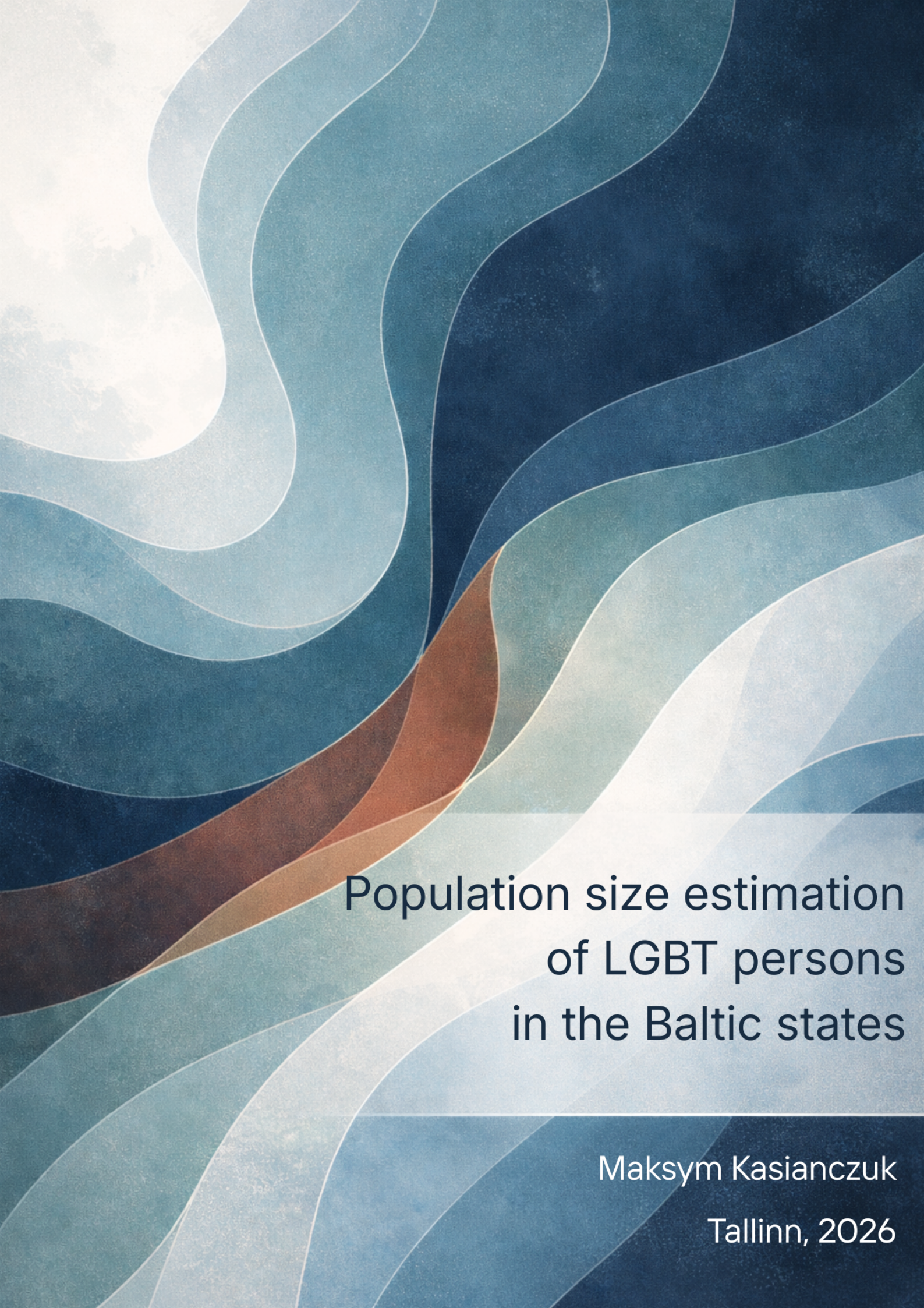

Population size estimation of LGBT persons in the Baltic states

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Translated in English by AI

EHPV Eesti HIV-positiivsete Võrgustik

Cover design: *Anastasiia Krugliakova*

Glossary

CI — Confidence interval: with a given probability (usually 95%), the true value lies between the upper and lower bounds of the interval

