HEALTH RESEARCH UNION

INTEGRATED BIO-BEHAVIORAL SURVEY AND POPULATION SIZE ESTIMATION AMONG TRANSGENDER PERSONS IN GEORGIA

Risk Behaviors, HIV Prevalence, and Population Size Estimation Among Transgender Persons

Study report
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NeoLab
CLINIC NEOLAB

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NCDC
NATIONAL CENTER FOR DISEASE CONTROL AND PUBLIC HEALTH

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Working group:

Maia Butsashvili MD, MS, PhD

George Kamkamidze MD, MS, PhD

Lasha Gulbiani MPH, PhD(c)

Giorgi Kanchelashvili MPH, PhD

Tinatin Abzianidze MD, MPH, PhD

Sopio Adamia MPH

Tina Kamkamidze MD

Elene Pestvenidze MD

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Acronyms

AIDS	Acquired Immune AIDS Deficiency Syndrome
AIDS Center	Infectious diseases, AIDS and clinical immunology research center
Anti HBc	Antibodies to hepatitis B core antigen
Anti-HCV	Hepatitis C virus antibodies
CI	Cumulative incidence
DEFF	Expected effect of the design
HBs Ag	Hepatitis B surface antigen
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
ITB	Information transmission biases
NSU	Network scale-up
OR	Odds Ratio
p	p value
PSU	Primary sampling unit
RDS	Respondent-driven sampling
RDS-A	RDS analyst
RPR	Rapid Plasma Reagen
SPSS	Statistical package for the social sciences
SSU	Secondary sampling unit
STI	Sexually Transmitted Infection
TPHA	Treponema Pallidum Hemagglutination
TSU	Tertiary sampling unit
UNAIDS	Joint United Nations Programme on HIV/AIDS
VCT	Voluntary counseling and testing
WHO	World Health Organization
$\chi 2$	A chi-square test
95% CI	95% confidence interval

Definitions

Transgender person: An individual whose gender identity differs from the sex they were assigned at birth.

Transgender man: A person assigned female at birth who identifies as male.

Transgender woman: A person assigned male at birth who identifies as female.

Non-binary gender: An umbrella term for gender identities that exist outside the male/female binary.

Regular sexual partner: A sexual partner with whom the relationship lasts more than one year or less than one year with an intention to continue.

Casual sexual partner: A sexual partner who is not a regular partner, with no financial compensation involved in the sexual relationship.

Commercial sexual partner: A sexual partner with whom a sexual relationship involves material remuneration, either paid to or received from the partner.

Study Summary

Introduction

HIV continues to be a major public health problem worldwide. Compared to the general population, the risk of HIV infection is on average 13 times higher among transgender persons and 49 times higher in transgender women due to social problems, HIV-related stigma, discriminatory gender and cultural norms, poverty and other inequities that create barriers to access HIV prevention and treatment services for this key population.

This report describes an integrated bio-behavioral surveillance survey (IBBSS) among Transgender people conducted in 2024 in Tbilisi and Batumi. The study objectives were:

1. Estimate the prevalence of HIV infection, hepatitis B, hepatitis C and syphilis among transgender people;
2. Determine HIV-related risky sexual behaviors among transgender people;
3. Evaluate the knowledge, attitude and practices about HIV/AIDS, hepatitis B and hepatitis C among transgender people;
4. Assessment of stigma, discrimination and violence among transgender people;
5. Evaluate the utilization of medical services and preventive programs among transgender people;
6. Identify preferred sources of information on HIV/AIDS and STIs.

Methods

The study was conducted using cross-sectional design in two cities of Georgia: Tbilisi and Batumi. Recruitment of the participants in the study was done by respondent-driven sampling (RDS) methodology. The study included behavioral and biomarker components. Inclusion criteria for the study participants were age ≥18 years, transgender men or women, sexual (both passive and active) contact (anal or oral) in the past 12 months, Georgian citizenship, living or working in the city selected for the study, ability to answer the questionnaire prepared in Georgian language, ability to give an informed consent to participate in the study, willingness to participate in both study components

In behavioral component of the study face-to-face interviews were conducted using the specially developed structured questionnaire. As a result of the survey, the following information was collected from the study participants: socio-demographic characteristics; alcohol and drug use; history of sexual life; number and types of sexual partners; engaging

in commercial sex; risky sexual behaviors; different sexual practices; use of condoms and lubricants; knowledge of sexually transmitted infections (STI), practices and utilization of medical services; knowledge, attitude and practices about HIV/AIDS, hepatitis B and C; practices of stigma, discrimination and violence; preferred sources of information about STIs, Information, practice and cost of hormonal therapy, with emphasis on injectable hormones, as well as utilization of surgical procedures, including gender-affirming surgery. The biomarker component of the study included testing of blood samples of the studyparticipants for HIV infection, syphilis, hepatitis B and C. Collected data were entered and analyzed using statistical software SPSS v26. Univariate, bivariate, and multivariate analyses were conducted. To obtain RDS data, collected data were entered into RDS-Analyst 3.6.0 software, where univariate analysis was performed using Gile's SS (Sequential Sampler) method.

Key Findings of the Study

Biomarker Study Results

- The prevalence of HIV among transgender individuals was 8.0%, with a significantly higher prevalence among individuals aged ≥25 compared to those aged <25 (16.7% vs. 1.7%; $p<0.01$).
- Syphilis was diagnosed in 5.5% of participants.
- Hepatitis C antibodies (anti-HCV) were detected in 2.5% of transgender individuals.
- The prevalence of hepatitis B core antibodies (anti-HBc) was 3.5%, and active hepatitis B infection (HBsAg-positive) was identified in 0.5% of participants.

Alcohol and Drug Use in the Past 12 Months

- A total of 74.0% of respondents reported using drugs in the past year, with 12.5% of transgender individuals reporting intravenous drug use.
- Marijuana (60.0%) and poppers (20.0%) were the most commonly used substances, with 19.5% of participants using sedatives.
- Unprotected sex with a drug user was reported by 8.5%.
- Daily alcohol consumption was reported by 4.5%, while 26.5% consumed alcohol at least once a week.

Sexual History

- One-third (33.5%) of participants reported having had sexual partners of both genders.
- Condom use during the last sexual encounter was reported by only 64.0%, and consistent condom use over the past 12 months was reported by just 42.5%. Condom use was particularly low among those who had sexual encounters abroad (60.4%).

Engagement in Commercial Sex Work

- Approximately 26.0% of transgender participants engaged in sex work, with 26.9% earning 51–100 GEL per encounter. Among these individuals, 71.2% had more than three regular clients, and 57.1% did not use condoms during their last sexual encounter, often citing it as unnecessary.

Condoms and Lubricants

- The vast majority (95.0%) of transgender individuals knew where to obtain condoms, with non-governmental organizations (79.5%), pharmacies (32.0%), and shops (25.0%) being the most commonly cited sources.
- Over the past 12 months, 71.7% received condoms and lubricants from social workers, health centers, or peer educators. This figure was higher among older participants (81.5% vs. 68.1%; $p<0.05$) and those from Batumi compared to Tbilisi (89.8% vs. 68.3%; $p<0.01$).

Sexually Transmitted Infections (STIs)

- STI testing was reported by 77.5% of transgender individuals, with higher rates among participants aged ≥25 years (87.8% vs. 74.1%; $p<0.05$) and those from Batumi compared to Tbilisi (91.8% vs. 75.9%; $p<0.05$).
- Symptoms such as rash (60.5%), burning or itching during urination (51.1%), and discharge (47.0%) were frequently reported.
- During the past 12 months, 22.0% experienced genital or anal discharge, rash, ulcers, or bumps. Among those with symptoms, 87.5% sought medical care, 45.0% consulted a pharmacy, and 12.5% visited traditional healers.

HIV/AIDS Knowledge, Attitudes, and Practices

- HIV testing was reported by 74.0% of respondents, and 88.5% of that untested expressed willingness to undergo free testing. Testing rates were higher in Batumi than in Tbilisi (88.0% vs. 69.3%; $p<0.01$).
- Knowledge of their HIV status was reported by 70.0%, with higher rates among those aged ≥25 (86.9% vs. 73.9%; $p<0.05$).
- Among those diagnosed with HIV (8.9%), 92.9% were enrolled in treatment programs, with 28.6% reporting undetectable viral loads.
- Misconceptions about HIV transmission were noted, with 16.0% and 14.5% citing mosquito bites and shared food as transmission routes, respectively.
- Pre-exposure prophylaxis (PrEP) use was reported by 18.7%, and post-exposure prophylaxis (PEP) by 9.5% in the past 12 months.

Knowledge, Attitudes, and Practices Regarding Hepatitis B and C

- Hepatitis C testing was reported by 68.5%, with higher rates among those aged ≥25 years (79.5% vs. 61.7%; $p<0.05$).
- Chronic hepatitis C was reported in 2.9% of participants, all of whom had undergone treatment.
- Awareness of the hepatitis C elimination program was noted in 61.0%, but only 57.0% knew treatment was free, and 23.5% incorrectly believed a vaccine existed for HCV.
- Hepatitis B testing was reported by 59.5%, with higher rates in Batumi compared to Tbilisi (82.0% vs. 52.0%; $p<0.001$).

Stigma and Discrimination

- Over the past 12 months, 26.6% experienced employment denial, 16.0% were refused housing, 9.5% were denied police assistance, and 9.5% were denied healthcare due to being transgender.
- Childhood physical abuse by parents was reported by 59.0%, and 54.0% experienced violence in the past 12 months. Among victims, only 25.0% reported incidents to the police, with distrust in law enforcement being a primary barrier (43.0%).

Introduction

According to UNAIDS data, at the end of 2023, approximately 39.9 million people (range: 36.1–44.6 million) were living with HIV worldwide. That year, HIV-related causes led to 630,000 deaths (range: 500,000–820,000), and 1.3 million people (range: 1.0–1.7 million) acquired new infections [1]. Co-infections are common among people with HIV (PLHIV), regardless of their immune status. Certain co-infections can influence the progression of HIV and vice versa, affecting diagnosis, susceptibility, symptoms, and treatment considerations, including the timing and choice of medications [2]. Having an STD, for example, can increase the risk of contracting HIV due to sores or breaks in the skin that make it easier for HIV to enter the body [3].

Social issues, HIV-related stigma, discriminatory gender and cultural norms, poverty, and other inequities create significant barriers to accessing HIV prevention and treatment, particularly for key populations such as transgender individuals. Transgender people are approximately 13 times more likely to be HIV-positive than other adults of reproductive age. They also face high rates of violence, family rejection, and violations of their rights to education, employment, and social protection. As a result, transgender individuals often experience elevated rates of unemployment, poverty, housing insecurity, and marginalization [4]. Additionally, there is limited data on the prevalence and incidence of viral hepatitis and other sexually transmitted infections (STIs) among transgender people. Transgender individuals are more likely than the general population to engage in behaviors that increase the risk of HIV and other infections. In countries where legal access to hormones is restricted, some transgender people may turn to street hormones, which are not prescribed by healthcare providers. Without prescription hormones, they also lack access to syringes, leading to syringe sharing. This practice carries a high risk of transmitting HIV, hepatitis C, and other blood-borne diseases, similar to syringe sharing for drug use. LGBTQ individuals as a whole often face higher levels of social stress, stigma, isolation, and discrimination, which can contribute to increased rates of substance use. Studies indicate that 20 to 30 percent of gay and transgender people abuse substances, compared to 9 percent among heterosexual individuals [5]. Similarly high rates are reported in youth: 9.9% to 35.8% of youth who had only same-sex partners have used heroin, compared to 7.5% to 18.8% among those who have only had different-sex partners [6]. LGBTQ youth experiencing homelessness, often due to family rejection, are especially vulnerable to substance use, increasing their risk of health complications from shared syringes. Given the stigma-related

increase in substance use and the use of street hormones, LGBTQ communities have an increased need for access to syringe exchange programs.

Data suggests that HIV has high prevalence among transgender women, especially those who have sexual contact with men. The HIV infection rate is approximately 19% according to meta-analysis from 15 different countries with laboratory confirmed data. Probability of being HIV-infected is 49 times higher in transgender women compared to the general population. HIV infection rate is even higher in transgender women who are involved in commercial sex (27%) and is 9 times higher than non-transgender women involved in commercial sex, 3 times higher than men involved in commercial sex [7].

Implementation of effective prevention services in key populations, including transgender people, can be achieved through the application of a comprehensive package of services recommended by WHO and other organizations to address HIV and other infectious diseases. Some of the interventions include HIV testing services STI testing, HBV and hepatitis C (HCV) testing, Screening and treatment for hazardous and harmful alcohol and other substance use, access to contraception, etc. Creating a supportive environment free from stigma and discrimination is essential for successfully implementing these interventions [4].

Georgia is a country with low prevalence of HIV/AIDS, however Since 2022, an increasing number of new cases of HIV infection has been observed in Georgia. As of August 12, 2024 a total of 10772 HIV/AIDS cases have been registered in the AIDS center, a total of 4,985 patients progressed to AIDS, with 2,296 deaths. In 2024, 380 new cases were identified. Between 1990 and 2010, drug injection was the primary route of HIV transmission; however, since 2011, the proportion of HIV cases resulting from sexual transmission has increased in Georgia. [8].

In 2023 the study on population size estimation of trans and non-binary people was conducted in Georgia, which suggests that 0.06% of the country's population are trans and non-binary individuals with 720 persons in the country's capital city – Tbilisi and 100 and 80 persons in Batumi and Kutaisi, respectively. The study also highlighted several issues regarding limited data on transgender persons as well as rapidly changing policies on gender identity for key populations [9].

Data regarding HIV and other infection prevalence among transgender people in Georgia is virtually nonexistent. It is appropriate to conduct behavioral biomarker studies on a regular basis for the estimation of HIV prevalence in key populations, assessment of factors

contributing to the spread of HIV infection, and evaluation HIV prevention interventions and programs.

This report describes an integrated bio-behavioral surveillance survey (IBBSS) in transgender people conducted in 2024 in Tbilisi and Batumi.

Study goal and objectives

The goal of the study was to estimate the prevalence of HIV infection and evaluate risky behaviors among transgender men and women.

Study objectives:

1. Estimate the prevalence of HIV infection, hepatitis B, hepatitis C and syphilis among transgender people;
2. Determine HIV-related risky sexual behaviors among transgender people;
3. Evaluate the knowledge, attitude and practices about HIV/AIDS, hepatitis B and hepatitis C among transgender people;
4. Assessment of stigma, discrimination and violence among transgender people;
5. Evaluate the utilization of medical services and preventive programs among transgender people;
6. Identify preferred sources of information on HIV/AIDS and STIs.

Study methods

Study design

The study was conducted using cross-sectional design. Inclusion of the participants in the study was done by respondent driven sampling (RDS) methodology. The study included behavioral and biomarker components. Behavioral component implied face-to-face interviewing of study participants with specially designed structured questionnaire. Biomarker component included blood testing of surveyed study subjects for HIV infection, syphilis, hepatitis B and hepatitis C.

Study site

The study was conducted in two cities of Georgia: Tbilisi and Batumi

Sample size

The sample size for this study was 200 persons, with the following distribution between cities: Tbilisi-150 and Batumi-50 persons.

Selection of study participants

Criteria for selection of study participants

Selection of the potential participants and enrollment in the study was done according to the following inclusion and exclusion criteria:

Inclusion criteria:

- Age ≥18 years;
- Transgender man or transgender woman;
- Sexual (both passive and active) contact (anal or oral) in the past 12 months
- Georgian citizenship;
- Living or working in the city (Tbilisi or Batumi) selected for the study;
- Ability to answer the questionnaire prepared in Georgian language;
- Ability to give informed consent to participate in the study (signing the informed consent form specially developed for the study);
- Consent to participate in both study components (behavioral and biomarker components).

Exclusion criteria:

- Already participating in the current study;
- Refusal to participate in any component of the study;
- Inability to give informed consent (including due to being under the influence of alcohol or drugs);
- Not having valid coupon.

Recruitment of study participants

Respondent-driven sampling (RDS) is a method used to recruit hard-to-reach populations with stigmatized behaviors. RDS method includes "snowball sampling" (which involves recruitment of research participants by other participants) with mathematical modeling, which allows to weight the sample and get closer to representative estimates as much as possible. Although the RDS methodology has limitations such as sampling error, it is widely used for the recruitment and enrollment of hard-to-reach populations in the study.

We started the recruitment of study participants with a purposive selection of "seeds" that represented the target population and the first participants of the study. Besides the inclusion and exclusion criteria, additional factors such as different socio-demographic characteristics and access to various groups of transgender people were considered during selection of "seeds" to ensure the diversity of the sample. In total 4 "seeds" were selected for the study, 3 in Tbilisi and 1 in Batumi.

Selection of "seeds" was carried out by organization with experience of working with transgender people: NNLE „Tanadgoma – Center for Information and Counseling".

Table 1. Social-demographic characteristics of "seeds" by cities

Characteristics	Tbilisi			Batumi
	First seed	Second seed	Third seed	First seed
Age	22	18	33	33
Education level				
High school/college/vocational training center			✔	✔
Student		✔		
Incomplete/complete university	✔			
Marital status				
Married				
Never been married	✔	✔	✔	✔
Employment				
Permament job	✔		✔	✔

Irregular job		✔		
Unemployed				
Monthly income				
<300 GEL				✔
300-700 GEL		✔		
700-1000 GEL				
>1000 GEL	✔		✔	
Refused to answer				

Enrollment of each selected “seed” in the study was done after signing a specially designed informed consent form. After study enrollment the "seeds" participated in behavioral (interviewing) and biomarker (blood sampling) components. After completing these procedures, each "seed" was given three coupons with special, unique code to recruit three transgender people from their social network for study participation. The "seeds" were instructed in detail how to recruit potential participants. All coupons had serial numbers, location of study sites and information about monetary reward. "Seeds" were offering their peers to participate in the study and giving coupons to those who agreed. Potential study subjects should present coupons for study participation. Each of the three transgender people recruited by the initial seed to participate in the study represented the first wave of the recruitment. These participants were also given coupons to recruit three other transgender people from their social networks to participate in the study, representing the second wave of the recruitment. Participants of the second wave were similarly given three coupons to recruit three other transgender people and this process continued until the desired number of study participants was reached. The distribution of recruitment coupons was discontinued shortly before the desired number of respondents was reached. The desired sample size was achieved in all two cities selected for the study. The number of waves from the "seeds" varied between the cities (Table 2).

Table 2. Information about recruitment

Study site	Maximal number of waves	Total number of coupons issued	Number of returned coupons	Number of respondents recruited by „seeds“
Tbilisi	9	340	147	147

Batumi	6	121	49	49
Total		**461**	**196**	**196**

Recruitment of the study participants included a double incentive system: a primary reward for participating in the study and a secondary reward for recruiting other MSM into the study. The primary reward was 40 GEL (approximately 14 USD), and the secondary reward was 15 GEL (approximately 5.5 USD) for the inclusion of each new respondent in the study.

Data related to coupons was managed in the MS Excel coupon management database specially developed for the study.

Before inclusion in the study, each potential participant underwent verification procedure, which allowed to verify that the individual really met study inclusion criteria. The procedure included an informal interview with the potential study subject about places and means of finding partners, sexual practices, frequency of changing partners and health problems related to homosexual relationships.

During the study enrollment, each participant was assigned a 15-digit unique identification code, which was recorded in the identification database to avoid duplication of the study subjects. The unique codes were generated using first letters or digits of name, surname, mother's and father's names, place of birth, gender, etc. of the study subjects.

Data collection

Fieldwork in both cities began on July 10, 2024, and ended on October 10, 2024. Field work was carried out by the following organizations: non-governmental organization Health Research Union and (in Tbilisi and Batumi) and Queer Association – Temida (Tbilisi and Batumi).

Behavioral component

Data collection was carried out through individual face-to-face interviews. The survey

tool was a structured questionnaire. Prior to the fieldwork the questionnaire was developed by a group of experts in the field, questions evaluated: socio-demographic characteristics; alcohol and drug use; history of sexual life; number and types of sexual partners; engaging in commercial sex; risky sexual behaviors; different sexual practices; use of condoms and

lubricants; knowledge of sexually transmitted infections (STI), practices and utilization of medical services; knowledge, attitude and practices about HIV/AIDS, hepatitis B and C; practices of stigma, discrimination and violence; preferred sources of information about STIs, Information, practice and cost of hormonal therapy, with emphasis on injectable hormones, as well as utilization of surgical procedures, including gender-affirming surgery.

Transgender people size estimation study was conducted in conjunction with the IBSS, so the questionnaire also included questions to estimate the size of the transgender population.

The study participants were interviewed by interviewers specially trained for this study. The interviewers were selected from the employees of NNLE "Health Research Union" and community organization- "TEMIDA", who had experience working with transgender persons and conducting similar studies. At the beginning of the study, all interviewers participated in the training, which included instruction, practical exercises, and piloting of all research procedures, such as enrolling subjects in the study, obtaining informed consent, conducting interviews, etc. During the training, all interviewers had the opportunity to review the study protocol and data collection instruments. During the training, special attention was paid to the ethical side of the research, in particular, the issues of the LGBTQ community; gender and sexuality; subpopulation of transgender people; HIV/AIDS-related stigma, discrimination, and activism; strategies and forms of ethical communication with the LGBTQ community; anonymity and confidentiality. Interviewers conducted face-to-face interviews in a private environment with full confidentiality. The average duration of the interview was 30-40 minutes. The interviews were conducted in Georgian using questionnaires administered by the interviewers.

