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'Break the Chains 2015' community-based HIV prevention campaign for men who have sex with men in Switzerland: non-randomised evaluation and cost analysis

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TITLE

‘Break the Chains 2015’ community-based HIV prevention campaign for men who have sex with men in Switzerland: non-randomised evaluation and cost analysis

CORRESPONDING AUTHOR

Prof. Dr. Daniel KÜBLER

Department of Political Science, University of Zurich, Affolterstrasse 56, 8050 Zürich, Switzerland, Email: Daniel.Kuebler@ipz.uzh.ch, Phone: +41 634 38 86

CO-AUTHORS

^a Kathrin FREY, Department of Political Science, University of Zurich, Zurich, Switzerland;

^a Stéphanie LOCICIRO, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland;

Patricia BLANK, Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland;

Matthias SCHWENKGLLENKS, Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland;

Françoise DUBOIS-ARBER, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland;

Rolf ROSENBROCK, Der Paritätische Gesamtverband, Berlin, Germany

Andreas LEHNER, Swiss Aids Federation, Zürich, Switzerland

Roger STAUB, Swiss Federal Office of Public Health, Bern, Switzerland;

Steven DERENDINGER, Swiss Federal Office of Public Health, Bern, Switzerland;

Axel J. SCHMIDT, Swiss Federal Office of Public Health, Bern, Switzerland

1
2
3 ^b Raphaël BIZE, Centre for Primary Care and Public Health (Unisanté), University of
4
5 Lausanne, Lausanne, Switzerland;

6
7 ^b Daniel Kübler, Departement of Political Science, University of Zurich, Zurich, Switzerland;

8
9
10 ^b Nicola LOW, Institute of Social and Preventive Medicine, University of Bern, Bern,
11
12 Switzerland.

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14
15
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19 ^a These authors contributed equally to the study

20
21
22 ^b These authors contributed equally to the study
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46 HIV infections, MSM, prevention, community-based campaign, cost, cost-effectiveness
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ABSTRACT

Objectives: To study the implementation, effects and costs of Break the Chains, a community-based HIV prevention campaign for men who have sex with men (MSM) in Switzerland, from March to May 2015, which aimed to reduce early HIV transmission by promoting short-term risk reduction and HIV testing.

Design: Non-randomised evaluation and cost analysis

Setting: Gay venues in 11 of 26 cantons in Switzerland and national online media campaign.

Participants: MSM in online surveys (pre-campaign N=834, post-campaign N=688) or attending HIV testing centres (N=885); campaign managers (N=9 face-to-face interviews); and campaign staff (N=38) or further intermediaries (N=80) in an online survey.

Primary and secondary outcome measures: The primary outcome measure was the proportion of MSM at risk of HIV infection who adhered to the campaign message. Secondary outcomes were post-campaign test uptake, knowledge about HIV primary infection, and sense of belonging to the gay community.

Results: Campaign staff estimated that they contacted 17,145 MSM in 11 cantons. Amongst 688 respondents to the post-campaign survey, 311 (45.2%) were categorised as MSM at risk of HIV. Of 402/688 (58.5%) MSM who had heard about Break the Chains 2015, MSM at risk of HIV were less likely to report having used a risk reduction strategy than MSM not at risk (adjusted odds ratio 0.24; 95% CI 0.14, 0.42). Costs for one MSM at risk to adhere to the campaign message were estimated at USD PPP 36-55.

Conclusion: Break the Chains increased HIV testing efficiently, but additional interventions are needed to reach MSM at highest risk of infection more accurately. Community-based campaigns should remain a cornerstone in HIV prevention strategies for MSM.

ARTICLE SUMMARY

Article focus

- Implementation, effects and costs of a community-based campaign to reduce HIV transmission during primary HIV infection in men who have sex with men (MSM).
- First full evaluation (implementation, effects and costs) of the ‘Break the Chains’ campaign in Switzerland, promoting short-term risk reduction and HIV testing.

Key messages

- The campaign efficiently increased HIV test uptake in MSM, but not necessarily by those with sexual behaviours associated with higher risks of HIV acquisition or transmission.
- The campaign had a modest effect on the adoption of risk reduction behaviour by MSM at risk (primary outcome).
- The message to have an HIV test came across more clearly than advice to avoid exposure to HIV.
- The development, improvement and evaluation of community-based campaigns identifying those at highest risk of HIV infection should remain a cornerstone of HIV prevention strategies for MSM.

STRENGTHS AND LIMITATIONS

- This study adds to a limited body of literature evaluating implementation, effects and costs of multicomponent, community-based campaigns to prevent HIV in MSM.
- The study is interdisciplinary and uses data on campaign implementation and costs, as well as outcome data from three online surveys in MSM.
- The study design did not include a control group.
- The primary study outcome is based on self-reported data.

ABBREVIATIONS

aOR, adjusted odds ratio; ART, antiretroviral therapy; CHF, Swiss Francs; CI, confidence interval; HIV, human immunodeficiency virus; LGBT, lesbian, gay, bisexual and transgender; MSM, men who have sex with men; MSMnr, MSM with no risk of HIV infection; MSMwr, MSM with a defined risk of HIV infection; OR, odds ratio; PrEP, pre-exposure prophylaxis; SD, standard deviation; USD PPP, US Dollars at purchasing power parity; VCT, voluntary counseling and testing.

INTRODUCTION

The number of new HIV diagnoses among men who have sex with men (MSM) remains high, even in countries that have high levels of use of antiretroviral treatment (ART).[1-5] Several modelling studies and studies of genetic sequence data suggest that a high proportion of new HIV infections results from MSM with undiagnosed early (primary) HIV infection.[3,4,6-8] Interventions that increase HIV testing and prevent transmission early on, when viral load is highest, could have a particularly powerful effect in reducing the incidence of HIV in MSM.[3,7,8]

Switzerland has a history of innovative HIV health promotion, including the “Stop AIDS” and “Love life” information campaigns and the “Swiss statement”, which emphasised the low risk of sexual transmission of HIV during effective ART ten years before “U=U” (undetectable equals untransmittable) was broadly promoted.[9] However, the population benefits of ART can only be realised if HIV infection is diagnosed, and reaching MSM with high risk sexual behaviours who are unaware of their HIV status is challenging. A mathematical modelling study in Switzerland estimated that in 2012 about 14% of HIV-infected MSM with undiagnosed infection were the source of more than 80% of new HIV infections in MSM.[8] Those with undiagnosed HIV infection are amongst about 20% of MSM in Switzerland who report never having had an HIV test and the 60% who have not had a test in the last year.[10] We estimate that in 2012, 6,300 MSM (8%) were living with HIV both diagnosed and undiagnosed, and 1,700 (or 2.2%) had non-suppressed HIV infection.[20] In addition, an increasing proportion of MSM report unprotected anal intercourse with one or more casual sex partners.[10]

The Swiss Federal Office of Public Health developed an innovative community-based campaign, Break the Chains, to reduce HIV transmission during primary HIV infection.[11,

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3 12] The rationale for the campaign is that intensive mobilisation by the MSM community will
4 encourage those at high risk of HIV acquisition and transmission to adopt short-term risk
5 reduction practices, followed by HIV testing [11]. The risk reduction period should allow
6 recently acquired HIV infections to become detectable using routine HIV testing
7 methods.[13] MSM with newly detected infections can be linked to care services and start
8 immediate ART to reduce viral load and to reduce further HIV transmission.[14] The
9 campaign has been implemented every year in spring since 2012. Whilst several individual
10 components of the Break the Chains campaign are theory-driven and effective, such as peer
11 outreach activities, social marketing to promote HIV testing and voluntary counselling and
12 testing [15-19], evaluations of multicomponent campaigns are rare. The objectives of this
13 study were to evaluate the implementation, the effects and the costs of the Break the Chains
14 2015 campaign.

31 **METHODS**

34 **Participants**

37 The Break the Chains 2015 campaign target population was MSM at risk of HIV infection
38 (Table 1). We define MSM as men who are attracted to other men or who have sex with men,
39 regardless of whether they identify themselves as gay. The population of MSM aged 15-65 in
40 Switzerland (2012) is estimated to be 80,000 (Bayesian 95% credibility interval 64,000 to
41 96,000) of whom about half live in the five largest cities.[20]

Table 1. Definition of MSM at risk, or not at risk of HIV acquisition or transmission, based on the theory of the 2015 Break the Chains campaign, Switzerland, March to May 2015

MSM with specified HIV risks (MSMwr) ^a	MSM with no specified HIV risks (MSMnr) ^a
UAI with a partner of unknown or different HIV status (steady and/or casual partners) over the last 12 months	Did not report any of the criteria for MSMwr; considered to have avoided any risk of HIV transmission ^b
UAI with casual partners over the last 12 months	
Unknown HIV status within a steady partnership over the last 12 months	
HIV-negative with steady partner who is HIV-positive but does not receive antiretroviral therapy and/or has a detectable viral load	
HIV-positive with detectable viral load ^c	

Note. UAI= unprotected anal intercourse.

^a MSMwr and MSMnr are mutually exclusive categories;

^b MSM in this category are assumed to continue to avoid any risk of HIV transmission during the campaign and follow up period;

^c MSM with HIV infection and a detectable viral load are at risk of transmitting HIV. They were not included in the calculation of those adopting the campaign message because they would not be expected to have another HIV test

Intervention

Break the Chains is a community-based multicomponent information and action campaign that involves: a media information campaign; local HIV prevention organization professionals and volunteers who deliver peer outreach activities; an incentive (reduced cost of testing) to increase the uptake of HIV testing; and evaluation. The key message of Break the Chains 2015 (Figure S1) was: “It's simple: In order to prevent new HIV infections, avoid taking any risks for the month of April and then take an HIV test for CHF10 [USD PPP 8 in May. The more men who take part in this campaign, the more successful we will be in our efforts to combat HIV. So tell your friends about Break the Chains and join us.”

The Swiss Aids Federation implemented Break the Chains 2015 in three phases (Figure 1): 1) Late February and March, mobilisation of MSM to follow the recommendations of Break the Chains and outreach activities to deliver the campaign message; 2) throughout April, Break the Chains action month, MSM avoid any risk of HIV transmission until they get tested for HIV, and 3) May, HIV test promotion at a reduced cost (USD PPP 8 instead of USD PPP 48).

The media information campaign was implemented across Switzerland with advertisements on websites, a Facebook page and a campaign website. Media included adverts and news stories in gay magazines, posters, flyers, condom catch covers and silicon bracelets. Local member organisations of the Swiss AIDS Federation delivered the campaign in 11 of 26 cantons in Switzerland. Intermediaries, such as gay community organisations and managers of gay bars, clubs and other venues gave permission for the prevention activities and put out the campaign materials. Community workers and volunteers visited gay venues in the main city in the five cantons most affected by HIV, and to a lesser extent in another six cantons from February to May 2015. They conducted peer outreach to engage MSM in conversation to inform them about the campaign, its message, and the availability of HIV testing. In one canton, only post-campaign HIV testing was offered. In May 2015, 34 voluntary counselling

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3 and testing (VCT) centres across Switzerland, including “Checkpoints”, i.e. dedicated health
4 centres for MSM, offered low cost HIV tests for MSM.
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9 FIGURE 1

10 11 12 **Data Collection and Outcome Measures**

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15 We developed a detailed programme theory and evaluation plan (Figure S2, supplementary
16 online material) before the campaign started.[21] The evaluation plan specified outcome
17 measures in a logic model, based on the theory of how the programme should work to prevent
18 HIV transmission during early infection. Outcomes for implementation, effects and costs were
19 defined (Table S1) and measured as follows.
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28 *Implementation fidelity:* this was measured as the intensity of the campaign activities,
29 coherence between the campaign concept and delivery, and support for the campaign by
30 intermediaries. We used three data sources. First, Swiss AIDS Federation staff collected
31 campaign monitoring data, including frequencies of outreach activities and estimates of the
32 numbers of contacts made. Second, we conducted qualitative face-to-face interviews with
33 campaign managers at the national and local level. Third, we set up an online questionnaire
34 for staff involved in the campaign delivery, bar and club managers, community activists, and
35 managers of HIV testing and prevention sites (Figure 1, Table S1). The interviews and the
36 online survey, completed in June 2015 after the campaign, included questions about the
37 campaign’s concept, the delivery and the support for the campaign.
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52 *Intervention effect:* the primary outcome was the proportion of MSM at risk of HIV infection
53 who used a HIV risk reduction strategy in April, and maintained it until HIV testing in May.
54 Secondary outcomes were: the proportion of MSM at risk of HIV infection who used a HIV
55 risk reduction strategy in April, and maintained it until HIV testing in May because of the
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3 campaign; test uptake in May, compared with the 12 preceding months; knowledge about
4 primary HIV infection; and the sense of belonging to the gay community.
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9 We collected data between October 2014 and September 2015 in three anonymous online
10 surveys. The surveys were advertised on gay community, dating and social networking
11 websites before and after the campaign period. Respondents to the survey were therefore self-
12 selected and only account for a small proportion of all those who were approached during the
13 campaign (Figure 1, Table S1). All three surveys included questions about HIV-related sexual
14 risk behaviours and socio-demographic variables and connectedness to the lesbian, gay,
15 bisexual, and transgender (LGBT) community.[22] We defined MSM with risk of HIV
16 infection (MSMwr) as having at least one of five indicators of HIV transmission risk in the
17 last year (Table 1). Survey respondents with none of the five indicators were defined as MSM
18 with no risk of HIV infection (MSMnr).
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33 The pre-campaign survey elicited intentions of MSM to take part in the campaign. We added
34 specific questions to the 2014 edition of Gaysurvey, a structured questionnaire that has been
35 conducted since 1987 as part of routine monitoring of sexual and preventive behaviours
36 related to HIV risk amongst MSM in Switzerland (as an online survey since 2004).[10]
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42 Participants were recruited through banner advertisements posted on relevant websites in
43 October 2014. They completed an internet-based self-administered questionnaire and
44 indicated whether they intended to take part in the 2015 Break the Chains campaign.
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50 An online post-campaign survey was conducted two months after the campaign using the
51 same recruitment strategy as the GaySurvey. The post-campaign survey asked about
52 awareness of the campaign, sexual behaviours during the campaign period and, for those who
53 used a HIV risk reduction strategy, whether they did it because of the campaign.
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3 In addition, MSM who visited any of the 34 VCT centres that offered reduced cost HIV tests
4 in May 2015 were invited to fill in a questionnaire. This VCT survey asked about campaign
5 exposure. Additionally, we collected data on the numbers of HIV tests taken by MSM in VCT
6 centres between March 2014 and September 2015.
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13 *Costs of Break the Chains 2015*: we used a full costing approach, including direct and indirect
14 costs. The main cost components were manpower and other expenses such as travel,
15 overheads of the involved organisations, campaign materials and services provided by third
16 parties (e.g. advertisements, translations), subsidies for HIV tests and the evaluation. The
17 Swiss Federal Office of Public Health and Swiss AIDS Federation provided financial
18 statements and time sheets on the numbers of paid and unpaid working hours by the staff and
19 volunteers who implemented Break the Chains 2015 (Figure 1, Table S2). The costs of unpaid
20 work were estimated based on the human capital approach that assumed an hourly rate
21 corresponding to the opportunity costs of a lost working hour in Switzerland.
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35 **Analyses**

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38 Qualitative interview data were analysed using qualitative content analysis.[23] Descriptive
39 statistics were used to report the pre-campaign intentions, intervention fidelity, uptake of the
40 intervention and of HIV testing.
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46 We calculated the uptake of the primary outcome, use of a risk reduction strategy during April
47 until HIV testing in May, amongst the sample of MSM who completed the post-campaign
48 survey and had heard about the campaign. We used logistic regression to compare the primary
49 outcome between the target group, MSMwr and MSM not in the target group (MSMnr)
50 according to campaign-related, demographic, community and behavioural factors using
51 univariable odds ratios (OR) with 95% confidence intervals (95% CI). We constructed a
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3 multivariable model to compare the outcome in MSMwr and MSMnr, adjusting for all factors
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5 in the univariable analysis.
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9 The cost estimates used full data obtained from all involved organizations so they are
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11 presented without measures of statistical uncertainty. We extrapolated these costs to the entire
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13 estimated population of MSM in Switzerland, using the 95% credibility intervals (64,000 to
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15 96,000)[20] to estimate the cost per encounter, and the cost to change the behaviour of one
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17 MSM at risk of HIV. All quantitative data were processed in Excel® (version 2016, Microsoft
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19 Corp., Seattle, WA) and analysed using SPSS® (version 23, IBM®, New York, NY) and Stata
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21 (version 14, Stata Corp. Austin, TX).
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25 26 **Ethical committee**

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29 The overall study was conducted in accordance with the Ethics Committee of the Faculty of
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31 Arts and Sciences at University of Zurich. The protocol of the online surveys among MSM
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33 was submitted to the Ethics Commission of the canton of Vaud, who considered it exempt
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35 from ethical committee review because it used anonymous data (art. 2, al.2, Letter c, LRH).
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39 **Patient and public involvement**

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42 A representative of the community organisation responsible for the campaign (the Swiss Aids
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44 Federation) participated in study design as well as elaboration of survey instruments, and is a
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46 co-author of this article.
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50 **RESULTS**

51 52 53 **Pre-campaign intentions**

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57 In October 2014, a sample of 834 MSM responded to the online invitations to take part in the
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59 pre-campaign GaySurvey. Of these, 395 (47.4% [95% CI: 43.9-50.8%]) said that they would
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3 be ready to take part in the Break the Chains 2015 campaign. Among these, there were 111
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5 MSMwr (28.1% [95% CI: 23.8-67.2%]) and 284 MSMnr (71.8% [95%CI: 67.2-76.1%]).
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8 **Implementation fidelity**

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12 Outreach workers and volunteers from local organisations attended venues on 92 evenings in
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14 March and April 2015. They estimated that they had contacted a total of 17,145 MSM in
15
16 eleven regions during this period and conducted 3,856 conversations of a few minutes each to
17
18 deliver the Break the Chains 2015 campaign message (Figure 1, Table S1). Of these, 10,584
19
20 (61.7%) contacts and 3169 (82.2%) conversations were in the five cities most affected by
21
22 HIV. Amongst venue managers, community activists, and managers of HIV testing and
23
24 prevention sites, 86.3% (69/80) reported having received the campaign posters and/or flyers
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26 and 87.0% (60/69) of those who received the materials said they had displayed them.
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31 Interviews with Break the Chains 2015 campaign managers and data from the survey among
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33 staff revealed that they found it difficult to convey the full campaign message in their
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35 outreach communications. Interviewees stated that public gay venues, such as crowded parties
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37 or bars, did not allow detailed communication about the rationale for reducing risk
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39 behaviours, the relevance of sexual networks and primary infection. Campaign staff reported
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41 that “take a test in May” was the message most frequently addressed in outreach
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43 conversations (on average in nine out of ten conversations), followed by “take part in Break
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45 the Chains and avoid any HIV transmission risk in April” (on average in eight out of ten
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47 conversations). Thus, the message that was delivered put more emphasis on HIV test
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49 promotion rather than equal emphasis on risk reduction and HIV testing.
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55 **Exposure to, and effects of, the Break the Chains campaign**

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58 Of the 688 respondents to the online invitations to take part in the post-campaign survey, 311
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60 (45.2%) were categorized as MSMwr and 377 as MSMnr (Figure 2). Of 402/688 (58.5%)

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3 MSM who reported that they had heard about Break the Chains 2015, 199 (49.5%) were
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5 MSMwr. MSMwr (64.0%; 199/311) were more likely to have heard of the campaign than
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7 MSMnr (53.8%; 203/377). Similar proportions of MSMwr and MSMnr were able to identify
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9 the main campaign message (overall, 65.4%; 95% CI 60.5, 70.1%; 263/402) or felt personally
10
11 concerned by the campaign (overall, 37.8%; 95% CI 33.1, 42.8%; 152/402).
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15 *Risk reduction behaviour:* Of the 402 respondents to the post-campaign survey who had heard
16
17 about the Break the Chains campaign, MSMwr (47.7%; 95/199) were less likely to report
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19 having consistently used a risk reduction strategy during April 2015 and maintained it until
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21 they got tested in May than MSMnr (76.8%; 156/203) (Table 2). This association remained in
22
23 multivariable analysis, after controlling for campaign-related, demographic and behavioural
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25 factors (adjusted, aOR 0.24; 95% CI 0.14, 0.42). Participation in a previous Break the Chains
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27 campaign was associated with an increased odds of using a risk reduction strategy (aOR 2.62;
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29 95% CI 1.41, 4.85). Regular use of sex-on-premises venues and use of the internet to find
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31 sexual partners were associated with reduced odds of using a risk reduction strategy (Table 2).
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Table 2. Factors associated with the uptake of the campaign message, according to HIV risk status, Break the Chains, Switzerland, March to May 2015, post-campaign survey

	All respondents		Risk reduction in April until tested				OR	Risk reduction in April until tested				
	N=402	%	Yes, N=251		No, No answer ^a N=151			[95% CI]	p-value from LR test	aOR ^b	95% CI	p-value from LR test
			N	%	N	%						
BTC target group												<0.001
MSMwr	199	49.5	95	37.9	104	68.9	0.28	[0.18;0.42]	<0.001	0.24	[0.14;0.42]	
MSMnr	203	50.5	156	62.1	47	31.3	Ref.					
Felt personally concerned by BTC									0.005			0.066
Yes	152	37.8	109	43.4	43	28.5	1.84	[1.19;2.84]		1.70	[0.96;3.00]	
No	245	61.0	142	56.6	103	68.2	Ref.			Ref.		
No response	5	1.2	0	0.0	5	3.3						
Understand the message of BTC^c									0.011			0.224
Yes	263	65.4	176	70.1	87	57.6	1.73	[1.13;2.63]		1.42	[0.81;2.51]	
No	139	34.6	75	29.9	64	42.4	Ref.			Ref.		
Participation in previous BTC campaign									<0.001			0.002
Yes	123	30.6	96	38.3	27	17.9	2.84	[1.75;4.63]		2.62	[1.41;4.85]	
No	279	69.4	155	61.8	124	82.1	Ref.			Ref.		
Age									0.508			0.270

	All respondents		Risk reduction in April until tested				Risk reduction in April until tested					
	N=402	%	Yes, N=251		No, No answer ^a N=151		OR	[95% CI]	p-value from LR test	aOR ^b	95% CI	p-value from LR test
			N	%	N	%						
<25 yr.	19	4.7	13	5.2	6	4.0	1.55	[0.55;4.34]		2.76	[0.75;10.12]	
25-49 yr.	215	53.5	137	54.6	78	51.7	1.26	[0.80;1.97]		1.06	[0.59;1.90]	
≥50 yr.	127	31.6	74	29.5	53	35.1	Ref.			Ref.		
No response	41	10.2	27	10.8	14	9.3						
University degree									0.011			0.053
Yes	250	62.2	168	66.9	82	54.3	1.72	[1.13;2.61]		1.74	[0.99;3.06]	
No	149	37.1	81	32.3	68	45.0	Ref.			Ref.		
No response	3	0.8	2	0.8	1	0.7						
Live in area with >100,000 inhabitants									0.416			0.587
Yes	165	41.0	107	42.6	58	38.4	1.19	[0.79;1.79]		1.17	[0.67;2.03]	
No	235	58.5	143	57.0	92	60.9	Ref.			Ref.		
No response	2	0.5	1	0.4	1	0.7						
Community connectedness									0.017			0.475
Mean	2.47		2.54		2.36							
Median	2.50											
Score 1-2.5	195	54.5	110	49.6	85	62.5	Ref.			Ref.		
Score 2.6-4	163	45.5	112	50.5	51	37.5	1.70	[1.10;2.62]		1.23	[0.70;2.14]	
Regularly visit sex-on-premises venues^d									0.009			0.032

	All respondents		Risk reduction in April until tested				Risk reduction in April until tested					
	N=402	%	Yes, N=251		No, No answer ^a N=151		OR	[95% CI]	p-value from LR test	aOR ^b	95% CI	p-value from LR test
			N	%	N	%						
Yes (frequently)	66	16.4	31	12.4	35	23.2	0.50	[0.29;0.84]		0.46	[0.22;0.94;]	
No (sometimes/never)	324	80.6	213	84.9	111	73.5	Ref.			Ref.		
No response	12	3.0	7	2.8	5	3.3						
Frequent use of the internet for sexual encounters^d									<0.001			0.024
Yes (frequently)	178	44.3	88	35.1	90	59.6	0.36	[0.24;0.55]		0.52	[0.30;0.92]	
No (sometimes/never)	221	55.0	161	64.1	60	39.7	Ref.			Ref.		
No response	3	0.8	2	0.8	1	0.7						

Note. BTC=Break the Chains; LR=likelihood ratio; MSM=men who have sex with men; MSMnr=MSM with no HIVrisk; MSMwr=MSM with HIV risk; OR=odds ratio; aOR=adjusted odds ratio, adjusted for all variables in the table; Ref.=reference category.