WHO — World Health Organization

LGBTQ — Lesbian, gay, bisexual, transgender, and queer people

MSM — Men who have sex with men

SOGI — Sexual orientation and gender identity

EHPV — Eesti HIV-positiivsete võrgustik — Estonian Network of People Living with HIV

EMIS — European MSM Internet Survey

FRA — European Union Agency for Fundamental Rights

Summary

Data on the size of LGBT communities in the Baltic states are very limited. This study is based on an analysis of both the author's own results and those of several other research teams (in particular, EMIS and FRA). In Estonia, in addition to estimating the number of gay, bisexual, and other cisgender men who have sex with men, the numbers of lesbian and bisexual cisgender women, as well as trans and non-binary people, were estimated. In Latvia and Lithuania, the available data allowed for a combined estimate of the number of MSM and trans people.

Summary Table of LGBT Community Size Estimates

Group	Consensus estimate	95% CI	
Estonia			
Gay, bisexual, and other cis men who have sex with men	6,900	4,400	10,900
Lesbian and bisexual cis women	8,200	5,600	12,500
Trans and nonbinary people	2,500	2,300	4,000
Latvia			
Gay, bisexual, and other cis men who have sex with men, plus trans and nonbinary people	12,300	9,800	15,500
Lithuania			
Gay, bisexual, and other cis men who have sex with men, plus trans and nonbinary people	17,500	15,500	19,600

Introduction

Population size estimates (PSE) of vulnerable groups are among the few key indicators of strategic information in public health [1]. Understanding the scale of the human immunodeficiency virus (HIV) epidemic faces many challenges. However, without accurate measurements and estimates of the impact and magnitude of HIV, it is impossible to carry out programmatic activities such as advocating for positive changes in the status of vulnerable groups, planning and implementing HIV prevention, care, and treatment programs, and evaluating implemented programs [2]. Establishing the size of groups at highest risk of HIV enables the development of models that forecast HIV prevalence [3].

From the perspective of politics as a system for organizing public life, size estimates matter because leaders of civil society organizations representing vulnerable communities (or more broadly, leaders of relevant social movements) use information on the size of their constituencies in dialogue with both the wider public and decision-makers [4]. Authorities are also interested in estimating the size of hidden populations—for example, estimates of informal employment [5, 6]. Another example of the political salience of size indicators is governments' interest (e.g., in the conservative Muslim countries of Azerbaijan and Tajikistan) in reducing the published size of persecuted social groups [7, 8].

Although data are becoming more available, their quality varies, raising the question of standardizing quality requirements. For PSEs, for example, the use of multiple alternative estimation methods and robust techniques for synthesizing estimates into a single figure, as well as documentation of extrapolation approaches, is recommended [9, 10].

1. MSM Population Size Estimates in the Baltic States

1.1. Estonia

The situation in Estonia with empirical PSEs was not encouraging up to 2023 (Fig. 1). The first estimate was published in 2013 [11], although the underlying data were collected back in 2009. For more than a decade, estimates were not updated—only in 2023 did a new estimate appear, based on 2021 data [12]. The data from two studies (2000 [13] and 2020 [14]) were

not known within the HIV-service sector and were not used in planning public health policy. Since 2023, data have begun to appear more regularly [15, 16], but they are still not in demand by state institutions.