Biomarker component

The biomarker component of the study included testing of blood samples for HIV infection, hepatitis B, hepatitis C and syphilis. After completing the behavioral component, the study participants were asked to provide voluntarily blood samples for HIV, hepatitis B, hepatitis C and syphilis testing which was organized at the place of interview in both cities. With the consent of the study subject, after the pre-test consultation, an experienced nurse was taking a blood sample in the amount of 3-5 ml. Samples were coded using unique identification number assigned in the study and fifteen-digit code. The double coding system made it possible to minimize the risks of losing connection between the sample and the questionnaire. Blood samples were sent to the laboratory of clinic NEOLAB (Tbilisi branch).

If blood could not be transported on the same day, the collected samples were centrifuged, and the serum was stored in a refrigerator at 4-80C. Rapid tests (On Site HIV1/2 Ab Plus Combo Rapid test, CTK Biotech) or Abbott ELISA (HIV Ag/Ab Combo Reagent Kit, ARCHITECT i1000SR) were used to screen for HIV infection. Confirmation of anti-HIV positive cases were performed at Infectious Diseases, AIDS, and Clinical Immunology Research Center. Screening for anti-HCV (hepatitis C virus antibodies) was performed by rapid tests (On Site HCV Ab Plus Combo Rapid test, CTK Biotech) or ELISA (HCV Ab – CVAB, Diagnostic BioProbes Srl- Dia-pro). Hepatitis B virus surface antigen (HBsAg) and anti-core antibodies (anti-HBc) were screened by ELISA (HBsAg and anti-HBc(total) one Version ULTRA, Diagnostic BioProbes Srl- Dia-pro; Abbott, HBs Ag Qual II Reagent Kit, ARCHITECT i1000SR). Syphilis screening was performed with a traditional algorithm: initially testing with a rapid plasma reagin (Syphilis RPR test, HUMAN), and in case of positive result confirmatory treponemal test such as T. pallidum hemagglutination assay (Syphilis TPHA liquid, HUMAN). laboratory test results were notified to the study participants within 1 week. Study participants who were diagnosed with HIV infection, hepatitis B, hepatitis C or syphilis by confirmatory testing were referred to appropriate diagnostic and treatment facilities.

Study ethics

Study participation was voluntary. Each potential study participant was informed about the goal, objectives, methods, procedures, risks, and benefits of the study. All individuals who agreed to participate in the study signed an informed consent form and then were enrolled in the study. The anonymity of the study participants was protected. The identity of the participants was not recorded, only the 15-digit code of the respondent was mentioned in the entire documentation. In the case of positive screening test result on HIV infection or hepatitis C the participant's identification data (name, surname, personal number) was obtained. Before initiation of field work, the study protocol and instruments were reviewed and approved by the Institutional Review Board of Health Research Union (IRB00009520; IORG005619).

Data analysis

Data entry, management and statistical analysis were performed using statistical software SPSS v26. Descriptive statistical methods were used to characterize the variables studied in the target populations. The study variables were compared between different study groups using t-test statistic for quantitative and chi-square tests for categorized data. The structures of social networks of transgender people and the recruitment data were analyzed using RDS

Analyst software. To obtain RDS data, collected data were entered into RDS-Analyst 3.6.0 software, where univariate analysis was performed.

Results

Biomarker Study Results

The prevalence of HIV among transgender individuals involved in the study was 8.0%. Syphilis was confirmed in 5.5% of the study participants. Hepatitis C antibodies (anti-HCV) were detected in 2.5% of transgender individuals. The prevalence of hepatitis B antibodies (anti-HBc) was 3.5%, while active hepatitis B (HBsAg positive) was found in 0.5% of the surveyed individuals (Table 1).

Socio-Demographic Characteristics

The study included 200 transgender individuals, of whom 75.0% were surveyed in Tbilisi and 25.0% in Batumi. Among the participants, 58.0% were ≤24 years old. Regarding education, 8.0% of the surveyed transgender individuals had incomplete secondary education, 29.0% had completed secondary/college/professional education, 18.5% had incomplete higher education, and 21.0% had higher education. Additionally, 22.0% of respondents were students.

In terms of housing stability, 67.5% of participants had stable housing, 25.0% rented accommodation, and 7.5% lived with someone else. The majority (92.5%) had never been married, only 1.0% were married, and 5.5% were divorced or separated. Only 3.0% of transgender individuals reported having biological children. Employment-wise, 43.5% had permanent jobs, 20.5% were temporarily employed, and 32.0% were unemployed. Regarding monthly income, 9.5% earned ≤300 GEL, while 41.0% had a monthly income exceeding 1,000 GEL (Table 2).

Alcohol and Drug Use

Over the past month, 4.5% of respondents reported drinking alcohol daily, 26.5% consumed alcohol at least once a week, and 29.5% reported not drinking at all.

Over the past 12 months, marijuana was the most commonly used drug (60.0%), followed by poppers (20.0%), sleeping/tranquilizing medications (19.5%), amphetamines (14.5%), ecstasy (13.5%), and cocaine (11.5%). The least frequently used drugs were mephedrone (0.5%) and desomorphine (Krokodil) (0.5%).

In the past year, 12.5% of participants had used intravenous drugs, and among them, 2.0% reported using a shared needle/syringe during their last drug use. Additionally, 8.5% had

unprotected sex with an injection drug user, and 7.0% were unsure whether they had such an experience in the past 12 months (Table 3).

Sexual History

გამოკითხულთა 71.5% საკუთარ გენდერულ იდენტობას ტრანს ქალს ასახელებს, ხოლო 28.5% ტრანს კაცს. Among participants, 42.5% reported having had sexual contact with male partners, 19.5% with female partners, and 33.5% with both. In response to the question “What kind of sexual partner are you?” 29.5% identified as "receptive," 9.5% as "insertive," 53.0% as "both receptive and insertive," and 8.0% declined to answer. During their last sexual contact, 19.0% were under the influence of alcohol, and 15.0% were under the influence of drugs. Among those under the influence, 35.3% used a condom, 25.5% did not, 2.0% were unsure, and 37.0% avoided answering. In the past 12 months, 37.5% had one regular partner, 22.0% had 2-3 partners, 9.0% had more than three partners, and 30.5% reported having no regular partners. Additionally, 54.0% had casual partners, with 32.5% having more than three casual partners. egarding commercial partners, 2.5% had 1-5 commercial partners in the past year, 23.5% had more than 5, and 71.5% reported no commercial partners. For first sexual contact, 4.0% had it at ≤10 years of age, 8.5% at 11-13 years, 59.0% at 14-17 years, 25.5% at ≥18 years and 3.0% declined to answer. 47.0% of participants reported their most recent sexual encounter was with one regular partner, 33.0% with one casual partner, 16.5% with a commercial partner, while 3.5% avoided answering the question. During their last sexual encounter, 59.5% used a condom. Regarding general condom usage in the past 12 months, 42.5% reported “always” using condoms, while 21.5% reported “never” using them.

Half of the participants (51.0%) had sexual contact with a foreign national in Georgia. Additionally, 23.5% reported having sexual encounters in other countries, of whom 60.4% did not use a condom.

Among the respondents, 3.0% knew, and 1.0% suspected that their last sexual partner was HIV-positive. Of all participants, 3.0% disclosed their HIV-positive status to their partner, and 61.5% did not discuss this topic. In the past year, 6.5% had received pre-exposure prophylaxis (PrEP), while 3.5% had post-exposure prophylaxis (PEP) treatment during their last sexual contact (Table 4).

Sexual History: Regular Partners

In the past 12 months, 56.1% of participants had anal sex with a regular partner, 82.0% had oral sex, 40.3% had vaginal sex, and 9.4% had all the above types of sex.

During their last sexual encounter with a regular partner, 45.9% did not use a condom. Among the reasons, 60.0% cited “not seeing the need,” 3.3% reported partner refusal, 8.3% disliked condoms, and 8.3% had not thought about using one.

Regarding condom usage frequency in the past year with regular partners, 30.1% reported “always” using condoms, 16.5% “often,” 18.0% “sometimes,” and 21.0% “never” (Table 5).

Sexual History: Casual Partners

In the past year, 70.9% of participants reported anal sex with casual partners, 83.6% had oral sex, 23.6% had vaginal sex, and 15.5% had all the above types of sex.

To the question 'Where have you most often met a casual partner in the last 12 months?', 42.7% of respondents named online platforms, 20.9% social networks, 15.5% clubs, and 11.8% bars/restaurants/cafes.

Among casual partners, 25.5% did not use a condom during their last sexual contact. The reasons cited included “not seeing the need” (71.4%) and “lack of a condom” (10.7%).

In terms of frequency, 52.7% reported “always” using condoms with casual partners in the past year, 28.2% “often,” 10.9% “sometimes,” and 8.2% “never” (Table 6).

Sexual History: Commercial Partners

In the past 12 months, 90.4% of respondents had anal sex with a commercial sexual partner, 90.4% had oral sex, and 5.8% had vaginal sex. During the last sexual encounter with a commercial partner, 9.6% did not use a condom, of which 60.0% cited "I didn't think it was necessary" as the reason. When asked, "In general, how often did you and your commercial partners use a condom during sexual contact in the past 12 months?", 65.4% answered "always," 28.8% "often," 1.9% "sometimes," and 3.8% "never" (Table 7).

Involvement in Commercial Sex (Sex Business)

26.0% of the respondents engage in sexual contact for material compensation. The frequency of sexual contact for material compensation in the past 12 months was as follows: daily - 30.8%, several times a week - 51.9%, 2-3 times a month - 11.5%, once a month - 3.8%. Among these respondents, all (100%) engage in commercial sex for monetary compensation, and 7.7% do so for food. When asked about the amount they receive for their services, the responses were as follows: ≤ 50 GEL - 1.9%, 51-100 GEL - 26.9%, and more than 100 GEL - 67.3%. Among the participants in this activity, 7.7% earn no more than 300 GEL, 19.2% earn 300-500 GEL, and 32.7% and 38.5% earn 500-1000 GEL and more than 1000 GEL,

respectively. 71.2% of transgender individuals involved in the commercial sex business report that they have no other source of income besides this activity. In the past 12 months, 32.7% of respondents had 1-2 clients per working day, and 57.7% had more than 2 clients. During the last contact with a commercial partner, 94.2% of the study participants used a condom. Over the past year, 59.6% of transgender individuals always used a condom with commercial partners, 34.6% used it often, and 3.8% never used it. 71.2% of respondents say they have more than 3 regular clients. Among them, 14.6% did not use a condom during the last sexual encounter with a regular client, and 57.1% did not consider it necessary to use a condom. In the past 12 months, 66.7% of respondents always used a condom during sexual contact with a regular client, while 2.1% never did (Table 8).

Group Sex Practice

In the past year, 27.0% of participants engaged in group sex. Among them, 44.4% reported the group consisted of males, 5.6% females, and 48.1% mixed genders.
During their last group sex experience, 72.2% used condoms with all partners (Table 9).

Condoms and Lubricants

95.0% of surveyed transgender individuals reported knowing where or from whom they could obtain condoms. The most frequently mentioned places or individuals for obtaining condoms were: NGOs (79.5%), pharmacies (32.0%), stores (25.0%), and friends (14.0%). A majority of respondents (71.7%) received condoms and lubricants from social workers, health cabinets, or peer educators in the last 12 months. Additionally, 96.5% did not experience any issues obtaining condoms during the past year.

Regarding lubricant use during sexual contact in the last 12 months, 25.0% of respondents always used lubricants, another 25.0% often used them, 24.0% used them rarely, 24.0% never used lubricants, and 2.0% refused to answer (table 10).

Other Sexual Practices

Among other sexual practices, respondents most frequently reported fingering (46.0%), with 12.0% using a condom and 34.0% without one. This was followed by dildo/phaloimitator use (23.0% with a condom and 15.0% without) and fisting (5.0% with a condom and 5.5% without) (table 11).

Sexually Transmitted Infections (STIs)

The main STI symptoms reported were discharge (47.0%), rash (60.5%), and burning or itching during urination (51.1%). In the last 12 months, 22.0% experienced discharge or ulcers/rashes/bumps in the genital or anal area. STI testing was conducted among 77.5% of transgender respondents, with 35.5% tested in the last 3 months, 48.7% within 3–12 months, 9.0% within 1–2 years, and 4.5% over 2 years ago.

Reasons for testing included "preventative reasons" (81.2%), "symptoms" (12.9%), and "upon request" (5.1%). Those who did not test cited reasons such as “I don’t need it; I know I’m healthy” (44.4%), “it didn’t occur to me” (35.6%), “I don’t know where to test” (8.9%), and “it’s too expensive” (6.7%).

Among those with symptoms, 87.5% sought help from a medical facility, 45.0% from pharmacies, and 12.5% from traditional healers. 40.0% did not disclose their symptoms to their partner, 37.5% did not stop having sex after experiencing symptoms, and 43.6% did not use condoms during this period (table 12).

HIV/AIDS Knowledge, Attitudes, and Practices

91.0% of respondents believe the risk of HIV transmission can be reduced by having one uninfected, faithful partner. 96.0% believe condom use can lower HIV risk. However, 4.0% think healthy-looking individuals cannot have HIV.

Regarding HIV transmission knowledge, respondents identified the following: mosquito bites (16.0%), sharing food (14.5%), shared syringes/needles (98.5%), and mother-to-child transmission (73.0%).

While 77.5% believe free and confidential HIV testing is available in their city, only 74.0% have undergone HIV testing. Testing was last conducted for 26.4% within the past 3 months, 27.7% within 3–12 months, 41.2% within 1–2 years, and 4.7% over 2 years ago.

Reasons for not testing include “I don’t think it’s necessary” (51.5%), “it never occurred to me” (8.8%), “I don’t know where to test” (5.8%), and “lack of money” (2.9%). Among those who haven’t been tested, 88.5% expressed willingness to test if it’s free.

79.0% of respondents know their HIV status, with 8.9% reporting “positive” and 91.1% “negative” results. 92.9% of HIV-positive individuals are receiving treatment.

75.0% of respondents have heard of PrEP, but only 18.7% used it in the last 12 months. Awareness of PEP stands at 58.0%, with NGOs (76.2%) being the main source of information, 11.2% named the internet, 11.2% named friends, and 6.8% named other sources. 9.5% of participants had received PEP (Post-Exposure Prophylaxis) in the past 12 months.

In the past 3 months, 42.0% of participants in Georgia received a free brochure/leaflet/booklet about HIV/AIDS, 42.0% received educational information about HIV/AIDS, 60.0% received condoms and lubricants, 5.0% received a syringe/needle/pipe/spoon/alcohol swab, 1.0% received financial assistance, and 1.0% received medicine.

In the past 12 months, 51.0% of transgender participants received a free brochure/leaflet/booklet about HIV/AIDS, 50.5% received educational information about HIV/AIDS, 74.0% received condoms and lubricants, and 4.0% received a syringe/needle/pipe/spoon/alcohol swab (table 13).

Hepatitis B and C Knowledge, Attitudes, and Practices

68.5% of respondents reported testing for hepatitis C, with 35.0% tested within the last 3 months, 38.7% within 3–12 months, 16.8% within 1–2 years, and 9.5% over 2 years ago. Among tested individuals, 95.6% were negative, and 2.9% tested positive for both anti-HCV and HCV RNA, with all receiving treatment. 61.0% of transgender respondents had heard of the hepatitis C elimination program, but only 57.0% knew treatment is free. Almost a quarter (23.5%) believe that there is a vaccine for Hepatitis C. 93.5% of participants are willing to join the elimination program if they are diagnosed with Hepatitis C. Regarding the ways Hepatitis C is transmitted, the responses from the study participants were as follows: through blood transfusion (79.0%), unprotected sex (79.0%), sharing needles/syringes (76.0%), receiving medical services (60.5%), and others.

For hepatitis B, only 59.5% had been tested. 40.3% of participants underwent testing for Hepatitis B in the last 3 months, 44.5% within the past 3-12 months, 11.8% within the past 1-2 years, and 2.5% more than 2 years ago. Among them, 95.0% were negative, 1.7% had

active infections, and 1.7% had past infections. None of those with active infections were receiving antiviral treatment.

73.0%, 73.5%, 67.5%, 57.5%, and 39.5% of participants identified the following transmission routes for Hepatitis B: blood transfusion, unprotected sex, sharing used needles/syringes, receiving medical/dental services, and sharing personal hygiene items, respectively.

48.0% know about hepatitis B treatment, while 52.0% know of the vaccine. Only 21.0% have been vaccinated. If offered vaccination, 78.5% would accept, while 11.4% said "no," and 10.1% were unsure. 56.7% of transgender individuals named medical facilities as their preferred place for Hepatitis B vaccination, while 27.7% preferred community organizations (table 14).

Stigma and Discrimination

In the past 12 months, 26.6% of respondents were denied employment, 16.0% were refused housing (or evicted), 9.5% were denied police assistance, and 9.5% were denied medical services due to being transgender. Over the past 6 months, these figures were as follows: employment - 10.0%, housing (or eviction) - 7.5%, police assistance - 4.0%, and medical services - 5.0%. In the last year, 43.5% of respondents avoided seeking medical care. When asked, "Do you receive support regarding your gender identity from family members/friends/colleagues?", 35.5% responded "yes," 51.5% "partially," and 11.5% "no."

Of the surveyed transgender individuals, 45.0% always dress/express themselves according to the gender they identify with, 27.0% do so frequently, 20.5% sometimes, and 6.5% rarely. A total of 7.5% of respondents have been imprisoned and believe it was related to their gender identity. In the last 12 months, 54.0% of participants experienced some form of violence. Among them, 11.6% experienced violence once, 2.6% twice, 46.4% 3-10 times, and 35.7% more than 10 times. Regarding types of violence: verbal - 39.0%, physical - 24.5%, psychological - 31.5%, and sexual - 11.0%. Respondents who experienced each type of violence were asked who committed the violence against them. Verbal, physical, and sexual violence was predominantly perpetrated by strangers (51.6%, 51.0%, and 72.7%, respectively). Psychological violence was mainly perpetrated by acquaintances (client - 7.9%, family member - 12.6%, friends/neighbors/relatives - 25.4%, former/partner - 7.9%).

Among those who experienced any form of violence in the past 12 months, only 25.0% reported the incident to the police. Reasons for not reporting violence to the police included

distrust in the police ("It's pointless, there won't be an adequate response" - 43.0%), followed by discomfort related to their gender identity (8.6%).

A total of 59.0% of participants reported experiencing physical violence during childhood from a parent or other adult guardian, while 41.5% reported being victims (or attempted victims) of sexual violence. Of the respondents, 71.5% identify their gender identity as trans women and 28.5% as trans men. A total of 11.0% have had plastic surgery to change their appearance, 35.0% plan to undergo trans-masculine/trans-feminine gender confirmation surgery, 35.0% are undecided, and 21.0% do not plan any surgical intervention for gender reassignment. Participants cited their sources of information about gender transition as follows: 66.0% the internet, 57.5% transgender individuals/friends, 52.0% non-governmental organizations, 25.0% specialized websites, 12.0% medical institutions/doctors, and 5.0% public health centers.

In the past 12 months, 27.0% of surveyed transgender individuals have taken hormones or other substances to change their appearance/voice. Of these, 61.1% used hormones or substances in tablet form, while 38.9% used injections. When asked, "On whose advice did you take injectable hormones or other substances?", 61.5% responded with "doctor's," 20.5% said "friend/relatives/other transgender individuals," and 17.9% self-medicated. Among those taking hormones or other substances, 68.1% spent more than 1,000 GEL on hormone therapy in the last 12 months, 19.1% spent 1,000 GEL or less, and 12.8% received financial support. Respondents who used injectable hormones never shared needles with others (Table 15).

Sources of Information

A total of 59.5% of participants received information about HIV/AIDS and other sexually transmitted infections (STIs) from community organizations, 44.0% from friends, 41.0% via the internet, 19.5% from television or radio, 16.5% from family members, and 8.5% from medical institutions. Most respondents cited NGOs (62.0%) and the internet (46.0%) as the most trusted sources of information.

