ არასოდეს ვყოფილვარ ქორწინებაში ☐ დაშორებული ☐ განქორწინებული ☐ ქვრივი ☐ სხვა
9.	გყავთ შვილები?	☐ არა ☐ დიახ, 1 ან 2 შვილი ☐ დიახ, 3 ან მეტი შვილი ☐ არ მსურს პასუხის გაცემა
პროვაიდერის დონის ბარიერები		
10.	მოტივირებული ვარ ეურჩიო პაციენტს ჩაიტაროს კიბოს სკრინინგი?	1. კატეგორიულად არ ვეთანხმები 2. არ ვეთანხმები 3. არც ვეთანხმები და უარვყოფ 4. ვეთანხმები 5. სრულიად ვეთანხმები 6. არ ვიცი 7. მირჩევნია არ ვთქვა
11.	სათანადოდ ინფორმირებული ვარ კიბოს სკრინინგის პროცედურებთან დაკავშირებით?	1. კატეგორიულად არ ვეთანხმები 2. არ ვეთანხმები 3. არც ვეთანხმები და უარვყოფ 4. ვეთანხმები 5. სრულიად ვეთანხმები 6. არ ვიცი 7. მირჩევნია არ ვთქვა
12.	ჩემი, როგორც ოჯახის ექიმის როლი კიბოს სკრინინგში მნიშვნელოვანია?	1. კატეგორიულად არ ვეთანხმები 2. არ ვეთანხმები 3. არც ვეთანხმები და უარვყოფ

ჩაწერეთ პირველად ჯანდაცვაში თქვენი მუშაობის სტაჟი		
მონიშნეთ თქვენი ოჯახური მდგომარეობა	☐ დაქორწინებული	☐ პარტნიორთან ერთად მცხოვრები (ცეხოვრობით, როგორც წყვილი)
	☐ განქორწინებული	☐ არასოდეს ვყოფილვარ ქორწინებაში
	☐ ქვრივი	☐ სხვა
გყავთ თუ არა შვილები	☐ არა	☐ არ მსურს პასუხის გაცემა
	☐ დიახ, 1 ან 2 შვილი	☐ დიახ, 3 ან მეტი შვილი

კიბოს სკრინინგის ბარიერების კვლევის კითხვარი

გთავაზობთ, მონაწილეობა მიიღოთ კვლევაში, რომლის მიზანია გამოავლინოს ის წინააღმდეგობები, რაც ხელს უშლის მოსახლეობის ჩართვას კიბოს სკრინინგის ეროვნულ პროგრამებში. კვლევა გულისხმობს პირველადი ჯანდაცვის პროფესიონალების გამოკითხვას წინამდებარე კითხვარის გამოყენებით. გამოკითხვა ანონიმურია, კითხვარზე არ იქნება აღნიშნული თქვენი საიდენტიფიკაციო მონაცემები. კვლევაში მონაწილეობა ნებაყოფლობითია. კითხვებზე პასუხის გაცემას, საშუალოდ, 30 წუთი დაჭირდება.

თუ თანახმა ხართ, გთხოვთ შეავსოთ წინამდებარე კითხვარი, რაც დაადასტურებს თქვენს თანხმობას.

#	კითხვა	პასუხი
ჯანდაცვის მიწოდების მახასიათებლები		
1.	რეგიონი	
2.	რაიონი	
3.	დაწესებულების მდებარეობა:	☐ სოფლად ☐ ნახევრად ურბანული/დაბა ☐ ურბანული /ქალაქი
4.	მონიშნეთ თქვენი პროფესიული ჯგუფი	☐ ექიმი ☐ ექთანი ☐ კლინიკის მენეჯერი ☐ საზოგადოებრივი ჯანდაცვის ცენტრის თანამშრომელი ☐ სხვა