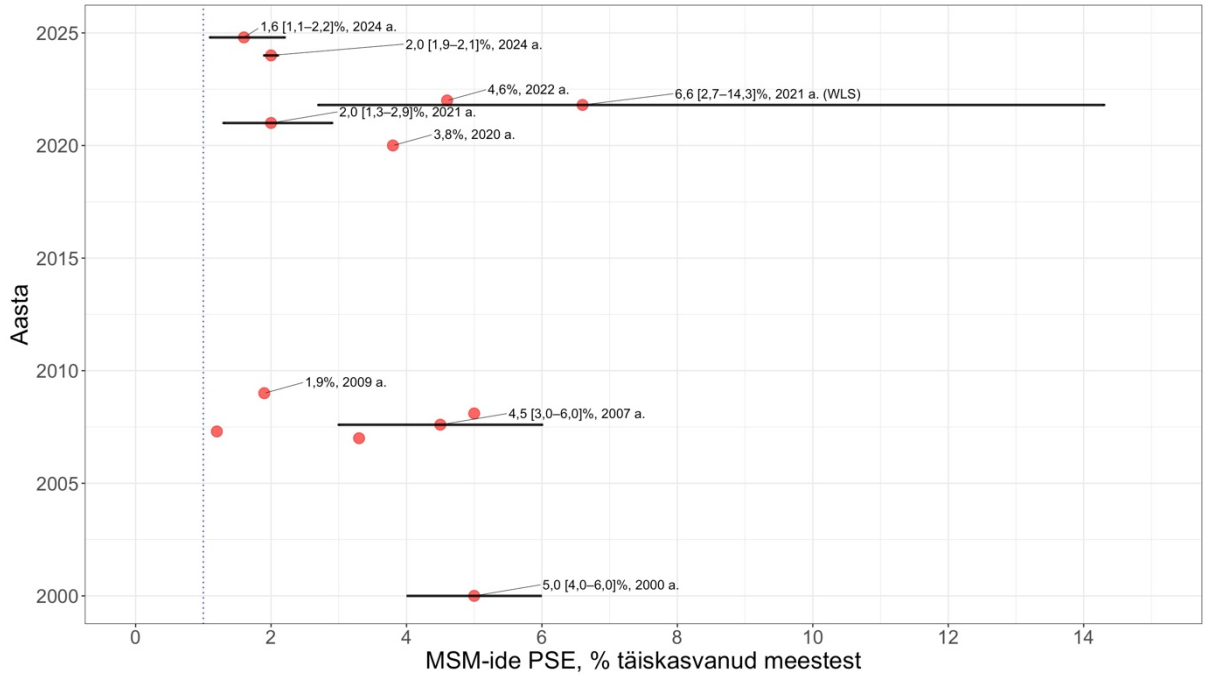

Figure 1 Estimates of the MSM population in Estonia

Notes: The figure is based on data from [11, 12, 14, 17]; the dashed vertical line indicates the WHO-recommended minimum of 1% of adult men [8]; until 2024, PSEs for MSM also included trans and nonbinary people

The population size of trans people in Estonia had not been established prior to 2024 [18], although there are limited data from a 2020 survey (0.96% of the population aged 18+) [14]. The number of identity documents changed due to a gender marker update can be obtained from Ministry of the Interior (Table 1); most records of gender marker changes were registered at the Tallinn Vital Statistics Department.

Table 1. Number of identity documents changed due to a gender marker change by year, according to data from the Estonian Ministry of the Interior / Population Register

Year	Identity documents changed
2019	22
2020	15
2021	9
2022	23
2023	25
2024	48
2025	39

Based on these data, as well as findings from a survey of LGBT people conducted during Tartu Pride 2024, publication [15] attempted to estimate the number of trans and non-binary people separately from MSM. The same publication also made the first empirical attempt to estimate the number of cisgender lesbian and bisexual women.

1.2. Latvia and Lithuania

Until 2020, the history of MSM PSEs in Latvia and Lithuania largely mirrored Estonia's, as they relied on the same studies—EMIS-2009 [11] and FRA surveys from 2012 [19] and 2020 [14]. In 2023, an additional estimate was produced for MSM aged 15–24, yielding 3,200 and 4,900 persons for Latvia and Lithuania, respectively [18]. The numbers of trans and non-binary people, as well as cisgender lesbian and bisexual women, were not empirically estimated. In Latvia, between 2019 and 2024, only seven people changed their name in connection with a gender marker change (Table 2) [20].

Table 2. Number of name changes in connection with a gender marker change by year, according to the Latvian Ministry of Justice

Year	Name changes
2019	3
2020	1
2021	3
2022–2024	0

2. Methods

A wide range of PSE methods exists [1]. More reliable results are obtained by combining several estimates into a consensus value [21]. Given available resources, we applied variants of the multiplier method, which is used when: (1) quantitative information is available from at least two independent sources; (2) the measured groups are known to overlap; and (3) the size of the overlap can be estimated.

Example: Source 1: an organization's roster interacting with members of the target group (statistical reports, routine information, and other databases). Source 2: information obtained directly from target group members about their contact with that organization.