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4 Amongst the 251 respondents to the post-campaign survey who consistently used a risk
5 reduction strategy in April, reasons for their actions were (Figure 2, multiple answers
6 allowed): 91.0% (142/165) of MSMnr and 69.5% (66/95) of MSMwr reported that they
7 always use a risk reduction strategy. Nineteen of the 95 (20.0%) MSMwr who reported they
8 had used a risk reduction strategy in April 2015 did it in order to comply with the key
9 message of the Break the Chains campaign (Figure 2).
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18 19 FIGURE 2

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21
22 *Test uptake:* 707 MSM who were tested in the VCT centres during May 2015 reported their
23 reason for getting a test (Figure S3, multiple answers were allowed): 65 (9.2%) came to test as
24 part of the campaign, having avoided HIV transmission risks in April; 342 (48.4%) were
25 being tested because of the reduced cost; 30 (4.2%) said the campaign made them aware of
26 transmission risks, but they did not follow the recommendations, for 300 (42.4%) the reason
27 was unrelated to the campaign, and 34 (4.8%) did not answer the question. Overall, 373 of
28 707 respondents (52.8%) mentioned a least one reason that was linked to the campaign, of
29 which reduced cost was the most common (Figure S3). We plotted monthly HIV test numbers
30 from March 2014 to September 2015. The number of tests during May 2015 Break the Chains
31 (n=883) was twice as high as the average (n=436) for months when there was no HIV test
32 promotion (Figure S4). MSMnr accounted for about 70% of HIV tests both during months
33 with HIV test promotion and all other months.
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51 *Knowledge about primary infection:* The proportion of survey respondents who felt well
52 informed about the primary HIV infection was higher in the post-campaign than the pre-
53 campaign survey (58.0% vs. 51.1%; p=0.019). Amongst respondents to the post-campaign
54 survey, this proportion was higher among those who had heard about the campaign than those
55 who had not (65.0% vs. 36.3%; p=0.000).
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3 *Sense of belonging to the gay community:* A higher score for connectedness to the LGBT
4 community was associated with adoption of a risk reduction strategy in univariable but not
5 multivariable analysis. The mean scores in respondents of the pre-campaign and post-
6 campaign (2.39; SD=0.84 vs. 2.37; SD=0.82, $p=0.745$) surveys were similar. Respondents to
7 the post-campaign survey who reported having heard about Break the Chains had a higher
8 score (2.47; SD=0.79) than the respondents who reported not having heard about the
9 campaign (2.14; SD=0.84).

10 **Costs of Break the Chains 2015**

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12 The total direct costs of the campaign were USD PPP 474,019 and the indirect costs were
13 USD PPP 14,965 (total, USD PPP 488,984, Table S2). Salaries accounted for 46.1% of the
14 total costs, while 6.0% of the total costs were spent on the reduction of the price for HIV tests
15 in May 2015. The costs of the present evaluation amounted to 16.4% of the total campaign
16 costs.

17
18 Table 3 shows the total costs in relation to the outcomes of the campaign. The cost per
19 encounter (outreach contacts and conversations, clicks on the campaign website) is estimated
20 at USD PPP 14. Based on the results of the post-campaign survey, an estimated 58.4% of the
21 MSM population in Switzerland had heard of the campaign. Extrapolation of these costs to
22 the estimated population of MSM in Switzerland resulted in an estimate of USD PPP 9-13 to
23 reach one MSM, USD PPP 36-55 for one MSM at risk of HIV infection to adhere to a risk
24 reduction strategy, and USD PPP 181-272 for one MSM at risk of HIV infection to adhere to
25 a risk reduction strategy because of the campaign.

Table 3. Approximate costs of outcomes of the campaign, Break the Chains, Switzerland, March to May 2015

Outcomes	Outcome measure (data source)	Estimated outcomes at the MSM population level	Campaign costs ^a / estimated outcome
Encounter	BTC 2015 outreach contacts/ conversations with MSM, clicks on the campaign website ^b	33,833	USD PPP 14
To reach one MSM	MSM who heard about BTC 2015 (58.4%, post-campaign survey)	37,376 – 52,560 ^c	USD PPP 9 - 13
One MSMwr adopts a risk reduction strategy in April 2015	MSM at risk who used a risk reduction strategy in April 2015 (13.8%, post-campaign survey ^d)	8,832 - 13,248 ^c	USD PPP 36 – 55
One MSMwr adopts an HIV risk reduction strategy because of the campaign	MSMwr who adopted an HIV risk reduction strategy in April and maintained it until HIV testing in May because of the BTC campaign (2.8%, post-campaign survey ^e)	1,792 – 2,688 ^c	USD PPP 181 - 272

Note. BTC=Break the Chains; MSM=men who have sex with men; MSMwr=MSM with HIV risk.

^a Total campaign costs were USD PPP 488,984 (incl. direct USD PPP 474,019 and indirect costs USD PPP 14,965, as well as the costs for the HIV test price reduction USD PPP 29,473) (CHF 603,896; purchasing power parity conversion rate for the year 2015: 1 CHF = 1.235 USD PPP)

^b 9,746 (28.8%) of the 33,833 encounters are web clicks (no information available if web users are belonging to the target population), data from Swiss AIDS Federation;

^c Extrapolation of the outcome measure to the Swiss MSM population (estimated size of the population of MSM between 15 and 65 years old: 64,000 – 96,000 men,[20]);

^d Of 402 (58.4%) respondents who heard of the campaign 95 MSMwr respondents indicated that they adopted an HIV risk reduction strategy in April and maintained it until HIV testing in May (95/688=13.8%);

^e Of 402 (58.4%) respondents who heard of the campaign 19 respondents indicated that they adopted their risk behavior in order to comply with the key message of the campaign (19/688=2.8%).

DISCUSSION

The multi-component community participatory Break the Chains campaign delivered information to an estimated 17,145 MSM in a large number of gay venues in Switzerland from March to April 2015. The target group, MSM at high risk of HIV infection, was more likely to have heard of the campaign but less likely than those not at risk to have used a risk

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3 reduction strategy until being tested for HIV in May 2015 (aOR 0.24; 95% CI 0.14, 0.42).

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5 Twenty percent of MSM at risk of HIV infection who used a HIV risk reduction strategy in
6
7 April did it as a direct result of the campaign. HIV test uptake increased after the campaign,
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9 but most tests were taken by men who were not at high risk of HIV infection. Self-reported
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11 level of knowledge about primary HIV infection and a sense of belonging to the LGBT
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13 community were higher in MSM who had heard about the campaign than those who had not.
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15 The campaign was estimated to have cost USD PPP 181-272 for each MSM at risk of HIV
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17 who adhered to the campaign message.
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23 Our results suggest that the Break the Chains campaign 2015 was an efficient way to increase
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25 a short term increase in HIV testing amongst MSM, but not necessarily by those with sexual
26
27 behaviours associated with higher risks of HIV acquisition or transmission. The information
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29 campaign achieved an exposure level that compares well with levels reported in the wider
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31 literature on HIV campaigns.[18,19,24] The peer outreach workers were well-organised and
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33 appeared to reach MSM who felt connected to the gay community. Their reports indicated,
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35 however, that the message to have an HIV test came across more clearly than advice to avoid
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37 exposure to HIV. The evaluation suggests that we underestimated the complexity of
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39 delivering the two-part message and its rationale in the outreach venues. Uptake of HIV
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41 testing might be higher with more emphasis on having an HIV test if one has had a potentially
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43 high risk exposure in the previous month.
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49 This comprehensive assessment of a complex community-based HIV prevention intervention
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51 at country level in Switzerland has several strengths. The campaign components were
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53 evidence-based and the interdisciplinary and multi-method research design was theory-driven,
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55 according to a logic model of the way in which the intervention should work.[21] The
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57 implementation and evaluation involved the main stakeholders in HIV prevention amongst
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59 MSM, allowed us to maximise the acceptability of data collection and to evaluate the
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3 campaign under real world conditions.[25] The online surveys were an efficient way to
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5 measure the pre-campaign intentions and campaign effects in independent samples of MSM
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7 across Switzerland and used a consistent way to define those at risk of HIV infection. The
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9 evaluation, however, also has weaknesses. First, we analysed campaign effects amongst all
10
11 respondents who had heard of the campaign and did not differentiate between those who were
12
13 contacted in outreach venues and those who had seen only the media information. We thus
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15 were unable to assess a possible dose-response effect. Second, self-administered online
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17 surveys might result in participation bias, limiting generalisability to the whole MSM
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19 population.[26,27] Nevertheless, online surveys are widely used to conduct research with hard
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21 to reach groups and have been used in Switzerland to assess sexual and preventive behaviours
22
23 related to HIV risk since 2009. Third, the primary outcome was self-reported so might be
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25 influenced by recall and social desirability biases. We tried to mitigate these concerns by
26
27 using a brief recall period (two months after the campaign) and self-administered, anonymous
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29 questionnaires. We acknowledge that respondents' attribution of changes in their behaviours
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31 would not capture subconscious influences of social networks and other mechanisms. Fourth,
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33 campaign collaborators and intermediaries might have overestimated their activities. The
34
35 overall number of campaign encounters is likely to be an underestimate because it does not
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37 include contacts achieved through other channels such as gay media communications, posters
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39 and flyers.
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48 **PUBLIC HEALTH IMPLICATIONS**

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51 The identification of people with undiagnosed HIV infection is the biggest challenge to the
52
53 achievement of the UNAIDS 90-90-90 targets to end HIV/AIDS as a public health
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55 problem.[20, 28] Health promotion practitioners and policy makers need interventions that
56
57 increase HIV testing uptake in MSM and other populations at the highest risk of acquiring
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59 HIV infection and of transmitting it before diagnosis and the start of antiretroviral therapy.
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3 Since the Break the Chains 2015 campaign, pragmatic trials have shown the effectiveness of
4 pre-exposure prophylaxis (PrEP) to prevent HIV infection in MSM with high levels of risk
5 behaviours.[29,30] Informing MSM at risk about PrEP as an additional risk reduction strategy
6 should therefore become part of HIV prevention campaigns, as it is already in Switzerland.
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10 This evaluation showed that Break the Chains increased HIV testing, but campaign messages
11 need to be simplified and additional interventions are needed to identify the target group more
12 accurately. The development, improvement and evaluation of community-based campaigns
13 identifying those at highest risk of infection should remain a cornerstone in HIV prevention
14 strategies for MSM.
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AUTHOR CONTRIBUTIONS

K.F., S.L., R.B., F.D.-A., R.R., N.L., D.K. conceived the study;

K.F. was responsible for the coordination of the research activities of the overall project and did the analysis of the implementation of the campaign;

S.L., R.B., and N.L. did the statistical analysis;

P.B. and M.S. did the cost analysis;

A.J.S. provided data on the total number of MSM and with unsuppressed HIV in Switzerland.

S.D., R.S., and A.L., provided monitoring and cost data for the analyses;

N.L., R.R., F.D.-A., A.J.S., D.K. gave advice on analysis and interpretation, all authors contributed to the interpretation;

K.F. wrote the first draft of the article;

S.L., R.B., D.K. and N.L. revised the article;

All authors reviewed and approved the final version.

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CONFLICT OF INTEREST

At the time of the study, Roger Staub, Axel J. Schmidt and Steven Derendinger were with the Swiss Federal Office of Public Health. They were responsible for HIV prevention of the Swiss government and developed and implemented the 'Break the Chains' campaign. Kathrin Frey, Stéphanie Locicero and Raphael Bize received salary support from the Swiss Federal Office of Public Health. Andreas Lehner is with the Swiss Aids Federation and was involved

1
2
3 in the development and implementation of the 'Break the Chains' campaign. All other authors
4
5 declared that they have no competing interests.
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8 **Note.** The findings and conclusion in this report are those of the authors and do not
9
10 necessarily represent the views of the Swiss Federal Office of Public Health or the Swiss Aids
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12 Federation.
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16 17 18 **FUNDING**

19
20 This work was supported by the Swiss Federal Office of Public Health.
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26 27 **DATA STATEMENT**

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29 Anonymised quantitative survey data used for the analyses in this article are available on
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31 request from the corresponding author.
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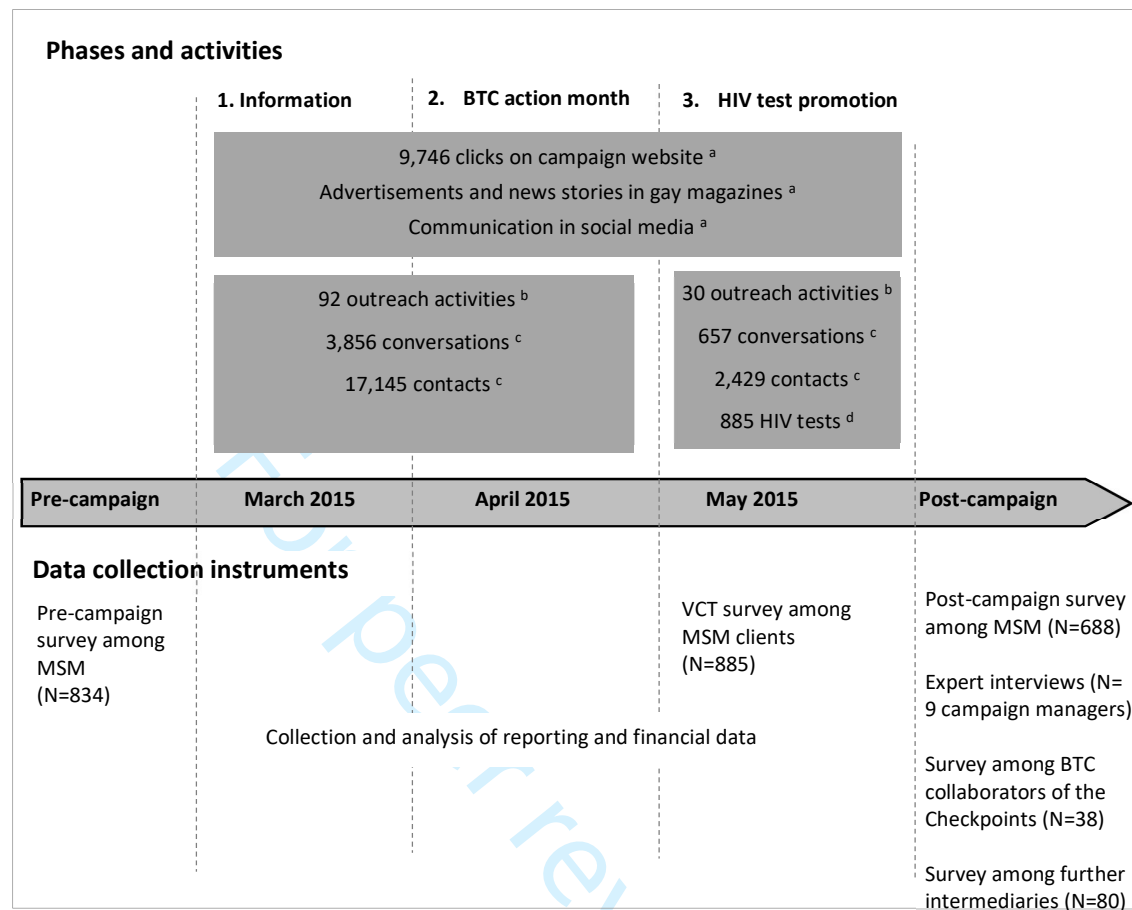


Figure 1. Campaign phases, activities and data collection instruments, Break the Chains, Switzerland, March to May 2015

Note. BTC=Break the Chains; MSM=men who have sex with men; VCT=voluntary counseling and testing.

^a web clicks: no information available if web users are belonging to the target population; communication in gay magazines and social media: no data available on the audience size. Source: Swiss AIDS Federation, October 2015

^b Outreach activities are visits to public gay venues by date of the activity and region. Data about outreach activities in May 2015 were missing for 3 out of 11 regions. Source: Swiss AIDS Federation, October 2015

^c The outreach worker responsible for each visit estimated the number of conversations and contacts; a “conversation” involved a conversation of at least a few minutes and the dissemination of the core campaign messages; a “contact” included handing out of leaflets or being seen, but with no conversation. Source: Swiss AIDS Federation, October 2015

^d Number of HIV tests among MSM clients of 34 VCT sites in May 2015, recorded by the Swiss Federal Office of Public Health.

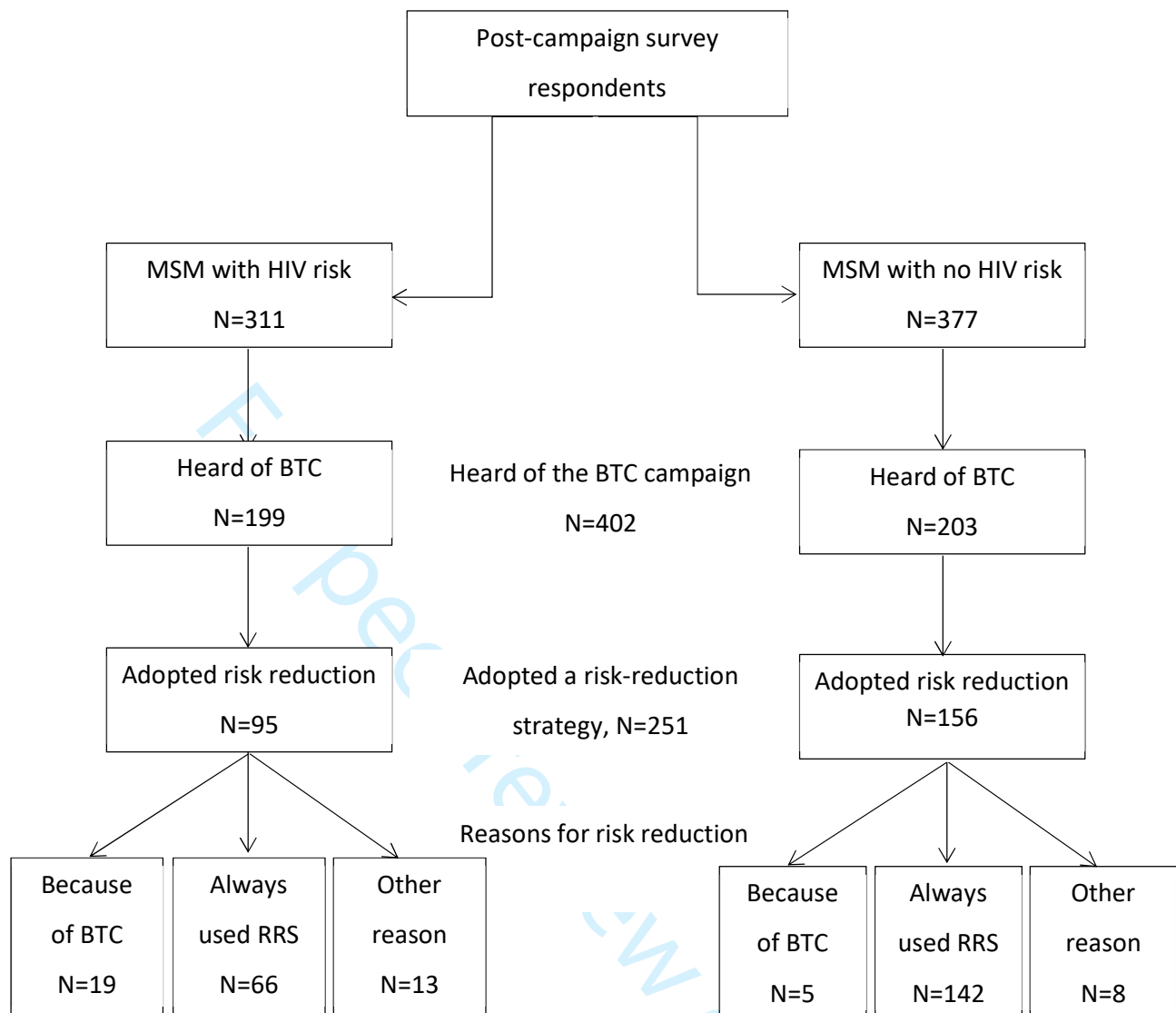


Figure 2. Outcome of campaign amongst respondents to the post-campaign online survey, Break the Chains, Switzerland, March to May 2015

Note. BTC=Break the Chains; MSM=men who have sex with men; RRS=risk reduction strategy

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3 **‘Break the Chains 2015’: evaluation of a community-based HIV prevention**
4 **campaign for men who have sex with men in Switzerland**
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10 **Supplementary material**
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12 **Supplementary tables**
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16 [Table S1. Overview of methods, samples and data sources, Break the Chains campaign, Switzerland, March to May 2015](#)2
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19 [Table S2. Estimated direct and indirect costs of the Break the Chains campaign, Switzerland, March to May 2015](#)3
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23 **Supplementary figures**
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26 [Figure S1. Break the Chains campaign poster, Switzerland, March to May 2015](#)4
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28 [Figure S2. Programme theory of the Break the Chains 2015 campaign May 2015](#)5
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30 [Figure S3. Reasons given for having an HIV test in May 2015, reported by respondents to online survey in voluntary counseling and testing centers, Break the Chains campaign, Switzerland, March to May 2015](#)6
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33 [Figure S4. HIV test uptake at voluntary counseling and testing sites in Switzerland by month of consultation and risk behavior, Break the Chains campaign, Switzerland, March to May 2015](#)7
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Table S1. Overview of methods, samples and data sources, Break the Chains campaign, Switzerland, March to May 2015

Focus of analysis	Methods	Sample size and data sources
Implementation	<ul style="list-style-type: none"> • Document analysis • Expert interviews • Survey among BTC collaborators of the Checkpoints • Survey among further mediators 	<ul style="list-style-type: none"> • Reporting data from the Swiss AIDS Federation • N = 9 campaign managers • N = 38 collaborators (54 invited; return rate 70.4%) • N = 80 intermediaries (138 invited, return rate 58.0%)
Effects among MSM	<ul style="list-style-type: none"> • Pre-campaign survey; internet-based, self-selected sampling • VCT sites survey; self-administered risk-assessment tool • Post-campaign survey; internet-based, self-selected sampling 	<ul style="list-style-type: none"> • N = 834 MSM • N = 885 MSM (clients of 34 VCT sites, May 2015) • N = 688 MSM
Costs	Analysis of reporting and financial data	All involved organizations (SFOPH, SAF, 12 local SAF member organizations) provided time sheets on working hours spent for BTC 2015; financial data obtained from the SAF and the SFOPH

Note. BTC=Break the Chains; MSM=men who have sex with men; SAF=Swiss AIDS Federation; SFOPH=Swiss Federal Office of Public Health; VCT=voluntary counseling and testing.