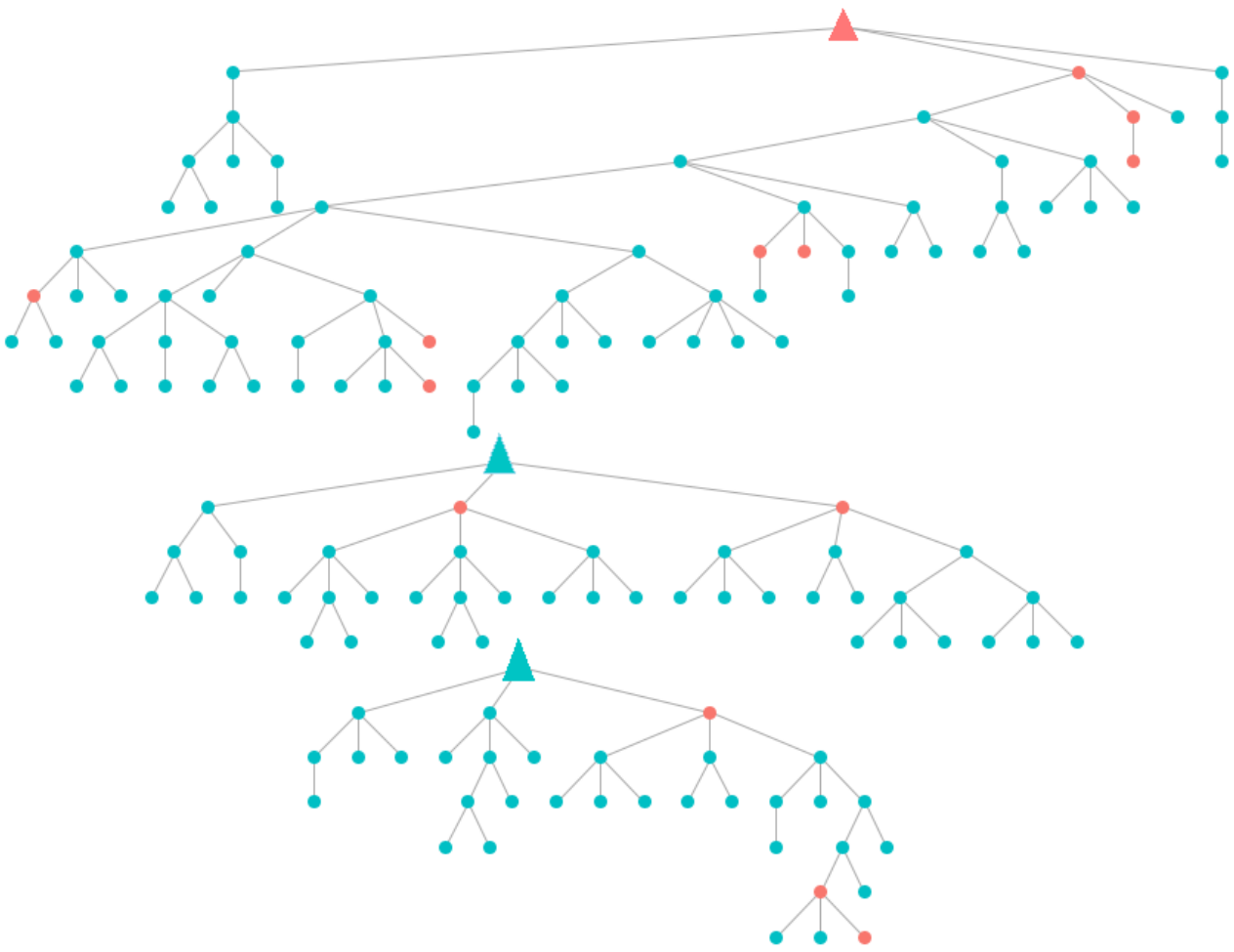
Respondents use online dating sites/mobile applications to find sexual partners, such as Grinder (31.0%), Tinder (31.0%), Instagram (15.0%), Facebook (11.0%), Odnoklassniki (8.0%), Xgeorgia (7.5%), Bumble (5.5%), Hornet (3.5%), Escort (2.5%), and others (12.5%). Most participants (85.0%) have created one profile per platform.

In the past 6 months, almost one-fifth (19.5%) of respondents have received services at a “health cabinet” (Table 15).

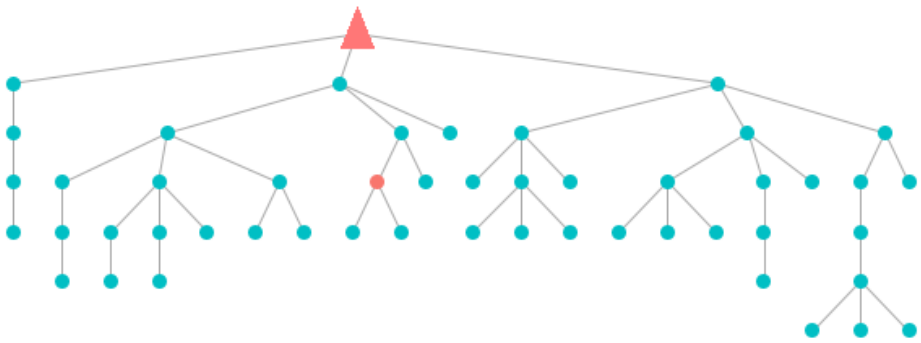
Recruitment of Participants by HIV Status

The images below illustrate the distribution of transgender people recruited by the "seeds" participating in the study across each of the two cities. These images were generated using RDS Analyst software. The HIV status of transgender people was denoted using the color orange. In the provided pictures, "seeds" are identified by large triangles.

Picture 1: Distribution of transgender people in Tbilisi by HIV status



Picture 2: Distribution of transgender people in Batumi by HIV status



HIV, Hepatitis and Syphilis seroprevalence by age group

Among transgender individuals, 16.7% of those ≥25 years old and 1.7% of those <25 years old were found to have anti-HIV (p<0.01). The prevalence of hepatitis C antibodies is relatively higher in the older age group (6.0% vs 0.0%; p=0.01). Syphilis is more prevalent among transgender individuals aged ≥25 years (7.1% vs 4.3%; p=0.53). In the younger age group, the prevalence of hepatitis B virus antibodies (anti-HBc) is lower compared to the older age group (6.0% vs 11.1%; p=0.44). The prevalence of active hepatitis B infection did not differ statistically by age group (p=0.41) (Table 16).

Sexual history by age group

66.4% of respondents aged <25 years and 77.8% of those aged ≥25 years identified as a trans woman; however, this difference was not statistically significant. Transgender individuals aged <25 years were more likely to have had sexual intercourse with male partners (48.1% vs 39.8%; p=0.50). Receptive sexual roles were more common in the younger age group (38.5% vs 23.8%), while incentive roles were more prevalent among those aged ≥25 years (17.5% vs 4.8%), and this difference was statistically significant (p<0.001). In the past 12 months, 17.5% of younger transgender individuals and 32.5% of older transgender individuals had >5 commercial sexual partners (p<0.05). Engaging in sexual intercourse in exchange for material compensation was reported by 20.7% of the younger age group and 33.3% of the older age group (p=0.05). Infrequent or non-use of condoms with regular, casual, and commercial sexual partners was lower among transgender individuals aged ≥25 years (47.3% vs 54.8%; 17.0% vs 20.6%; and 25.0% vs 45.8%, respectively), however, these differences were not statistically significant. 81.5% of older respondents and 68.1% of younger respondents had

received condoms and lubricants from social workers, health centers, or peer educators ($p<0.05$). Over the past 12 months, the use of lubricants during sexual contact was more frequent among transgender individuals aged ≥25 years (56.6% vs 46.9%; p=0.19) (Table17).

Knowledge, attitude, and practices regarding different infectious diseases by age group

The rate of testing for sexually transmitted infections is relatively higher among study participants aged ≥25 years (87.8% vs 74.1%), and this difference is statistically significant ($p<0.05$). Transgender individuals in the older age group are more aware of where free and confidential HIV testing can be conducted in their neighborhood or city (81.0% vs 75.0%; p=0.39). The percentage of transgender individuals who know their HIV status is relatively higher among participants aged ≥25 years (86.9% vs 73.9%; $p<0.05$). A positive HIV test result was reported by 15.1% of participants aged ≥25 years compared to 3.5% of those <25 years ($p<0.05$).

Participants aged ≥25 years were more likely to have heard about PrEP (82.1% vs 69.8%; $p<0.05$). In the past 12 months, 18.5% of transgender individuals <25 years and 18.8% of those ≥25 years used PrEP (p=1.00). Awareness of PEP was slightly higher among participants aged ≤24 years (59.5% vs 56.0%; p=0.66). The need for PEP use in the past 12 months was more frequent among transgender individuals aged ≤24 years (10.1% vs 8.5%; p=1.00).

Hepatitis C testing was conducted among 79.5% of participants aged ≥25 years and 61.7% of those ≤24 years ($p<0.05$). Awareness of the HCV elimination program was also higher among individuals aged ≥25 years; however, this difference was not statistically significant (p=0.56). Awareness of the availability of antiviral treatment for hepatitis B was reported by 44.0% of younger transgender individuals and 53.6% of older transgender individuals (p=0.19). Knowledge of the HBV vaccine was higher among transgender individuals aged ≥25 years (56.0% vs 49.1%; p=0.39). No difference was observed between the younger and older age groups regarding HBV vaccination rates (19.0% and 23.8%; p=0.71) (Table 18).

Stigma and discrimination by age group

The rates of violence in the past 12 months among transgender individuals ≤24 years and ≥25 years were as follows: verbal violence: 43.1% and 33.3%, physical violence: 20.7% and 29.8%, psychological violence: 31.9% and 31.0%, sexual violence: 11.2% and 10.7%,

respectively. However, the difference was not statistically significant in the cases mentioned. The rate of reporting violence to the police was relatively higher among participants aged ≥25 years (30.0% vs 18.3%; p=0.18). The percentage of transgender individuals who experienced sexual violence/attempted sexual violence during childhood was relatively higher in the younger age group (43.1% vs 39.3%; p=0.66) (Table).

Plastic surgery to alter appearance had been performed by 6.9% of participants aged ≤24 years and 16.7% of those aged ≥25 years (p=0.39). Future plans for trans-masculine/trans-feminine gender-affirming surgeries were more common among transgender individuals aged ≤24 years (40.4% vs 35.6%; p=0.33). Support from family members, friends, or colleagues regarding gender identity was reported slightly more by older transgender individuals (41.0% vs 32.5%; p=0.23). In the last 6 months, 14.8% of respondents aged ≤24 years and 26.8% of those aged ≥25 years received services at a "health cabinet" ($p<0.05$) (Table 19).

HIV, Hepatitis and Syphilis prevalence by study regions

The prevalence of anti-HIV was twice as high among transgender individuals surveyed in Tbilisi (9.3%) compared to Batumi (4.0%) (p=0.36). However, the prevalence of anti-HCV was higher in Batumi (4.0%) compared to Tbilisi (2.0%) (p=0.60). The proportion of transgender individuals with a positive RPR test result was relatively higher in Tbilisi (6.0%) compared to Batumi (4.0%) (p=0.73). Positive anti-HBc was identified in 4.7% of respondents in Tbilisi, while no positive cases of anti-HBc were found in Batumi (Table 20).

Socio-demographic characteristics by place of residence

Stable housing was reported by 72.0% of transgender individuals surveyed in Batumi and 66.0% in Tbilisi (p=0.48). A monthly income exceeding 700 GEL was reported by 70.0% of respondents in Tbilisi and 59.2% in Batumi (p=0.21). In Tbilisi, 3.5% of transgender individuals had their first sexual contact at age ≤10 years, while in Batumi this figure was 6.0% (p=0.21) (Table 21).

Sexual practice by study regions

Sexual intercourse with one regular partner in the last 12 months was more frequent in Tbilisi (39.2%) than in Batumi (34.0%) (p=0.05). Condom use with regular partners was less consistent (sometimes/never) in Batumi (65.5%) compared to Tbilisi (47.5%) (p=0.09). The proportion of transgender individuals who had sex with >3 casual sexual partners in the last 12 months was higher in Batumi (38.0%) than in Tbilisi (30.7%), although this difference was not statistically significant (p=0.47). Condom use during casual partner sex was less consistent (sometimes/never) in Tbilisi (23.2%) compared to Batumi (7.1%) (p=0.09). The percentage of having >5 commercial partners in the last 12 months was slightly higher in Batumi (25.5%) than in Tbilisi (23.3%) (p=0.93). The proportion of transgender individuals who always used condoms during sexual contact with regular clients was relatively higher in Batumi (69.2%) compared to Tbilisi (56.4%) (p=0.52). Sexual contact abroad in the past year was more frequent among transgender individuals surveyed in Batumi (26.0%) compared to Tbilisi (22.7%) (p=0.12). Finally, 89.8% of respondents in Batumi and 68.3% in Tbilisi received condoms and lubricants from social workers, health cabinets, or peer educators (p<0.01) (Table 22).

Knowledge, attitude, and practices regarding different infectious diseases by study regions

The rate of testing for sexually transmitted infections is higher in Batumi (91.8%) compared to Tbilisi (75.9%), and this difference is statistically significant (p<0.05). When asked whether free and confidential HIV testing is available in their neighborhood or city, 72.7% of transgender individuals in Tbilisi and 92.0% in Batumi answered positively (p<0.01). HIV testing was more common in Batumi (88.0%) than in Tbilisi (69.3%), and this difference is statistically significant. The majority of transgender individuals, both in Tbilisi (76.7%) and in Batumi (87.8%), know their HIV status. A positive HIV test result was reported by 10.4% of respondents in Tbilisi and 4.7% in Batumi (p=0.35).

Knowledge of PrEP is relatively higher in Batumi (78.0%) than in Tbilisi (74.0%), but this difference is not statistically significant. The proportion of transgender individuals who have taken PrEP in the last 12 months was higher in Batumi (23.1%) compared to Tbilisi (17.1%) (p=0.47). 60.0% of respondents in Batumi and 57.3% in Tbilisi have heard of PEP (p=0.86). In the last 12 months, 11.6% of transgender individuals in Tbilisi and 3.3% in Batumi have taken PEP (p=0.28) (Table).

In the last three months, a slightly higher percentage of transgender individuals in Batumi (44.9%) compared to Tbilisi (41.9%) received free brochures/leaflets/booklets on HIV/AIDS,

although this difference was not statistically significant. In the last 12 months, 72.0% of respondents in Batumi and 44.0% in Tbilisi received free brochures/leaflets/booklets on HIV/AIDS ($p<0.01$).

In the last three months, 44.9% of respondents in Batumi and 41.9% in Tbilisi received free educational information about HIV/AIDS ($p=0.74$). In the last 12 months, 66.0% of respondents in Batumi and 45.3% in Tbilisi received this information ($p<0.01$). 63.3% of respondents in Batumi and 60.1% in Tbilisi received free condoms and lubricants in the last three months ($p=0.73$).

In the last 12 months, a significantly higher percentage of transgender individuals in Batumi (90.0%) received free condoms or lubricants compared to Tbilisi (68.7%) ($p<0.01$). 6.8% of transgender individuals in Tbilisi received free syringes/needles/butterfly needles/spoons/alcohol swabs, whereas no one in Batumi received these products ($p=0.07$).

45.3% of respondents in Tbilisi and 20.0% in Batumi reported that they had never heard of the HCV elimination program ($p<0.001$). A higher rate of HCV testing was observed in Batumi (78.0%) compared to Tbilisi (66.2%) ($p=0.15$). 82.0% of respondents in Batumi and 52.0% in Tbilisi have been tested for hepatitis B, and this difference is statistically significant ($p<0.001$). 46.0% of respondents in Tbilisi and 70.0% in Batumi are aware that a vaccine for HBV exists ($p<0.01$). The rate of HBV vaccination among transgender individuals was 14.7% in Tbilisi and 40.0% in Batumi ($p<0.001$).

Stigma and discrimination by study regions

In the past 12 months, transgender individuals in Tbilisi were more likely to be denied medical services, employment, or housing due to their gender identity, though no statistically significant differences were found in these cases. 43.0% of respondents in Tbilisi and 47.9% in Batumi have avoided medical services during the last 12 months ($p=0.61$). The percentage of transgender individuals who feel they lack support from their family, friends, or colleagues regarding their gender identity is twice as high in Batumi (18.8%) compared to Tbilisi (9.4%) ($p<0.01$). Regarding the frequency of expressing their gender identity, 48.0% of respondents in Tbilisi and 38.0% in Batumi answered “always,” and this difference is statistically significant. In the past 12 months, the rates of violence experienced by transgender individuals in Tbilisi and Batumi are as follows: verbal violence: 44.7% in Tbilisi vs. 22.0% in Batumi ($p<0.01$), physical violence: 28.7% in Tbilisi vs. 12.0% in Batumi ($p<0.05$), psychological violence: 36.7% in Tbilisi vs. 16.0% in Batumi ($p<0.01$), sexual

violence: 14.0% in Tbilisi vs. 2.0% in Batumi ($p<0.01$) The percentage of transgender individuals who experienced sexual violence (or attempts) during childhood is twice as high in Tbilisi (47.3%) compared to Batumi (24.0%) ($p<0.01$). 57.3% of respondents in Tbilisi and 64.0% in Batumi experienced physical violence from parents or other adult guardians during childhood ($p=0.50$). 34.0% of transgender individuals in Batumi and 24.7% in Tbilisi have used hormones or other substances to change their appearance/voice ($p=0.34$) (Table 24).

Other gender related characteristics by study regions

24.0% of respondents in Batumi and 18.0% of respondents in Tbilisi had received services at a health clinic in the last 6 months, although this difference was not statistically significant. The sources from which condoms can be obtained for free or purchased in Tbilisi and Batumi are as follows: store (15.6% and 54.0%, $p<0.001$), pharmacy (21.1% and 66.0%, $p<0.001$), non-governmental organization (76.9% and 92.0%, $p<0.05$) (Table 25).

HIV, Hepatitis and Syphilis prevalence by age groups

11.2% of trans women were found to have anti-HIV antibodies, while no cases of anti-HIV were detected among trans men ($p<0.01$). For syphilis (RPR), 5.6% of trans women and 5.3% of trans men tested positive; however, this difference was not statistically significant ($p=1.00$). The prevalence of antibodies against hepatitis C is relatively higher among trans women compared to trans men (2.8% and 1.8%, respectively, $p=1.00$). The prevalence of antibodies against hepatitis B virus (anti-HBc) is also higher in trans women (4.5%) compared to trans men (1.9%), and this difference is statistically significant ($p<0.01$). Active hepatitis B infection (HBsAg) was found in 1.3% of trans women, while this antigen was not detected in trans men (0.0%) ($p=1.00$) (Table 26).

Socio-demographic characteristics by age group

Among the study participants, 74.8% of trans women were surveyed in Tbilisi, while 25.2% were surveyed in Batumi. Similarly, trans men were distributed by location as follows: 75.4%

in Tbilisi and 24.6% in Batumi (p=1.00). The age group of ≤24 years comprises 53.8% of trans women and 68.4% of trans men. Among trans women, 62.2% reported having stable housing, compared to 80.7% of trans men (p<0.05). Permanent employment was reported by 43% of trans women and 50.9% of trans men, while 21.5% of trans women and 21.1% of trans men mentioned having temporary employment. This difference was not statistically significant (p=0.54) (Table 27).

Sexual practice by gender identity

Sexual contact with male partners were reported by 56.9% of trans women and 13.0% of trans men. Sexual contact with partners of both genders were reported by 29.2% of trans women and 50.0% of trans men (p<0.01). 37.6% of trans women and 17.6% of trans men identified themselves as a receptive sexual partner. Both receiving and penetrative roles in sexual partnerships were reported by 56.4% of trans women and 60.8% of trans men (p<0.01). Consistent condom use during sexual contact was reported by 48.6% of trans women, compared to 32.7% of trans men (p<0.01). Sexual relations with foreigners in Georgia were more frequently reported by trans women (58.0%) compared to trans men (40.0%) (p<0.05). During sexual contact with regular partners, condoms were always or frequently used by 55.6% of trans women and 31.6% of trans men (p<0.05) (Table 28).

Knowledge, attitude, and practices regarding different infectious diseases by study regions

The majority of trans women and trans men (77.6% and 78.9%, respectively) reported not experiencing discharge or rash/ulcer/pimple in the genital or anal area. A higher percentage of trans women compared to trans men have undergone testing for STIs (82.7% vs. 72.7%; p=0.16) and HIV (79.0% vs. 61.4%; p<0.05). Their HIV status is known to 83.1% of trans women and 70.2% of trans men (p=0.05). Awareness of PrEP is higher among trans women (79%) compared to trans men (64.9%; p<0.05), while awareness of PEP is reported by 60.1% of trans women and 52.6% of trans men (p=0.34). More trans women than trans men have been tested for hepatitis C (70.4% vs. 66.1%; p=0.60) and hepatitis B (63.6% vs. 49.1%; p=0.07). Vaccination for hepatitis B has been reported by 26.6% of trans women and only 7.0% of trans men (Table 29).

Stigma and discrimination and other gender related characteristics by gender identity

In the past 12 months, 19.7% of trans women participating in the study reported being denied housing or being evicted due to their transgender identity, compared to 7% of trans

men ($p<0.05$). In the past 12 months, trans men (61.4%) were more likely to avoid seeking medical services compared to trans women (37.1%), a difference that is statistically significant ($p<0.01$). In the last 6 months, 11.9% of trans women and 24.6% of trans men participating in the study reported experiencing violence ($p<0.05$). Psychologists and social workers were identified as preferred sources of information about gender transition by 43.4% of trans women and 73.7% of trans men (Table 30-31).