During Tartu Pride 2024, letters were sent to Estonian LGBTIQ organizations requesting the number of cisgender men and women, as well as trans/non-binary people, who participated in organizational events from August 2023 to August 2024. Responses were received from MTÜ Q-Space, MTÜ SevenBow, MTÜ Vikerlased, MTÜ Peemoti Raamatud, and MTÜ Eesti Transinimeste Ühing. An LGBTIQ survey conducted during Pride provided the second data component [15].

In the FRA 2024 survey, respondents were asked about participation in analogous surveys in 2012 and 2019 (capture–recapture method) [22]. Affirmative responses (for Estonia—disaggregated by SOGI; for Latvia and Lithuania—among cis-MSM and trans people of all genders) were matched to the corresponding 2012 [19] and 2020 [14] samples. FRA survey datasets are publicly available at https://www.gesis.org/home. The estimates reported here comprise FRA-refined figures for Estonia and new estimates for Latvia and Lithuania.

Point estimates were obtained using formulas (1–3).

$$P = I \cdot \frac{N}{n} \qquad (1)$$

P — the estimated size of the group; *I* — the number of members of the estimated group according to an independent source; *N* — the survey sample size; *n* — the number of respondents who indicated their affiliation with the independent source

$$Var(P) = \frac{N \cdot I \cdot (N-n) \cdot (I-n)}{n^3} \quad (2)$$

95% CI: $P \pm 1.96 \cdot \sqrt{Var(P)}$ (3)

The synthesis of estimates was performed using a Bayesian approach in the Triangulator library (https://fellstat.github.io/triangulator/) [23]. Each point estimate's contribution to the consensus value is based on "data strength": estimates with narrower confidence intervals exert greater influence than those with wider intervals. Reliability was assessed by the research team's expert judgment (e.g., counts of gender-marker changes do not capture trans and non-binary people who do not intend to change their marker; such point estimates are assigned lower reliability, which widens confidence intervals, thereby reducing their weight in the final estimate). All other computations were conducted in the R [24].

3. Results

Population size estimates are based on data from Estonian LGBTIQ organizations and LGBTIQ commercial initiatives reported in the previous publication [15], supplemented by FRA survey data from 2012, 2019, and 2023 [19, 22, 25, 26].

3.1. Estonia

GB men and other MSM (Table 3). The minimum point estimate (762) exceeds the number of male clients not only at MTÜ Peemoti Raamatud but also the counts of male visitors to the Festheart (648) and Q-Space (600) festivals. This allows inclusion of all point estimates in the consensus figure (Fig. 2): 6,900 [4,400–10,900], or 1.3% [0.8–2.0%] of men aged 15+ (538,798 according to https://www.stat.ee for 2024).

LB community (Table 4). The minimum value (1,604) exceeds the number of unique female clients of MTÜ Peemoti Raamatud and visitors to Festheart (648) and Q-Space (600), allowing inclusion of all point estimates in the consensus figure (Fig. 3): 8,200 [5,600–12,500], or 1.3% [0.9–2.0%] of women aged 15+ (615,581 according to https://www.stat.ee for 2024).

Trans and non-binary people (Table 5). Point estimates span a sevenfold range; the minimum value (417) exceeds the number of gender-marker changes (94), permitting inclusion of all point estimates in the consensus calculation (Fig. 4): 2,500 [2,300–4,000], or 0.2% [0.1–0.3%] of Estonia's residents aged 15+ (1,154,379 according to https://www.stat.ee for 2024).

Table 3. Data and results of point estimates for the size of GB/MSM in Estonia and their 95% Cis

Independent data source	I	N	n	PSE	95% CI	
EMIS-2024 participants [α)]	184	120	27	818	567	1069
Peemoti Raamatud	316	120	11	3447	1540	5355
Festheart [β)]	648	120	27	2878	1942	3813
Q-Space [β)]	600	120	24	3000	1948	4052
X-baar [γ)]	2950	120	58	6103	4986	7221
Hello Bar [γ)]	1000	120	49	2449	1935	2963
In a registered marriage or partnership with a person of the same gender [δ)] (comparison with the Tartu Pride survey)	127	120	20	762	482	1042
In a registered marriage or partnership with a person of the same gender [ε)] (comparison with FRA-2024)	127	189	10	2400	1011	3790
FRA-2019 participants [ζ)]	285	189	22	2448	1525	3372
FRA-2012 participants [ζ)]	190	189	6	5985	1348	10622