Table S2. Estimated direct and indirect costs of the Break the Chains campaign, Switzerland, March to May 2015

Cost categories	In PPP USD	(CHF)	% of total costs
Direct costs			
Salaries (total paid working hours = 3,423)			
National organizations SFOPH (hours =55) and SAF (hours = 1,703) ^a	142,348	(175,800)	29.1
Local partner organizations: campaign management (hours = 629) ^b	43,306	(53,484)	8.9
Local partner organizations: outreach activities (hours = 1,036) ^c	39,705	(49,036)	8.1
Paid out-of-pocket expense (e.g. travel expenses)	2,278	(2,814)	0.5
Material and third party services (e.g. consultancy, website, advertisements, translations, printing posters and flyers)	136,842	(169,000)	28.0
Price reduction of HIV tests in May 2015	29,473	(36,400)	6.0
Total costs for the present study	80,000	(98,880)	16.4
Total direct costs	474,019	(585,414)	96.9
Indirect costs			
Volunteer work of the local partner organizations (unpaid working hours = 427) ^d	11,409	(14,091)	2.3
Unpaid out-of-pocket expenses	3,555	(4,391)	0.7
Total indirect costs	14,965	(18,482)	3.1
Total cost estimation (incl. direct and indirect costs)	488,984	(603,896)	100.0

Note. CHF 1 = USD PPP 1.235, conversion rate to 2015 purchasing power parity (ppp). Sources: Swiss Federal Office of Public Health (SFOPH) and Swiss AIDS Federation (SAF).

^a For the Swiss Federal Office of Public Health and the Swiss AIDS Federation an hourly rate of USD PPP 80 (CHF 100) including overhead costs was assumed.

^b For the local campaign managers an hourly rate of USD 88 (CHF 85) including overhead costs was assumed

^c Hourly rates for the outreach work differed regionally and ranged between USD PPP 16 (CHF 20) and 48 (CHF 60), effective rates were included.

^d Based on the Swiss average income of USD PPP 54'574 (CHF 67,400) per year an hourly rate of USD PPP 26 (CHF 33) for the volunteer work was assumed.



Figure S1. Break the Chains campaign poster, Switzerland, March to May 2015

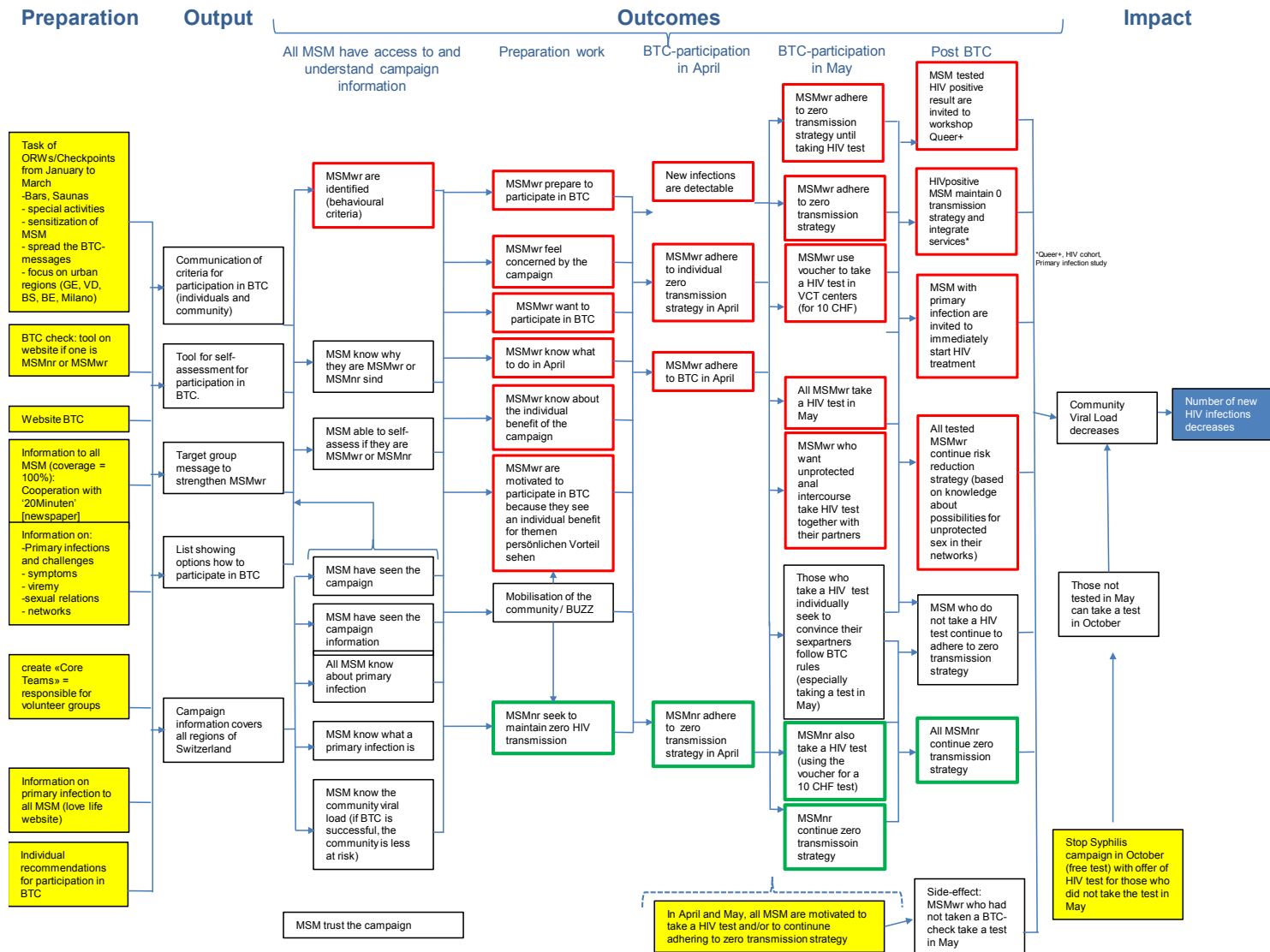
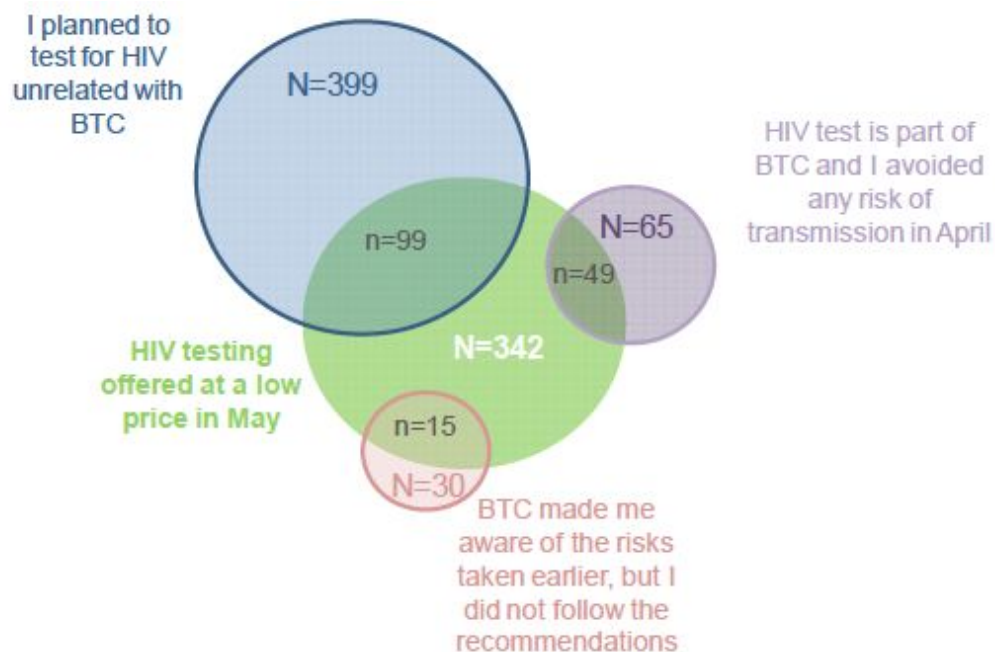


Figure S2. Programme theory of the Break the Chains 2015 campaign



Denominator: respondents who came specifically to get tested (N=707). 34 respondents did not mention any of the four reasons.

Figure S3. Reasons given for having an HIV test in May 2015, reported by respondents to online survey in voluntary counseling and testing centers, Break the Chains campaign, Switzerland, March to May 2015.

Note. BTC=Break the Chains. Respondents could give more than one reason.

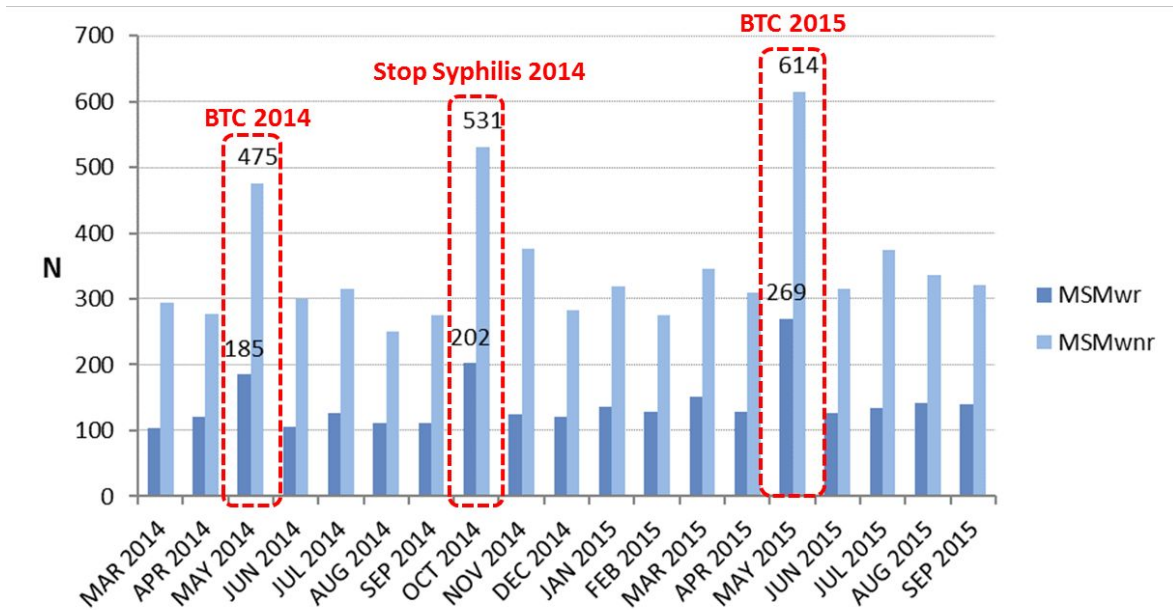


Figure S4. HIV test uptake at voluntary counseling and testing sites in Switzerland by month of consultation and risk behavior, Break the Chains campaign, Switzerland, March to May 2015

Note. BTC=Break the Chains; MSMwnr=men who have sex with men with none of the specified risks of HIV transmission; MSMwr=men who have sex with men with a specified risk of HIV transmission; N=number of tests; Stop Syphilis=health promotion campaign that offered free tests for syphilis. Red dashed lines indicate months in which HIV or syphilis tests were available at reduced or no cost.

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'Break the Chains 2015' community-based HIV prevention campaign for men who have sex with men in Switzerland: non-randomised evaluation and cost analysis

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TITLE

‘Break the Chains 2015’ community-based HIV prevention campaign for men who have sex with men in Switzerland: non-randomised evaluation and cost analysis

CORRESPONDING AUTHOR

Prof. Dr. Daniel KÜBLER

Department of Political Science, University of Zurich, Affolterstrasse 56, 8050 Zürich, Switzerland, Email: Daniel.Kuebler@ipz.uzh.ch, Phone: +41 634 38 86

CO-AUTHORS

^a Kathrin FREY, Department of Political Science, University of Zurich, Zurich, Switzerland;

^a Stéphanie LOCICIRO, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland;

Patricia BLANK, Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland;

Matthias SCHWENKGLER, Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland;

Françoise DUBOIS-ARBER, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland;

Rolf ROSENBROCK, Der Paritätische Gesamtverband, Berlin, Germany

Andreas LEHNER, Swiss Aids Federation, Zürich, Switzerland

Roger STAUB, Swiss Federal Office of Public Health, Bern, Switzerland;

Steven DERENDINGER, Swiss Federal Office of Public Health, Bern, Switzerland;

Axel J. SCHMIDT, Swiss Federal Office of Public Health, Bern, Switzerland

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1
2
3 ^b Raphaël BIZE, Centre for Primary Care and Public Health (Unisanté), University of
4
5 Lausanne, Lausanne, Switzerland;

6
7 ^b Daniel Kübler, Departement of Political Science, University of Zurich, Zurich, Switzerland;

8
9
10 ^b Nicola LOW, Institute of Social and Preventive Medicine, University of Bern, Bern,
11
12 Switzerland.

13
14
15
16
17
18
19 ^a These authors contributed equally to the study

20
21
22 ^b These authors contributed equally to the study
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24
25
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57
58
59
60

AUTHORS AND INSTITUTIONS

^a Kathrin Frey, frey@kek.ch, Department of Political Science, University of Zurich, Zurich, Switzerland;

^a Stéphanie Locicero, Stephanie.Locicero@efk.admin.ch, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland;

Patricia Blank, patricia.blank@unibas.ch, Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland;

Matthias Schwenkglenks, matthias.schwenkglenks@uzh.ch, Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland;

Françoise Dubois-Arber, Dubois-Arber@bluewin.ch, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland

Rolf Rosenbrock, rolf.rosenbrock@paritaet.org, Der Paritätische Gesamtverband, Berlin, Germany

Andreas Lehner, andreas.lehner@aids.ch, Swiss Aids Federation, Zurich, Switzerland;

Roger Staub, r.staub@promentesana.org, Swiss Federal Office of Public Health, Bern, Switzerland;

Steven Derendinger, Steven.Derendinger@bluewin.ch, Swiss Federal Office of Public Health, Bern, Switzerland;

Axel J. Schmidt, axel.j.schmidt@emis-project.eu, Swiss Federal Office of Public Health, Bern, Switzerland

^b Raphaël Bize, Raphael.Bize@unisante.ch, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland;

^b Daniel Kübler, daniel.kuebler@ipz.uzh.ch, Department of Political Science, University of Zurich, Zurich, Switzerland;

^b Nicola Low, nicola.low@ispm.unibe.ch, Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland.

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^a These authors contributed equally to the study

^b These authors contributed equally to the study

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ABSTRACT

Objectives: To study the implementation, effects and costs of Break the Chains, a community-based HIV prevention campaign for men who have sex with men (MSM) in Switzerland, from March to May 2015, which aimed to reduce early HIV transmission by promoting short-term risk reduction and HIV testing.

Design: Non-randomised evaluation and cost analysis

Setting: Gay venues in 11 of 26 cantons in Switzerland and national online media campaign.

Participants: MSM in online surveys (pre-campaign N=834, post-campaign N=688) or attending HIV testing centres (N=885); campaign managers (N=9 face-to-face interviews); and campaign staff (N=38) or further intermediaries (N=80) in an online survey.

Primary and secondary outcome measures: The primary outcome measure was the proportion of MSM at risk of HIV infection who adhered to the campaign message. Secondary outcomes were post-campaign test uptake, knowledge about HIV primary infection, and sense of belonging to the gay community.

Results: Campaign staff estimated that they contacted 17,145 MSM in 11 cantons. Amongst 688 respondents to the post-campaign survey, 311 (45.2%) were categorised as MSM at risk of HIV. Of 402/688 (58.5%) MSM who had heard about Break the Chains 2015, MSM categorised as being at risk were less likely to report adherence to the campaign message than MSM not at risk (adjusted odds ratio 0.24; 95% CI 0.14, 0.42). Costs for one MSM at risk to adhere to the campaign message were estimated at USD PPP 36-55.

Conclusion: Break the Chains increased HIV testing, but additional interventions are needed to reach MSM at highest risk of infection more accurately. This implies that community-based campaigns remain a cornerstone in HIV prevention strategies for MSM.

STRENGTHS AND LIMITATIONS

- This study adds to a limited body of literature evaluating implementation, effects and costs of multicomponent, community-based campaigns to prevent HIV in MSM.
- The study is interdisciplinary and uses data on campaign implementation and costs, as well as outcome data from three surveys in MSM.
- The study design did not include a control group.
- The primary study outcome measurement is based on self-reported data collected from a non-random sample of respondents.

ABBREVIATIONS

aOR, adjusted odds ratio; ART, antiretroviral therapy; CAI, condomless anal intercourse; CHF, Swiss Francs; CI, confidence interval; HIV, human immunodeficiency virus; LGBT, lesbian, gay, bisexual and transgender; MSM, men who have sex with men; MSMnr, MSM with no risk of HIV acquisition or transmission; MSMwr, MSM with a defined risk of HIV acquisition or transmission; OR, odds ratio; PrEP, pre-exposure prophylaxis; SD, standard deviation; USD PPP, US Dollars at purchasing power parity; VCT, voluntary counseling and testing.

INTRODUCTION

The number of new HIV diagnoses among men who have sex with men (MSM) remains high, even in countries that have high levels of use of antiretroviral treatment (ART).[1-5] Several modelling studies and studies of genetic sequence data suggest that a high proportion of new HIV infections results from MSM with undiagnosed early (primary) HIV infection.[3,4,6-8] Interventions that increase HIV testing and prevent transmission early on, when viral load is highest, could have a particularly powerful effect in reducing the incidence of HIV in MSM.[3,7,8]

Switzerland has a history of innovative HIV health promotion, including the “Stop AIDS” and “Love life” information campaigns and the “Swiss statement”, which emphasised the low risk of sexual transmission of HIV during effective ART ten years before “U=U” (undetectable equals untransmittable) was broadly promoted.[9] However, the population benefits of ART can only be realised if HIV infection is diagnosed, and reaching MSM with high risk sexual behaviours who are unaware of their HIV status is challenging. A mathematical modelling study in Switzerland estimated that in 2012 about 14% of HIV-infected MSM with undiagnosed infection were the source of more than 80% of new HIV infections in MSM.[8] Those with undiagnosed HIV infection are amongst about 20% of MSM in Switzerland who report never having had an HIV test and the 60% who have not had a test in the last year.[10] We estimate that in 2012, 6,300 MSM (8%) were living with HIV both diagnosed and undiagnosed, and 1,700 (or 2.2%) had non-suppressed HIV infection.[11] In addition, an increasing proportion of MSM report condomless anal intercourse with one or more casual sex partners.[10]

The Swiss Federal Office of Public Health developed an innovative community-based campaign, Break the Chains, to reduce HIV transmission during primary HIV infection.[12,

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3 13] The rationale for the campaign is that intensive mobilisation by the MSM community will
4 encourage those at high risk of HIV acquisition and transmission to adopt short-term risk
5 reduction practices, followed by HIV testing [12]. The risk reduction period should allow
6 recently acquired HIV infections to become detectable using routine HIV testing
7 methods.[14] MSM with newly detected infections can be linked to care services and start
8 immediate ART to reduce viral load and to reduce further HIV transmission.[15] The
9 campaign has been implemented every year in spring since 2012. Whilst several individual
10 components of the Break the Chains campaign are theory-driven and effective, such as peer
11 outreach activities, social marketing to promote HIV testing and voluntary counselling and
12 testing [16-20], evaluations of multicomponent campaigns are rare. The objectives of this
13 study were to evaluate the implementation, the effects and the costs of the Break the Chains
14 2015 campaign.

31 **METHODS**

34 **Participants**

37 The Break the Chains 2015 campaign target population was MSM at risk of HIV acquisition
38 or transmission (Table 1). We define MSM as men who are attracted to other men or who
39 have sex with men, regardless of whether they identify themselves as gay. The population of
40 MSM aged 15-65 in Switzerland (2012) is estimated to be 80,000 (Bayesian 95% credibility
41 interval 64,000 to 96,000) of whom about half live in the five largest cities (Zurich, Geneva,
42 Basel, Lausanne, Bern).[11]

Table 1. Definition of MSM at risk, or not at risk of HIV acquisition or transmission, based on the theory of the 2015 Break the Chains campaign, Switzerland, March to May 2015

MSM with specified HIV risks (MSMwr) ^a	MSM with no specified HIV risks (MSMnr) ^a
CAI with a partner of unknown or different HIV status (steady and/or casual partners) over the last 12 months	Did not report any of the criteria for MSMwr; considered to have avoided any risk of HIV transmission ^b
CAI with casual partners over the last 12 months	
Unknown HIV status within a steady partnership over the last 12 months	
HIV-negative with steady partner who is HIV-positive but does not receive antiretroviral therapy and/or has a detectable viral load	
HIV-positive with detectable viral load ^c	

Note. CAI= condomless anal intercourse.

^a MSMwr and MSMnr are mutually exclusive categories;

^b MSM in this category are assumed to continue to avoid any risk of HIV transmission during the campaign and follow up period;

^c MSM with HIV infection and a detectable viral load are at risk of transmitting HIV. They were not included in the calculation of those adopting the campaign message because they would not be expected to have another HIV test.