Discussion

- The selection of study participants was challenging and progressed slowly due to events during the study period that caused concern among transgender individuals and reduced their willingness to participate (e.g., the murder of a well-known transgender woman and ongoing political events in the country, particularly the development of discriminatory legislation such as Georgia's "Law on Family Values and Protection of Minors").
- Since this is the first biomarker-based study conducted among the transgender population, we cannot perform comparative analyses to evaluate trends over time.
- HIV and syphilis prevalence is high among transgender individuals, reflecting the general trend of HIV prevalence within the transgender population (studies in various countries show HIV prevalence among transgender individuals to be significantly higher than in the general population).
- Compared to Tbilisi, the proportion of transgender individuals in Batumi who had undergone HIV, STI, and hepatitis testing and had received educational materials is higher. This may be attributed to better service coverage in Batumi or to the fact that we included more beneficiaries of NGOs in the study and could not cover the non-beneficiary population as effectively.
- It is difficult for us to explain why hepatitis prevalence is lower than in the general population, for both hepatitis B and C, despite a significant proportion reporting injecting drug use (12.5% reported injecting drug use in the past 12 months). A possible explanation is that approximately half of our study population is young (<25 years old), and viral hepatitis prevalence is generally low in this age group in Georgia. This is particularly true for hepatitis B, as the country has implemented universal newborn vaccination against hepatitis B since 2002.
- Alcohol use is prevalent among transgender individuals—19% reported being under the influence of alcohol during their last sexual encounter.
- Risky sexual behaviors are common among transgender individuals—over half reported having casual sexual partners in the past year.

- The practice of sex in exchange for material compensation is high—one-quarter reported engaging in such practices, and most of them stated it was their only source of income. This can be explained by the significant stigma and discrimination faced by the transgender population, leaving commercial sex work as their only employment option.
- Early sexual experiences are frequent—over two-thirds reported having their first sexual encounter before the age of 18, with some stating it occurred before the age of 10.
- Condom use rates are low.
- Foreign nationals actively utilize transgender services in Georgia—over half of the participants reported having had sex with a foreign national within the country.
- Knowledge about the hepatitis C elimination program is low, reflecting a general trend of declining awareness about the program in the country. This serves as a reminder of the need for more active informational campaigns to increase screening and treatment coverage for hepatitis C.
- Awareness about hepatitis B and HBV vaccination is also low. Most transgender individuals stated that they are not vaccinated, and about half of the respondents were unaware of the vaccine's existence. Community organizations are viewed as the preferred location for vaccination. Similar results have been found in studies of other high-risk groups (e.g., people who inject drugs and MSM). However, given that many young transgender individuals also reported being unvaccinated, it is likely that some participants lack accurate information about their hepatitis B vaccination status.
- Over half of the respondents reported being victims of violence, a rate considerably higher than that reported by MSM (20%)- one of the most vulnerable groups in this regard.
- Trust in the police is low—only one-quarter reported incidents of violence to the police.
- 11% have undergone surgery to alter their appearance, while 35% planned to. Legislative changes are expected to create significant barriers in this regard.
- Notably, 40% of respondents frequently use hormones without medical supervision. This is an alarmingly high percentage and is expected to increase further due to restrictions on specific services for transgender patients in medical institutions.
- The role of physicians in increasing awareness among transgender patients is very limited. Family physicians, in particular, are not involved in counseling and managing transgender individuals. Most information, including health-related information, is obtained from community organizations.
- Young individuals (<25 years old) have lower service utilization rates (e.g., receiving condoms, lubricants, or other services) despite constituting almost half of the study group.

Therefore, access to this group should be improved to increase the coverage of preventive services.

Recommendations

- The discriminatory law, **"Georgia's Law on Family Values and Protection of Minors,"** which creates barriers for vulnerable groups, including transgender individuals, to access health services, must be repealed. These barriers pose a threat not only to the health of high-risk groups but also to public health in general, as they reduce access to preventive services for HIV and other sexually transmitted infections within these populations.
- Informational campaigns targeted at the transgender population should be strengthened to raise awareness about safe sex practices as well as the risks associated with alcohol and injecting drug use. Additionally, the inclusion of transgender individuals in harm reduction programs should be discussed.
- Measures must be taken to combat stigma, discrimination, and violence against the transgender population. These steps are crucial for improving their integration into society, employment opportunities, and access to healthcare services.
- Awareness and screening coverage of HIV infection, syphilis and viral hepatitis as well as vaccination against hepatitis B among transgender individuals must be improved. This recommendation should be considered by the management team of the newly launched hepatitis B program. Furthermore, decentralization of vaccination and other hepatitis prevention services is essential to enhance accessibility through community organizations.
- Training programs for law enforcement should be implemented to promote the protection of transgender individuals' rights and prevent violence against them. This is necessary to build trust in the police among transgender individuals and encourage them to report incidents when needed. However, considering the significant decline in general public trust in the police due to recent political events, improving this situation within the transgender population will be even more challenging.
- Repealing the discriminatory law is also critical to preventing transgender individuals from resorting to self-treatment, which poses serious health risks.
- Access to preventive services for younger transgender individuals should be improved to ensure broader coverage within this demographic.
- Educational programs for physicians, particularly family doctors, should be developed and implemented to enhance their ability to manage the health needs of transgender individuals. Sensitization of healthcare workers is also crucial to ensure that medical needs

of this population are addressed within primary healthcare settings rather than relying solely on community organizations.

Population size estimation among transgender people

Executive summary

Estimating and monitoring the prevalence of transgender people is a crucial task to ensure the timely implementation of HIV/AIDS prevention and control measures in the country. Evaluating the effectiveness of existing medical services and preventive programs for high-risk groups, such as transgender people, will enhance the ability to allocate financial resources effectively for future interventions at the national or international level.

In 2022, the organization "Queer Association Temida" conducted the first-ever study on the population size of transgender and nonbinary people in Georgia. According to the research, 0.06% (0.05%-0.07%) of Georgian urban (Tbilisi, Batumi and Kutaisi) residents are either transgender or nonbinary, with a ratio of 1:2, respectively [10].

The Health Research Union (HRU) conducted an Integrated Bio-Behavioral Survey (IBBS) among transgender individuals in two major cities of Georgia (Tbilisi and Batumi). Study participants were selected using the respondent-driven sampling (RDS) method, and the "Nomination" questionnaire was also employed. The purpose of the study was to estimate the size and prevalence of the transgender population in Georgia in 2023. This report presents the results of the aforementioned research.

The final estimates are as follows:

Estimated number of transgender people in two cities of Georgia per 15-64-year-old population
943 (851 – 1041)
0.10% (0.09%-0.11%)

Introduction

According to the 2020 UNAIDS report (Country progress report – Georgia), Georgia is considered a country with low HIV infection/AIDS prevalence, with a rate of 0.4% in the general adult population [11]. However, considering Georgia's relatively small population, the presence of approximately 10,950 individuals infected with HIV as of December 1, 2024, is particularly noteworthy. It is also worth noting that 45.5% (n=4,985) of individuals infected with HIV progressed to AIDS, and 74.9% (n=8,203) of those infected were men. In 2024, 558 new cases of HIV infection were recorded in Georgia, with the majority occurring in individuals aged 29 to 40 [3]. The COVID-19 pandemic exacerbated the issue of reduced HIV testing in Georgia and other regional countries, likely contributing to a decline in registered cases. Since the onset of the SARSCoV-2 pandemic, the decrease in reported cases is believed to stem from a lack of testing among individuals at the highest risk of HIV infection (AIDS Center, 2022). In Georgia, the human immunodeficiency virus is concentrated within main risk groups, including men who have sex with men, injecting drug users, sex workers, and transgender individuals [12].

High-risk groups constitute less than 5% of the global population, yet they account for 70% of new cases of HIV infection and AIDS, as of 2021 [13]. In 2022, the prevalence of HIV is 14 times higher transgender individuals, with a 20 times higher risk of HIV transmission in transgender women compared to the general population (adults aged 15-49) [14,15]. According to a 2022 study assessing the transgender and nonbinary population size in Georgia, approximately 0.06% of country population represents transgender and nonbinary individuals [10].

As per available data, the global average proportion of individuals identifying as transgender, gender-fluid, or non-binary is approximately 2%. This figure varies across countries due to differences in cultural acceptance, legal recognition, and data collection methodologies. In a

2021 survey of 27 countries, Germany and Sweden reported the highest percentages, with about 3% of their populations identifying as transgender, gender-fluid, or non-binary. In the United States, approximately 1.6% of the population identifies as transgender or non-binary, with higher percentages observed among younger age groups. It's important to note that these figures are estimates, as many countries are just beginning to officially track transgender populations. For instance, Canada added transgender and non-binary gender options to its census data in 2021, becoming one of the first countries to do so. Additionally, societal stigma and legal challenges may lead to underreporting in less accepting regions [16].

A meta-analysis encompassing data from multiple countries estimated that the prevalence of individuals undergoing surgical or hormonal gender-affirming therapy is 9.2 per 100,000 population, while those with transgender-related diagnoses constitute 6.8 per 100,000 population. Globally, systematic reviews highlight that variations in transgender prevalence are influenced by healthcare access, social stigma, and methodological differences in data collection [17-19].

Given these circumstances, it is imperative to determine the precise size of the transgender population in Georgia. This information is vital for identifying the vulnerable population, estimating the prevalence of HIV and other sexually transmitted infections, and designing effective sexual health and wellness programs. Population size estimation (PSE) is employed at the local and state levels to enhance social and economic calculations, respond to critical health needs, and monitor epidemics. However, measuring a partially hidden population, such as transgender individuals, poses a significant challenge. Existing methods used to determine the size of hidden populations are prone to errors [20]. Recognizing the importance of accurately measuring the size of this hidden population, we employed different methods for calculation, including the capture-recapture and service consumption ratio method based on independent sampling, as well as the respondent-oriented sampling and network size determination method based on a social network approach.

Methodology

Research Tasks

The primary objective of this study was to estimate the size of the transgender population in Georgia in 2023.

Target Population

Transgender people were defined as individuals whose gender identity is different from the sex they were assign from birth (transgender women, born as a male, but identify themselves as a female; transgender men, born as a female, but identify themselves as a male).

Criteria for inclusion in the study

Within the framework of IBSS, participants were selected based on the following criteria:

1. Adult (18 years or older) at the time of inclusion in the study
2. Citizen of Georgia
3. Knows the Georgian language.
4. Resident or worker in Georgia
5. Presented a valid survey participation coupon on the research site.
6. Provided informed consent.
7. Confirmed that the individual identifies as a transgender man or transgender woman, as applicable.

Overview of Methods

The results presented in this report are derived from various methods used to estimate the size of the hidden population (transgender population), including: (1) Network Scale-Up (NSU) method, (2) Network based Capture-Recapture, (3) Service Multiplier Method, (4) Unique Object Multiplier Method, (5) Mobile Apps and Websites Service Multiplier, and (6) Wisdom of the Crowd (WOC) method. The indicators of transgender population size and prevalence in Georgia were estimated using these methods.

Determining the Size of the Network

Network Scale-Up

The first step of the NSU method is to estimate the average network size of respondents in the household survey. First, we asked respondents how many people they knew or had a meal with during the last two years from 16 pre-specified groups. Using questions about "how many X's do you know" in each group can reduce potential bias in network size estimation and is based on an adapted game of contacts [21,22]. This method has been successfully applied to estimate the size of hard-to-reach populations [23,24].

The definition of a "Person you know" was as follows: [People that you know by sight and name, and who also know you by sight and name] **AND** [People that you had some contact with either in-person, over the phone or internet (e.g.: e-mail, Skype, chat through social networks) in the last 2 years] **AND** [People of all ages who live in Georgia].

The definition of a "person you know with whom you shared meal" was as follows: [People that you know by sight and name, and who also know you by sight and name] **AND** [People that you shared a meal or drink with in the last 2 years, including family members, friends, coworkers, or neighbors, as well as meals or drinks taken at any location, such as at home, at work, or in a restaurant] **AND** [People of all ages who live in Georgia].

Next, using the 16 known population sizes (Table 1), we back-calculated the average network size for the residents of each of the three cities (equations shown below). To account for

implausible responses, we capped the responses at 16 for the total number reported known in each group.

The following steps were used to calculate the average network size in our data:

(1) First, we estimated the network size for each participant (i) using the populations listed in Table 1, with known size (j)

$$\widehat{c_i} = \frac{\sum_j m_{ij}}{\sum_j e_j} \times N$$

- Where $\widehat{c_i}$ is the estimated network size for person i
- m_{ij} is the number of people person i reports knowing in group j
- e_j is the population size of group j
- N is the size of the general population

(2) Next, we estimated the average network size across all participants ($\hat{c}$)

(3) and then calculate the population size of each group j, using $\hat{c}$

$$e_j = \frac{\widehat{e_j}}{\hat{c}} \times N$$

- Where $\widehat{e_j}$ is the average number of individuals known in each of the 16 groups reported by respondents

(4) We then calculated a bias factor as:

$$Bias\ factor_j = \frac{E_j}{e_j}$$

- Where E_j is the observed population size for group j

(5) If the bias factor was greater than 2.0 or less than 0.5, we removed the population from our calculations and repeated all steps until all bias factors were within the range of 0.5 to 2.0. We obtained our final estimate of the average network size for our participants from the remaining groups.

Estimating the size of the transgender people

To estimate the size of the transgender people, we asked respondents how many transgender individuals they knew or had shared food or drinks with over the past year. The maximum number of responses to this question was capped at 30. Using the average size of the participants' networks, we then estimated the size of the transgender population as follows:

$$\hat{e} = \frac{\sum_i m_i}{\sum_i \hat{c}_i} \times N$$

- where $\hat{e}$ represents the estimated size of the transgender population, m_i denotes the number of transgender individuals identified as acquaintances by participant i
- $\hat{c}_i$ is the estimated size of participant i personal network, and
- N refers to the total adult population (aged 15–64) in each of the two cities in 2023.

Table 1. List and population size of sixteen "known size" populations in Georgia

Question Known	Size	Sex Category	Same-sex Population Size in Georgia	Total Population in Georgia	% of the same-sex category	% of total population
First name of "Mamuka" in 2023?	21605	Male	1793820	3736357	1.20%	0.58%
First name of "Luka" in 2023?	44486	Male	1793820	3736357	2.48%	1.19%
First name of "Zurab, or Zura, or Zuka or Zuriko" in 2023?	49123	Male	1793820	3736357	2.74%	1.31%
First name of "Vazha" in 2023?	11264	Male	1793820	3736357	0.63%	0.30%
First name of "Sophiko, or Sophio or Sopho" in 2023?	31303	Female	1942537	3736357	1.61%	0.84%
First name of "Manana" in 2023?	33180	Female	1942537	3736357	1.71%	0.89%
First name of "Shorena" in 2023?	15585	Female	1942537	3736357	0.80%	0.42%
First name of "Nino, or Niniko, or Nina" in 2023?	127478	Female	1942537	3736357	6.56%	3.41%
First name of "Maya" in 2023?	47381	Female	1942537	3736357	2.44%	1.27%
First name of "Davit, or Dato, or Datuna, or Datiko" in 2023?	101161	Male	1793820	3736357	5.64%	2.71%
Married in 2023?	22275	Both	3736357	3736357	0.60%	0.60%
Teachers in 2023-2024	63665	Both	3736357	3736357	1.70%	1.70%
Deaths in 2023	42756	Both	3736357	3736357	1.14%	1.14%
Deaths due to cancer in 2023	4939	Both	3736357	3736357	0.13%	0.13%
Injured or deaths in road accidents in 2023	394	Both	3736357	3736357	0.01%	0.01%
Students in higher education institutions in 2023-2024	177791	Both	3736357	3736357	4.76%	4.76%

Source: National Statistical Service of Georgia; State Services Development Agency of the Ministry of Justice of Georgia.

Household Survey

For NSU method, the survey was conducted in households in the same two cities—Tbilisi and Batumi. A multi-stage sampling method was employed. Primary sampling units (PSUs) consisted of clusters, which, in this case, represented municipalities of the two large cities in Georgia (Tbilisi and Batumi). Secondary sampling units (SSUs) were census divisions within these municipalities. Tertiary sampling units (TSUs) were households selected through a systematic random sampling approach. Respondents within households were identified using the Kish methodology, targeting individuals aged 15-64. Quantitative data were collected through face-to-face individual interviews.

Table 2: Household Survey

Cities	Number of census divisions	Number of selected census divisions	Total N= 200
Tbilisi	2178	15	150
Batumi	287	5	50
Total	2465	20	200

Method of Coefficients

The Method of Coefficients involves utilizing two independent data sources to estimate the coefficient. This method relies on data from a subset of the target population, such as transgender, obtained from external sources [17]. For each of these data sources, a coefficient is computed, and these coefficients are then applied to estimate the size of the total transgender population. It is essential that the external data source is specific to the target population; for instance, it may involve HIV testing among transgender individuals in the past 12 months. The transgender count in each external source is crucial for calculating the coefficient, and this external data is referred to as the base data or "benchmark."

Internally, the ratio is computed within the target group, reflecting the proportion that experienced a corresponding baseline ("benchmark") event. For instance, using RDS data, we determined the proportion of transgender who had undergone HIV testing within the last year. The coefficient was then calculated as the reciprocal of this proportion (1 divided by the proportion). Subsequently, we estimated the transgender population by multiplying this coefficient by the external data's population size.

Regional Prevalence Estimates

To gauge the size and prevalence of transgender populations in two cities, the following approach was employed:

(1) Basic information related to transgender was gathered from routine information sources, as detailed below under "Routine Information Collection."

(2) Coefficients (M) were computed to estimate the size of the transgender population. This involved determining the proportion of transgender who had experienced a "benchmark event," such as HIV testing. The coefficient (M) was then calculated by taking the reciprocal of this proportion, done separately for each city.

(3) The estimated number of transgenders for each city was obtained by multiplying the count of individuals who experienced the benchmark event by the respective coefficient (M).

(4) Estimating Transgender Prevalence. The evaluation of indicators was segmented into three parts for each city. Population size calculations were based on data from the National Statistical Service of Georgia (www.geostat.ge), utilizing 2023 population data by age.

Routine Information Gathering

The Multiplier-Benchmark method was employed to estimate the approximate size of the transgender population in two cities in Georgia. The data was collected from the following organizations: "Tanadgoma – Center for Information and Counseling" and „Queer Association Temida“. Additionally, data were gathered from physicians referred by transgender individuals for trans-specific services, as well as from government agencies involved in this field. Baseline data concerning transgender were collected from the following key sources:

1. National Center for Disease Control and Public Health (NCDC): The NCDC, serving as the state central organization overseeing the HIV/AIDS epidemic surveillance system, provided vital information. They provided an indicator of services offered to transgender people, a group at high risk of infection, including coverage with a basic preventive package, voluntary counseling and testing, and HIV pre-exposure prophylaxis (PrEP) (Table 3).

Table 3. Service indicators for transgender people by cities

City	Use of services	HIV PrEP
Tbilisi	129	32
Batumi	42	2
Two cities	171	34

2. Ministry of Justice of Georgia, Ministry of Development of State Services. The Ministry of Justice of Georgia provided information on the size of the group of names according to the data of 2023 (Table 1). It was not possible to request information from the mentioned ministry about how many people applied to change the gender marker in the documents of the Public Services Development Agency (identity card, passport, etc.), because the agency does not process the said information.

3. National Statistics Office of Georgia – GEOSTAT. GEOSTAT provided data on the number of people who died in road traffic accidents in 2023. Additional information recorded in 2023 was obtained from the official GEOSTAT website (www.geostat.ge), including the number of married individuals, the number of teachers for 2023-2024, overall mortality, cancer-related deaths, and the number of students for 2023-2024 (Table 1).

4. " Tanadgoma – Center for Information and Counseling". The non-governmental organization provides support to various vulnerable groups, including men who have sex with men (MSM), transgender people, injecting drug users (IWM), sex workers (SM), youth, prisoners, the LGBT community, victims of trafficking, individuals affected by HIV/AIDS, those impacted by tuberculosis, forcibly displaced persons, and others. With many years of experience, the organization offers its services to both the general population of reproductive age and at-risk populations. A range of services is extended to transgender individuals, encompassing voluntary HIV/AIDS counseling and testing, screening and self-testing, prevention packages (including condoms and lubricants), as well as testing for sexually transmitted infections (such as syphilis). The organization uniquely tracks data on the number of transgender individuals who have availed themselves of these services, providing valuable insights into the coverage of services among this specific group.

Table 4. " Tanadgoma – Center for Information and Counseling", 2023

Characteristic	N
Transgender people who used „Tanadgoma“-s services in 2023	13

Source: " Tanadgoma – Center for Information and Counseling"

5. “Queer Association Temida”. “Temida” is a community organization, being operating and fighting for building safe, equal and proper political, righteous and social environment for trans and queer people. Organization’s aim is to build a proper, equal, and just political, legal, and social environment for transgender people, where their needs, concerns, challenges, and rights are seen and supported by the state and society. “Temida” offers transgender people a diverse range of services. Specifically, temporary housing service, employment consultant, legal assistance service, free help from social worker, psychologist consultation, prevention package for HIV and other sexually transmitted infections (condoms, lubricants and a rapid HIV test).

Table 5. "Queer Association Temida", 2023

Characteristic	N
Transgender people who used „Temida"-s services in 2023	211

Source: "Queer Association Temida"

Service Multiplier Method

The Service Multiplier Method is a ratio-based approach that utilizes data obtained from health centers associated with program outreach to hidden populations. The primary external data source is service consumption data reported by transgenders, referred to as the "Benchmark." Voluntary HIV counseling and testing (NCT) conducted over the past year serves as the multiplier in this method. As part of the research, information regarding the number of beneficiaries who availed themselves of these services in Tbilisi, and Batumi was collected from "health cabinets" and non-governmental organizations actively engaged with the hidden population. Doctors, who provide services such as hormone therapy, sex change surgeries, including mammoplasty and mastectomy, penectomy, vaginoplasty, phalloplasty, feminization and masculinization cosmetic surgeries, presented to us the amount of people, who used aforementioned services in 2023. Additionally, data provided by NCDC served as an external source for the coefficient method.