Notes: symbols *I, N, n, PSE* correspond to formulae (1–3); [α)] preliminary data as of 07 July 2024; [β)] 50% of the number of visitors to festivals organized by MTÜ SevenBow and MTÜ Q-Space from August 2023 to August 2024, according to those organizations; [γ)] data from the previous estimate [16], assuming the annual number of male visitors did not change; [δ)] data from [27]; [ε)] data from [25, 27]; [ζ)] data from [19, 22, 25, 26]

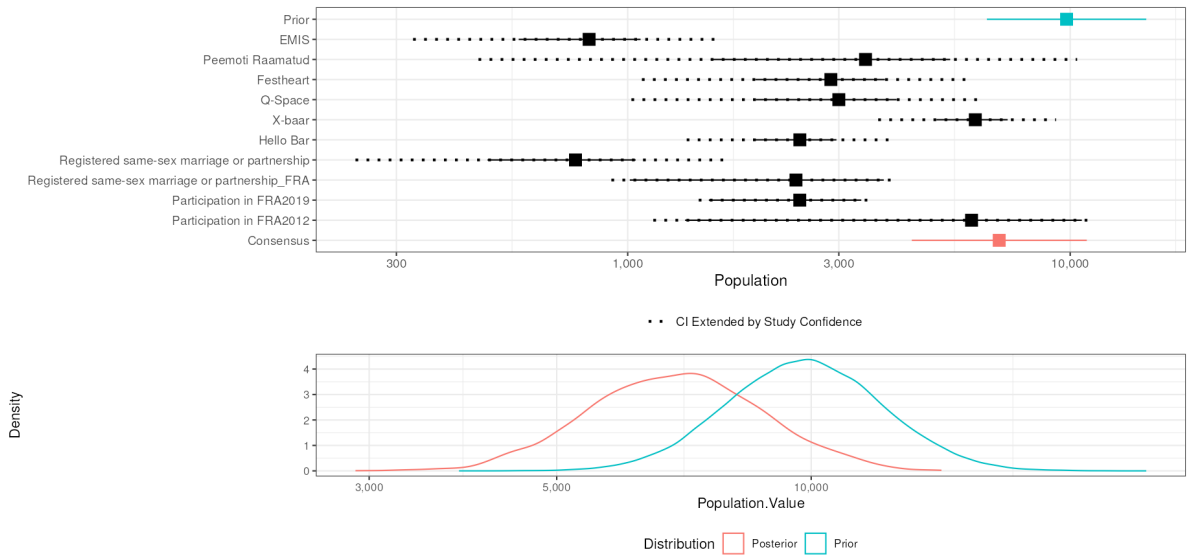

Figure 2. Deriving the consensus estimate of the size of GB/MSM in Estonia from the data in Table 3; the *a priori* value is taken from publication [16]

Table 4. Data and results of point estimates for the size of LB women in Estonia and their 95% CIs

Independent data source	**I**	**N**	**n**	**PSE**	**95% CI**	
Peemoti Raamatud	296	120	18	1973	1159	2788
Festheart [α)]	648	120	12	6475	3032	9918
Q-Space [α)]	600	120	15	4800	2556	7044
In a registered marriage or partnership with a person of the same gender [β)] (comparison with the Tartu Pride survey)	254	120	19	1604	968	2241
In a registered marriage or partnership with a person of the same gender [γ)] (comparison with FRA-2024)	254	507	35	3679	2587	4771
FRA-2019 participants [δ)]	652	507	18	18365	10148	26581

Notes: symbols *I, N, n, PSE* correspond to formulae (1–3); [α)] 50% of the number of visitors to festivals organized by MTÜ SevenBow and MTÜ Q-Space from August 2023 to August 2024, according to those organizations; [β)] data from [27]; [γ)] data from [25, 27]; [δ)] data from [19, 22, 25, 26]