Intervention

Break the Chains is a community-based multicomponent information and action campaign that involves: a media information campaign; local HIV prevention organization professionals and volunteers who deliver peer outreach activities; an incentive (reduced cost of testing) to increase the uptake of HIV testing; and evaluation. The key message of Break the Chains 2015 (Figure S1) was: “It's simple: In order to prevent new HIV infections, avoid taking any risks for the month of April and then take an HIV test for CHF10 [USD PPP 8] in May. The more men who take part in this campaign, the more successful we will be in our efforts to combat HIV. So tell your friends about Break the Chains and join us.” The strategies to avoid taking risks were: safer sex practices (i.e. condom use for penetrative sex, no sperm or blood in the mouth), and strategies adapted to the personal situation (e.g. abstinence, only oral sex, sex exclusively with the steady partner who is either HIV negative or under treatment with an undetectable viral load). Pre-exposure prophylaxis (PrEP) has only been recommended in Switzerland since 2016.[21]

The Swiss Aids Federation implemented Break the Chains 2015 in three phases (Figure 1): 1) Late February and March, mobilisation of MSM to follow the recommendations of Break the Chains and outreach activities to deliver the campaign message; 2) throughout April, Break the Chains action month, MSM avoid any risk of HIV transmission until they get tested for HIV, and 3) May, HIV test promotion at a reduced cost (USD PPP 8 instead of USD PPP 48).

The media information campaign was implemented across Switzerland with advertisements on websites, a Facebook page and a campaign website. Media included adverts and news stories in gay magazines, posters, flyers, condom catch covers and silicon bracelets. Local member organisations of the Swiss AIDS Federation delivered the campaign in 11 of 26 cantons in Switzerland. Intermediaries, such as gay community organisations and managers of

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3 gay bars, clubs and other venues gave permission for the prevention activities and put out the
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5 campaign materials. Community workers and volunteers visited gay venues in the main city
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7 in the five cantons most affected by HIV, and to a lesser extent in another six cantons from
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9 February to May 2015. They conducted peer outreach to engage MSM in conversation to
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11 inform them about the campaign, its message, and the availability of HIV testing. In May
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13 2015, 34 voluntary counselling and testing (VCT) centres across Switzerland, including
14
15 “Checkpoints”, i.e. dedicated health centres for MSM, offered low cost HIV tests for MSM.
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20 FIGURE 1

23 **Data Collection and Outcome Measures**

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26 We developed a detailed programme theory and evaluation plan (Figure S2, supplementary
27
28 online material) before the campaign started.[22] The evaluation plan specified outcome
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30 measures based on the theory of how the programme should work to prevent HIV
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32 transmission during early infection. Outcomes for implementation, effects and costs were
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34 defined (Table S1) and measured as follows.
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39 *Implementation fidelity:* this was measured as the intensity of the campaign activities,
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41 coherence between the campaign concept and delivery, and support for the campaign by
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43 intermediaries. We used three data sources (Figure 1, Table S1). First, Swiss AIDS Federation
44
45 staff collected campaign monitoring data, including frequencies of outreach activities and
46
47 estimates of the numbers of contacts made. Second, we conducted qualitative face-to-face
48
49 interviews with campaign managers at the national and local level. Third, we set up an online
50
51 questionnaire for staff involved in the campaign delivery, bar and club managers, community
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53 activists, and managers of HIV testing and prevention sites. The interviews and the online
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55 survey, completed in June 2015 after the campaign, included questions about the campaign’s
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57 concept, the delivery and the support for the campaign.
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3 *Intervention effect:* the primary outcome was the proportion of MSM at risk of HIV infection
4 who used one of the promoted HIV risk reduction strategies in April, and maintained it until
5 HIV testing in May. Secondary outcomes were: the proportion of MSM at risk of HIV
6 infection who used a HIV risk reduction strategy in April, and maintained it until HIV testing
7 in May because of the campaign; test uptake in May, compared with the 12 preceding months;
8 knowledge about primary HIV infection; and the sense of belonging to the gay community.
9

10 We collected data between October 2014 and September 2015 in three anonymous online
11 surveys (Figure 1). The surveys were advertised on gay community, dating and social
12 networking websites before and after the campaign period. Respondents to the survey were
13 therefore self-selected and only account for a small proportion of all those who were
14 approached during the campaign (Figure 1, Table S1). All three surveys included questions
15 about self-reported HIV infection status, HIV-related sexual risk behaviours and socio-
16 demographic variables and connectedness to the lesbian, gay, bisexual, and transgender
17 (LGBT) community.[23] We defined MSM with risk of HIV infection (MSMwr) as having at
18 least one of five indicators of HIV transmission risk in the last year (Table 1). Survey
19 respondents with none of the five indicators were defined as MSM with no risk of HIV
20 infection (MSMnr).
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44 The pre-campaign survey elicited intentions of MSM to take part in the campaign. We added
45 specific questions to the 2014 edition of Gaysurvey, a structured questionnaire that has been
46 conducted since 1987 as part of routine monitoring of sexual and preventive behaviours
47 related to HIV risk amongst MSM in Switzerland (as an online survey since 2004).[10]
48 Participants were recruited through banner advertisements posted on relevant websites in
49 October 2014. They completed an internet-based self-administered questionnaire and
50 indicated whether they intended to take part in the 2015 Break the Chains campaign.
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3 An online post-campaign survey was conducted two months after the campaign using the
4 same recruitment strategy as the GaySurvey. The post-campaign survey asked about
5 awareness of the campaign, sexual behaviours during the campaign period and, for those who
6 used a HIV risk reduction strategy, whether they did it because of the campaign (Table S2).
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13 In addition, MSM who visited any of the 34 VCT centres that offered reduced cost HIV tests
14 in May 2015 were invited to fill in a questionnaire. This VCT survey asked about campaign
15 exposure. Additionally, we collected data on the numbers of HIV tests taken by MSM in VCT
16 centres between March 2014 and September 2015.
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23 *Costs of Break the Chains 2015*: we used a full costing approach, including direct
24 (irrespective of payer) and indirect costs.[24] Costs were recorded in 2015 Swiss francs
25 (CHF). Considering purchasing power parity for the same year, they were converted to United
26 States Dollars (USD PPP). The direct cost components were personnel and other expenses
27 such as travel, overheads of the involved organisations, campaign materials and services
28 provided by third parties (e.g. advertisements, translations), subsidies for HIV tests and the
29 evaluation. The Swiss Federal Office of Public Health and Swiss AIDS Federation provided
30 financial statements and time sheets on the numbers of paid and unpaid working hours by the
31 staff and volunteers who implemented Break the Chains 2015 (Figure 1, Table S3). The main
32 indirect cost component was unpaid volunteer work, estimated based on the human capital
33 approach that assumed an hourly rate corresponding to the opportunity costs of a lost working
34 hour in Switzerland (i.e. USD PPP 26 per hour). Cost results are reported as programme costs
35 and as cost per outcome achieved (e.g. MSM reached).
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54 **Analyses**

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57 Qualitative interviews were conducted by a member of the evaluation team, using an
58 interview guide. The interviews were digitally recorded and then transcribed. A trained
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3 researcher used qualitative content analysis to analyse data about the implementation of the
4 campaign.[25] Descriptive statistics were used to report the pre-campaign intentions,
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6 intervention fidelity, uptake of the intervention and of HIV testing, as well as secondary
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8 outcomes.
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13 We calculated the uptake of the primary outcome, use of a risk reduction strategy during April
14 until HIV testing in May, amongst the sample of MSM who completed the post-campaign
15 survey and had heard about the campaign. HIV-positive MSMwr (n=7/688) were excluded
16 from these analyses as they were not supposed to take an HIV test in May. We used logistic
17 regression to compare the primary outcome between the target group, MSMwr and MSM not
18 in the target group (MSMnr) according to campaign-related, demographic, community and
19 behavioural factors using univariable odds ratios (OR) with 95% confidence intervals (95%
20 CI). We constructed a multivariable model to compare the outcome in MSMwr and MSMnr,
21 adjusting for all factors in the univariable analysis, including the secondary outcome of sense
22 of belonging to the gay community. Other secondary outcomes were described using
23 frequencies (post-campaign test uptake) and chi-square tests (knowledge of primary HIV
24 infection).
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42 The cost estimates used full data obtained from all involved organizations so they are
43 presented without measures of statistical uncertainty. We multiplied the unit costs, calculated
44 from the campaign, to extrapolate to the entire estimated population of MSM in Switzerland,
45 with uncertainty derived from the 95% credibility intervals (64,000 to 96,000)[20] to estimate
46 the cost per encounter, and the cost to change the behaviour of one MSM at risk of HIV.
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54 All quantitative data were processed in Excel® (version 2016, Microsoft Corp., Seattle, WA)
55 and analysed using SPSS® (version 23, IBM®, New York, NY) and Stata (version 14, Stata
56 Corp. Austin, TX).
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Ethical committee

The overall study was conducted in accordance with the Ethics Committee of the Faculty of Arts and Sciences at University of Zurich. The protocol of the online surveys among MSM was submitted to the Ethics Commission of the canton of Vaud, who considered it exempt from ethical committee review because it used anonymous data (art. 2, al.2, Letter c, LRH).

Patient and public involvement

A representative of the community organisation responsible for the campaign (the Swiss Aids Federation) participated in study design as well as elaboration of survey instruments, and is a co-author of this article.

RESULTS

Pre-campaign intentions

In October 2014, a sample of 834 MSM responded to the online invitations to take part in the pre-campaign GaySurvey. Of these, 395 (47.4% [95% CI: 43.9-50.8%]) said that they would be ready to take part in the Break the Chains 2015 campaign. Among these, there were 111 MSM_{wr} (28.1% [95% CI: 23.8-67.2%]) and 284 MSM_{nr} (71.8% [95%CI: 67.2-76.1%]).

Implementation fidelity

Outreach workers and volunteers from local organisations attended venues on 92 evenings in March and April 2015. They estimated that they had contacted a total of 17,145 MSM in eleven regions during this period and conducted 3,856 conversations of a few minutes each to deliver the Break the Chains 2015 campaign message (Figure 1, Table S1). Of these, 10,584 (61.7%) contacts and 3169 (82.2%) conversations were in the five cities most affected by HIV. Amongst venue managers, community activists, and managers of HIV testing and

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3 prevention sites, 86.3% (69/80) reported having received the campaign posters and/or flyers
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5 and 87.0% (60/69) of those who received the materials said they had displayed them.
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9 Interviews with Break the Chains 2015 campaign managers and data from the survey among
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11 staff revealed that they found it difficult to convey the full campaign message in their
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13 outreach communications. Interviewees stated that public gay venues, such as crowded parties
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15 or bars, did not allow detailed communication about the rationale for reducing risk
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17 behaviours, the relevance of sexual networks and primary infection. Campaign staff reported
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19 that “take a test in May” was the message most frequently addressed in outreach
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21 conversations (on average in nine out of ten conversations), followed by “take part in Break
22
23 the Chains and avoid any HIV transmission risk in April” (on average in eight out of ten
24
25 conversations). Thus, the message that was delivered put more emphasis on HIV test
26
27 promotion rather than equal emphasis on risk reduction and HIV testing.
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32 33 **Exposure to, and effects of, the Break the Chains campaign**

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36 Of the 688 respondents to the online invitations to take part in the post-campaign survey, 311
37
38 (45.2%) were categorized as MSMwr and 377 as MSMnr (Figure 2). Of 402/688 (58.5%)
39
40 MSM who reported that they had heard about Break the Chains 2015, 199 (49.5%) were
41
42 MSMwr. MSMwr (64.0%; 199/311) were more likely to have heard of the campaign than
43
44 MSMnr (53.8%; 203/377) (difference in proportions 10.1%, 95% CI 2.8, 17.5%, p=0.007).
45
46 Similar proportions of MSMwr and MSMnr were able to identify the main campaign message
47
48 (overall, 65.4%; 95% CI 60.5, 70.1%; 263/402) or felt personally concerned by the campaign
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50 (overall, 37.8%; 95% CI 33.1, 42.8%; 152/402).
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55 *Risk reduction behaviour:* Of the 402 respondents to the post-campaign survey who had heard
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57 about the Break the Chains campaign, MSMwr (47.7%; 95/199) were less likely to report
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59 having consistently used a risk reduction strategy during April 2015 and maintained it until
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3 they got tested in May than MSMnr (76.8%; 156/203) (Table 2). This association remained in
4
5 multivariable analysis, after controlling for campaign-related, demographic and behavioural
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7 factors (adjusted, aOR 0.24; 95% CI 0.14, 0.42). Participation in a previous Break the Chains
8
9 campaign was associated with an increased odds of using a risk reduction strategy (aOR 2.62;
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11 95% CI 1.41, 4.85). Regular use of sex-on-premises venues and use of the internet to find
12
13 sexual partners were associated with reduced odds of using a risk reduction strategy (Table 2).
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Table 2. Factors associated with the uptake of the campaign message, according to HIV risk status, Break the Chains, Switzerland, March to May 2015, post-campaign survey (amongst respondents who reported having heard of the campaign: n=402/688)

	All respondents		Risk reduction in April until tested ^a				Risk reduction in April until tested					
	N=402	column %	Yes, N=251		No N=151		OR	[95% CI]	p-value from LR test	aOR	95% CI	p-value from LR test
			N	column %	N	column %						
BTC target group												<0.001
MSMwr	199	49.5	95	37.9	104	68.9	0.28	[0.18;0.42]	<0.001	0.24	[0.14;0.42]	
MSMnr	203	50.5	156	62.1	47	31.3	Ref.					
Felt personally concerned by BTC									0.005			0.066
Yes	152	37.8	109	43.4	43	28.5	1.84	[1.19;2.84]		1.70	[0.96;3.00]	
No	245	61.0	142	56.6	103	68.2	Ref.			Ref.		
No response	5	1.2	0	0.0	5	3.3						
Understand the message of BTC^c									0.011			0.224
Yes	263	65.4	176	70.1	87	57.6	1.73	[1.13;2.63]		1.42	[0.81;2.51]	
No	139	34.6	75	29.9	64	42.4	Ref.			Ref.		
Participation in previous BTC campaign									<0.001			0.002
Yes	123	30.6	96	38.3	27	17.9	2.84	[1.75;4.63]		2.62	[1.41;4.85]	
No	279	69.4	155	61.8	124	82.1	Ref.			Ref.		

	All respondents		Risk reduction in April until tested ^a				Risk reduction in April until tested					
	N=402	column %	Yes, N=251		No N=151		OR	[95% CI]	p-value from LR test	aOR	95% CI	p-value from LR test
			N	column %	N	column %						
Age								0.508				0.270
<25 yr.	19	4.7	13	5.2	6	4.0	1.55	[0.55;4.34]		2.76	[0.75;10.12]	
25-49 yr.	215	53.5	137	54.6	78	51.7	1.26	[0.80;1.97]		1.06	[0.59;1.90]	
≥50 yr.	127	31.6	74	29.5	53	35.1	Ref.			Ref.		
No response	41	10.2	27	10.8	14	9.3						
University degree								0.011				0.053
Yes	250	62.2	168	66.9	82	54.3	1.72	[1.13;2.61]		1.74	[0.99;3.06]	
No	149	37.1	81	32.3	68	45.0	Ref.			Ref.		
No response	3	0.8	2	0.8	1	0.7						
Live in area with >100,000 inhabitants								0.416				0.587
Yes	165	41.0	107	42.6	58	38.4	1.19	[0.79;1.79]		1.17	[0.67;2.03]	
No	235	58.5	143	57.0	92	60.9	Ref.			Ref.		
No response	2	0.5	1	0.4	1	0.7						

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	All respondents		Risk reduction in April until tested ^a				Risk reduction in April until tested					
	N=402	column %	Yes, N=251		No N=151		OR	[95% CI]	p-value from LR test	aOR	95% CI	p-value from LR test
			N	column %	N	column %						
Community connectedness									0.017			0.475
Mean	2.47		2.54		2.36							
Score 1-2.5	195	54.5	110	49.6	85	62.5	Ref.			Ref.		
Score 2.6-4	163	45.5	112	50.5	51	37.5	1.70	[1.10;2.62]		1.23	[0.70;2.14]	
Regularly visit sex-on-premises venues^b									0.009			0.032
Yes (frequently)	66	16.4	31	12.4	35	23.2	0.50	[0.29;0.84]		0.46	[0.22;0.94;]	
No (sometimes/never)	324	80.6	213	84.9	111	73.5	Ref.			Ref.		
No response	12	3.0	7	2.8	5	3.3						

	All respondents		Risk reduction in April until tested ^a				Risk reduction in April until tested					
	N=402	column	Yes, N=251		No N=151		OR	[95% CI]	p-value	aOR	95% CI	p-value
		%							from LR			from LR
			N	column	N	column			test			test
			%		%							
Frequent use of the internet for sexual encounters^b												
Yes (frequently)	178	44.3	88	35.1	90	59.6	0.36	[0.24;0.55]		0.52	[0.30;0.92]	
No (sometimes/never)	221	55.0	161	64.1	60	39.7	Ref.			Ref.		
No response	3	0.8	2	0.8	1	0.7						

Note. BTC=Break the Chains; LR=likelihood ratio; MSM=men who have sex with men; MSMnr=MSM with no HIVrisk; MSMwr=MSM with HIV risk; OR=odds ratio; aOR=adjusted odds ratio, adjusted for all variables in the table; Ref.=reference category.

^a Respondents were categorised as having adopted an RRS if they reported 'always' to either of two questions asking whether they had followed one of the two strategies promoted by the campaign (i.e. followed safer sex practices [151 respondents], or a risk reduction strategy adapted to their personal situation [232 respondents]). Other answer categories were 'sometimes', 'never', 'no answer'. (For exact question wording, see Table S2.)

^b In the last 12 months.

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4 Amongst the 251 respondents to the post-campaign survey who consistently used a risk
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6 reduction strategy in April, reasons for their actions were (Figure 2, multiple answers
7
8 allowed): 91.0% (142/165) of MSMnr and 69.5% (66/95) of MSMwr reported that they
9
10 always use a risk reduction strategy. Nineteen of the 95 (20.0%) MSMwr who reported they
11
12 had used a risk reduction strategy in April 2015 did it in order to comply with the key
13
14 message of the Break the Chains campaign (Figure 2).
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18 19 FIGURE 2

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21
22 *Test uptake:* 707 MSM who were tested in the VCT centres during May 2015 reported their
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24 reason for getting a test (Figure S3, multiple answers were allowed): 65 (9.2%) came to test as
25
26 part of the campaign, having avoided HIV transmission risks in April; 342 (48.4%) were
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28 being tested because of the reduced cost; 30 (4.2%) said the campaign made them aware of
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30 transmission risks, but they did not follow the recommendations, for 300 (42.4%) the reason
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32 was unrelated to the campaign, and 34 (4.8%) did not answer the question. Overall, 373 of
33
34 707 respondents (52.8%) mentioned a least one reason that was linked to the campaign, of
35
36 which reduced cost was the most common (Figure S3). A plot of monthly HIV test numbers
37
38 from March 2014 to September 2015 (Figure S4) shows that the number of tests during May
39
40 2015 (n=883) was twice as high as the average (n=436) for months when there was no HIV
41
42 test promotion. MSMnr accounted for about 70% of HIV tests both during months with HIV
43
44 test promotion and all other months.
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51 *Knowledge about primary infection:* The proportion of survey respondents who felt well
52
53 informed about primary HIV infection was higher in the post-campaign than the pre-
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55 campaign survey (58.0% vs. 51.1%; p=0.019). Amongst respondents to the post-campaign
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57 survey, this proportion was higher among those who had heard about the campaign than those
58
59 who had not (65.0% vs. 36.3%; p<0.001).
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3 *Sense of belonging to the gay community:* A higher score for connectedness to the LGBT
4 community was associated with adoption of a risk reduction strategy in univariable but not
5 multivariable analysis (Table 2). The mean scores in respondents of the pre-campaign and
6 post-campaign (2.39; SD=0.84 vs. 2.37; SD=0.82, p=0.745) surveys were similar.
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12 Respondents to the post-campaign survey who reported having heard about Break the Chains
13 had a higher score (2.47; SD=0.79) than the respondents who reported not having heard about
14 the campaign (2.14; SD=0.84).
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18 19 20 **Costs of Break the Chains 2015**

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23 The total costs of the campaign were USD PPP 488,984, with direct costs of USD PPP
24 474,019 and indirect costs of USD PPP 14,965 (Table S3). Salaries accounted for 46.1% of
25 the total costs, while 6.0% of the total costs (USD PPP 29,473) were spent on the reduction of
26 the price for HIV tests in May 2015. The costs of the present evaluation amounted to 16.4%
27 of the total campaign costs.
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36 Table 3 shows the total costs in relation to the outcomes of the campaign. The cost per
37 encounter (outreach contacts and conversations, clicks on the campaign website) is estimated
38 at USD PPP 14. Based on the results of the post-campaign survey, an estimated 58.4% of the
39 MSM population in Switzerland had heard of the campaign. Extrapolation of these costs to
40 the estimated population of MSM in Switzerland resulted in an estimate of USD PPP 9-13 to
41 reach one MSM, USD PPP 36-55 for one MSM at risk of HIV infection to adhere to a risk
42 reduction strategy, and USD PPP 181-272 for one MSM at risk of HIV infection to adhere to
43 a risk reduction strategy because of the campaign.
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Table 3. Approximate costs of outcomes of the campaign, Break the Chains, Switzerland, March to May 2015

Outcomes	Outcome measure (data source)	Estimated outcomes at the MSM population level	Campaign costs ^a / estimated outcome
Encounter	BTC 2015 outreach contacts/ conversations with MSM, clicks on the campaign website ^b	33,833	USD PPP 14
To reach one MSM	MSM who heard about BTC 2015 (58.4%, post-campaign survey)	37,376 – 52,560 ^c	USD PPP 9 - 13
One MSMwr adopts a risk reduction strategy in April 2015	MSM at risk who used a risk reduction strategy in April 2015 (13.8%, post-campaign survey ^d)	8,832 - 13,248 ^c	USD PPP 36 – 55
One MSMwr adopts an HIV risk reduction strategy because of the campaign	MSMwr who adopted an HIV risk reduction strategy in April and maintained it until HIV testing in May because of the BTC campaign (2.8%, post-campaign survey ^e)	1,792 – 2,688 ^c	USD PPP 181 - 272

Note. BTC=Break the Chains; MSM=men who have sex with men; MSMwr=MSM with HIV risk.

^a Total campaign costs were USD PPP 488,984 (incl. direct USD PPP 474,019 and indirect costs USD PPP 14,965, as well as the costs for the HIV test price reduction USD PPP 29,473) (CHF 603,896; purchasing power parity conversion rate for the year 2015: 1 CHF = 1.235 USD PPP). See Table S3 for more detailed explanation.

^b 9,746 (28.8%) of the 33,833 encounters are web clicks (no information available if web users are belonging to the target population), data from Swiss AIDS Federation;

^c Extrapolation of the outcome measure to the Swiss MSM population (estimated size of the population of MSM between 15 and 64 years old: 64,000 – 96,000 men,[20]);

^d Of 402 (58.4%) respondents who heard of the campaign 95 MSMwr respondents indicated that they adopted an HIV risk reduction strategy in April and maintained it until HIV testing in May (95/688=13.8%);

^e Of 402 (58.4%) respondents who heard of the campaign 19 MSMwr respondents indicated that they adopted their risk behavior in order to comply with the key message of the campaign (19/688=2.8%).