To calculate the service utilization ratio, internal data involved the proportion of the target group that documented the corresponding baseline ("benchmark") event. As part of the IBSS survey, respondents were asked whether they had received services from NGOs or doctors of various profiles in the past year, whether they had been tested for HIV, and whether they had used HIV PrEP services.

Mobile Apps and Websites Service multiplier

Virtual platforms serve as secure public spaces for transgenders, allowing them to connect and seek sexual partners discreetly, free from stigma or discrimination. These platforms, including mobile applications and social networking sites, indirectly assist in estimating the transgender population size. However, such estimates are generalized and based on the number of registered transgenders on various platforms.

As per previous surveys on the size of the transgender population, Georgian transgenders primarily utilize HornetApp and GrindrApp and websites dedicated to sex-workers, such as 91xgeorgia.me, eskort.gg, eurogirlsescort.com/boys-trans and amor.ge. Before the study, a focus group discussion was held with experienced members of the transgender community, resulting in a list of the most used virtual platforms by transgender. This list remained unchanged from the previous survey. Consequently, within our study framework, researchers, following a

predetermined schedule, created profiles on each platform and regularly visited them for a month and a half.

Data collection for coefficient calculation through virtual platforms involved two phases:

1. *First phase.* Two weeks before the study, researchers recorded the total number of registered online transgender users during both day and night on each platform using a pre-designed format. Additionally, within a month after the study commenced, two momentary assessments were conducted to count the online visibility of transgender on these sites. The non-duplicated number of transgenders using different virtual platforms at various times was determined.
2. *Second phase.* As part of the IBSS survey, beneficiaries were asked whether they had used any mobile application or website platform in the last month. The proportion of transgenders participating in the survey and their practice of using virtual platforms 2 weeks before or within a month after the survey were identified.

This data helps us to calculate the coefficient using the above method. It is through these two data that we calculated the approximate number of transgenders using the ratio method using a unique item. In the initial phase, data entry and analysis were conducted using Microsoft Excel, while in the second phase, data entry and processing were performed using SPSS 26.0.

The following formula was used to calculate the coefficient for all methods:

$$Var\ (N) = \frac{Var\ (M)}{[E\ (P)]^2} + \frac{[E\ (M)]^2}{[E\ (P)]^4} Var(P)$$

- Where M is the number of transgenders who had a benchmark event (received different services in health clinics/ distributed a unique item/ used different virtual platforms).
- P is the proportion of those transgenders who, within the scope of the survey, identified receiving services/received a unique item within the scope of the survey/used different

The variances for M and P were combined by using the following formula.

To approximate the Poisson distribution, the normal distribution was employed for calculating the confidence interval. In the computation of the 95% confidence interval (CI), with an α confidence level (type 1 error) set at 0.05, $z_{\alpha/2}$=1.96. The RDSAT standard deviation (SE) was derived from P. In the confidence interval calculation, a 1000-fold bootstrap was applied to determine the lower and upper bounds of the confidence interval for P and to estimate the uncertainty associated with the number of individuals who participated in the study. The confidence interval was computed using the following formula:

$$95\%CI\ for\ N = N \pm 1.96 \times \sqrt{Var(N)}$$

Capture-Recapture

The capture-recapture (CR) method has been employed in recent years to estimate the size of latent populations. Methodologies vary among studies. In our research, we utilized a modified version of this method that eliminates the necessity for two independent samples, as required in standard capture-recapture methods, and avoids the use of "benchmark" information. The anonymity of participants and their contacts was maintained, and this modified capture-recapture method is also referred to as the "telefunken" method.

Based on the content of this method, researchers are afforded the opportunity to repeatedly reach representatives of the hidden population through RDS waves. The proportion obtained by identifying identical individuals should be utilized to estimate the total population size.

Estimation Process

The population size estimation (PSE) was calculated using the following formula:

$$PSE = \frac{N}{R} \cdot S$$

Where:

- PSE: Estimated population size.
- N: Number of people participating in the study
- S: Number of valid "Telefunken" codes generated by respondents during the study.
- R: Number of respondents with a "Telefunken" code identified by other respondents, excluding random coincidences.

To apply this method, two critical criteria must be satisfied: (i) the study sample must be representative of the anonymous population, and (ii) all members of the anonymous population participating in the study must have an equal chance of being captured.

Data collection for this method was executed through a survey of participants involved in the IBSS study. This process entailed gathering personal information from each RDS respondent and identifying 5 contacts (transgenders) from each of them. A code was generated for each individual, considering the number of digits specified by the protocol. This involved acquiring data on the size of the survey respondents' network, along with demographic and personal characteristics (height, weight, hair color, eye color, ethnicity), phone numbers, and matching anonymized codes.

In particular, participants were required to disclose the last four digits of their phone number, with each digit being coded based on whether it was odd or even, low (0-4) or high (5-9). For instance, if the last 4 digits of the telephone code are 2451, it would be encoded as even-even-odd-odd-low-low-high-low. This approach allowed each research participant and their associated acquaintance to be identified with a corresponding code, preserving the anonymity of both the respondent and their representatives while enabling matching with contacts reported by other respondents.

The study beneficiary had to select acquaintances from the list whose numbers were recently added to the mobile phone contact directory. If there were fewer than five transgender acquaintances' numbers in their cell phone, they listed all contacts. In cases with a large number of transgender contacts, the selection of the first contact was made by randomly choosing the first letter of the last name from the alphabet. Subsequently, a unique code was created for the first person recorded with this letter in the respondent's phone contacts, and the remaining four contacts were selected sequentially—each subsequent SMS contact.

When calculating the population size using this method, study beneficiaries were treated as the "capture," acquaintances named by respondents during interviews as the "recapture," and the number of matches in named acquaintances was referred to as the "matches." A drawback of this method is the potential for false matches (matching of individuals who happen to have the same code), introducing the possibility of an error in the obtained population size.

Variance and Confidence Interval Calculation

The variance of the estimated population size (Var(PSE)) was calculated using the formula:

$$\text{Var(PSE)} = \frac{N \cdot S \cdot (N - R) \cdot (S - R)}{R^3}$$

The 95% confidence interval (CI) for the PSE was determined as:

$$\text{95\% CI: PSE} \pm 1.96 \times \sqrt{\text{Var(PSE)}}$$

Wisdom of Crowd

The average of multiple estimates is more accurate than any single estimate. This evaluation method is known as the Wisdom of Crowd (WOC). Wisdom of the crowds assumes that, in aggregate, the responses of a sufficient number of key population members about the size of their population will provide a good estimate of the actual size of their population. Participants in the RDS survey were asked for their best guesstimate on the population size and the average was computed.

As part of the survey, IBSS participants were asked how many transgender people they personally knew and how many of those individuals knew them in return. Using the Gilles rating scale (a component of the RDS-A analysis system) and relying on the responses of the study participants, we computed both the mean value and the 95% confidence interval, encompassing the minimum and maximum values.

Ethical issues

Participation in the study was voluntary. To estimate the size of the transgender population, both the household survey component and beneficiaries of the transgender behavioral surveillance study were informed about the study's purpose, objectives, methods, procedures, risks, and benefits. All subjects who willingly agreed to take part in the study signed an informed consent form and were only then included in the study. The principle of anonymity was upheld, with the identity of the participants not being recorded. For those recruited within the IBSS component, only the 15-digit code of the respondent was referenced in all documentation. Before commencing the study, the study protocol and instruments underwent review and approval by the Ethics Committee of the Health Research Union (IRB00009520; IORG005619).

Results

Network scale-up

Demographic data of transgender population

The study included 200 participants. The median age of transgender individuals was 24.0 years, distributed by city as follows: 23.5 years in Tbilisi and 24.5 years in Batumi. Overall, 30.0% of participants had higher education. By city, 29.4% of transgender individuals in Tbilisi had higher education, compared to 29.3% in Batumi. Regarding marital status, 4.4% of participants were married or divorced. Employment status showed that 55.8% of transgender individuals in Tbilisi were employed or self-employed, while this figure was 74.0% in Batumi (Table 6).

Table 6. IBBS study population characteristics (RDS-A population estimations).

Characteristics	Tbilisi N= 150	Batumi N= 50	Total N=200
Age (median)	23.5 y	24.5 y	24.0 y
≤ 24 years	62.6%	56.6%	59.7%
>24 years	37.4%	43.4%	40.3%
Education			
Higher education	29.4%	29.3%	30.0%
Other	70.6%	70.7%	70.0%
Marital status			
Married/divorced	10.1%	0.5%	4.4%
Other	89.9%	99.5%	95.6%
Employment			
Employed/self-employed	55.8%	74.0%	65.4%
Unemployed	44.2%	26.0%	34.6%

Demographic data of the general population

The household survey, conducted in Tbilisi and Batumi, included a total of 200 participants. The majority of respondents in both cities were female, with 64.4% in Tbilisi and 54.0% in Batumi. The median age of participants was 43 years, distributed by city as follows: 41 years in Tbilisi and 45 years in Batumi. The highest rate of higher education was observed in Tbilisi at 69.3%. Most participants in both cities were married, with 70.7% in Tbilisi and 64.0% in Batumi. Regarding employment status, 72.5% of participants were employed or self-employed, with city-specific rates of 74.0% in Tbilisi and 68.0% in Batumi (Table 7).

Table 7. Household survey population characteristics

Characteristics	Tbilisi N= 150	Batumi N= 50	Total N= 200
Sex			
Female	64.4%	54.0%	61.7%
Male	35.6%	46.0%	38.3%
Age (median)	41 y	45 y	43 y
≤ 24 years	9.3%	2.0%	7.5%
>24 years	90.7%	98.0%	92.5%
Education			
Higher education	69.3%	40.0%	62.0%
Other	30.7%	60.0%	38.0%
Marital status			
Married	70.7%	64.0%	69.0%
Other	29.3%	36.0%	31.0%
Employment			
Employed/self-employed	74.0%	68.0%	72.5%
Unemployed	26.0%	32.0%	27.5%

NSU population size estimates

The standard NSU method was not optimal for estimating the number of transgender people, as it significantly overestimated the figures compared to the expected real number. This discrepancy arose because, within the transgender network, the proportion of transgender individuals known to participants was exceptionally high. Consequently, when this proportion was applied to the corresponding age population, the resulting estimate was unrealistically inflated. To address this issue, we used a modified NSU method, incorporating data obtained from household surveys to calculate a more accurate estimate of the transgender population. According to the analysis conducted by this NSU method, the total number of transgender people for two cities was 1120, which was equal to 0.12% of the two cities population aged 15-64 years (Table 8).

Table 8. Transgender people population size estimation

Transgender people population				Transgender people prevalence % (Tbilisi and Batumi population aged 15-64 years)		
Cities	Estimated number	95% CI		Prevalence	95% CI	
Two cities	1120	880	1360	0.12%	0.10%	0.15%

Multiplier population size estimates

The size of the transgender population was estimated using coefficients derived from various methods, including the use of services provided by non-governmental organizations (NGOs), services provided by doctors across various specialties, HIV prevention services and PrEP, and mobile/web applications. The current estimates of the transgender population are as follows: based on the use of NGO services - 171, HIV prevention services - 808, PrEP services - 381, and services provided by doctors - 486.

For the transgender people, estimates based on coefficients from mobile and web applications are distributed as follows: “GrindrApp” - 756, “HornetApp” - 1,763, “91xGeorgia” - 940, and “ESCORT” - 371. See Table 9 for the city-wise distribution of these indicators.

Table 9. Estimated number of transgender people according to indicators

Multiplier type	Estimated number	95% CI	
HIV services			
Tbilisi	561	492	630
Batumi	247	187	307
Two cities	808	753	863

PrEP service			
Tbilisi	337	271	402
Batumi	44	16	73
Two cities	381	314	449
Doctors' services			
Two cities	485	416	555
Services from non-governmental organizations			
Two cities	171	118	223
GrindrApp			
Tbilisi	587	518	655
Batumi	169	117	221
Two cities	756	696	816
HornetApp			
Tbilisi	1475	980	1970
Batumi	288	225	350
Two cities	1763	1235	2291
91xgeorgia (web site)			
Tbilisi	750	690	810
Batumi	190	136	244
Two cities	940	907	973
ESCORT (web site)			
Tbilisi	288	224	350
Batumi	83	45	122
Two cities	371	304	438

Capture-recapture estimates

The size of the transgender people was calculated using the capture-recapture method, employing unique "Telefunken codes" individually assigned to each study participant. Based on the results, the transgender people across both cities were estimated at 1065, distributed as follows: 628 in Tbilisi and 437 in Batumi (Table 10).

Table 10. Estimating transgender population size using the capture-recapture method

	Transgender population						Transgender people prevalence among Tbilisi and Batumi population aged 15-64 years		
City	Match	Capture	Recapture	Estimated number	Lower	Upper	Estimated prevapence	Lower	Upper
Tbilisi	101	138	423	628	567	689	0.08%	0.07%	0.09%
Batumi	12	46	105	437	234	640	0.38%	0.20%	0.56%
Two cities	113	184	528	1065	862	1268	0.12%	0.10%	0.14%

Wisdom of the Crowd

The size of the transgender people was estimated using the IBSS survey results and the group knowledge method. According to the findings, the estimated transgender people across both cities was 1,496, with a range of 613 to 2,379. By city, the transgender population was distributed as follows: 1,308 in Tbilisi and 188 in Batumi (Table 11).

Table 11. Population size of transgender people using Wisdom of the Crowd Method

City	Estimated number	Lower	Upper
Tbilisi	1308	536	2079
Batumi	188	77	300
Two cities	1496	613	2379

Data Synthesis and Triangulation

For data synthesis and triangulation, we utilized the "Anchor Multiplier tool (UCSF)" developed by the University of San Francisco, which incorporated results from all methods. During data processing, the program rejected the estimated number of transgender people based on the coefficient of non-governmental organizations. As a result, this data was excluded from the analysis. Also, by decision taken at the consensus meeting, results obtained by methods (PrEP service, doctors' services, and ESCORT website data) that had low results were excluded from the program. According to the results, the estimated transgender people population size in two cities was 943, falling within a range of 851 to 1041. Among the Georgian population, the percentage of the transgender people population was 0.10%, with a confidence interval ranging from 0.09% to 0.11% (Table 12).

Table 12. Transgender people population size in two cities among Tbilisi and Batumi population aged 15–64, 2023, final version.

Tbilisi	Mean %	Lower %	Upper %	Population (mean)	Population (lower)	Population (upper)
Anchored Multiplier Variance Adjusted	**0.10%**	**0.09%**	**0.11%**	**943**	**851**	**1041**
Prior research results	0.09%	0.08%	0.11%	820	690	970
NSU multiplier (Modified)	0.12%	0.10%	0.15%	1120	880	1360
HIV services multiplier	0.09%	0.08%	0.10%	808	753	863
Grindr (mobile application)	0.08%	0.08%	0.09%	756	696	816
Hornet (mobile application)	0.19%	0.14%	0.25%	1763	1235	2291
91xgeorgia (web site)	0.10%	0.10%	0.11%	940	907	973
Wisdom of the Crowd multiplier	0.17%	0.07%	0.26%	1496	613	2379
Capture-recapture	0.12%	0.10%	0.14%	1065	862	1268

The initial results of the Anchor Multiplier program, which included data from all methods except the NGO coefficient, were presented at the consensus meeting. According to these initial results, the estimated size of the transgender population in both cities was 889, with a range of 779 to 1010. The transgender population constituted 0.10% of the population aged 15-64 in Tbilisi and Batumi, with an interval of 0.09% to 0.11% (Table 13).

Table 13. Transgender people population size in two cities among Tbilisi and Batumi population aged 15–64, 2023, first version.

Tbilisi	Mean %	Lower %	Upper %	Population (mean)	Population (lower)	Population (upper)
Anchored Multiplier Variance Adjusted	**0.10%**	**0.09%**	**0.11%**	**889**	**779**	**1010**
NSU multiplier	0.12%	0.10%	0.15%	1120	880	1360
HIV services multiplier	0.09%	0.08%	0.10%	808	753	863
HIV PrEP multiplier	0.04%	0.03%	0.05%	381	314	449
Doctors' services	0.05%	0.05%	0.06%	485	416	555
Grindr (mobile application)	0.08%	0.08%	0.09%	756	696	816
Hornet (mobile application)	0.19%	0.14%	0.25%	1763	1235	2291
91xgeorgia (web site)	0.10%	0.10%	0.11%	940	907	973
ESCORT (web site)	0.04%	0.03%	0.05%	371	304	438
Wisdom of the Crowd multiplier	0.17%	0.07%	0.26%	1496	613	2379
Capture-recapture	0.12%	0.10%	0.14%	1065	862	1268

Discussion and recommendations

The following limitations were considered during the study:

The latest available data on population age groups by city is from 2014 (general census data). To analyze results for 2023, we calculated the proportion of people aged 15-64 in Georgia using 2023 data and applied this proportion to the general population size of each city. This provided an approximate size of the "adult" population (15-64 years) in these cities, which was then used to calculate prevalence rates.

The transgender population size estimate is based on data from only two cities, Tbilisi and Batumi. As a result, it was not possible to estimate the transgender population size for the entire country or calculate national prevalence rates.

For the coefficient method, external data sources of varying quality were used. Without access to individual-level data, there is a possibility of double-counting transgender individuals in specific baseline datasets.

Data from NGOs presented challenges due to low numbers of transgender individuals utilizing their services, likely because of incomplete reporting. Similar issues were observed with PrEP use and reporting by physicians. Information from certain websites (e.g., ESCORT) was also inadequate, requiring exclusion of these sources from the final aggregate calculations.

The challenges encountered during data collection and analysis were addressed in a consensus meeting that included representatives from the project donor, field experts, NGOs working with transgender individuals, and members of the transgender community. Together, they determined which information sources should be used for calculating the synthetic total indicator.

During the consensus meeting, it was noted that information sources vary significantly in their coverage of transgender subpopulations (e.g., transgender women or transgender men). It was recommended that future reviews assess which subpopulations are covered by each source to improve data accuracy.

The final synthetic indicator for estimating the transgender population size aligns closely with average indicators from neighboring countries (Armenia, Azerbaijan) but remains significantly lower than estimates for Western Europe and North America.

As a recommendation, it is necessary to continuously search for, develop, and validate new approaches to estimate the size of the transgender population. Each individual method used for this purpose has limitations, particularly in the context of country-

specific factors. Therefore, employing multiple methods together is essential to achieve estimates that are as accurate and realistic as possible.

The consensus meeting also recommended more effective use of modern, social network-based electronic resources to improve the accuracy of transgender population assessments. These tools can help provide a more detailed characterization of transgender subpopulations, including their quantitative and qualitative attributes. These methods have also potential to estimate geographic distribution of transgender population providing data for calculation of national prevalence.

We hope that accurate estimates of the transgender population size will significantly contribute to the planning and evaluation of interventions aimed at modifying risky behaviors, as well as prevention and treatment programs for HIV and other sexually transmitted infections.