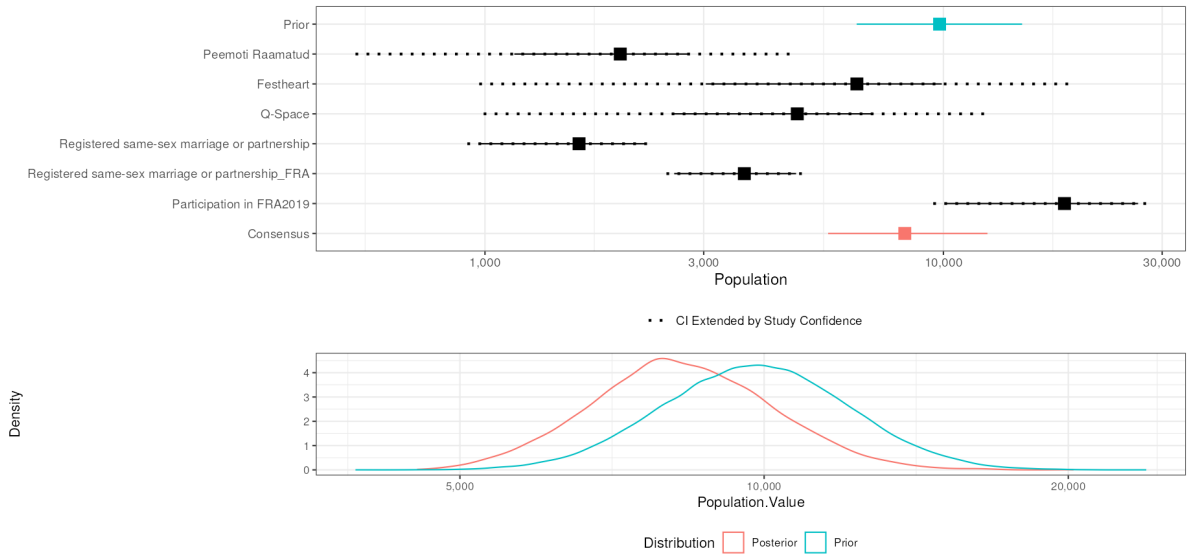

Figure 3. Deriving the consensus estimate of the size of GB/MSM in Estonia from the data in Table 4; the *a priori* value is taken equal to GB/MSM from publication [16]

Table 5. Data and results of point estimates for the size of trans and nonbinary people in Estonia and their 95% CIs

Independent data source	**I**	**N**	**n**	**PSE**	**95% CI**	
EMIS-2024 participants $^{\alpha)}$	54	85	11	417	212	623
Individuals who have changed their gender marker according to government registers $^{\beta)}$ (comparison with the Tartu Pride survey)	94	85	11	726	350	1103
Individuals who have changed their gender marker according to government registers (comparison with FRA-2024) $^{\gamma)}$	94	414	4	2780	1459	4100
Eesti Transinimeste Ühing	150	85	13	981	512	1450
Peemoti Raamatud	1361	85	38	3044	2335	3754
FRA-2019 participants $^{\delta)}$	187	414	27	2867	1900	3835
FRA-2012 participants $^{\delta)}$	20	414	4	2070	264	3876

Notes: *symbols I, N, n, PSE* correspond to formulae (1–3); $^{\alpha)}$ preliminary data as of 07 July 2024; $^{\beta)}$ data from [16]; $^{\gamma)}$ data from [16, 25]; $^{\delta)}$ data from [19, 22, 25, 26]