DISCUSSION

The multi-component community participatory Break the Chains campaign delivered information to an estimated 17,145 MSM in a large number of gay venues in Switzerland from March to April 2015. The target group, MSMwr, was more likely to have heard of the campaign but less likely than MSMnr to have used a risk reduction strategy until being tested

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3 for HIV in May 2015 (aOR 0.24; 95% CI 0.14, 0.42). Twenty percent of MSMwr who used a
4 HIV risk reduction strategy in April did it as a direct result of the campaign. HIV test uptake
5 increased after the campaign, but most tests were taken by MSMnr. Self-reported level of
6 knowledge about primary HIV infection and a sense of belonging to the LGBT community
7 were higher in MSM who had heard about the campaign than those who had not. The
8 campaign was estimated to have cost USD PPP 181-272 for each MSMwr who adhered to the
9 campaign message.

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12 Our results suggest that the Break the Chains campaign 2015 was an efficient way to increase
13 a short term increase in HIV testing amongst MSM, but not necessarily by those with sexual
14 behaviours associated with higher risks of HIV acquisition or transmission. The information
15 campaign achieved an exposure level that compares well with levels reported in the wider
16 literature on HIV campaigns.[18,19,26] The peer outreach workers were well-organised and
17 appeared to reach MSM who felt connected to the gay community. Their reports indicated,
18 however, that the message to have an HIV test came across more clearly than advice to avoid
19 exposure to HIV. The evaluation suggests that we underestimated the complexity of
20 delivering the two-part message and its rationale in the outreach venues. Uptake of HIV
21 testing might be higher with more emphasis on having an HIV test if one has had a potentially
22 high risk exposure in the previous month.

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25 This comprehensive assessment of a complex community-based HIV prevention intervention
26 at country level in Switzerland has several strengths. The campaign components were
27 evidence-based and the interdisciplinary and multi-method research design was theory-driven,
28 according to a programme theory of the way in which the intervention should work.[22] The
29 implementation and evaluation involved the main stakeholders in HIV prevention amongst
30 MSM, allowed us to maximise the acceptability of data collection and to evaluate the
31 campaign under real world conditions.[27] The online surveys were an efficient way to

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3 measure the pre-campaign intentions and campaign effects in independent samples of MSM
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5 across Switzerland and used a consistent way to define those at risk of HIV infection or
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7 transmission. The evaluation, however, also has weaknesses. First, we analysed campaign
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9 effects amongst all respondents who had heard of the campaign and did not differentiate
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11 between those who were contacted in outreach venues and those who had seen only the media
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13 information. We thus were unable to assess a possible dose-response effect. Second, self-
14
15 administered online surveys might result in participation bias, limiting generalisability to the
16
17 whole MSM population.[28,29] Nevertheless, online surveys are widely used to conduct
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19 research with hard to reach groups and have been used in Switzerland to assess sexual and
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21 preventive behaviours related to HIV risk since 2009. Third, the primary outcome was self-
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23 reported so might be influenced by recall and social desirability biases. We tried to mitigate
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25 these concerns by using a brief recall period (two months after the campaign) and self-
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27 administered, anonymous questionnaires. We acknowledge that respondents' attribution of
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29 changes in their behaviours would not capture subconscious influences of social networks and
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31 other mechanisms. We also acknowledge that the association with reported sense of belonging
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33 to the gay community might have been either a motivation for, or a consequence of the
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35 campaign. Fourth, campaign collaborators and intermediaries might have overestimated their
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37 activities. The overall number of campaign encounters is likely to be an underestimate
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39 because it does not include contacts achieved through other channels such as gay media
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41 communications, posters and flyers. Fifth, the extrapolation of costs to the national level
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43 assumes that the costs for areas involved in the campaign can be simply multiplied. In a small
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45 country like Switzerland, we think this was a reasonable assumption.
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54 **PUBLIC HEALTH IMPLICATIONS**

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57 The identification of people with undiagnosed HIV infection is the biggest challenge to the
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59 achievement of the UNAIDS 90-90-90 targets to end HIV/AIDS as a public health
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3 problem.[20, 30] Health promotion practitioners and policy makers need interventions that
4
5 increase HIV testing uptake in MSM and other populations at the highest risk of acquiring
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7 HIV infection and of transmitting it before diagnosis and the start of antiretroviral therapy.
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9 Since the Break the Chains 2015 campaign, pragmatic trials have shown the effectiveness of
10
11 pre-exposure prophylaxis (PrEP) to prevent HIV infection in MSM with high levels of risk
12
13 behaviours.[31,32] Informing MSM at risk about PrEP as an additional risk reduction strategy
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15 should therefore become part of HIV prevention campaigns, as it is already in
16
17 Switzerland.[21] This evaluation showed that Break the Chains increased HIV testing, but
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19 campaign messages need to be simplified and additional interventions are needed to identify
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21 the target group more accurately. The development, improvement and evaluation of
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23 community-based campaigns identifying those at highest risk of infection should remain a
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25 cornerstone in HIV prevention strategies for MSM.
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Author contributions

K.F., S.L., R.B., F.D.-A., R.R., N.L., D.K. conceived the study;

K.F. was responsible for the coordination of the research activities of the overall project and did the analysis of the implementation of the campaign;

S.L., R.B., and N.L. did the statistical analysis;

P.B. and M.S. did the cost analysis;

A.J.S. provided data on the total number of MSM and with unsuppressed HIV in Switzerland.

S.D., R.S., and A.L., provided monitoring and cost data for the analyses;

N.L., R.R., F.D.-A., A.J.S., D.K. gave advice on analysis and interpretation, all authors contributed to the interpretation;

K.F. wrote the first draft of the article;

S.L., R.B., D.K. and N.L. revised the article;

All authors reviewed and approved the final version.

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Conflicts of interest

At the time of the study, Roger Staub, Axel J. Schmidt and Steven Derendinger were with the Swiss Federal Office of Public Health. They were responsible for HIV prevention of the Swiss government and developed and implemented the 'Break the Chains' campaign. Kathrin Frey, Stéphanie Locicero and Raphael Bize received salary support from the Swiss Federal Office of Public Health. Andreas Lehner is with the Swiss Aids Federation and was involved

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2
3 in the development and implementation of the ‘Break the Chains’ campaign. All other authors
4
5 declared that they have no competing interests.
6
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8 **Note.** The findings and conclusion in this report are those of the authors and do not
9
10 necessarily represent the views of the Swiss Federal Office of Public Health or the Swiss Aids
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12 Federation.
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26 27 **Data statement**

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29 Anonymised quantitative survey data used for the analyses in this article are available on
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31 request from the corresponding author.
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Figure Legends

Figure 1: Campaign phases, activities and data collection instruments, Break the Chains, Switzerland, March to May 2015.

Note. BTC=Break the Chains; MSM=men who have sex with men; VCT=voluntary counseling and testing.

^a web clicks: no information available if web users are belonging to the target population; communication in gay magazines and social media: no data available on the audience size. Source: Swiss AIDS Federation, October 2015

^b Outreach activities are visits to public gay venues by date of the activity and region. Data about outreach activities in May 2015 were missing for 3 out of 11 regions. Source: Swiss AIDS Federation, October 2015

^c The outreach worker responsible for each visit estimated the number of conversations and contacts; a “conversation” involved a conversation of at least a few minutes and the dissemination of the core campaign messages; a “contact” included handing out of leaflets or being seen, but with no conversation. Source: Swiss AIDS Federation, October 2015

^d Number of HIV tests among MSM clients of 34 VCT sites in May 2015, recorded by the Swiss Federal Office of Public Health.

Figure 2: Outcome of campaign amongst respondents to the post-campaign online survey, Break the Chains, Switzerland, March to May 2015.

Note. BTC=Break the Chains; MSM=men who have sex with men; RRS=risk reduction strategy

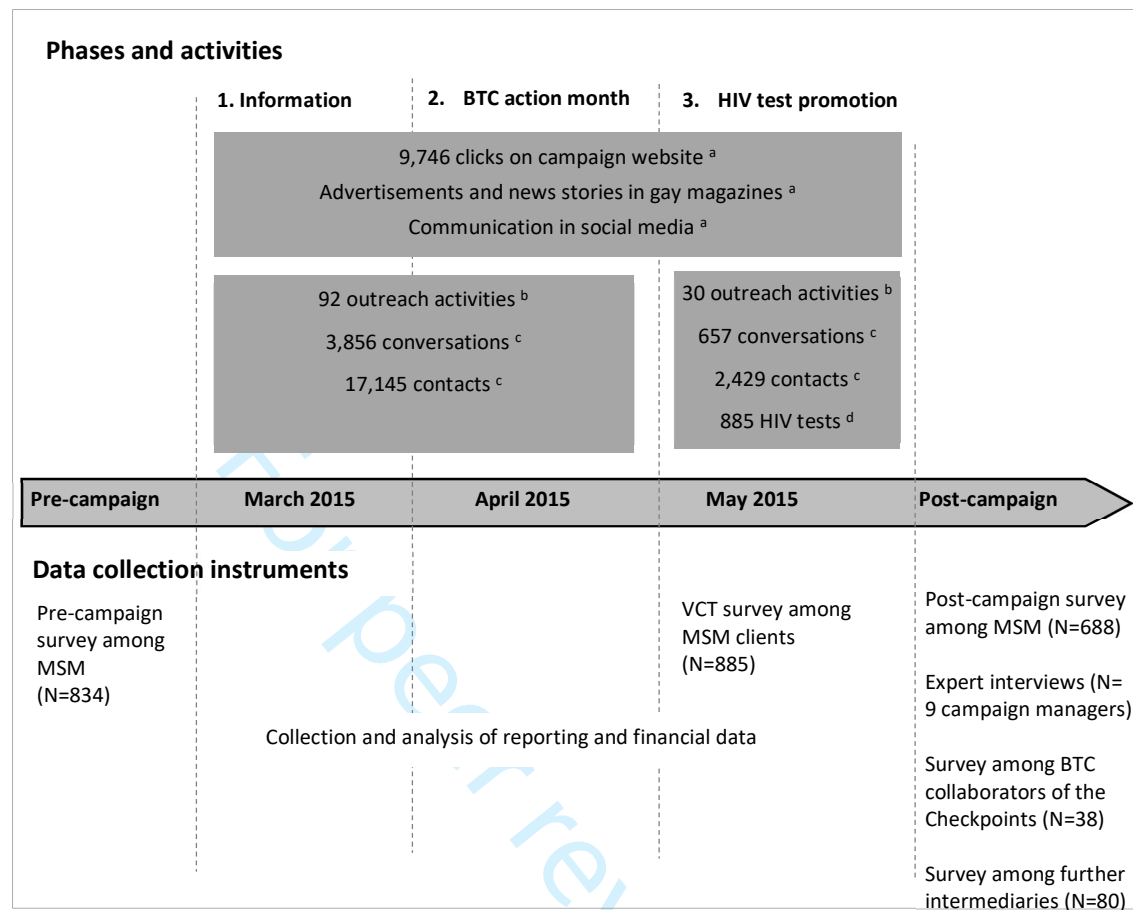


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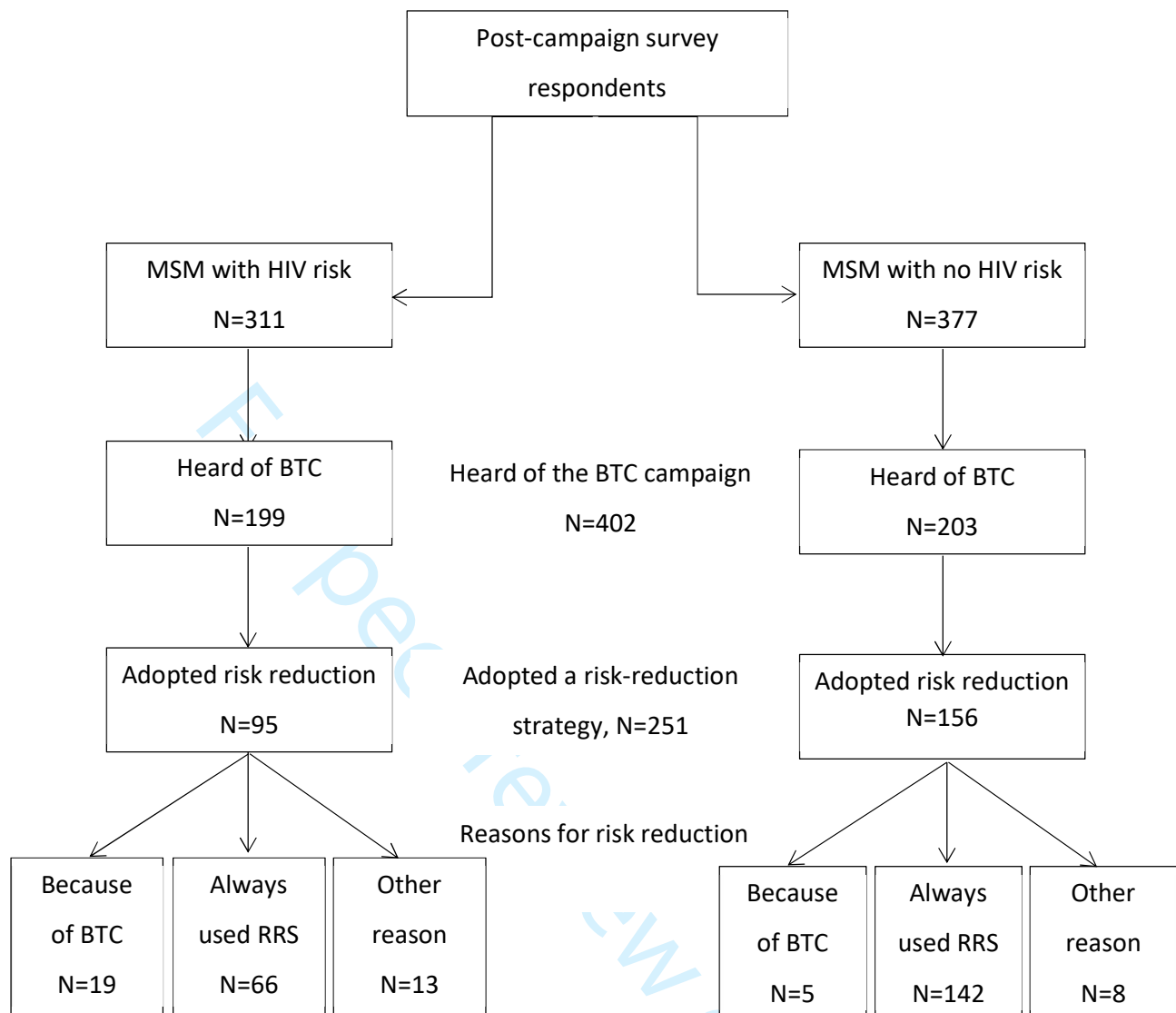


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3 **'Break the Chains 2015': evaluation of a community-based HIV prevention**
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5 **campaign for men who have sex with men in Switzerland**
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10 **Supplementary material**

11 **Supplementary tables**

12
13
14
15 [Table S1. Overview of methods, samples and data sources, Break the Chains campaign, Switzerland, March to May 2015](#) 2
16
17

18 [Table S2. Estimated direct and indirect costs of the Break the Chains campaign, Switzerland, March to May 2015](#) 3
19
20

21
22 **Supplementary figures**

23
24 [Figure S1. Break the Chains campaign poster, Switzerland, March to May 2015](#) 4
25

26 [Figure S2. Programme theory of the Break the Chains 2015 campaign May 2015](#) 5
27

28 [Figure S3. Reasons given for having an HIV test in May 2015, reported by respondents to online survey in voluntary counseling and testing centers, Break the Chains campaign, Switzerland, March to May 2015](#)..... 6
29
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31 [Figure S4. HIV test uptake at voluntary counseling and testing sites in Switzerland by month of consultation and risk behavior, Break the Chains campaign, Switzerland, March to May 2015](#) 7
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Table S1. Overview of methods, samples and data sources, Break the Chains campaign, Switzerland, March to May 2015

Focus of analysis	Methods	Sample size and data sources
Implementation	<ul style="list-style-type: none"> • Document analysis • Expert interviews • Survey among BTC collaborators of the Checkpoints • Survey among further mediators 	<ul style="list-style-type: none"> • Reporting data from the Swiss AIDS Federation • N = 9 campaign managers • N = 38 collaborators (54 invited; return rate 70.4%) • N = 80 intermediaries (138 invited, return rate 58.0%)
Effects among MSM	<ul style="list-style-type: none"> • Pre-campaign survey; internet-based, self-selected sampling • VCT sites survey; self-administered risk-assessment tool • Post-campaign survey; internet-based, self-selected sampling 	<ul style="list-style-type: none"> • N = 834 MSM • N = 885 MSM (clients of 34 VCT sites, May 2015) • N = 688 MSM
Costs	Analysis of reporting and financial data	All involved organizations (SFOPH, SAF, 12 local SAF member organizations) provided time sheets on working hours spent for BTC 2015; financial data obtained from the SAF and the SFOPH

Note. BTC=Break the Chains; MSM=men who have sex with men; SAF=Swiss AIDS Federation; SFOPH=Swiss Federal Office of Public Health; VCT=voluntary counseling and testing.

Table S2. Wording of survey questions for primary and secondary outcome measures (translated from the French original)

Outcome measure and questions	Answer categories
<i>Use of risk reduction strategy (RRS)^a</i>	
Have you used either of the following protection strategies during the month of April 2015, before getting tested?	
a) Followed safer sex rules (no penetration without condom, no sperm or blood in the mouth, doctor's visit for itching, discharge or pain in the genital area)	Always sometimes never
b) Other risk reduction strategy adapted to my personal situation (e.g. abstinence during 1 month, only oral sex, sexual intercourse exclusively between my steady partner and me)	Always sometimes never
<i>Knowledge about primary HIV infection</i>	
<u>Do you know what primary [hiv] infection is?</u>	Yes, and I think I am well informed Yes, but I don't think I am well informed No, I haven't heard of it
<i>Sense of belonging to the LGBT community^b</i>	
These questions concern the LGBT (lesbian, homosexual, bisexual and transgender) group in your region (canton of residence and/or neighbouring cantons). Do you agree or disagree with the following statements?	
a) You feel fully integrated into the LGBT group in your region.	<i>Answer scale from</i>
b) Being part of the LGBT community of your region is a positive thing for you.	1 I fully agree <i>to</i>
c) When we work together, gays and bisexuals can solve the problems of the LGBT community in our region.	4 I fully disagree
d) You really feel that all problems of the LGBT group in your region are also your own problems.	

Note. RRS and Sense of belonging to the LGBT community are composite measures, defined as follows:

^a Respondents were categorised as having adopted an RRS if they reported 'always' to either of two questions asking whether they had followed one of the two RRS promoted by the campaign.

^b The overall score for connectedness to the LGBT community is calculated as the arithmetic mean of the responses to the four statements.

Table S3. Estimated direct and indirect costs of the Break the Chains campaign, Switzerland, March to May 2015

Cost categories	In PPP USD	In CHF	% of total costs
Direct costs			
Salaries (total paid working hours = 3,423)			
National organizations SFOPH (hours =55) and SAF (hours = 1,703) ^a	142,348	175,800	29.1
Local partner organizations: campaign management (hours = 629) ^b	43,306	53,484	8.9
Local partner organizations: outreach activities (hours = 1,036) ^c	39,705	49,036	8.1
Paid out-of-pocket expense (e.g. travel expenses)	2,278	2,814	0.5
Material and third party services (e.g. consultancy, website, advertisements, translations, printing posters and flyers)	136,842	169,000	28.0
Price reduction of HIV tests in May 2015	29,473	36,400	6.0
Total research costs for the present study	80,000	98,880	16.4
Total direct costs	474,019	585,414	96.9
Indirect costs			
Volunteer work of the local partner organizations (unpaid working hours = 427) ^d	11,409	14,091	2.3
Unpaid out-of-pocket expenses	3,555	4,391	0.7
Total indirect costs	14,965	18,482	3.1
Total cost estimation (incl. direct and indirect costs)	488,984	603,896	100.0

Note. CHF 1 = USD PPP 1.235, conversion rate to 2015 purchasing power parity (ppp). Sources: Swiss Federal Office of Public Health (SFOPH) and Swiss AIDS Federation (SAF).

^a For the Swiss Federal Office of Public Health and the Swiss AIDS Federation an hourly rate of USD PPP 80 (CHF 100) including overhead costs was assumed.

^b For the local campaign managers an hourly rate of USD 88 (CHF 85) including overhead costs was assumed

^c Hourly rates for the outreach work differed regionally and ranged between USD PPP 16 (CHF 20) and 48 (CHF 60), effective rates were included.

^d This is measured as productivity losses on the labour market; the assumed hourly rate corresponds to the opportunity costs of a lost working hour. Based on the Swiss average income of USD PPP 54'574 (CHF 67,400) per year an hourly rate of USD PPP 26 (CHF 33) for the volunteer work was assumed.