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Tables

Table 1. Results of Biomarker Research

Characteristic	SPSS		RDS
	N	%	%
Anti-HIV			
Positive	16	8.0%	2.6
Negative	184	92.0%	97.4
RPR			
Positive	11	5.5%	3.0
Negative	189	94.5%	97.0
Anti-HCV			
Positive	5	2.5%	2.5
Negative	195	97.5%	97.5
Anti-HBc (N=86)			
Positive	7	3.5%	2.8
Negative	79	39.5%	97.2
HBsAg (N=124)			
Positive	1	0.5%	0.2
Negative	123	61.5%	99.8

Table 2. Socio-Demographic Characteristics

Characteristics	SPSS		RDS
	N	%	%
Place of Interview			
Tbilisi	150	75.0%	59.1
Kutaisi	50	25.0%	40.9
Age			
≤24	116	58.0	59.1
≥25	84	42.0	40.9

Education Level			
Incomplete Secondary	16	8.0	9.0
Complete Secondary	58	29.0	32.1
Incomplete Higher	37	18.5	17.9
Higher	42	21.0	11.4
Student	44	22.0	26.8
Refused to Answer	3	1.5	2.8
Duration of Living in the City			
≤1 year	9	4.8	6.6
2-10 years	57	30.7	25.3
≥10 years	120	64.5	68.1
Stable Residence			
Yes	135	67.5	70.9
No, Renting	50	25.0	24.4
No, Living with Others	15	7.5	4.7
Marital Status			
Married	2	1.0	2.0
Divorced/Separated	11	5.5	4.2
Never Married	185	92.5	93.5
Refused to Answer	2	1.0	0.3
Number of Biological Children			
1	6	3.0	2.5
2	4	2.0	1.7
No Data	190	95.0	95.8
Employment Status			
Yes, Permanent Job	87	43.5	47.3
Yes, Occasional Temporary Job	41	20.5	19.2
No	64	32.0	31.5
Other	8	4.0	2.0

Monthly Income			
≤300 GEL	19	9.5	8.3
300-700 GEL	43	21.5	26.0
700-1000 GEL	45	22.5	27.8
1000 GEL	82	41.0	32.7
Refused to Answer |	11	5.5	5.2

Table 3. Alcohol and Drug Use

Characteristic	Total		
	SPSS		RDS
	N	%	
Alcohol consumption in the last month			
Every Day	9	4.5	2.7
At Least Weekly	53	26.5	19.3
At Least Biweekly	29	14.5	20.9
Monthly	49	24.5	18.1
Not Consumed	59	29.5	38.2
Don't Know	1	0.5	0.8
Drug use in the last month			
Yes	148	74.0	70.5
No	52	26.0	29.5
Substance Use in the Last 12 Months			
Heroin	5	2.5	0.6
Opium	2	1.0	0.2
Subutex	3	1.5	0.2
Vint/Jeff	17	8.5	4.4
Desomorphine (Krokodil)	1	0.5	0.3
Amphetamine	29	14.5	13.7
Marijuana	120	60.0	57.2
GHB/GBL	17	8.5	9.8

Poppers	40	20.0	18.9
Ecstasy	27	13.5	14.6
Cocaine	23	11.5	6.7
Sleeping/Tranquilizers	39	19.5	13.8
"Bio"	11	5.5	4.1
Spruce	4	2.0	0.6
MDMA	5	2.5	1.9
Mephedrone	1	0.5	0.1
Ketamine	3	1.5	3.4
LSD	2	1.0	1.3
Have you used any of the above-mentioned substances intravenously in the last 12 months?			
Yes	12	8.1	4.1
Have you used any of the above-mentioned substances intravenously in the last 12 months?			
Yes	1	2.0	0.3
Don't remember	1	2.0	0.1
In the last 12 months, have you had unprotected sex with an injection drug user?			
Yes	17	8.5	6.7
No	169	84.5	85.0
Don't remember:	14	7.0	8.3

Table 4. Sexual History

Characteristic	Total		
	SPSS		RDS
	N	%	%
What is your gender identity?			
Trans woman	143	71.5	66.1
Trans man	57	28.5	33.9
Gender of Sexual Partner(s)			
Male	85	42.5	48.0
Female	39	19.5	16.1
Both	67	33.5	32.9
Other	6	3.0	1.3
Refused to Answer	3	1.5	1.5
Sexual Role			
Receptive	59	29.5	29.4
Incentive	19	9.5	10.4
Both	106	53.0	55.3
Refused to Answer	16	8.0	4.9
Alcohol Use During Last Sexual Contact			
Yes	38	19.0	11.2
No	162	81.0	88.8
Drug Use During Last Sexual Contact			
Yes	30	15.0	11.0
No	170	85.0	89.0
Condom Use During Alcohol/Drug-Involved Sex			
Yes	18	35.3	28.8
No	13	25.5	40.7
Don't Know	1	2.0	2.8
Refused to Answer	19	37.0	27.7

Number of Regular Partners in Last 12 Months			
0	63	31.5	27.9
1	75	37.5	38.0
2-3	44	22.0	28.8
>3	18	9.0	4.3
No Data	2	1.0	1.0
Number of Casual Partners in Last 12 Months			
0	92	45.0	54.1
1	11	5.5	3.3
2-3	32	16.0	8.5
>3	65	32.5	34.0
Number of Commercial Partners in Last 12 Months			
0	143	71.5	78.4
1-5	5	2.5	2.2
>5	47	23.5	17.4
No Data	5	2.5	2.0
How old were you when you had your first sexual contact?			
≤10 years	8	4.0	4.7
11-13 years	17	8.5	5.3
14-17 years	118	59.0	63.4
≥18 years	51	25.5	23.4
No data	6	3.0	3.2
Who did you have sex with most recently?			
With one regular partner	94	47.0	51.6
With one casual partner	66	33.0	35.0
With a commercial partner	33	16.5	11.7
Refused to answer	7	3.5	1.7

Did you and your partner use a condom during your last sexual contact?			
Yes	119	59.5	54.1
No	72	36.0	42.0
Don't remember	3	1.5	2.2
Refused to answer	6	3.0	1.7
In general, how often did you and your partners use condoms during sex in the last 12 months?			
Always	85	42.5	38.4
Often	38	19.0	18.5
Sometimes	27	13.5	13.1
Never	43	21.5	27.3
Refused to answer	7	3.5	2.7
In the last 12 months, have you had sex in another country?			
Yes	47	23.5	26.9
No	146	73.0	71.3
Refused to answer	7	3.5	1.8
If yes, did you have sex without using a condom?			
Yes	29	60.4	59.8
Have you had sex in Georgia with a foreigner?			
Yes	102	51.0	46.5
No	91	45.5	51.8
Refused to answer	7	3.5	1.7
During your last sexual encounter, what do you think was your partner's HIV status?			
I think they were not HIV-infected	41	20.5	17.7
I know they were not HIV-infected	85	42.5	48.1
I think they were HIV-infected	2	1.0	0.1
I know they were HIV-infected	6	3.0	2.0
I know they were unsure	1	0.5	0.2
I didn't think about it	37	18.5	23.3

Don't remember/Don't know	21	10.5	6.7
Refused to answer	7	3.5	1.8
During your last sexual encounter, did you talk to your partner about your HIV status?			
I told them I was not infected	61	30.5	24.9
I told them I was infected	6	3.0	1.7
I said nothing about my status	123	61.5	71.0
Don't remember/Don't know	4	2.0	1.3
Refused to answer	6	3.0	1.1
During your last sexual encounter:			
They were on pre-exposure prophylaxis (PrEP)	3	1.5	3.7
They were on post-exposure prophylaxis (PEP)	2	1.0	0.4
I don't know/Don't remember	18	9.0	4.5
I was on pre-exposure prophylaxis (PrEP)	13	6.5	7.4
I was on post-exposure prophylaxis (PEP)	7	3.5	0.9
Neither of us was on prophylaxis	145	72.5	78.5
Refused to answer	9	4.5	2.0
Have you had anal sexual contact in the last 12 months?			
Yes	115	57.5	61.0
No	85	42.5	39.0

Table 5. Sexual History: Regular Partners

Characteristic	Total		
	SPSS		RDS
	N	%	%
Type of Sexual Contact with Regular Partners in Last 12 Months			
Anal	78	56.1	58.6
Oral	114	82.0	78.1
Vaginal	56	40.3	37.9
All of the Above	13	9.4	12.0
Refused to Answer	11	7.9	5.7
Condom Use During Last Sexual Contact with Regular Partner			
Yes	72	54.1	38.8
No	61	45.9	61.2
If not, what was the reason for not using a condom?			
Partner's refusal	2	3.3	1.0
I don't like condoms	5	8.3	13.8
Didn't consider it necessary	36	60.0	63.1
Didn't think about it	5	8.3	9.1
Other	11	18.3	10.2
Refused to answer	2	3.3	2.7
In general, how often did you and your regular partner(s) use condoms during sexual contact in the last 12 months?			
Always	40	30.1	27.9
Often	22	16.5	9.1
Sometimes	24	18.0	19.2
Never	42	21.0	41.9
No data	5	3.8	1.9

Table 6. Sexual History: Casual Partners

Characteristic	Total		
	SPSS		RDS
	N	%	%
Type of Sexual Contact with Casual Partners in Last 12 Months			
Anal	78	70.9	68.2
Oral	92	83.6	77.0
Vaginal	26	23.6	15.6
All of the Above	17	15.5	28.4
Refused to answer	1	0.9	0.4
Most Common Place to Meet Casual Partners in Last 12 Months			
Bar/Restaurant/Cafe	13	11.8	8.5
Club	17	15.5	5.9
Online Platforms	47	42.7	52.7
Social media	23	20.9	23.3
Street	10	9.1	9.7
Condom Use During Last Sexual Contact with Casual Partner			
Yes	79	71.8	75.5
No	28	25.5	19.6
Don't Konw/Don't Remember	1	0.9	2.4
Refused to answer	2	1.8	2.6
If not, what was the reason for not using a condom?			
Did not have one	3	10.7	9.4
I don't like condoms	1	3.6	4.6
Didn't consider it necessary	20	71.4	69.8
Didn't think about it	4	14.3	16.2

In general, how often did you and your casual partner(s) use condoms during sexual contact in the last 12 months?			
Always	58	52.7	46.1
Often	31	28.2	37.0
Sometimes	12	10.9	6.8
Never	9	8.2	10.1

Table 7. Sexual History: Commercial Partners

Characteristic	SPSS		RDS
	N	%	%
Type of Sexual Contact with Commercial Partners in Last 12 Months			
Anal	47	90.4	93.6
Oral	47	90.4	94.3
Vaginal	3	5.8	4.5
All of the Above	3	5.8	4.5
Refused to answer	1	1.9	0.6
Condom Use During Last Sexual Contact with Commercial Partner			
Yes	47	90.4	91.7
No	5	9.6	9.3
If not, what was the reason for not using a condom?			
Partner's refusal	1	20.0	29.9
I don't like condoms	1	20.0	19.7
Didn't consider it necessary	3	60.0	50.4
In general, how often did you and your commercial partner(s) use condoms during sexual contact in the last 12 months?			
Always	34	65.4	66.8
Often	15	28.8	26.1
Sometimes	1	1.9	1.2
Never	2	3.8	5.9

Table 8: Involvement in Commercial Sex (Sex Work)

Characteristic	Total		
	SPSS		RDS
	N	%	%
Do you engage in sexual contact in exchange for material compensation?			
Yes	52	26.0	18.9
No	148	74.0	81.1
In the last 12 months, approximately how often did you engage in sexual contact for material compensation?			
Every day	16	30.8	18.4
Several times a week	27	51.9	54.4
2-3 times a month	6	11.5	16.2
Once a month	2	3.8	7.5
Don't know	1	1.9	3.5
What type of material compensation do you usually receive for your services?			
Money	52	100	100
Food	4	7.7	12.1
How much do you receive for your services?			
≤ 50 GEL	1	1.9	0.4
51-100 GEL	14	26.9	22.7
Over 100 GEL	35	67.3	75.8
No data	2	3.8	1.1
What is your monthly income from this activity?			
201-300 GEL	4	7.7	10.3
301-500 GEL	10	19.2	22.9
501-1000 GEL	17	32.7	39.3
1001 GEL or more	20	38.5	24.0
Don't know	1	1.9	3.5

Do you have other sources of income besides commercial sex?			
Yes	15	28.8	33.0
No	37	71.2	67.0
In the last 12 months, how many clients did you have per workday?			
1-2	17	32.7	34.5
> 2	30	57.7	58.6
Don't know	3	5.8	4.3
Refused to answer	2	3.8	2.6
During the last sexual contact for material compensation, did you and your partner use a condom?			
Yes	49	94.2	92.9
No	3	5.8	7.1
If not, what was the reason for not using a condom?			
Partner's refusal	1	33.3	34.9
I don't like condoms	1	33.3	32.2
Didn't consider it necessary	1	33.3	32.9
In general, how often did you and your clients use condoms during sexual contact in the last 12 months?			
Always	31	59.6	63.1
Often	18	34.6	29.8
Sometimes	1	1.9	1.2
Never	2	3.8	5.9
How many regular clients do you have?			
No regular clients	3	5.7	4.5
1-3	12	23.1	24.5
>3	37	71.2	71.0
Did you use a condom during the last sexual contact with a regular client?			
Yes	41	85.4	88.5
No	7	14.6	11.5

If not, what was the reason for not using a condom?			
Didn't have one	2	28.6	31.1
I don't like condoms	1	14.3	24.3
Didn't consider it necessary	4	57.1	44.6
In general, how often did you and your regular clients use condoms during sexual contact in the last 12 months?			
Always	32	66.7	71.5
Often	13	27.1	24.3
Sometimes	2	4.2	1.4
Never	1	2.1	2.8

Table 9. Group Sex Practices

Characteristic	Total		
	SPSS		RDS
	N	%	%
Participation in Group Sex in Last 12 Months			
Yes	54	27.0	24.3
No	132	66.0	71.9
Refused to Answer	14	7.0	3.8
Group Composition			
Men Only	24	44.4	43.9
Women Only	3	5.6	4.2
Mixed	26	48.1	51.0
Refuse to answer	1	1.9	0.9
Use of condoms with all partners in last group sex:			
Yes	39	72.2	68.4
No	11	20.4	13.9
I don't know	1	1.9	13.5
No answer	3	5.6	4.2

Table 10: Condoms, Lubricants

Characteristic	Total		
	SPSS		RDS
	N	%	%
Where do you know you can obtain or buy condoms for free or at a low cost?			
Non-governmental organizations (NGOs)	159	79.5	82.4
Shop	50	25.0	37.6
Pharmacy	64	32.0	44.2
Clinic	3	1.5	2.0
Bar/Hotel	5	2.5	3.8
Friend	28	14.0	12.3
Don't know	10	5.0	7.1
In the last 12 months, have you received condoms and lubricants from social workers, health centers, or peer educators?			
Yes	143	71.5	73.9
No	51	25.5	23.7
Don't know/Refused to answer	6	3	2.4
In the last 12 months, have you had any problems finding condoms?			
Yes	7	3.5	4.3
No	193	96.5	95.7
Have you used lubricant during sexual contact in the last 12 months?			
Always	50	25.0	28.9
Often	50	25.0	19.8
Rarely	48	24.0	26.3
Never	48	24.0	24.3
Refused to answer	4	2.0	0.7

Table 11: Other Sexual Practices

Characteristic	Total		
	SPSS		RDS
	N	%	%
Do you use dildos/phallic imitators during sex?			
Yes, with a condom	46	23.0	17.1
Yes, without a condom	30	15.0	11.6
No	120	60.0	69.2
Refused to answer	4	2.0	2.1
Do you practice fingering during sex?			
Yes, with a condom	24	12.0	11.8
Yes, without a condom	68	34.0	29.4
No	103	51.5	56.6
Refused to answer	5	2.5	2.2
Do you practice fisting during sex?			
Yes, with a condom	10	5.0	1.5
Yes, without a condom	11	5.5	2.5
No	172	86.0	92.9
Refused to answer	7	3.5	3.1

Table 12: Sexually Transmitted Infections (STIs)

Characteristic	Total		
	SPSS		RDS
	N	%	%
Can you describe any external signs (symptoms) of these diseases?			
Discharge from genital or anus	94	47.0	54.7
Burning and pain during urination	103	51.5	54.4
Rash or sores on genital or anus	121	60.5	58.8
Swelling in the groin	22	11.0	4.3
Weakened immunity	8	4	3.8
Fatigue	21	10.5	4.7
Fever	14	7	6.8
Itching	12	6	7.4
Other	7	3.5	3.9
No answer	9	4.5	4.8
In the last 12 months, have you had genital discharge or rash/sores/pimples in the genital or anal area?			
Yes	44	22.0	13.7
No	156	78	86.3
Have you ever been tested for STIs?			
Yes	155	77.5	81.5
No	45	22.5	18.5
If yes, when was the last time you were tested for STIs?			
In the last 3 months	55	35.5	36.9
In the last 3-12 months	77	49.7	50.6
1-2 years ago	14	9.0	10.2
More than 2 years ago	7	4.5	1.9
Don't remember	2	1.3	0.4

Why did you get tested?			
For prevention	126	81.2	93.1
After noticing symptoms	20	12.9	6.1
At someone else's request	8	5.1	4.7
Due to rape	1	0.5	0.7
Pre-surgery, at doctor's request	4	2.0	2.2
As part of a study	4	2.0	2.2
Employer's request	2	1.0	1.3
No answer	2	1.2	1.4
If you didn't get tested, why not?			
Don't know where to get tested	4	8.9	2.4
Don't need it, I know I'm healthy	20	44.4	50.9
Never thought about it	16	35.6	26.8
It's too expensive	3	6.7	2.9
I'm embarrassed with medical staff	1	2.2	1.6
No answer	1	2.2	1.5
What did you do when you had genital (sex organ) or anal discharge, or sores/pimples?			
Self-medicated	1	2.5	2.5
Went to a traditional medicine practitioner	5	12.5	5.2
Went to a medical facility	35	87.5	94.7
Went to a pharmacy	18	45.0	47.0
Told my partner about STI symptoms	24	60.0	71.3
Did you stop sex when symptoms appeared?			
Yes	25	62.5	64.6
No	15	37.5	35.4
Did you use a condom during the symptomatic period?			
Yes	22	56.4	66.0
No	17	43.6	34.0

Table 13: Knowledge, Attitudes, and Practices Related to HIV/AIDS

Charachteristics	Total		
	SPSS		RDS
	N	%	%
Is it possible to reduce the risk of HIV transmission (which causes AIDS) by having one, faithful, non-infected sexual partner?			
Yes	182	91.0	91.7
No	14	7.0	7.0
I don't know	4	2.0	1.3
Is it possible to reduce the risk of HIV transmission by using a condom during every sexual encounter?			
Yes	192	96.0	93.6
No	5	2.5	6.2
I don't know	3	1.5	0.2
Is it possible for a person who looks healthy to have HIV, which causes AIDS?			
Yes	190	95.0	94.4
No	8	4.0	3.3
I don't know	2	1.0	2.3
Is it possible for a person to contract HIV from a mosquito bite?			
Yes	32	16.0	11.9
No	129	64.5	71.8
I don't know	39	19.5	16.3
Is it possible for a person to get HIV by sharing food with an infected person?			
Yes	29	14.5	9.8
No	158	79.0	81.9
I don't know	13	6.5	8.3
Is it possible for a person to get HIV if they use a needle/syringe used by someone else?			
Yes	197	98.5	97.8
No	3	1.5	2.2

Can an HIV-infected woman pass the infection to her baby during pregnancy or childbirth?			
Yes	146	73.0	68.8
No	19	9.5	9.2
I don't know	35	17.5	22.0
Can you get a free and confidential HIV test in your area (city) (meaning no one will know about the test or its results unless you choose to share)?			
Yes	155	77.5	83.9
No	22	11.0	9.9
I don't know	23	11.5	6.2
Have you ever been tested for HIV?			
Yes	148	74.0	79.3
No	52	26.0	20.7
When did you last get an HIV test?			
Last 3 months	39	26.4	27.4
3-12 months	41	27.7	34.1
1-2 years ago	61	41.2	35.8
More than 2 years ago	7	4.7	2.7
Please specify why you have not been tested for HIV in the last 12 months?			
I don't think it's necessary	35	51.4	59.0
I don't know where to get tested	4	5.8	5.5
I don’t have money	2	2.9	4.5
I never thought about it	6	8.8	8.4
Would you get tested for HIV if it were free?			
Yes	46	88.5	87.3
No	2	3.8	9.5
I don't know	2	3.8	1.6
Refused to answer	2	3.8	1.6

Why wouldn't you get tested for HIV?			
I don't think it's necessary	3	75.0	71.4
Refused answer	1	25.0	28.6
Do you know your HIV status?			
Yes	158	79.0	84.2
No	41	20.5	14.1
Refused to answer	1	0.5	1.6
Could you tell us your HIV status?			
Positive	14	8.9	2.8
Negative	144	91.1	97.2
Are you receiving HIV treatment?			
Yes	13	92.9	97.3
Refused to answer	1	7.1	2.7
Is your viral load detectable?			
Yes	10	71.4	85.1
No	4	28.6	14.9
How would you assess your individual risk for HIV infection?			
High risk	21	10.5	10.3
Medium risk	51	25.5	39.4
Low risk	93	46.5	32.6
No risk	29	14.5	16.6
No data	6	3.0	1.1
Have you heard of PrEP (Pre-Exposure Prophylaxis)?			
Yes	150	75.0	70.4
No	50	25.0	29.6
Have you used PrEP in the last 12 months?			
Yes	28	18.7	23.3
No	122	81.3	76.7

If yes, in what form have you been involved in PrEP?			
Stable involved in program	19	67.9	76.2
On demand in program	2	7.1	12.0
Self-administered	2	7.1	2.6
Other	2	7.1	8.0
Refused to answer	3	10.7	1.2
Have you heard of PEP?			
Yes	116	58.0	55.3
No	84	42.0	44.7
If yes, where from?			
Organization	89	76.2	75.4
Internet	13	11.2	10.3
Friends	13	11.2	12.2
Other	8	6.8	2.1
Have you received PEP in the last 12 months?			
Yes	11	9.5	3.7
No, I didn't need it	105	90.5	96.3
In the last 3 months, have you received any of the following products/information for free in Georgia?			
Brochure/Leaflet/Pamphlet about HIV/AIDS	84	42.0	34.6
Educational information about HIV/AIDS	84	42.0	35.1
Condoms and lubricants	120	60.0	48.5
Syringes/Needles/Butterfly/Spirits Tampons	10	5.0	1.3
Other	198	98.0	97.6
Financial assistance	2	1.0	1.3
Medicine	2	1.0	1.3

In the last 12 months, have you received any of the following products/information for free in Georgia?			
Brochure/Leaflet/Pamphlet about HIV/AIDS	102	51.0	58.7
Educational information about HIV/AIDS	101	50.5	54.8
Condoms and lubricants	148	74.0	77.3
Syringes/Needles/Butterfly/Spirits Tampons	8	4.0	1.0
How would you assess your individual risk of contracting HIV?			
High risk	21	10.5	10.3
Medium risk	51	25.5	39.4
Low risk	93	46.5	32.6
No risk	29	14.5	16.6
Refused to answer	6	3.0	1.1