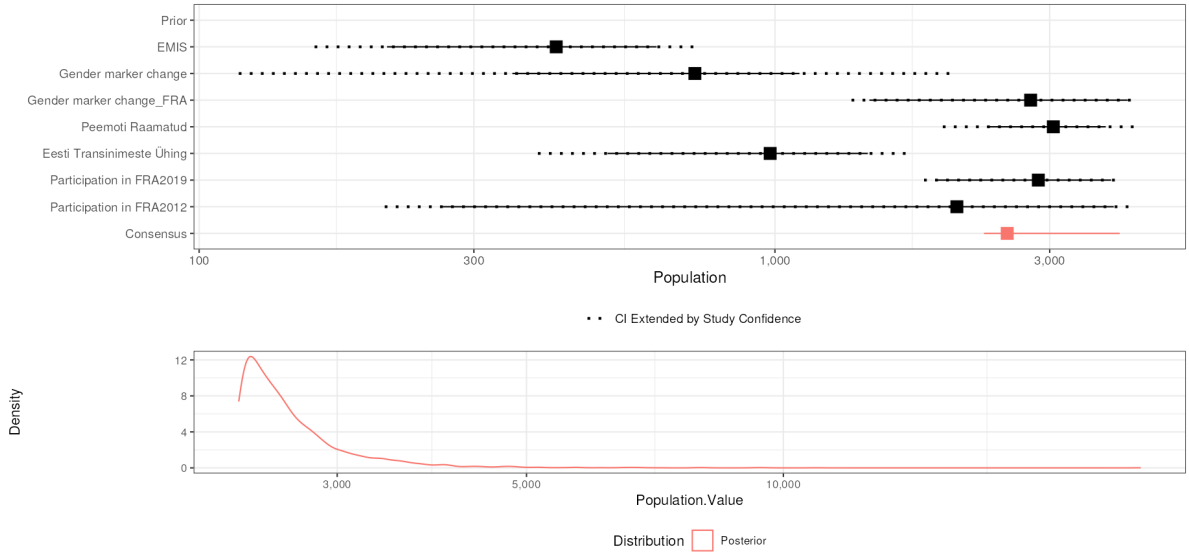

Figure 4. Deriving the consensus estimate of the population size of trans and nonbinary people in Estonia based on the data in Table 5: the *a priori* value was set at a minimum of 0.2% of residents aged 15+ in Estonia, following WHO recommendations (0.1% as the minimum share of trans people [1] and an equal 0.1% for nonbinary persons)

3.2. GB and other MSM, as well as trans and non-binary people in Latvia and Lithuania

There are very few source data for estimating the size of MSM and trans/non-binary people in Latvia (Table 6), and unfortunately no validation data are available. However, the resulting confidence intervals overlap, and the final estimate (taking into account the a priori value of 12,880 [11]) is 12,300 [9,800–15,500] persons, or 1.7% [1.4–2.2%] of men in Latvia aged 15 and older (714,328 men according to https://stat.gov.lv/en for 2022).

Table 6. Data and results of point estimates for the size of GB/MSM in Latvia and their 95% Cis

Independent data source	I	N	n	PSE	95% CI	
EMIS-2024 participants $^{\alpha)}$	198	27	7	764	285	1242
FRA-2019 participants $^{\beta)}$	415	470	19	10266	5849	14683
FRA-2012 participants $^{\beta)}$	278	470	4	32665	1020	64310

Notes: symbols *I, N, n, PSE* correspond to formulae (1–3); $^{\alpha)}$ preliminary data as of 07 July 2024; $^{\beta)}$ data from [19, 22, 25, 26]

There are even fewer source data for estimating the number of MSM and trans/non-binary people in Lithuania (Table 7). The resulting confidence intervals overlap, and the final estimate (accounting for the a priori value of 17,760 [11]) is 17,500 [15,500–19,600] persons, or 1.3% [1.1–1.5%] of men in Lithuania aged 15 and older (1,373,683 men according to https://osp.stat.gov.lt/statistiniu-rodikliu-analize#/ as of 1 January 2025).

Table 7. Data and results of point estimates for the size of GB/MSM in Lithuania and their 95% Cis

Independent data source	I	N	n	PSE	95% CI	
FRA-2019 participants $^{\alpha)}$	672	642	37	11660	8115	15206
FRA-2012 participants $^{\alpha)}$	402	642	11	23462	9906	37019

Notes: symbols *I, N, n, PSE* correspond to formulae (1–3); $^{\alpha)}$ data from [19, 22, 25, 26]

4. Discussion

As shown in Section 1, data on the sizes of LGBT populations in the Baltic countries are quite limited and generally pertain to MSM (with the exception of Estonia, where since 2021 regular estimates have been produced and published by communities affected by HIV). In this study, taking into account new data [22], we revised the previously published [15] estimates of the sizes of LGBT communities in Estonia, which—unlike earlier estimates [12, 16]—for the first time separately included groups of lesbian and bisexual women and trans/non-binary people. We also separately estimated the number of MSM (including trans and non-binary people) in Latvia and Lithuania.