50 **Figure S1.** Break the Chains campaign poster, Switzerland, March to May 2015

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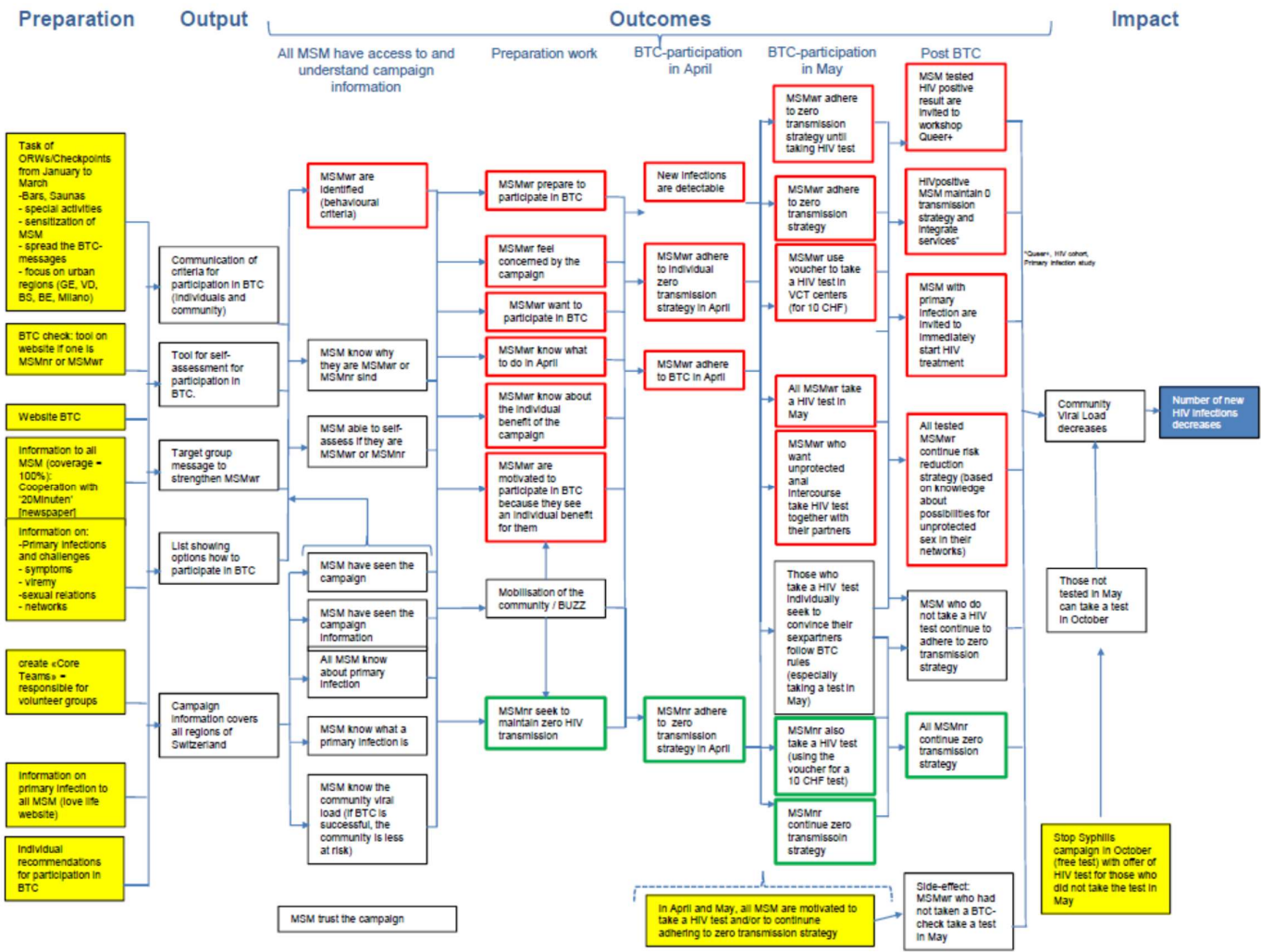
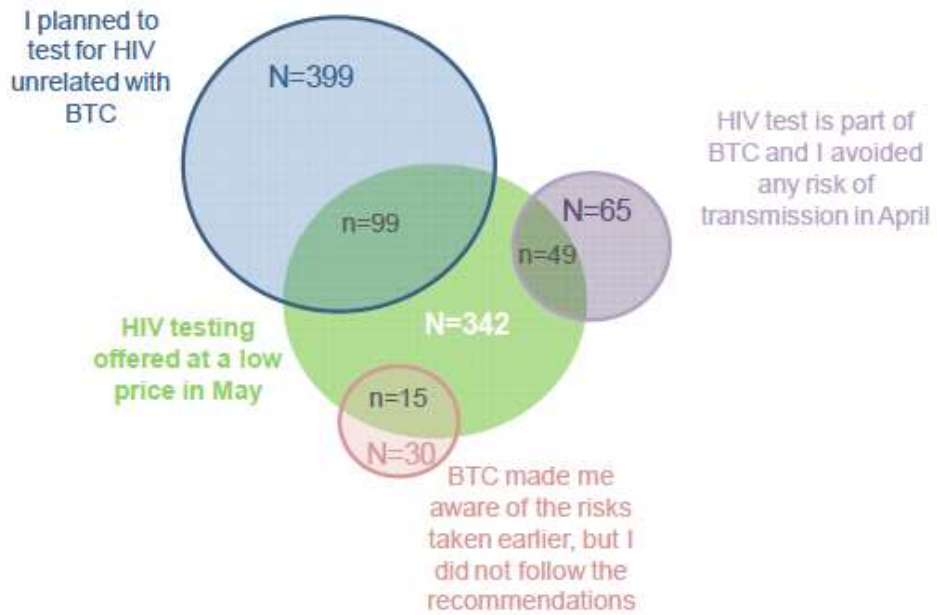


Figure S2. Programme theory of the Break the Chains 2015 campaign



Denominator: respondents who came specifically to get tested (N=707). 34 respondents did not mention any of the four reasons.

Figure S3. Reasons given for having an HIV test in May 2015, reported by respondents to online survey in voluntary counseling and testing centers, Break the Chains campaign, Switzerland, March to May 2015.

Note. BTC=Break the Chains. Respondents could give more than one reason.

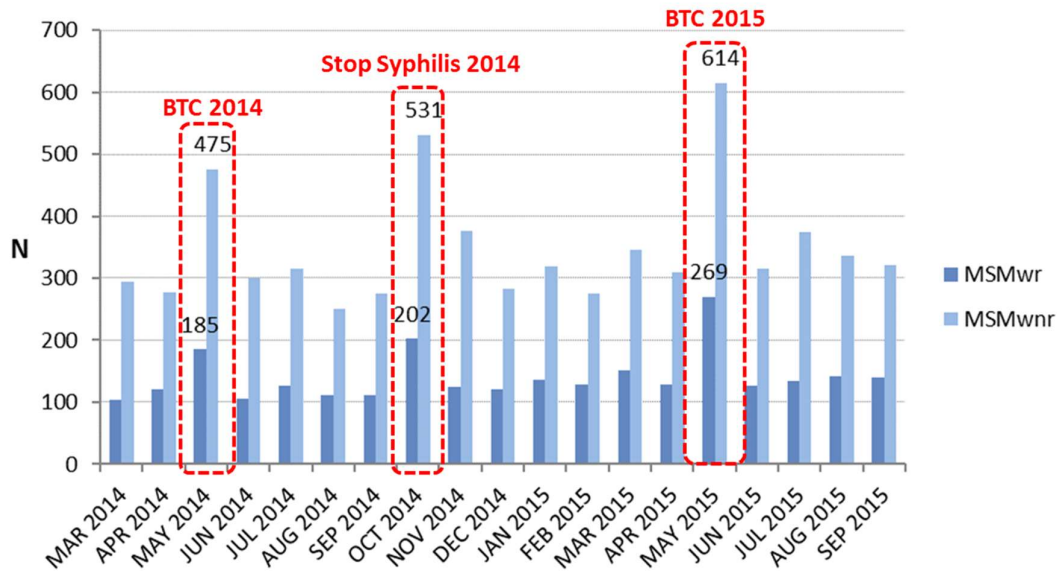


Figure S4. HIV test uptake at voluntary counseling and testing sites in Switzerland by month of consultation and risk behavior, Break the Chains campaign, Switzerland, March to May 2015

Note. BTC=Break the Chains; MSMwnr=men who have sex with men with none of the specified risks of HIV transmission; MSMwr=men who have sex with men with a specified risk of HIV transmission; N=number of tests; Stop Syphilis=health promotion campaign that offered free tests for syphilis. Red dashed lines indicate months in which HIV or syphilis tests were available at reduced or no cost.

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'Break the Chains 2015' community-based HIV prevention campaign for men who have sex with men in Switzerland: non-randomised evaluation and cost analysis

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TITLE

‘Break the Chains 2015’ community-based HIV prevention campaign for men who have sex with men in Switzerland: non-randomised evaluation and cost analysis

AUTHORS AND INSTITUTIONS

^a Kathrin FREY, frey@kek.ch, Department of Political Science, University of Zurich, Zurich, Switzerland;

^a Stéphanie LOCICIRO, Stephanie.Lociciro@efk.admin.ch, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland;

Patricia BLANK, patricia.blank@unibas.ch, Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland;

Matthias SCHWENKGLLENKS, matthias.schwenkglenks@uzh.ch, Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Zurich, Switzerland;

Françoise DUBOIS-ARBER, Dubois-Arber@bluewin.ch, Centre for Primary Care and Public Health (Unisanté), University of Lausanne, Lausanne, Switzerland

Rolf ROSENBROCK, rolf.rosenbrock@paritaet.org, Der Paritätische Gesamtverband, Berlin, Germany

Andreas LEHNER, andreas.lehner@aids.ch, Swiss Aids Federation, Zurich, Switzerland;

Roger STAUB, r.staub@promentesana.org, Swiss Federal Office of Public Health, Bern, Switzerland;

Steven DERENDINGER, Steven.Derendinger@bluewin.ch, Swiss Federal Office of Public Health, Bern, Switzerland;

Axel J. SCHMIDT, axel.j.schmidt@emis-project.eu, Swiss Federal Office of Public Health, Bern, Switzerland

1
2
3 ^b Raphaël BIZE, Raphael.Bize@unisanté.ch, Centre for Primary Care and Public Health
4
5 (Unisanté), University of Lausanne, Lausanne, Switzerland;
6

7 ^b Daniel KÜBLER, daniel.kuebler@ipz.uzh.ch, Department of Political Science, University of
8
9 Zurich, Zurich, Switzerland;
10

11 ^b Nicola LOW, nicola.low@ispm.unibe.ch, Institute of Social and Preventive Medicine,
12
13 University of Bern, Bern, Switzerland.
14
15

16
17
18 ^a These authors contributed equally to the study
19

20
21 ^b These authors contributed equally to the study
22
23
24
25
26
27
28
29

30 **CORRESPONDING AUTHOR**

31
32 Prof. Dr. Daniel KÜBLER
33

34 Department of Political Science, University of Zurich, Affolternstrasse 56, 8050 Zürich,
35
36 Switzerland, Email: Daniel.Kuebler@ipz.uzh.ch, Phone: +41 44 634 38 86
37
38
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57 HIV infections, MSM, prevention, community-based campaign, cost, cost-effectiveness
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ABSTRACT

Objectives: To study the implementation, effects and costs of Break the Chains, a community-based HIV prevention campaign for men who have sex with men (MSM) in Switzerland, from March to May 2015, which aimed to reduce early HIV transmission by promoting the campaign message to adopt short-term risk reduction followed by HIV testing.

Design: Non-randomised evaluation and cost analysis

Setting: Gay venues in 11 of 26 cantons in Switzerland and national online media campaign.

Participants: MSM in online surveys (pre-campaign N=834, post-campaign N=688) or attending HIV testing centres (N=885); campaign managers (N=9); and campaign staff (N=38) or further intermediaries (N=80) in an online survey.

Primary and secondary outcome measures: The primary outcome measure was the proportion of MSM at risk of HIV acquisition or transmission who adhered to the campaign message. Secondary outcomes were post-campaign test uptake, knowledge about HIV primary infection, and sense of belonging to the gay community.

Results: Campaign staff estimated that they contacted 17,145 MSM in 11 cantons. Amongst 688 respondents to the post-campaign survey, 311 (45.2%) were categorised as MSM at risk. Of 402/688 (58.5%) MSM who had heard about Break the Chains 2015, MSM categorised as being at risk were less likely to report adherence to the campaign message than MSM not at risk (adjusted odds ratio 0.24; 95% CI 0.14, 0.42). Twenty per cent of MSM who adopted risk reduction declared having done so because of the campaign. Costs for one MSM at risk to adhere to the campaign message were estimated at USD PPP 36-55. The number of HIV tests in the month after the campaign was twice the monthly average.

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3 *Conclusion:* Break the Chains increased HIV testing, implying that community-based
4 campaigns are useful HIV prevention strategies for MSM. Additional interventions are
5 needed to reach MSM at highest risk of infection more effectively.
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10 11 **STRENGTHS AND LIMITATIONS**

- 14 • This study adds to a limited body of literature evaluating implementation, effects and
15 costs of multicomponent, community-based campaigns to prevent HIV in MSM.
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- 17 • The study is interdisciplinary and uses data on campaign implementation and costs, as
18 well as outcome data from three surveys in MSM.
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- 20 • The study design did not include a control group.
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- 22 • The primary study outcome measurement is based on self-reported data collected from a
23 non-random sample of respondents.
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30 31 **ABBREVIATIONS**

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35 aOR, adjusted odds ratio; ART, antiretroviral therapy; CAI, condomless anal intercourse;
36
37 CHF, Swiss Francs; CI, confidence interval; HIV, human immunodeficiency virus; LGBT,
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39 lesbian, gay, bisexual and transgender; MSM, men who have sex with men; MSMnr, MSM
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41 with no risk of HIV acquisition or transmission; MSMwr, MSM with a defined risk of HIV
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43 acquisition or transmission; OR, odds ratio; PrEP, pre-exposure prophylaxis; SD, standard
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45 deviation; USD PPP, US Dollars at purchasing power parity; VCT, voluntary counseling and
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47 testing.
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INTRODUCTION

The number of new HIV diagnoses among men who have sex with men (MSM) remains high, even in countries that have high levels of use of antiretroviral treatment (ART).[1-5] Several modelling studies and studies of genetic sequence data suggest that a high proportion of new HIV infections results from MSM with undiagnosed early (primary) HIV infection.[3,4,6-8] Interventions that increase HIV testing and prevent transmission early on, when viral load is highest, could have a particularly powerful effect in reducing the incidence of HIV in MSM.[3,7,8]

Switzerland has a history of innovative HIV health promotion, including the “Stop AIDS” and “Love life” information campaigns and the “Swiss statement”, which emphasised the low risk of sexual transmission of HIV during effective ART ten years before “U=U” (undetectable equals untransmittable) was broadly promoted.[9] However, the population benefits of ART can only be realised if HIV infection is diagnosed, and reaching MSM with high risk sexual behaviours who are unaware of their HIV status is challenging. A mathematical modelling study in Switzerland estimated that in 2012 about 14% of HIV-infected MSM with undiagnosed infection were the source of more than 80% of new HIV infections in MSM.[8] Those with undiagnosed HIV infection are amongst about 20% of MSM in Switzerland who report never having had an HIV test during their life or among the 60% who have not had a test in the last year.[10] We estimate that in 2012, 6,300 MSM (8%) were living with HIV both diagnosed and undiagnosed, and 1,700 (or 2.2%) had non-suppressed HIV infection.[11] In addition, an increasing proportion of MSM report condomless anal intercourse with one or more casual sex partners.[10]

The Swiss Federal Office of Public Health developed an innovative community-based campaign, Break the Chains, to reduce HIV transmission during primary HIV infection.[12,

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3 13] The rationale for the campaign is that intensive mobilisation by the MSM community will
4 encourage those at high risk of HIV acquisition and transmission to adopt short-term risk
5 reduction practices, followed by HIV testing [12]. The risk reduction period should allow
6 recently acquired HIV infections to become detectable using routine HIV testing
7 methods.[14] MSM with newly detected infections can be linked to care services and start
8 immediate ART to reduce viral load and to reduce further HIV transmission.[15] The
9 campaign has been implemented every year in spring since 2012. Whilst several individual
10 components of the Break the Chains campaign are theory-driven and effective, such as peer
11 outreach activities, social marketing to promote HIV testing and voluntary counselling and
12 testing [16-20], evaluations of multicomponent campaigns are rare. The objectives of this
13 study were to evaluate the implementation, the effects and the costs of the Break the Chains
14 2015 campaign.

31 **METHODS**

34 **Participants**

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37 The Break the Chains 2015 campaign target population was MSM at risk of HIV acquisition
38 or transmission (Table 1). We define MSM as men who are attracted to other men or who
39 have sex with men, regardless of whether they identify themselves as gay. The population of
40 MSM aged 15-65 in Switzerland (2012) is estimated to be 80,000 (Bayesian 95% credibility
41 interval 64,000 to 96,000) of whom about half live in the five largest cities (Zurich, Geneva,
42 Basel, Lausanne, Bern).[11]

Table 1. Definition of MSM at risk, or not at risk of HIV acquisition or transmission, based on the theory of the 2015 Break the Chains campaign, Switzerland, March to May 2015

MSM with specified HIV risks (MSMwr) ^a	MSM with no specified HIV risks (MSMnr) ^a
CAI with a partner of unknown or different HIV status (steady and/or casual partners) over the last 12 months	Did not report any of the criteria for MSMwr; considered to have avoided any risk of HIV transmission ^b
CAI with casual partners over the last 12 months	
Unknown HIV status within a steady partnership over the last 12 months	
HIV-negative with steady partner who is HIV-positive but does not receive antiretroviral therapy and/or has a detectable viral load	
HIV-positive with detectable viral load ^c	

Note. CAI= condomless anal intercourse.

^a MSMwr and MSMnr are mutually exclusive categories;

^b MSM in this category are assumed to continue to avoid any risk of HIV transmission during the campaign and follow up period;

^c MSM with HIV infection and a detectable viral load are at risk of transmitting HIV. They were not included in the calculation of those adopting the campaign message because they would not be expected to have another HIV test.

Intervention

Break the Chains is a community-based multicomponent information and action campaign that involves: a media information campaign; local HIV prevention organization professionals and volunteers who deliver peer outreach activities; an incentive (reduced cost of testing) to increase the uptake of HIV testing; and evaluation. The campaign message of Break the Chains 2015 (Figure S1) was: “It’s simple: In order to prevent new HIV infections, avoid taking any risks for the month of April and then take an HIV test for CHF10 [USD PPP 8] in May. The more men who take part in this campaign, the more successful we will be in our efforts to combat HIV. So tell your friends about Break the Chains and join us.” The strategies to avoid taking risks were: safer sex practices (i.e. condom use for penetrative sex, no sperm or blood in the mouth), and strategies adapted to the personal situation (e.g. abstinence, only oral sex, sex exclusively with the steady partner who is either HIV negative or under treatment with an undetectable viral load). Pre-exposure prophylaxis (PrEP) has only been recommended in Switzerland since 2016.[21]

The Swiss Aids Federation implemented Break the Chains 2015 in three phases (Figure 1): 1) Late February and March, mobilisation of MSM to follow the recommendations of Break the Chains and outreach activities to deliver the campaign message; 2) throughout April, Break the Chains action month, MSM avoid any risk of HIV transmission until they get tested for HIV, and 3) May, HIV test promotion at a reduced cost (USD PPP 8 instead of USD PPP 48).

The media information campaign was implemented across Switzerland with advertisements on websites, a Facebook page and a campaign website. Media included adverts and news stories in gay magazines, posters, flyers, condom catch covers and silicon bracelets. Local member organisations of the Swiss AIDS Federation delivered the campaign in 11 of 26 cantons in Switzerland. Intermediaries, such as gay community organisations and managers of

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3 gay bars, clubs and other venues gave permission for the prevention activities and put out the
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5 campaign materials. Community workers and volunteers visited gay venues in the main city
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7 in the five cantons most affected by HIV, and to a lesser extent in another six cantons from
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9 February to May 2015. They conducted peer outreach to engage MSM in conversation to
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11 inform them about the campaign, its message, and the availability of HIV testing. In May
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13 2015, 34 voluntary counselling and testing (VCT) centres across Switzerland, including
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15 “Checkpoints”, i.e. dedicated health centres for MSM, offered low cost HIV tests for MSM.
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20 FIGURE 1

23 **Data Collection and Outcome Measures**

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26 We developed a detailed programme theory and evaluation plan (Figure S2, supplementary
27
28 online material) before the campaign started.[22] The evaluation plan specified outcome
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30 measures based on the theory of how the programme should work to prevent HIV
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32 transmission during early infection. Outcomes for implementation, effects and costs were
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34 defined (Table S1) and measured as follows.
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39 *Implementation fidelity:* this was measured as the intensity of the campaign activities,
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41 coherence between the campaign concept and delivery, and support for the campaign by
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43 intermediaries. We used three data sources (Figure 1, Table S1). First, Swiss AIDS Federation
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45 staff collected campaign monitoring data, including frequencies of outreach activities and
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47 estimates of the numbers of contacts made. Second, we conducted qualitative face-to-face
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49 interviews with campaign managers at the national and local level. Third, we set up an online
50
51 questionnaire for staff involved in the campaign delivery, bar and club managers, community
52
53 activists, and managers of HIV testing and prevention sites. The interviews and the online
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55 survey, completed in June 2015 after the campaign, included questions about the campaign’s
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57 concept, the delivery and the support for the campaign.
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3 *Intervention effect:* the primary outcome was the proportion of MSM at risk of HIV
4 acquisition or transmission who used one of the promoted HIV risk reduction strategies in
5 April, and maintained it until HIV testing in May. Secondary outcomes were: the proportion
6 of MSM at risk of HIV who used a HIV risk reduction strategy in April, and maintained it
7 until HIV testing in May because of the campaign; test uptake in May, compared with the 12
8 preceding months; knowledge about primary HIV infection; and the sense of belonging to the
9 gay community.
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20 We collected data between October 2014 and September 2015 in three anonymous online
21 surveys (Figure 1). The surveys were advertised on gay community, dating and social
22 networking websites before and after the campaign period. Respondents to the survey were
23 therefore self-selected and only account for a small proportion of all those who were
24 approached during the campaign (Figure 1, Table S1). All three surveys included questions
25 about self-reported HIV infection status, HIV-related sexual risk behaviours and socio-
26 demographic variables and connectedness to the lesbian, gay, bisexual, and transgender
27 (LGBT) community.[23] We defined MSM with risk of HIV infection (MSMwr) as having at
28 least one of five indicators of HIV transmission risk in the last year (Table 1). Survey
29 respondents with none of the five indicators were defined as MSM with no risk of HIV
30 infection (MSMnr).
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46 The pre-campaign survey elicited intentions of MSM to take part in the campaign. We added
47 specific questions to the 2014 edition of Gaysurvey, a structured questionnaire that has been
48 conducted since 1987 as part of routine monitoring of sexual and preventive behaviours
49 related to HIV risk amongst MSM in Switzerland (as an online survey since 2004).[10]
50 Participants were recruited through banner advertisements posted on relevant websites in
51 October 2014. They completed an internet-based self-administered questionnaire and
52 indicated whether they intended to take part in the 2015 Break the Chains campaign.
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3 An online post-campaign survey was conducted two months after the campaign using the
4 same recruitment strategy as the GaySurvey. In addition to topics covered in the pre-
5 campaign survey, the post-campaign survey asked about awareness of the campaign, sexual
6 behaviours during the campaign period and, for those who adopted an HIV risk reduction
7 strategy during April 2015, whether they did it because of the campaign (Table S2).
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12 In addition, MSM who visited any of the 34 VCT centres that offered reduced cost HIV tests
13 in May 2015 were invited to fill in a questionnaire. This VCT survey asked about campaign
14 exposure. Additionally, we collected data on the numbers of HIV tests taken by MSM in VCT
15 centres between March 2014 and September 2015.
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20 *Costs of Break the Chains 2015:* we used a full costing approach, including direct costs
21 (irrespective of payer) and costs of non-market items.[24] Costs were recorded in 2015 Swiss
22 francs (CHF). Considering purchasing power parity for the same year, they were converted to
23 United States Dollars (USD PPP). The direct cost components were personnel and other
24 expenses such as travel, overheads of the involved organisations, campaign materials and
25 services provided by third parties (e.g. advertisements, translations), subsidies for HIV tests
26 and the evaluation. The Swiss Federal Office of Public Health and Swiss AIDS Federation
27 provided financial statements and time sheets on the numbers of paid and unpaid working
28 hours by the staff and volunteers who implemented Break the Chains 2015 (Figure 1, Table
29 S3). The non-market cost component was unpaid volunteer work, estimated based on the
30 human capital approach that assumed an hourly rate corresponding to the opportunity costs of
31 a lost working hour in Switzerland (i.e. USD PPP 26 per hour). Cost results are reported as
32 programme costs and as cost per outcome achieved (e.g. MSM reached).
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55 56 **Analyses** 57 58 59 60