Table 14: Knowledge, Attitudes, and Practices Related to Hepatitis B and C

Characteristic	Total		
	SPSS		RDS
	N	%	%
Have you ever been tested for Hepatitis C?			
Yes	137	68.5	75.5
No	61	30.5	22.8
I don't remember	2	1.0	1.7
If yes, what was the result?			
Primary positive, second negative	1	0.7	2.2
Both tests positive	4	2.9	0.3
Negative	131	95.6	97.4
I don't remember	1	0.7	0.1

If yes, when did you last get tested?			
Last 3 months	48	35.0	32.0
3-12 months	53	38.7	48.4
1-2 years ago	23	16.8	14.0
More than 2 years ago	13	9.5	5.6
Did you undergo treatment?			
Yes, completed the treatment course	4	100	100
No	0	0.0	0.0
Have you heard of hepatitis C elimination programs?			
Yes	122	61.0	69.0
No	75	37.5	30.0
I don't know	3	1.5	1.0
Is Hepatitis C diagnosis and treatment free in Georgia?			
Yes, fully	114	57.0	55.2
Yes, partially	32	16.0	22.7
No	16	8.0	8.9
I don't know	38	19.0	13.2
If you had Hepatitis C, would you undergo treatment through the elimination program?			
Yes	187	93.5	96.2
No	2	1.0	0.3
I don't know	11	5.5	3.5
Is there a vaccine for hepatitis C?			
Yes	47	23.5	16.2
No	60	30.0	46.0
I don't know	93	46.5	37.7

How is the hepatitis C virus transmitted?			
Through food and water	16	8.0	4.7
By handshake	7	3.5	3.2
Unprotected sex	158	79.0	82.8
Blood transfusion	158	79.0	84.1
Airborne	6	3.0	2.3
Medical/dental services	121	60.5	71.4
Using used needles/syringes	152	76.0	78.0
From mother to child during pregnancy	59	29.5	24.4
From mother to child during childbirth	65	32.5	25.6
Sharing personal hygiene products	96	48.0	46.5
I don't know	25	12.5	7.7
How is the Hepatitis B virus transmitted?			
Through food and water	15	7.5	3.1
By handshake	7	3.5	4.3
Unprotected sex	147	73.5	78.9
Blood transfusion	146	73.0	81.4
Airborne	11	5.5	6.3
Medical/dental services	115	57.5	70.0
Using used needles/syringes	135	67.5	73.2
From mother to child during pregnancy	55	27.5	23.1
From mother to child during childbirth	60	30.0	21.1
Sharing personal hygiene products	79	39.5	39.4
I don't know	36	18.0	11.6
Have you ever been tested for Hepatitis B?			
Yes	119	59.5	70.9
No	75	37.5	29.5
I don't know/I don't remember	6	3.0	0.6

If yes, when did you last get tested for Hepatitis B?			
Last 3 months	48	40.3	37.8
3-12 months	53	44.5	46.3
1-2 years ago	14	11.8	13.4
More than 2 years ago	3	2.5	2.5
If yes, what was the result?			
Negative	113	95.0	96.6
Positive, active infection	2	1.7	3.1
Positive, previously treated infection	2	1.7	0.2
I don't remember	2	1.7	0.2
Are you currently undergoing antiviral treatment for Hepatitis B?			
No	2	50.0	94.3
Refuse to answer	2	50.0	5.7
Are there antiviral medications for the treatment of Hepatitis B?			
Yes	96	48.0	44.0
No	28	14.0	12.3
I don't know	76	38	43.7
Is there a vaccine for Hepatitis B?			
Yes	104	52.0	60.8
No	21	10.5	13.1
I don't know	75	37.5	26.1
Are you vaccinated for Hepatitis B?			
Yes	42	21.0	33.0
No	111	55.5	45.8
I don't know	47	23.5	21.2
If offered Hepatitis B vaccination, would you get vaccinated?			
Yes	124	78.5	79.3
No	18	11.4	11.4
I don't know	16	10.1	9.3

If yes, where would you like to get vaccinated for Hepatitis B?			
At a medical facility	80	56.7	64.4
At a community organization	39	27.7	22.6
Anywhere	22	15.6	13.0
If not vaccinated, why?			
I didn't know the vaccine existed	62	56.3	54.4
I didn't think it was necessary	25	22.7	23.4
I had no interest	7	6.3	6.5
Other	16	14.5	15.7

Table 15: Stigma and Discrimination

Characteristic	SPSS		
	N	%	
In the past 12 months, has there been a case when you were denied any of the following because you are a transgender person?			
Medical services	19	9.5	9.5
Employment	52	26.0	22.8
Renting a house or being evicted	32	16.0	15.3
Police assistance	19	9.5	5.2
In the past 6 months, has there been a case when you were denied any of the following because you are a transgender person?			
Medical services	10	5.0	5.7
Employment	20	10.0	8.2
Renting a house or being evicted	15	7.5	8.7
Police assistance	8	4.0	2.7
Have you ever avoided medical services in the past 12 months?			
Yes	87	43.5	40.8
No	110	55.0	55.0
I don't remember	1	0.5	3.3
Refused to answer	2	1.0	0.9

Do you have support from your family members/friends/colleagues regarding your gender identity?			
Yes	71	35.5	22.0
Partially	103	51.5	59.1
No	23	11.5	15.4
I don't know/Refused to answer	3	1.5	3.5
How often do you dress or express yourself according to the gender you identify with?			
Always	90	45.0	35.1
Often	54	27.0	18.0
Sometimes	41	20.5	29.9
Rarely	13	6.5	16.8
Refused to answer	2	1.0	0.2
If you have been in prison, do you think this was related to your gender identity?			
Yes	15	7.5	4.7
No	177	88.5	91.9
I don't know	1	0.5	0.5
Refused to answer	7	3.5	3.0
Have you been a victim of verbal violence in the past 12 months?			
Yes	78	39.0	22.0
No	122	61.0	78.0

If yes, from whom?			
Stranger	41	51.6	54.4
Partner	4	5.1	4.7
Family	9	11.5	10.4
Client	4	5.1	5.4
Close relative	9	11.5	7.8
Shelter resident	4	5.1	2.3
Have you been a victim of physical violence in the past 12 months?			
Yes	49	24.5	15.6
No	151	75.5	84.4
If yes, from whom?			
Client	6	12.2	13.3
Family	7	14.2	9.8
Stranger	25	51.0	55.6
Friends/Neighbors	4	8.1	8.7
Ex/Partner	4	8.1	8.7
Other	2	4.0	4.2
Have you been a victim of psychological violence in the past 12 months?			
Yes	63	31.5	27.2
No	137	68.5	72.8
If yes, from whom?			
Client	5	7.9	6.8
Family	8	12.6	11.4
Stranger	21	33.3	35.6
Friends/Neighbors/Close relative	16	25.4	27.6
Ex/Partner	3	4.7	4.2
Other	5	7.9	7.2

Have you been a victim of sexual violence in the past 12 months?			
Yes	22	11.0	4.6
No	178	89.0	95.4
If yes, from whom?			
Client	3	13.6	11.4
Stranger	16	72.7	75.5
Ex-Spouse	1	4.5	3.2
Partner	2	9.0	4.2
How many times have you been a victim of violence?			
1	13	11.6	10.4
2	3	2.6	2.7
3-10	52	46.4	45.2
>10	40	35.7	41.7
Did you report the incident to the police?			
Yes	28	23.1	19.2
No	93	76.9	80.8
If not, why?			
It doesn't make any sense	48	43.0	50.5
Embarrassed to disclose I'm transgender	8	8.6	3.3
Other	31	33.3	42.2
Have you been hit or physically abused by a parent or other adult guardian in your childhood?			
Yes	118	59.0	60.1
No	82	41.0	39.9
Have you been a victim of sexual violence (or attempted sexual violence) in your childhood?			
Yes	83	41.5	32.1
No	117	58.5	67.9

Have you undergone any surgical or cosmetic procedures to change your appearance?			
Yes	22	11.0	7.6
No	178	89.0	92.4
Do you plan to undergo a trans-masculine/trans-feminine gender confirmation surgery?			
Yes	70	35.0	23.5
No	42	21.0	26.7
Not decided yet	70	35.0	37.5
Already done	1	0.5	0.1
No desire	3	1.5	5.4
Health problems prevent me	2	1.0	0.1
I don't have enough money	10	5.0	5.5
It's not available in Georgia and I can't afford it abroad	1	0.5	0.3
Refused to answer	1	0.5	0.7
Which source do you get information about gender transition from?			
Internet communication	132	66.0	74.0
Special websites	50	25.0	21.8
Communication with trans people/friends	115	57.5	49.5
Medical institutions/doctors	24	12.0	3.7
Public health centers	10	5.0	7.1
NGOs (psychologists, social workers)	104	52.0	52.2
Have you taken hormones or any other substances to change your appearance/voice in the last 12 months?			
Yes	54	27.0	29.5
No	146	73.0	70.5
Which methods have you used to take hormones or other substances in the last 12 months?			
Tablets	33	61.1	72.6
Injections	21	38.9	27.4

Whose advice did you follow for taking injectable hormones or other substances?			
Self-administered	7	17.9	14.6
Doctor's advice	24	61.5	70.7
Advice from friends/relatives/other trans people	8	20.5	14.7
How much has hormone therapy cost you in the last 12 months?			
Sponsored	6	12.8	13.4
<=1000 GEL	9	19.1	18.7
>1000 GEL	32	68.1	67.9
In the last 12 months, have you shared needles or syringes while taking injectable hormones or other substances?			
Yes	0	0.0	0.0
No	21	100	100
Where did you hear information about STDs/AIDS?			
TV/Radio	39	19.5	19.4
Friends	88	44.0	47.8
Clients	3	1.5	0.6
Family	33	16.5	29.5
Internet	82	41.0	30.4
Community/NGOs	119	59.5	44.6
Medical institution	17	8.5	8.2
Which source of information is most reliable to you?			
TV/Radio	10	5.0	9.9
Internet	92	46.0	55.8
Special brochures	55	27.5	48.3
Friends, relatives	29	14.5	15.0
Other trans people	51	25.5	22.2
NGO representatives	124	62.0	57.8

Which online dating sites/mobile apps do you use to find a sexual partner?			
Grinder	62	31.0	33.0
Tinder	62	31.0	32.5
Instagram	30	15.0	16.3
Facebook	22	11.0	11.8
Odnoklassniki	16	8.0	7.6
Xgeorgia	15	7.5	8.8
Bumble	11	5.5	7.5
Hornet	7	3.5	4.5
Escort	5	2.5	3.5
Other	25	12.5	14.5
How many profiles do you have on the listed dating sites/mobile apps?			
1	38	31.3	28.8
1-1	65	53.7	52.2
2	9	7.4	6.5
3	4	3.3	4.5
4	2	1.7	1.8
5	2	1.7	1.8
6	1	0.9	1.5
Have you received services from the "Health Cabinet" in the last 6 months?			
Yes	39	19.5	15.9
No	158	79.0	83.8
I don't know	1	0.5	0.1
Refused to answer	2	1.0	0.2

Table 16. HIV, Hepatitis and Syphilis prevalence by age groups

Characteristic	Age				*P* value
	<25		≥25		
	N	%	N	%	
Anti-HIV					
Positive	2	1.7	14	16.7	<0.001
Negative	114	98.3	70	83.3	
RPR					
Positive	5	4.3	6	7.1	0.53
Negative	111	95.7	78	92.9	
Anti-HCV					
Positive	0	0.0	5	6.0	<0.01
Negative	116	100	79	94.0	
Anti-HBc					
Positive	3	6.0	4	11.1	0.44
Negative	47	94.0	32	88.9	
HBsAg					
Positive	0	0.0	1	1.9	0.41
Negative	72	100	51	98.1	

Table 17. Sexual history by age group

What is your gender identity?					
Trans woman	107	71.3	36	72.0	1.00
Trans man	43	28.7	14	28.0	
What is your gender identity?					
Trans woman	77	66.4	66	78.6	0.08
Trans man	39	33.6	18	21.4	
With partners of which sex have you had sexual contact?					

Male	52	48.1	33	39.8	0.50
Female	21	19.4	18	21.7	
Both	35	32.4	32	38.6	
In general, what kind of sexual partner are you?					
Receptive	40	38.5	19	23.8	<0.001
Insertive	5	4.8	14	17.5	
Receptive and insertive	59	56.7	47	58.8	
Have you had anal sexual contact in the last 12 months?					
Yes	66	56.9	49	58.3	0.88
No	50	43.1	35	41.7	
Number of commercial partners in the last 12 months					
0	90	78.9	55	66.3	<0.05
1-5	4	3.5	1	1.2	
>5	20	17.5	27	32.5	
Did you and your partner use a condom?					
Yes	63	58.3	56	67.5	0.22
No	45	41.7	27	32.5	
How often do you and your partners use condoms during sexual contact?					
Always	49	44.5	36	43.4	0.47
Often	18	16.4	20	24.1	
Sometimes	18	16.4	9	10.8	
Never	25	22.7	18	21.7	
How often do you and your regular partner (partners) use condoms during sexual contact?					
Always/Often	33	45.2	29	52.7	0.47
Sometimes/Never	40	54.8	26	47.3	
How often do you and your casual partners use condoms durign sexual contact?					

Always/Often	50	79.4	39	83.0	0.80
Sometimes/Never	13	20.6	8	17.0	
How often do you and your commercial partners use condoms during sexual contact?					
Always	13	54.2	21	75.0	0.10
Often/Sometimes/Never	11	45.8	7	25.0	
Have social workers, health centers, or peer educators provided you with condoms or lubricants?					
Yes	77	68.1	66	81.5	<0.05
No	36	31.9	15	18.5	
Have you used lubricants during sexual contact in the past 12 months?					
Always/Often	53	46.9	47	56.6	0.19
Sometimes/Never	60	53.1	36	43.4	

Table 18. Knowledge, attitude, and practices regarding different infectious diseases by age group

Have you ever been tested for STIs?					
Yes	83	74.1	72	87.8	<0.05
No	29	25.9	10	12.2	
If yes, when was the last time you were tested on STIs?					
During the last 3 months	28	34.1	27	38.0	0.68
During the last 3-12 months	41	50.0	36	50.7	
>1 year ago	13	15.9	8	11.3	
Is free and confidential HIV testing available in your area (city)?					
Yes	87	75.0	68	81.0	0.39
No/Don't know	29	25.0	16	19.0	
Do you know your HIV status?					
Yes	85	73.9	73	86.9	<0.05

No	30	26.1	11	13.1	
You may not tell me, but what was your HIV status?					
Positive	3	3.5	11	15.1	<0.05
Negative	82	96.5	62	84.9	
Have you heard about PrEP?					
Yes	81	69.8	69	82.1	<0.05
No	35	30.2	15	17.9	
Have you received PreP during the last 12 months?					
Yes	15	18.5	13	18.8	0.10
No	66	81.5	56	81.2	
Have you heard about PEP?					
Yes	69	59.5	47	56.0	0.66
No	47	40.5	37	44.0	
Have you received PEP during the last 12 months?					
Yes	7	10.1	4	8.5	0.10
No/Did not need	62	89.9	43	91.5	
Have you received the following products and/or information for free in Georgia during the last 3 months? Condom and lubricant					
Yes	66	57.4	54	65.9	0.24
No	49	42.6	28	34.1	
Have you ever been tested for HCV					
Yes	71	61.7	66	79.5	<0.01
No	44	38.3	17	20.5	
Have you ever heard about HCV elimination program?					
Yes	64	55.2	58	69.0	0.56
No	52	44.8	26	31.0	
Do HBV antiviral medications exist?					

Yes	51	44.0	45	53.6	0.19
No/Don't know	65	56.0	39	46.4	
Does HBV vaccine exist?					
Yes	57	49.1	47	56.0	0.39
No/Don't know	59	50.9	37	44.0	
Are you vaccinated against HBV?					
Yes	22	19.0	20	23.8	0.71
No	66	56.9	45	53.6	
Don't know	28	24.1	19	22.6	

Table 19. Stigma and discrimination by age group

During the last 6 months have you been denied medical services, or employement, or renting an apartment, or help from police because you are a transgender person?					
Yes	20	17.2	11	13.1	0.55
No	96	82.8	73	86.9	
During the last 12 months, have you been a victim of violence?					
Yes	65	56.0	47	56.0	1.00
No	51	44.0	44	44.0	
During the last 12 months, have you been a victim of verbal abuse?					
Yes	50	43.1	28	33.3	0.18
No	66	56.9	56	66.7	
During the last 12 months, have you been a victim of physical violence?					
Yes	24	20.7	25	29.8	0.18
No	92	79.3	59	70.2	
During the last 12 months, have you been a victim of psychological abuse?					
Yes	37	31.9	26	31.0	0.10

No	79	68.1	58	69.0	
During the last 12 months, have you been a victim of sexual abuse?					
Yes	13	11.2	9	10.7	0.10
No	103	88.8	75	89.3	
(Among those who were victims of violence) Did you notify police about this incident?					
Yes	13	18.3	15	30.0	0.18
No	58	81.7	35	70.0	
Have you been a victim of sexual abuse (attempt) during childhood?					
Yes	50	43.1	33	39.3	0.66
No	66	56.9	51	60.7	
Have you undergone surgical or cosmetic procedures to change your appearance?					
Yes	8	6.9	14	16.7	<0.05
No	108	93.1	70	83.3	
Have you received service in a “health cabinet” during the last 6 months?					
Yes	17	14.8	22	26.8	<0.05
No	98	85.2	60	73.2	
Do you have sex for material benefit?					
Yes	24	20.7	28	33.3	0.05
No	92	79.3	56	66.7	
Do you have support from your family members, friends, or colleagues regarding your gender identity?					
Yes	37	32.5	34	41.0	0.23
Partially/No	77	67.5	49	59.0	
Do you plan to undergo masculinizing or feminizing gender-affirming surgery?					
Yes	44	40.4	26	35.6	0.33
No	21	19.3	21	28.8	

Have not decided yet	44	40.4	26	35.6	

Table 20. HIV, Hepatitis and Syphilis prevalence by study regions

Characteristic	Place of residence				*P* value
	Tbilisi		Batumi		
	N	%	N	%	
Anti-HIV					
Positive	14	9.3	2	4.0	0.36
Negative	136	90.7	48	96.0	
RPR					
Positive	9	6.0	2	4.0	0.73
Negative	141	94.0	48	96.0	
Anti-HCV					
Positive	3	2.0	2	4.0	0.60
Negative	147	98.0	48	96.0	
Anti-HBc					
Positive	7	4.7	0	0.0	0.12
Negative	65	43.3	14	36.8	
No data	78	52.0	24	63.2	
HBsAg					
Positive	1	1.1	0	0.0	0.10
Negative	87	98.9	36	100	

Table 21. Socio-demographic characteristics by place of residence

Do you have stable housing?					
Yes	99	66.0	36	72.0	0.48
No, I rent/Live with someone else	51	34.0	14	28.0	
What is your average monthly income?					
<700	42	30.0	20	40.8	0.21
>700	98	70.0	29	59.2	

Table 22. Sexual practice by study regions

In general, what kind of sexual partner are you?					
Receptive	47	34.3	12	25.5	0.40
Insertive	15	10.9	4	8.5	
Receptive and insertive	75	54.7	31	66.0	
How many regular partners have you had in the last 12 months?					
0	42	28.4	19	38.0	0.01
1	58	39.2	17	34.0	
2-3	30	20.3	14	28.0	
>3	18	12.2	0	0.0	
How many casual partners have you had in the last 12 months?					
0	70	46.7	22	44.0	0.53
1	10	6.7	1	2.0	
2-3	24	16.0	8	16.0	
>3	46	30.7	19	38.0	
How many commercial partners have you had in the last 12 months?					
0	111	74.0	34	72.3	0.93
1-5	4	2.7	1	2.1	

>5	35	23.3	12	25.5	
How old were you when you first had sexual contact?					
0-10	5	3.5	3	6.0	0.21
11-13	13	9.0	4	8.0	
14-17	83	57.6	35	70.0	
>=18	43	29.9	8	16.0	
Did you and your partner use a condom during the last sexual contact?					
Yes	63	58.3	56	67.5	0.22
No	45	41.7	27	32.5	
Have you had sexual contact abroad during last year?					
Yes	34	22.7	13	26.0	0.12
No	109	72.7	37	74.0	
Refused to answer	7	4.7	0	0.0	
How often do you and your regular partner (partners) use condoms during sexual contact?					
Always/Often	52	52.5	10	34.5	0.09
Sometimes/Never	47	47.5	19	65.5	
How often do you and your casual partners use condoms during sexual contact?					
Always/Often	63	76.8	26	92.9	0.09
Sometimes/Never	19	23.2	2	7.1	
How often do you and your comercial partners use condoms during sexual contact?					
Always	25	64.1	9	69.2	0.10
Often/Sometimes/Never	14	35.9	4	30.8	
How often do you and your clients use condoms during sexual contact?					
Always	22	56.4	9	69.2	0.52
Other	17	43.6	4	30.8	