The new data for MSM are summarized in Fig. 5, which shows that, despite some dispersion of point estimates due to differences in the data-source sets used, the size estimates lie along a single continuum (the confidence intervals overlap substantially).

Although the Latvian and Lithuanian data, unlike the Estonian data, additionally include trans and non-binary people, the relatively small size of the latter does not materially affect the overall MSM totals. Whereas previously the number of GB men and other MSM, as well as trans / non-binary people, in Estonia was estimated at 9,892 [9,628–10,172] persons [16], the

combined total for these groups is now 9,400 [6,700–14,900]. Because the 95% CIs overlap, it can be asserted that the values have not changed in the year since the previous estimate.

The newly presented MSM size estimates for Latvia and Lithuania also align well with the 2009 data [11]. The earlier estimates (12,880 and 17,760 for Latvia and Lithuania, respectively) fall within the confidence intervals of the new estimates.

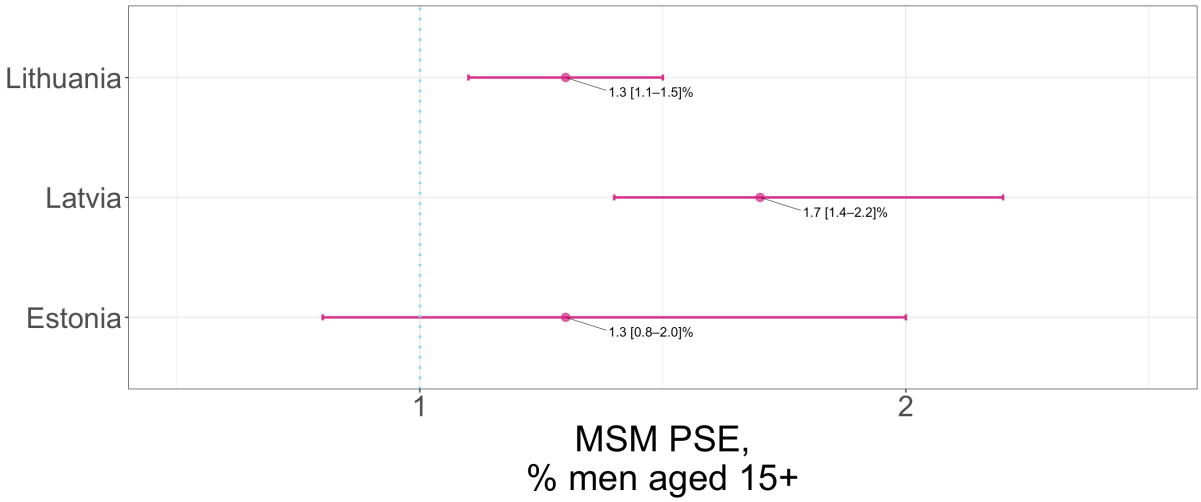

Figure 5. Estimates of the MSM population in the Baltic countries

Notes: the dashed vertical line indicates the WHO-recommended minimum of 1% of adult men [8]; the MSM estimates for Latvia and Lithuania also include trans and nonbinary people

It should be noted that estimates of MSM aged 15–24 published in 2019 [18] may differ from the data presented here. For example, in Lithuania that estimate reported 4,900 MSM aged 15–24; if extrapolated to all age groups 15+ (i.e., multiplied by 1,299,477/143,059—the ratio of all men aged 15+ to men aged 15–24), the result (44,509) would be more than twice the upper bound of our 95% confidence interval. However, such an extrapolation assumes that the same proportion of MSM in every age group, which may not reflect reality.

Because PSEs (see Introduction) are a practical starting point for planning HIV prevention programs, Estonia's available data on the number of MSM receiving PrEP prescriptions can be compared directly with the size estimate. In 2024, 2,291 MSM in Estonia were prescribed PrEP—about one-third of the estimated MSM population (6,900).

The results have several methodological limitations:

- Convenience-based sampling implicitly assumes uniform representation of LGBT people across adult age groups.
- It also assumes equal access to services used as independent data sources across all LGBT subgroups—assumptions that likely do not hold (e.g., gay bars are more accessible in large cities; women and trans people seek services from HIV NGOs implementing MSM programs much less often than men).

Therefore, estimates should be regularly revised as new, more detailed source data become available.

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