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3 Qualitative interviews were conducted by a member of the evaluation team, using an
4 interview guide. The interviews were digitally recorded and then transcribed. A trained
5 researcher used qualitative content analysis to analyse data about the implementation of the
6 campaign.[25] Descriptive statistics were used to report the pre-campaign intentions,
7 intervention fidelity, uptake of the intervention and of HIV testing, as well as secondary
8 outcomes.
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11 We calculated the uptake of the primary outcome, use of a risk reduction strategy during April
12 until HIV testing in May, amongst the sample of MSM who completed the post-campaign
13 survey and had heard about the campaign. HIV-positive MSM_{wr} (n=7/688) were excluded
14 from these analyses as they were not supposed to take an HIV test in May. We used logistic
15 regression to compare the primary outcome between the target group, MSM_{wr} and MSM not
16 in the target group (MSM_{nr}) according to campaign-related, demographic, community and
17 behavioural factors using univariable odds ratios (OR) with 95% confidence intervals (95%
18 CI). We constructed a multivariable model to compare the outcome in MSM_{wr} and MSM_{nr},
19 adjusting for all factors in the univariable analysis, including the secondary outcome of sense
20 of belonging to the gay community. Other secondary outcomes were described using
21 frequencies (post-campaign test uptake) and chi-square tests (knowledge of primary HIV
22 infection).
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46 The cost estimates used full data obtained from all involved organizations so they are
47 presented without measures of statistical uncertainty. We estimated the campaign costs per
48 outcome by extrapolating the campaign effects measured among survey respondents to the
49 entire estimated population of MSM in Switzerland, with uncertainty derived from the 95%
50 credibility intervals (64,000 to 96,000).[20]
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3 All quantitative data were processed in Excel[®] (version 2016, Microsoft Corp., Seattle, WA)
4 and analysed using SPSS[®] (version 23, IBM[®], New York, NY) and Stata (version 14, Stata
5 Corp. Austin, TX).
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10 **Ethical committee**

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14 The overall study was conducted in accordance with the Ethics Committee of the Faculty of
15 Arts and Sciences at University of Zurich. The protocol of the online surveys among MSM
16 was submitted to the Ethics Commission of the canton of Vaud, who considered it exempt
17 from ethical committee review because it used anonymous data (art. 2, al.2, Letter c, LRH).
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23 **Patient and public involvement**

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25 A representative of the community organisation responsible for the campaign (the Swiss Aids
26 Federation) participated in study design as well as elaboration of survey instruments, and is a
27 co-author of this article.
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35 **RESULTS**

36 **Pre-campaign intentions**

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39 In October 2014, a sample of 834 MSM responded to the online invitations to take part in the
40 pre-campaign GaySurvey. Of these, 395 (47.4% [95% CI: 43.9-50.8%]) said that they would
41 be ready to take part in the Break the Chains 2015 campaign. Among these, there were 111
42 MSMwr (28.1% [95% CI: 23.8-67.2%]) and 284 MSMnr (71.8% [95%CI: 67.2-76.1%]).
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52 **Implementation fidelity**

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56 Outreach workers and volunteers from local organisations attended venues on 92 evenings in
57 March and April 2015. They estimated that they had contacted a total of 17,145 MSM in
58 eleven regions during this period and conducted 3,856 conversations of a few minutes each to
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3 deliver the Break the Chains 2015 campaign message (Figure 1, Table S1). Of these, 10,584
4 (61.7%) contacts and 3169 (82.2%) conversations were in the five cities most affected by
5
6 HIV. Amongst venue managers, community activists, and managers of HIV testing and
7
8 prevention sites, 86.3% (69/80) reported having received the campaign posters and/or flyers
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10 and 87.0% (60/69) of those who received the materials said they had displayed them.
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15 Interviews with Break the Chains 2015 campaign managers and data from the survey among
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17 staff revealed that they found it difficult to convey the full campaign message in their
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19 outreach communications. Interviewees stated that public gay venues, such as crowded parties
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21 or bars, did not allow detailed communication about the rationale for reducing risk
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23 behaviours, the relevance of sexual networks and primary infection. Campaign staff reported
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25 that “take a test in May” was the message most frequently addressed in outreach
26
27 conversations (on average in nine out of ten conversations), followed by “take part in Break
28
29 the Chains and avoid any HIV transmission risk in April” (on average in eight out of ten
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31 conversations). Thus, the message that was delivered put more emphasis on HIV test
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33 promotion rather than equal emphasis on risk reduction and HIV testing.
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39 **Exposure to, and effects of, the Break the Chains campaign**

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42 Of the 688 respondents to the online invitations to take part in the post-campaign survey, 311
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44 (45.2%) were categorized as MSMwr and 377 as MSMnr (Figure 2). Of 402/688 (58.5%)
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46 MSM who reported that they had heard about Break the Chains 2015, 199 (49.5%) were
47
48 MSMwr. MSMwr (64.0%; 199/311) were more likely to have heard of the campaign than
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50 MSMnr (53.8%; 203/377) (difference in proportions 10.1%, 95% CI 2.8, 17.5%, p=0.007).
51
52 Similar proportions of MSMwr and MSMnr were able to identify the main campaign message
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54 (overall, 65.4%; 95% CI 60.5, 70.1%; 263/402) or felt personally concerned by the campaign
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56 (overall, 37.8%; 95% CI 33.1, 42.8%; 152/402).
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3 *Risk reduction behaviour:* Of the 402 respondents to the post-campaign survey who had heard
4 about the Break the Chains campaign, MSMwr (47.7%; 95/199) were less likely to report
5 having consistently used a risk reduction strategy during April 2015 and maintained it until
6 they got tested in May than MSMnr (76.8%; 156/203). The lower odds for MSMwr,
7 compared with MSMnr, to use a risk reduction strategy (Table 2) remained in multivariable
8 analysis, after controlling for campaign-related, demographic and behavioural factors
9 (adjusted, aOR 0.24; 95% CI 0.14, 0.42). Participation in a previous Break the Chains
10 campaign was associated with an increased odds of using a risk reduction strategy (aOR 2.62;
11 95% CI 1.41, 4.85). Regular use of sex-on-premises venues and use of the internet to find
12 sexual partners were associated with reduced odds of using a risk reduction strategy (Table 2).
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Table 2. Factors associated with the uptake of the campaign message, according to HIV risk status, Break the Chains, Switzerland, March to May 2015, post-campaign survey (amongst respondents who reported having heard of the campaign: n=402/688)

	All respondents		Risk reduction in April until tested ^a				Risk reduction in April until tested					
	N=402	column %	Yes, N=251		No N=151		OR	[95% CI]	p-value from LR test	aOR	95% CI	p-value from LR test
			N	column %	N	column %						
BTC target group												<0.001
MSMwr	199	49.5	95	37.9	104	68.9	0.28	[0.18;0.42]	<0.001	0.24	[0.14;0.42]	
MSMnr	203	50.5	156	62.1	47	31.3	Ref.					
Felt personally concerned by BTC									0.005			0.066
Yes	152	37.8	109	43.4	43	28.5	1.84	[1.19;2.84]		1.70	[0.96;3.00]	
No	245	61.0	142	56.6	103	68.2	Ref.			Ref.		
No response	5	1.2	0	0.0	5	3.3						
Understand the message of BTC^c									0.011			0.224
Yes	263	65.4	176	70.1	87	57.6	1.73	[1.13;2.63]		1.42	[0.81;2.51]	
No	139	34.6	75	29.9	64	42.4	Ref.			Ref.		
Participation in previous BTC campaign									<0.001			0.002
Yes	123	30.6	96	38.3	27	17.9	2.84	[1.75;4.63]		2.62	[1.41;4.85]	
No	279	69.4	155	61.8	124	82.1	Ref.			Ref.		

	All respondents		Risk reduction in April until tested ^a				Risk reduction in April until tested					
	N=402	column %	Yes, N=251		No N=151		OR	[95% CI]	p-value from LR test	aOR	95% CI	p-value from LR test
			N	column %	N	column %						
Age								0.508				0.270
<25 yr.	19	4.7	13	5.2	6	4.0	1.55	[0.55;4.34]		2.76	[0.75;10.12]	
25-49 yr.	215	53.5	137	54.6	78	51.7	1.26	[0.80;1.97]		1.06	[0.59;1.90]	
≥50 yr.	127	31.6	74	29.5	53	35.1	Ref.			Ref.		
No response	41	10.2	27	10.8	14	9.3						
University degree								0.011				0.053
Yes	250	62.2	168	66.9	82	54.3	1.72	[1.13;2.61]		1.74	[0.99;3.06]	
No	149	37.1	81	32.3	68	45.0	Ref.			Ref.		
No response	3	0.8	2	0.8	1	0.7						
Live in area with >100,000 inhabitants								0.416				0.587
Yes	165	41.0	107	42.6	58	38.4	1.19	[0.79;1.79]		1.17	[0.67;2.03]	
No	235	58.5	143	57.0	92	60.9	Ref.			Ref.		
No response	2	0.5	1	0.4	1	0.7						

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	All respondents		Risk reduction in April until tested ^a				Risk reduction in April until tested					
	N=402	column %	Yes, N=251		No N=151		OR	[95% CI]	p-value from LR test	aOR	95% CI	p-value from LR test
			N	column %	N	column %						
Community connectedness									0.017			0.475
Mean	2.47		2.54		2.36							
Score 1-2.5	195	54.5	110	49.6	85	62.5	Ref.			Ref.		
Score 2.6-4	163	45.5	112	50.5	51	37.5	1.70	[1.10;2.62]		1.23	[0.70;2.14]	
Regularly visit sex-on-premises venues^b									0.009			0.032
Yes (frequently)	66	16.4	31	12.4	35	23.2	0.50	[0.29;0.84]		0.46	[0.22;0.94;]	
No (sometimes/never)	324	80.6	213	84.9	111	73.5	Ref.			Ref.		
No response	12	3.0	7	2.8	5	3.3						

	All respondents		Risk reduction in April until tested ^a				Risk reduction in April until tested					
	N=402	column %	Yes, N=251		No N=151		OR	[95% CI]	p-value from LR test	aOR	95% CI	p-value from LR test
			N	column %	N	column %						
Frequent use of the internet for sexual encounters^b												
Yes (frequently)	178	44.3	88	35.1	90	59.6	0.36	[0.24;0.55]		0.52	[0.30;0.92]	
No (sometimes/never)	221	55.0	161	64.1	60	39.7	Ref.			Ref.		
No response	3	0.8	2	0.8	1	0.7						

Note. BTC=Break the Chains; LR=likelihood ratio; MSM=men who have sex with men; MSMnr=MSM with no HIV risk; MSMwr=MSM with HIV risk; OR=odds ratio; aOR=adjusted odds ratio, adjusted for all variables in the table; Ref.=reference category.

^a Respondents were categorised as having adopted an RRS if they reported 'always' to either of two questions asking whether they had followed one of the two strategies promoted by the campaign (i.e. followed safer sex practices [151 respondents], or a risk reduction strategy adapted to their personal situation [232 respondents]). Other answer categories were 'sometimes', 'never', 'no answer'. (For exact question wording, see Table S2.)

^b In the last 12 months.

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4 Amongst the 251 respondents to the post-campaign survey who consistently used a risk
5 reduction strategy in April, 91.0% (142/165) of MSMnr and 69.5% (66/95) of MSMwr
6 reported that they always use a risk reduction strategy. Nineteen of the 95 (20.0%) MSMwr
7 who reported they had used a risk reduction strategy in April 2015 did it in order to comply
8 with the key message of the Break the Chains campaign (Figure 2, multiple answers allowed).
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16 FIGURE 2

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20 *Test uptake:* 707 MSM who were tested in the VCT centres during May 2015 reported their
21 reason for getting a test (Figure S3, multiple answers were allowed): 65 (9.2%) came to test as
22 part of the campaign, having avoided HIV transmission risks in April; 342 (48.4%) were
23 being tested because of the reduced cost; 30 (4.2%) said the campaign made them aware of
24 transmission risks, but they did not follow the recommendations, for 300 (42.4%) the reason
25 was unrelated to the campaign, and 34 (4.8%) did not answer the question. Overall, 373 of
26 707 respondents (52.8%) mentioned a least one reason that was linked to the campaign, of
27 which reduced cost was the most common (Figure S3). A plot of monthly HIV test numbers
28 from March 2014 to September 2015 (Figure 3) shows that the number of tests during May
29 2015 (n=883) was twice as high as the average (n=436) for months when there was no HIV
30 test promotion. MSMnr accounted for about 70% of HIV tests both during months with HIV
31 test promotion and all other months.
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47 FIGURE 3

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51 *Knowledge about primary infection:* The proportion of survey respondents who felt well
52 informed about primary HIV infection was higher in the post-campaign than the pre-
53 campaign survey (58.0% vs. 51.1%; p=0.019). Amongst respondents to the post-campaign
54 survey, this proportion was higher among those who had heard about the campaign than those
55 who had not (65.0% vs. 36.3%; p<0.001).
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3 *Sense of belonging to the gay community:* A higher score for connectedness to the LGBT
4 community was associated with adoption of a risk reduction strategy in univariable but not
5 multivariable analysis (Table 2). The mean scores in respondents of the pre-campaign and
6 post-campaign (2.39; SD=0.84 vs. 2.37; SD=0.82, p=0.745) surveys were similar.
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12 Respondents to the post-campaign survey who reported having heard about Break the Chains
13 had a higher score (2.47; SD=0.79) than the respondents who reported not having heard about
14 the campaign (2.14; SD=0.84).
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18 19 20 **Costs of Break the Chains 2015**

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23 The total costs of the campaign were USD PPP 488,984, with direct costs of USD PPP
24 474,019 and costs of non-market items of USD PPP 14,965 (Table S3). Salaries accounted for
25 46.1% of the total costs, while 6.0% of the total costs (USD PPP 29,473) were spent on the
26 reduction of the price for HIV tests in May 2015. The costs of the present evaluation
27 amounted to 16.4% of the total campaign costs.
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35 Table 3 shows the total costs in relation to the outcomes of the campaign. The cost per
36 encounter (outreach contacts and conversations, clicks on the campaign website) is estimated
37 at USD PPP 14. Based on the results of the post-campaign survey, an estimated 58.4% of the
38 MSM population in Switzerland had heard of the campaign. Extrapolation of these costs to
39 the estimated population of MSM in Switzerland resulted in an estimate of USD PPP 9-13 to
40 reach one MSM, USD PPP 36-55 for one MSM at risk of HIV to adhere to a risk reduction
41 strategy, and USD PPP 181-272 for one MSM at risk of HIV to adhere to a risk reduction
42 strategy because of the campaign.
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Table 3. Approximate costs of outcomes of the campaign, Break the Chains, Switzerland, March to May 2015

Outcomes	Outcome measure (data source)	Estimated outcomes at the MSM population level	Campaign costs ^a / estimated outcome
Encounter	BTC 2015 outreach contacts/ conversations with MSM, clicks on the campaign website ^b	33,833	USD PPP 14
To reach one MSM	MSM who heard about BTC 2015 (58.4%, post-campaign survey)	37,376 – 52,560 ^c	USD PPP 9 - 13
One MSMwr adopts a risk reduction strategy in April 2015	MSM at risk who used a risk reduction strategy in April 2015 (13.8%, post-campaign survey ^d)	8,832 - 13,248 ^c	USD PPP 36 – 55
One MSMwr adopts an HIV risk reduction strategy because of the campaign	MSMwr who adopted an HIV risk reduction strategy in April and maintained it until HIV testing in May because of the BTC campaign (2.8%, post-campaign survey ^e)	1,792 – 2,688 ^c	USD PPP 181 - 272

Note. BTC=Break the Chains; MSM=men who have sex with men; MSMwr=MSM with HIV risk.

^a Total campaign costs were USD PPP 488,984 (incl. direct USD PPP 474,019 and costs of non-market items USD PPP 14,965, as well as the costs for the HIV test price reduction USD PPP 29,473) (CHF 603,896; purchasing power parity conversion rate for the year 2015: 1 CHF = 1.235 USD PPP). See Table S3 for more detailed explanation.

^b 9,746 (28.8%) of the 33,833 encounters are web clicks (no information available if web users are belonging to the target population), data from Swiss AIDS Federation;

^c Extrapolation of the outcome measure to the Swiss MSM population (estimated size of the population of MSM between 15 and 64 years old: 64,000 – 96,000 men,[20]);

^d Of 402 (58.4%) respondents who heard of the campaign 95 MSMwr respondents indicated that they adopted an HIV risk reduction strategy in April and maintained it until HIV testing in May (95/688=13.8%);

^e Of 402 (58.4%) respondents who heard of the campaign 19 MSMwr respondents indicated that they adopted their risk behavior in order to comply with the key message of the campaign (19/688=2.8%).

DISCUSSION

The multi-component community participatory Break the Chains campaign delivered information to an estimated 17,145 MSM in a large number of gay venues in Switzerland from March to April 2015. The target group, MSMwr, was more likely to have heard of the campaign but less likely than MSMnr to have used a risk reduction strategy until being tested

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3 for HIV in May 2015 (aOR 0.24; 95% CI 0.14, 0.42). Twenty percent of MSMwr who used a
4 HIV risk reduction strategy in April did it as a direct result of the campaign. HIV test uptake
5 increased after the campaign, but most tests were taken by MSMnr. Self-reported level of
6 knowledge about primary HIV infection and a sense of belonging to the LGBT community
7 were higher in MSM who had heard about the campaign than those who had not. The
8 campaign was estimated to have cost USD PPP 181-272 for each MSMwr who adhered to the
9 campaign message.
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20 Our results suggest that the Break the Chains campaign 2015 produced a substantial short
21 term increase in HIV testing amongst MSM, but not necessarily by those with sexual
22 behaviours associated with higher risks of HIV. The information campaign achieved an
23 exposure level that compares well with levels reported in the wider literature on HIV
24 campaigns.[18,19,26] The peer outreach workers were well-organised and appeared to reach
25 MSM who felt connected to the gay community. Their reports indicated, however, that the
26 message to have an HIV test came across more clearly than advice to avoid exposure to HIV.
27 The evaluation suggests that we underestimated the complexity of delivering the two-part
28 message and its rationale in the outreach venues. Uptake of HIV testing might be higher with
29 more emphasis on having an HIV test if one has had a potentially high risk exposure in the
30 previous month.
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46 This comprehensive assessment of a complex community-based HIV prevention intervention
47 at country level in Switzerland has several strengths. The campaign components were
48 evidence-based and the interdisciplinary and multi-method research design was theory-driven,
49 according to a programme theory of the way in which the intervention should work.[22] The
50 implementation and evaluation involved the main stakeholders in HIV prevention amongst
51 MSM, allowed us to maximise the acceptability of data collection and to evaluate the
52 campaign under real world conditions.[27] The online surveys were an efficient way to
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3 measure the pre-campaign intentions and campaign effects in independent samples of MSM
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5 across Switzerland and used a consistent way to define those at risk of HIV infection or
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7 transmission. The evaluation, however, also has weaknesses. First, we analysed campaign
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9 effects amongst all respondents who had heard of the campaign and did not differentiate
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11 between those who were contacted in outreach venues and those who had seen only the media
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13 information. We thus were unable to assess a possible dose-response effect. Second, self-
14
15 administered online surveys might result in participation bias, limiting generalisability to the
16
17 whole MSM population.[28,29] Nevertheless, online surveys are widely used to conduct
18
19 research with hard to reach groups and have been used in Switzerland to assess sexual and
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21 preventive behaviours related to HIV risk since 2009. Third, the primary outcome was self-
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23 reported so might be influenced by recall and social desirability biases. We tried to mitigate
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25 these concerns by using a brief recall period (two months after the campaign) and self-
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27 administered, anonymous questionnaires. We acknowledge that respondents' attribution of
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29 changes in their behaviours would not capture subconscious influences of social networks and
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31 other mechanisms. We also acknowledge that the association with reported sense of belonging
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33 to the gay community might have been either a motivation for, or a consequence of the
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35 campaign. Fourth, campaign collaborators and intermediaries might have overestimated their
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37 activities. The overall number of campaign encounters is likely to be an underestimate
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39 because it does not include contacts achieved through other channels such as gay media
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41 communications, posters and flyers. Fifth, the extrapolation of costs to the national level
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43 assumes that the costs for areas involved in the campaign can be simply multiplied. In a small
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45 country like Switzerland, we think this was a reasonable assumption. It remains unknown to
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47 what extent the unpaid volunteer work provided, conceptualised here as a non-market cost
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49 item, translated into a reduction of paid work, and thus cost of lost productivity at the societal
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51 level.
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PUBLIC HEALTH IMPLICATIONS

The identification of people with undiagnosed HIV infection is the biggest challenge to the achievement of the UNAIDS 90-90-90 targets to end HIV/AIDS as a public health problem.[20, 30] Health promotion practitioners and policy makers need interventions that increase HIV testing uptake in MSM and other populations at the highest risk of acquiring HIV infection and of transmitting it before diagnosis and the start of antiretroviral therapy. Since the Break the Chains 2015 campaign, pragmatic trials have shown the effectiveness of pre-exposure prophylaxis (PrEP) to prevent HIV infection in MSM with high levels of risk behaviours.[31, 32] Informing MSM at risk about PrEP as an additional risk reduction strategy should therefore become part of HIV prevention campaigns, as it is already in Switzerland.[21] This evaluation showed that Break the Chains increased HIV testing, but campaign messages need to be simplified and additional interventions are needed to identify the target group more accurately. The development, improvement and evaluation of community-based campaigns identifying those at highest risk of infection should remain a cornerstone in HIV prevention strategies for MSM.

Author contributions

K.F., S.L., R.B., F.D.-A., R.R., N.L., D.K. conceived the study;

K.F. was responsible for the coordination of the research activities of the overall project and did the analysis of the implementation of the campaign;

S.L., R.B., and N.L. did the statistical analysis;

P.B. and M.S. did the cost analysis;

A.J.S. provided data on the total number of MSM and with unsuppressed HIV in Switzerland.

S.D., R.S., and A.L., provided monitoring and cost data for the analyses;

N.L., R.R., F.D.-A., A.J.S., D.K. gave advice on analysis and interpretation, all authors contributed to the interpretation;

K.F. wrote the first draft of the article;

S.L., R.B., D.K. and N.L. revised the article;

All authors reviewed and approved the final version.

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Conflicts of interest

At the time of the study, Roger Staub, Axel J. Schmidt and Steven Derendinger were with the Swiss Federal Office of Public Health. They were responsible for HIV prevention of the Swiss government and developed and implemented the 'Break the Chains' campaign. Kathrin Frey, Stéphanie Locicero and Raphael Bize received salary support from the Swiss Federal Office of Public Health. Andreas Lehner is with the Swiss Aids Federation and was involved

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2
3 in the development and implementation of the ‘Break the Chains’ campaign. All other authors
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5 declared that they have no competing interests.
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8 **Note.** The findings and conclusion in this report are those of the authors and do not
9
10 necessarily represent the views of the Swiss Federal Office of Public Health or the Swiss Aids
11
12 Federation.
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16 17 18 **Funding**

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20 This work was supported by the Swiss Federal Office of Public Health.
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26 27 **Data statement**

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29 Anonymised quantitative survey data used for the analyses in this article are available on
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31 request from the corresponding author.
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Figure Legends

Figure 1: Campaign phases, activities and data collection instruments, Break the Chains, Switzerland, March to May 2015.

Note. BTC=Break the Chains; MSM=men who have sex with men; VCT=voluntary counseling and testing.