Have social workers, health centers, or peer educators provided you with condoms or lubricants?					
Yes	99	68.3	44	89.8	<0.01
No	46	31.7	5	10.2	

Table 23. Knowledge, attitude, and practices regarding different infectious diseases by study regions

Have you ever been tested for STIs?					
Yes	110	75.9	45	91.8	<0.05
No	35	24.1	4	8.2	
Is free and confidential HIV testing available in your area (city)?					
Yes	109	72.7	46	92.0	<0.01
No/Don't know	41	27.3	4	8.0	
Have you ever been tested for HIV infection?					
Yes	104	69.3	44	88.0	<0.01
No	46	30.7	6	12.0	
When was the last time you got tested for HIV?					
During the last <=12 months	41	51.2	39	57.4	0.51
>12 months ago	39	48.8	29	42.6	
Do you know your HIV status?					
Yes	115	76.7	43	87.8	0.10
No	35	23.3	6	12.2	
You may not tell me, but what was your HIV status?					
Positive	12	10.4	2	4.7	0.35
Negative	103	89.6	41	95.3	
Have you heard about PrEP?					
Yes	111	74.0	39	78.0	0.70
No	39	26.0	11	22.0	
Have you received PrEP during the last 12 months?					
Yes	19	17.1	9	23.1	0.47
No	92	82.9	30	76.9	
Have you heard about PEP?					
Yes	86	57.3	30	60.0	0.86

No	64	42.7	20	40.0	
Have you received PEP during the last 12 months?					
Yes	10	11.6	1	3.3	0.28
No/Did not need	76	88.4	29	96.7	
Have you received the following products and/or information for free in Georgia during the last 3 months? Brochure/leaflet/booklet regarding HIV/AIDS					
Yes	62	41.9	22	44.9	0.74
No	86	58.1	27	55.1	
Have you received the following products and/or information for free in Georgia during the last 3 months? Educational information regarding HIV/AIDS					
Yes	62	41.9	22	44.9	0.74
No	86	58.1	27	55.1	
Have you received the following products and/or information for free in Georgia during the last 3 months? Condom and lubricant					
Yes	89	60.1	31	63.3	0.73
No	59	39.9	18	36.7	
Have you received the following products and/or information for free in Georgia during the last 3 months? Syringe/needle/butterfly needle/spoon/alcohol pad					
Yes	10	6.8	0	0.0	0.07
No	138	93.2	49	100	
Have you received the following products and/or information for free in Georgia during the last 12 months? Brochure/leaflet/booklet regarding HIV/AIDS					
Yes	66	44.0	36	72.0	<0.01
No	84	56.0	14	28.0	

Have you received the following products and/or information for free in Georgia during the last 12 months? Educational information regarding HIV/AIDS					
Yes	68	45.3	33	66.0	<0.05
No	82	54.7	17	34.0	
Have you received the following products and/or information for free in Georgia during the last 12 months? Condom and lubricant					
Yes	103	68.7	45	90.0	<0.01
No	47	31.3	5	10.0	
Have you received the following products and/or information for free in Georgia during the last 12 months? Syringe/needle/butterfly needle/spoon/alcohol pad					
Yes	10	6.7	0	0.0	0.06
No	140	93.3	50	100	
Have you ever been tested for HCV					
Yes	98	66.2	39	78.0	0.15
No	50	33.8	11	22.0	
Have you ever heard about HCV elimination program?					
Yes	82	54.7	40	80.0	<0.001
No	68	45.3	10	20.0	
Do you think that the diagnosis and treatment of hepatitis C is free in Georgia?					
Yes	85	56.7	29	58.0	<0.10
Other	65	43.3	21	42.0	
Have you ever been tested for HBV?					
Yes	78	52.0	41	82.0	<0.001
No	72	48.0	9	18.0	
When was the last time you were tested for HBV?					
During the last 3 months	34	43.6	14	34.1	<0.20

During the last 3-12 months	32	41.0	21	51.2	
During the last 1-2 years	9	11.5	5	12.2	
More than 2 years ago	3	3.8	0	0.0	
Don't know	0	0.0	1	2.4	
Does HBV vaccine exist?					
Yes	69	46.0	35	70.0	<0.01
No/Don't know	81	54.0	15	30.0	
Are you vaccinated against HBV?					
Yes	22	14.7	20	40.0	<0.001
No	91	60.7	20	40.0	
Don't know	37	24.7	10	20.0	

Table 24. Stigma and discrimination by study regions

During the last 12 months, has there been any instance where you were denied medical services because you are a transgender person?					
Yes	15	10.0	4	8.0	0.78
No	135	90.0	46	92.0	
During the last 12 months, has there been any instance where you were denied employment because you are a transgender person?					
Yes	44	29.3	8	16.3	0.05
No	106	70.7	41	83.7	
During the last 12 months, has there been any instance where you were denied renting an apartment or were evicted because you are a transgender person					
Yes	26	17.3	6	12.0	0.48
No	123	82.0	44	88.0	
During the last 6 months, has there been any instance where you were denied medical services because you are a transgender person?					
Yes	7	29.2	3	60.0	0.30

No	17	70.8	2	40.0	
During the last 6 months, has there been any instance where you were denied employment because you are a transgender person?					
Yes	17	34.0	3	33.3	0.84
No	32	64.0	6	66.7	
Refused to answer	1	2.0	0	0.0	
During the last 6 months, has there been any instance where you were denied renting an apartment or were evicted because you are a transgender person					
Yes	13	39.4	2	25.0	<0.56
No	19	57.6	6	75.0	
Refused to answer	1	3.0	0	0.0	
Have you ever avoided medical services in the last 12 months?					
Yes	64	43.0	23	47.9	0.61
No	85	57.0	25	52.1	
How often do you dress/express yourself according to the gender you identify with?					
Always	71	48.0	19	38.0	<0.05
Often	44	29.7	10	20.0	
Sometimes	28	18.9	13	26.0	
Rarely	5	3.4	8	16.0	
During the last 12 months, have you been a victim of verbal abuse?					
Yes	67	44.7	11	22.0	<0.01
No	83	55.3	39	78.0	
During the last 12 months, have you been a victim of physical violence?					
Yes	43	28.7	6	12.0	<0.05
No	107	71.3	44	88.0	
During the last 12 months, have you been a victim of psychological abuse?					

Yes	55	36.7	8	16.0	<0.01
No	95	63.3	42	84.0	
During the last 12 months, have you been a victim of sexual abuse?					
Yes	21	14.0	1	2.0	<0.05
No	129	86.0	49	98.0	
Did you notify police about this incident?					
Yes	23	23.0	5	23.8	<1.00
No	77	77.0	16	76.2	
As a child, were you ever hit or physically abused by a parent or another adult guardian?					
Yes	86	57.3	32	64.0	0.50
No	64	42.7	18	36.0	
Were you ever a victim of sexual abuse (or an attempt) during childhood?					
Yes	71	47.3	12	24.0	<0.01
No	79	52.7	38	76.0	

Table 25. Other gender related characteristics by study regions

Have you undergone surgical or cosmetic procedures to change your appearance?					
Yes	17	11.3	5	10.0	0.10
No	133	88.7	45	90.0	
Have you taken hormones or any other substances to change your appearance/voice?					
Yes	37	24.7	17	34.0	0.34
No	112	74.7	33	66.0	
Refused to answer	1	0.7	0	0.0	
Have you received service in a “health cabinet” during the last 6 months?					
Yes	27	18.0	12	24.0	0.48
No	120	80.0	38	76.0	

Don't know	1	0.7	0	0.0	
Refused to answer	2	1.3	0	0.0	
Which place or person do you know where you can purchase/obtain condoms? Shop					
Yes	23	15.6	27	54.0	<0.001
No	124	84.4	23	46.0	
Which place or person do you know where you can purchase/obtain condoms? Pharmacy					
Yes	31	21.1	33	66.0	<0.001
No	116	18.9	17	34.0	
Which place or person do you know where you can purchase/obtain condoms? Non-governmental organization					
Yes	113	76.9	46	92.0	<0.05
No	34	23.1	4	8.0	
Do you have support from your family members, friends, or colleagues regarding your gender identity?					
Yes	62	41.6	9	18.8	<0.01
No/Partially	87	58.4	39	81.3	

Table 26. HIV, Hepatitis and Syphilis prevalence by age groups

Characteristic	Gender identity				*P* value
	Trans woman		Trans man		
	N	%	N	%	
Anti-HIV					
Positive	16	11.2	0	0.0	<0.01
Negative	127	88.8	57	100	
RPR					
Positive	8	5.6	3	5.3	1.00
Negative	135	94.4	54	94.7	

Anti-HCV					
Positive	4	2.8	1	1.8	1.00
Negative	139	97.2	56	98.2	
Anti-HBc					
Positive	6	4.5	1	1.9	<0.01
Negative	67	50.0	12	22.2	
N/A	61	45.5	41	75.9	
HBsAg					
Positive	1	1.3	0	0.0	1.00
Negative	77	98.7	46	100	

Table 27. Socio-demographic characteristics by age group

Characteristic	Gender identity				P value
	Trans woman		Trans man		
	N	%	N	%	
Place of interview					
Tbilisi	107	74.8	43	75.4	1.00
Batumi	36	25.2	14	24.6	
Age					
<25	77	53.8	39	68.4	0.08
≥25	66	46.2	18	31.6	
Do you have stable housing?					
Yes	89	62.2	46	80.7	<0.05
No, I rent/Live with someone else	54	37.8	11	19.3	
Employment status:					
Yes, stable	58	43.0	29	50.9	0.54
Yes, occasional	29	21.5	12	21.1	
No	48	35.6	16	28.1	

Table 28. Sexual practice by gender identity

Characteristic	Gender identity				P value
	Trans woman		Trans man		
	N	%	N	%	
With partners of which sex have you had sexual contact?					
Male	78	56.9	7	13.0	<0.01
Female	19	13.9	20	37.0	
Both	40	29.2	27	50.0	
In general, what kind of sexual partner are you?					
Receptive	50	37.6	9	17.6	<0.01
Insertive	8	6.0	11	21.6	
Receptive and insertive	75	56.4	31	60.8	

How often do you and your partners use condoms during sexual contact?					
Always	67	48.6	18	32.7	<0.01
Often	31	22.5	7	12.7	
Sometimes	17	12.3	10	18.2	
Never	23	16.7	20	36.4	
Have you had sex in Georgia with foreigner within the last 12 months?					
Yes	80	58.0	22	40.0	<0.05
No	58	42.0	33	60.0	
Did you and your regular partner use condom?					
Yes	58	62.4	14	35.0	<0.01
No	35	37.6	26	65.0	
How often do you and your regular partner (partners) use condoms during sexual contact?					
Always/Often	50	55.6	12	31.6	<0.05
Sometimes/Never	40	44.4	26	68.4	
How often do you and your casual partners use condoms during sexual contact?					
Always/Often	70	85.4	19	67.9	0.05
Sometimes/Never	12	14.6	9	32.1	

Table 29. Knowledge, attitude, and practices regarding different infectious diseases by study regions

Characteristics	Gender identity				*P* value
	Trans woman		Trans man		
	N	%	N	%	
Have you ever had discharge or rash/ulcer/pimple in the genital or anal area					
Yes	32	22.4	12	21.1	1.00
No	111	77.6	45	78.9	
Have you ever been tested for STIs?					
Yes	115	82.7	40	72.7	0.16

No	24	17.3	15	27.3	
Is free and confidential HIV testing available in your area (city)?					
Yes	105	73.4	50	87.7	<0.05
No/Don't know	38	26.6	7	12.3	
Have you ever been tested for HIV?					
Yes	113	79.0	35	61.4	<0.05
No	30	21.0	22	38.6	
Do you know your HIV status?					
Yes	118	83.1	40	70.2	0.05
No	24	16.9	17	29.8	
Have you heard about PrEP?					
Yes	113	79.0	37	64.9	<0.05
No	30	21.0	20	35.1	
Have you heard about PEP?					
Yes	86	60.1	30	52.6	0.34
No	57	39.9	27	47.4	
Have you received the following products and/or information for free in Georgia during the last 3 months? Brochure/leaflet/booklet regarding HIV/AIDS					
Yes	58	41.4	26	45.6	0.63
No	82	58.6	31	54.4	
Have you received the following products and/or information for free in Georgia during the last 3 months? Educational information regarding HIV/AIDS					
Yes	57	40.7	27	47.4	0.42
No	83	59.3	30	52.6%	
Have you received the following products and/or information for free in Georgia during the last 3 months? Condom and lubricant					
Yes	93	66.4	27	47.4	<0.05
No	47	33.6	30	52.6	

Have you received the following products and/or information for free in Georgia during the last 12 months? Brochure/leaflet/booklet regarding HIV/AIDS					
Yes	69	48.3	33	32.4	0.27
No	74	51.7	24	42.1	
Have you received the following products and/or information for free in Georgia during the last 12 months? Educational information regarding HIV/AIDS					
Yes	69	48.3	32	56.1	0.34
No	74	51.7	25	43.9	
Have you received the following products and/or information for free in Georgia during the last 12 months? Condom and lubricant					
Yes	111	77.6	37	64.9	0.07
No	32	22.4	20	35.1	
Have you received the following products and/or information for free in Georgia during the last 12 months? Syringe/needle/butterfly needle/spoon/alcohol pad					
Yes	8	5.6	2	3.5	0.72
No	135	94.4	55	96.5	
How would you assess your individual risk of HIV infection?					
High risk	17	11.9	4	7.0	0.12
Moderate risk	39	27.3	12	21.1	
Low risk	59	41.3	34	59.6	
No risk	22	15.4	7	12.3	
Have you ever been tested for HCV					
Yes	100	70.4	37	66.1	0.60
No	42	29.6	19	33.9	
Have you ever heard about HCV elimination program?					
Yes	84	58.7	38	66.7	0.33
No	59	41.3	19	33.3	
Do you think that the diagnosis and treatment of hepatitis C is free in Georgia?					

Yes	85	59.4	29	50.9	0.27
No	58	40.6	28	49.1	
Have you ever been tested for HBV?					
Yes	91	63.6	28	49.1	0.07
No	52	36.4	29	50.9	
Does HBV vaccine exist?					
Yes	80	55.9	24	42.1	0.08
No/Don't know	63	44.1	33	57.9	
Are you vaccinated against HBV?					
Yes	38	26.6	4	7.0	<0.01
No	74	51.7	37	64.9	
Don't know	31	21.7	16	28.1	

Table 30. Stigma and discrimination by gender identity

Characteristics	Gender identity				*P* value
	Trans woman		Trans man		
	N	%	N	%	
During the last 12 months, has there been any instance where you were denied medical services because you are a transgender person?					
Yes	15	10.5	4	7.0	0.59
No	128	89.5	53	93.0	
During the last 12 months, has there been any instance where you were denied employment because you are a transgender person?					
Yes	36	25.4	16	28.1	0.72
No	106	74.6	41	71.9	
During the last 12 months, has there been any instance where you were denied renting an apartment or were evicted because you are a transgender person					
Yes	28	19.7	4	7.0	<0.05
No	114	80.3	53	93.0	

During the last 12 months have you been denied help from police because you are a transgender person?					
Yes	13	9.1	6	10.5	0.79
No	130	90.9	51	89.5	
Have you ever avoided medical services in the last 12 months?					
Yes	52	37.1	35	61.4	<0.01
No	88	62.9	22	38.6	
Do you have support from your family members, friends, or colleagues regarding your gender identity?					
Yes	53	37.6	18	32.1	0.51
No/Partially	88	62.4	38	67.9	

How often do you dress/express yourself according to the gender you identify with?					
Always	60	42.3	30	53.6	0.13
Often	43	30.3	11	19.6	
Sometimes	32	22.5	9	16.1	
Rarely	7	4.9	6	10.7	
During the last 12 months, have you been a victim of violance?					
Yes	85	59.4	27	47.4	0.15
No	58	40.6	30	52.6	
During the last 6 months, have you been a victim of violance?					
დიახ	17	11.9	14	24.6	<0.05
არა	126	88.1	43	75.4	
Were you ever a victim of sexual abuse (or an attempt) during childhood?					
Yes	57	39.9	26	45.6	0.52
No	86	60.1	31	54.4	

Table 31. Other gender related characteristics by gender identity

Characteristics	Gender identity				*P* value
	Trans woman		Trans man		
	N	%	N	%	
Have you undergone surgical or cosmetic procedures to change your appearance?					
Yes	17	11.9	5	8.8	0.62
No	126	88.1	52	91.2	
Do you plan to undergo masculinizing or feminizing gender-affirming surgery?					
Yes	52	40.0	18	34.6	0.75
No	30	21.1	12	23.1	
Have not decided yet	48	36.9	22	42.3	

What is your information source of gender transition (NGO, phycologists, social wortkers)					
Yes	62	43.4	42	73.7	<0.01
No	81	56.6	15	26.3	
Have you taken hormones or any other substances to change your appearance/voice?					
Yes	39	27.3	15	26.8	1.00
No	104	72.7	41	73.2	

NSU questionnaire for Household survey

Questionnaire number __

Section A. For interviewers			
Interviewers code	_____ _____ _____	Interview started	_____ _____(hr/m)
Date of interview	_____ _____ _____	Interview finished	_____ _____(hr/m)

Section B. Demographic Data	
1. Age	_____ years
2. Sex	1. Male 2. Female
3. Ethnicity	1. Georgian 2. Other _____
4. Educational level	1. I have no education 2. Incomplete average 3. Complete Secondary/College/Prof. school 4. Incomplete higher 5. Higher 6. Student 99. Refused to answer
5. Marital status	1. Unmarried 2. Married 3. Divorced 4. Widow 99. Refusal to answer
6. Employment	1. Employed/self-employed 2. Unemployed 99. Refusal to answer

Section C. Number of People You Know by Specific Name
Now I want you to recall all the people you know by specific name and write their number down. Please also take into consideration that • You should know such person by face and name, and he/she should also know you by face and name; And • **Alternative 1** You should have had contact with such person during the last 2 years personally, by phone or by the Internet (e.g. via e-mail, Skype, correspondence on social networks); Or • **Alternative 2** You should have shared food or drink with such person anywhere during the last 2 years (e.g. at work, restaurant, home), this person might be a family member, coworker, neighbor, etc.; And • Such person should be of any age and should live in Georgia

For example: Imagine that I am asking you to recall the number of people whose name is "Manana". Let's recall the total number of people whose name is "Manana". Let's say you recalled and counted 11 such people. Excellent! Let's now exclude the number of people whom you know, although they do not know you (let's say there is 1 such person). Then exclude all the people named “Manana” who do not live in Georgia (in this case, let's assume that all the people named “Manana” you know live in Georgia). Also, exclude all the people named “Manana” whom you have interacted with neither personaly, nor by phone/the internet during the last 2 years (let’s say there are 3 such people).
Therefore, the number of your acquaintances named “Manana” is 11-1-3 = 7 people.
We know that this is not an easy task. Please try your best and recall. Finally, if you could not recall a single person with such particular name, please enter - 0.

Description	Answers
How many “**Mamuka**” do you know?	_____ people
How many “**Luka**” do you know?	_____ people
How many “**Zurab**”, “**Zura**”, “**Zuka**” and “**Zuriko**” do you know?	_____ people
How many “**Vazha**” do you know?	_____ people
How many “**Sophiko**”, “**Sophio**” and “**Sopho**” do you know?	_____ people
How many “**Manana**” do you know?	_____ people
How many “**Shorena**” do you know?	_____ people
How many “**Nino**”, “**Niniko**” and “**Nina**” do you know?	_____ people
How many “**Maia**” do you know?	_____ people
How many “**Davit**”, “**Dato**”, “**Datuna**” and “**Datiko**” do you know?	_____ people

Section D. Number of Acquaintances by Groups

Now I will ask you about other people you know. I will repeat once more and remind you that

- You should know such person by face and name, and he/she should also know you by face and name;

And

- **Alternative 1** You should have had contact with such person during the last 2 years personally, by phone or by the Internet (e.g. via e-mail, Skype, correspondence on social networks);

Or

- **Alternative 2** You should have shared food or drink with such person anywhere during the last 2 years (e.g. at work, restaurant, home), this person might be a family member, coworker, neighbor, etc.;

And

- Such person should be of any age and should live in Georgia

Question	Total	Only men
How many people do you know who **got married** in 2022?	_____ people	_____ men
How many **school teachers** do you know?	_____ people	_____ men
How many people did you know who **died** in 2022?	_____ people	_____ men
How many people did you know who **died of cancer** in 2022?	_____ people	_____ men
How many people do you know who **were injured or died in a road accident** in 2022?	_____ people	_____ men
How many **higher education students** do you know?	_____ people	_____ men

Section E. Number of people known by high-risk groups

Now we move on to the next section, which involves a discussion and answering the questions provided by the respondent.

- You must know this person by face and name, and they must also recognize you by face and know your name; and:
  Version 1. You have had a relationship with this person within the last two years, either in person, by phone, or online (e.g., via email, Skype, or social media correspondence).
  Version 2. You have shared food or drink with this person within the last two years, whether at work, in a restaurant, at home, or elsewhere. This person could be a family member, co-worker, neighbor, etc.; and this person can be of any age but must reside in Georgia.

N	Description	Please indicate the number of people you know			
		Total	Age		
			<18 y	18-30	>30 y
1	How many transgender people do you know?				