^a web clicks: no information available if web users are belonging to the target population; communication in gay magazines and social media: no data available on the audience size. Source: Swiss AIDS Federation, October 2015

^b Outreach activities are visits to public gay venues by date of the activity and region. Data about outreach activities in May 2015 were missing for 3 out of 11 regions. Source: Swiss AIDS Federation, October 2015

^c The outreach worker responsible for each visit estimated the number of conversations and contacts; a “conversation” involved a conversation of at least a few minutes and the dissemination of the core campaign messages; a “contact” included handing out of leaflets or being seen, but with no conversation. Source: Swiss AIDS Federation, October 2015

^d Number of HIV tests among MSM clients of 34 VCT sites in May 2015, recorded by the Swiss Federal Office of Public Health.

Figure 2: Outcome of campaign amongst respondents to the post-campaign online survey, Break the Chains, Switzerland, March to May 2015.

Note. BTC=Break the Chains; MSM=men who have sex with men; RRS=risk reduction strategy

Figure 3. HIV test uptake at voluntary counseling and testing sites in Switzerland by month of consultation and risk behavior, Break the Chains campaign, Switzerland, March to May 2015

Note. BTC=Break the Chains; MSMwnr=men who have sex with men with none of the specified risks of HIV transmission; MSMwr=men who have sex with men with a specified risk of HIV transmission; N=number of tests; Stop Syphilis=health promotion campaign that offered free tests for syphilis. Red dashed lines indicate months in which HIV or syphilis tests were available at reduced or no cost.

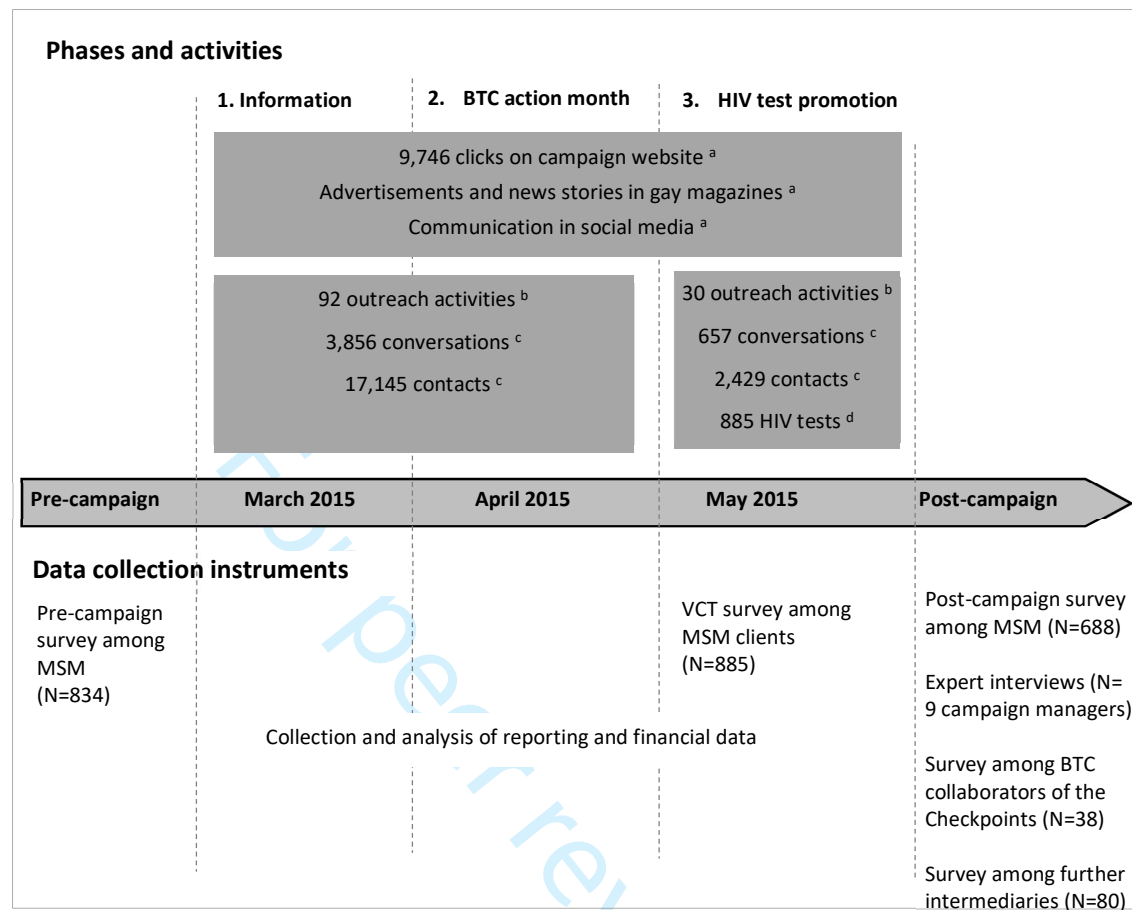


Figure 1. Campaign phases, activities and data collection instruments, Break the Chains, Switzerland, March to May 2015

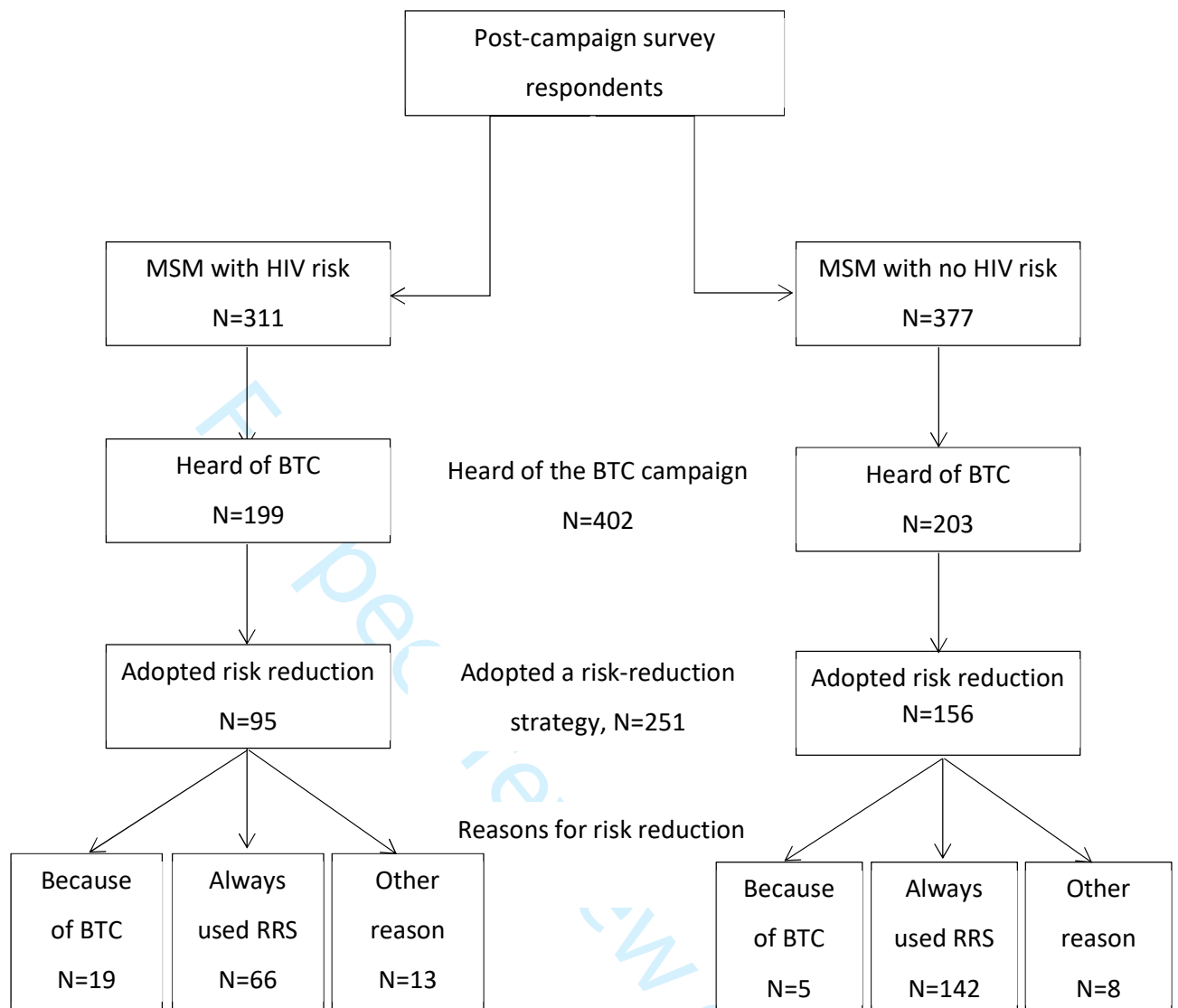
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39 **Figure 2.** Outcome of campaign amongst respondents to the post-campaign online survey,
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41 *Note.* BTC=Break the Chains; MSM=men who have sex with men; RRS=risk reduction strategy

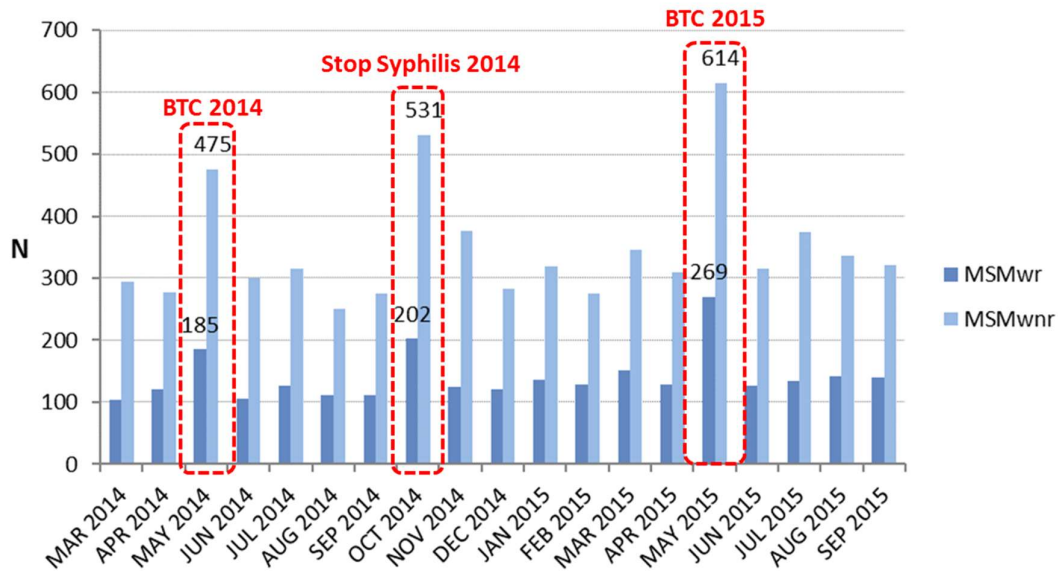


Figure 3. HIV test uptake at voluntary counseling and testing sites in Switzerland by month of consultation and risk behavior, Break the Chains campaign, Switzerland, March to May 2015

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3 **'Break the Chains 2015': evaluation of a community-based HIV prevention**
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5 **campaign for men who have sex with men in Switzerland**
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10 **Supplementary material**

11 **Supplementary tables**

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15 **Table S1.** Overview of methods, samples and data sources, Break the Chains campaign, Switzerland,
16 March to May 2015 2
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18 **Table S2.** Wording of survey questions for primary and secondary outcome measures
19 (translated from the French original) 3
20

21 **Table S3.** Estimated direct costs and costs of non-market items and indirect costs of the Break the
22 Chains campaign, Switzerland, March to May 2015..... 4
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25 **Supplementary figures**

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27 **Figure S1.** Break the Chains campaign poster, Switzerland, March to May 2015 5
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29 **Figure S2.** Programme theory of the Break the Chains 2015 campaign May 2015 6
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31 **Figure S3.** Reasons given for having an HIV test in May 2015, reported by respondents to online
32 survey in voluntary counseling and testing centers, Break the Chains campaign, Switzerland, March to
33 May 2015..... 7
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Table S1. Overview of methods, samples and data sources, Break the Chains campaign, Switzerland, March to May 2015

Focus of analysis	Methods	Sample size and data sources
Implementation	<ul style="list-style-type: none"> • Document analysis • Expert interviews • Survey among BTC collaborators of the Checkpoints • Survey among further mediators 	<ul style="list-style-type: none"> • Reporting data from the Swiss AIDS Federation • N = 9 campaign managers • N = 38 collaborators (54 invited; return rate 70.4%) • N = 80 intermediaries (138 invited, return rate 58.0%)
Effects among MSM	<ul style="list-style-type: none"> • Pre-campaign survey; internet-based, self-selected sampling • VCT sites survey; self-administered risk-assessment tool • Post- campaign survey; internet-based, self-selected sampling 	<ul style="list-style-type: none"> • N = 834 MSM • N = 885 MSM (clients of 34 VCT sites, May 2015) • N = 688 MSM
Costs	Analysis of reporting and financial data	All involved organizations (SFOPH, SAF, 12 local SAF member organizations) provided time sheets on working hours spent for BTC 2015; financial data obtained from the SAF and the SFOPH

Note. BTC=Break the Chains; MSM=men who have sex with men; SAF=Swiss AIDS Federation; SFOPH=Swiss Federal Office of Public Health; VCT=voluntary counseling and testing.

Table S2. Wording of survey questions for primary and secondary outcome measures (translated from the French original)

Outcome measure and questions	Answer categories
<i>Use of risk reduction strategy (RRS)^a</i>	
Have you used either of the following protection strategies during the month of April 2015, before getting tested?	
a) Followed safer sex rules (no penetration without condom, no sperm or blood in the mouth, doctor's visit for itching, discharge or pain in the genital area)	Always sometimes never
b) Other risk reduction strategy adapted to my personal situation (e.g. abstinence during 1 month, only oral sex, sexual intercourse exclusively between my steady partner and me)	Always sometimes never
<i>Knowledge about primary HIV infection</i>	
<u>Do you know what primary [hiv] infection is?</u>	Yes, and I think I am well informed Yes, but I don't think I am well informed No, I haven't heard of it
<i>Sense of belonging to the LGBT community^b</i>	
These questions concern the LGBT (lesbian, homosexual, bisexual and transgender) group in your region (canton of residence and/or neighbouring cantons). Do you agree or disagree with the following statements?	
a) You feel fully integrated into the LGBT group in your region.	<i>Answer scale from</i>
b) Being part of the LGBT community of your region is a positive thing for you.	1 I fully agree <i>to</i>
c) When we work together, gays and bisexuals can solve the problems of the LGBT community in our region.	4 I fully disagree
d) You really feel that all problems of the LGBT group in your region are also your own problems.	

Note. RRS and Sense of belonging to the LGBT community are composite measures, defined as follows:

^a Respondents were categorised as having adopted an RRS if they reported 'always' to either of two questions asking whether they had followed one of the two RRS promoted by the campaign.

^b The overall score for connectedness to the LGBT community is calculated as the arithmetic mean of the responses to the four statements.

Table S3. Estimated direct costs and costs of non-market items of the Break the Chains campaign, Switzerland, March to May 2015

Cost categories	In PPP USD	In CHF	% of total costs
Direct costs			
Salaries (total paid working hours = 3,423)			
National organizations SFOPH (hours =55) and SAF (hours = 1,703) ^a	142,348	175,800	29.1
Local partner organizations: campaign management (hours = 629) ^b	43,306	53,484	8.9
Local partner organizations: outreach activities (hours = 1,036) ^c	39,705	49,036	8.1
Paid out-of-pocket expense (e.g. travel expenses)	2,278	2,814	0.5
Material and third party services (e.g. consultancy, website, advertisements, translations, printing posters and flyers)	136,842	169,000	28.0
Price reduction of HIV tests in May 2015	29,473	36,400	6.0
Total research costs for the present study	80,000	98,880	16.4
Total direct costs	474,019	585,414	96.9
Costs of non-market items			
Volunteer work of the local partner organizations (unpaid working hours = 427) ^d	11,409	14,091	2.3
Unpaid out-of-pocket expenses	3,555	4,391	0.7
Total costs of non-market items	14,965	18,482	3.1
Total cost estimation	488,984	603,896	100.0

Note. CHF 1 = USD PPP 1.235, conversion rate to 2015 purchasing power parity (ppp). Sources: Swiss Federal Office of Public Health (SFOPH) and Swiss AIDS Federation (SAF).

^a For the Swiss Federal Office of Public Health and the Swiss AIDS Federation an hourly rate of USD PPP 80 (CHF 100) including overhead costs was assumed.

^b For the local campaign managers an hourly rate of USD 88 (CHF 85) including overhead costs was assumed

^c Hourly rates for the outreach work differed regionally and ranged between USD PPP 16 (CHF 20) and 48 (CHF 60), effective rates were included.

^d This is measured as productivity losses on the labour market; the assumed hourly rate corresponds to the opportunity costs of a lost working hour. Based on the Swiss average income of USD PPP 54'574 (CHF 67,400) per year an hourly rate of USD PPP 26 (CHF 33) for the volunteer work was assumed.



Figure S1. Break the Chains campaign poster, Switzerland, March to May 2015

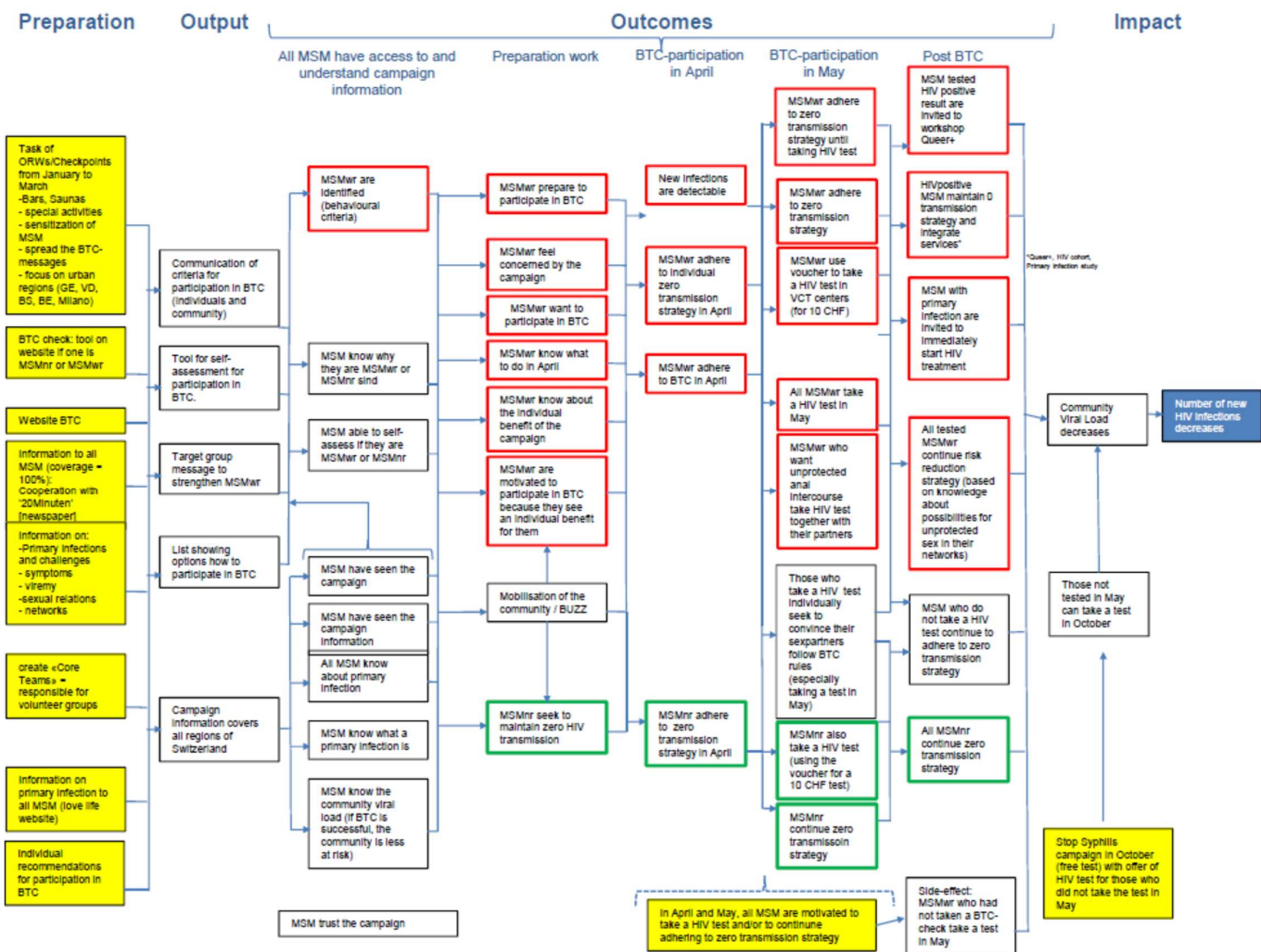
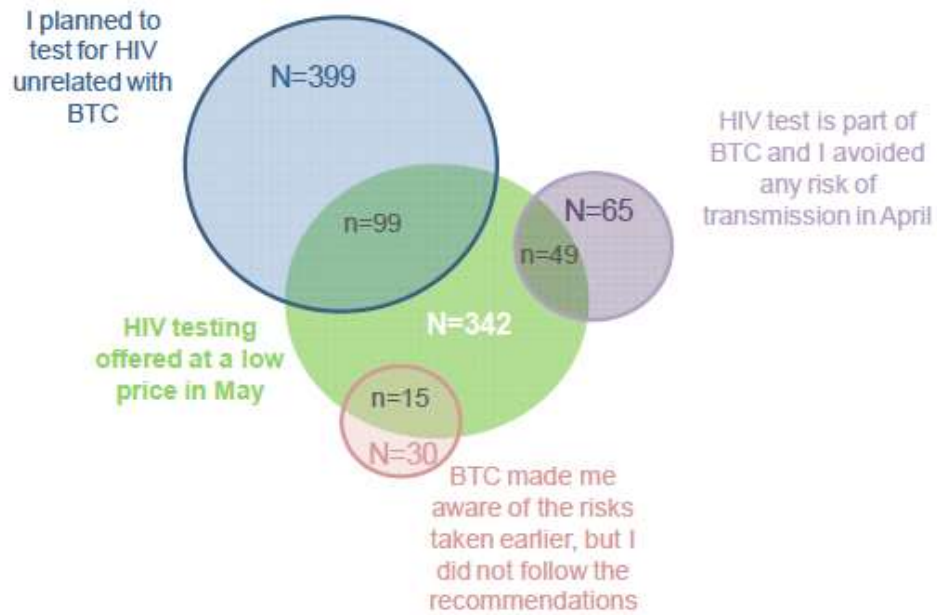


Figure S2. Programme theory of the Break the Chains 2015 campaign



Denominator: respondents who came specifically to get tested (N=707). 34 respondents did not mention any of the four reasons.

Figure S3. Reasons given for having an HIV test in May 2015, reported by respondents to online survey in voluntary counseling and testing centers, Break the Chains campaign, Switzerland, March to May 2015.

Note. BTC=Break the Chains. Respondents could give more than one reason.