

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	'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	Frey, Kathrin; Locicero, Stéphanie; Blank, Patricia; Schwenkglenks, M; Dubois-Arber, Françoise; Rosenbrock, Rolf; Lehner, Andreas; Staub, Roger; Derendinger, Steven; Schmidt, Axel; Bize, Raphael; Kübler, Daniel; Low, Nicola

VERSION 1 – REVIEW

REVIEWER	Allen Roberts University of Washington, USA
REVIEW RETURNED	04-Oct-2019

GENERAL COMMENTS	<p>This paper presents a mixed-methods analysis of a media and outreach campaign designed to increase HIV testing and promote risk reduction strategies among MSM in Switzerland. The widespread campaign was conducted by the federal government and evaluated by academic researchers. Overall, the researchers estimated that 17,145 MSM were contacted directly through the campaign. The number of HIV tests conducted at VCT centers increased during the month of the campaign compared to prior months. Of 199 MSM who were surveyed, 19 reported using a risk reduction method during the month of May as a result of the campaign. The cost for an MSM with a specific HIV risk factor (for acquisition or transmission) to report adhering to risk reduction was estimated to be \$36-55.</p> <p>This study is important because it evaluates a large-scale HIV prevention campaign as implemented. Furthermore, the multiple dimensions (costs, qualitative interviews, VCT uptake, and post-campaign surveys) provide useful context for both academic researchers and implementers. Nevertheless, the analysis has several methodologic limitations. A stronger evaluation design would have measured risk behaviors among MSM before and after the campaign, rather than simply asking MSM to report whether they adopted risk reduction strategies because of the campaign. Furthermore, the convenience sample obtained to evaluate the post-campaign survey is likely to overestimate the impact of the intervention, as it would preferentially reach MSM who are connected to social media, who may have been more likely to hear about the campaign in the first place. In addition, the reporting of analytic methods, especially for cost and qualitative analyses, is not sufficient to interpret or be able to evaluate the quality of the results.</p> <p>Detailed comments are provided below.</p>
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	<p>Major Comments:</p> <p>Abstract: What benchmark are you using for determining whether the intervention increased HIV testing "efficiently"? What cost threshold would be considered inefficient? The last sentence in the conclusion, while probably true, is not supported by the results presented in this paper.</p> <p>Methods: Page 7, line 38: The target population was actually the MSMwr, which includes HIV+ MSM (not just MSM at risk of HIV infection). I was initially confused by this definition - it would be helpful to clarify it here. Same issue in line 52. When you use the phrase "at risk of HIV infection", you are referring to HIV-negative individuals who have a non-negligible chance of acquiring HIV. This intervention was instead targeted at HIV-negative individuals at high risk of acquiring HIV, as well as HIV-positive individuals at high risk of transmitting HIV.</p> <p>Page 9: The specific risk reduction approaches that were promoted should be listed. Was the message really "avoid taking any risks", or were specific behaviors encouraged? What behaviors were measured to determine who adhered to risk reduction?</p> <p>Page 11, line 5: Is "sense of belonging to the gay community" an outcome of the intervention? I would think of it as more of an effect modifier; ie, individuals who report higher levels of belonging to the community may be more likely to take up the intervention. Without measuring this variable over time, it's a stretch to assume it's an outcome of the intervention.</p> <p>Page 12: Costing methodology should be described in more detail. What perspective was adopted? How were capital costs discounted? What year are estimates reported in, and how was adjustment for timing performed? What costing metrics are reported? Overall program cost? Cost per person tested? These all need to be described and justified in the methods section.</p> <p>How were costs extrapolated to the population level? Did you first calculate the unit cost as observed in the campaign, and then simply multiply the unit cost by the estimated number of MSM in Switzerland? Or did you use some sort of cost model, where some costs are expected to change with scale up to the population level while other costs are expected to be fixed? This has implications for Table 3. Is the last column (campaign costs/estimated outcome) derived directly from the costs and outcomes as observed? If so, where does the uncertainty derive from?</p> <p>Page 12, line 30: What specifically did you assume for the hourly rate of the opportunity cost for volunteers? Where did you obtain that number?</p> <p>Page 12, line 38: Provide more details about the qualitative analysis beyond "qualitative content analysis". How were the interviews recorded? Who conducted the interviews and who conducted the analysis? How was the analysis conducted - using software, or otherwise? There are general standards for reporting qualitative methods that are not met in this paper.</p> <p>Results:</p>
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Table S2: What year are these cost estimates indexed to? Also, don't put the CHF estimates in parentheses. In accounting, parentheses often indicate debts or losses.

Table S2: What does "Total costs for the present study" mean? Are these specifically research costs?

Table S2: The "direct vs. indirect" distinction is non-standard. Please define what is counted as a direct cost vs. an indirect cost. Consider fixed vs. variable as a more useful distinction.

Page 15, lines 5-8: Are the differences in proportion hearing of the campaign between MSMwr and MSMnr statistically significant?

Page 15, "Risk reduction behavior" section: The difference in risk behavior after the campaign between MSMwr and MSMnr isn't surprising. MSMwr are defined by their risk characteristics. If the campaign had no effect, we would still expect to see lower use of risk reduction strategies among MSMwr than MSMnr. As such, it's hard to evaluate what this comparison means, and I wouldn't emphasize this metric in the evaluation.

Table 2: I don't see the footnotes. How many responses were missing?

Table 2: I think the presentation of the percentages is confusing. It looks like the first row, fourth column of the table is reporting the percentage of those who reported risk reduction in April until tested who were MSMwr. I would reverse this - it's more interesting (and interpretable) to look at the percentage of MSMwr who reported risk reduction in April until tested. Same applies for the rest of the table. I would reframe the results section that way as well.

Page 20, first paragraph: The claim in the first sentence is not supported by the statistics that follow. Please reference where those results can be found.

Table 3: The extrapolation of costs to the entire MSM population is interesting but makes strong assumptions. First, it assumes that MSM who responded to the survey are representative of those who didn't respond to the survey. Second, it assumes that the costs of implementing the campaign in other areas are the same as those incurred during the study. These assumptions deserve discussion.

Table S4: I think this is the most dramatic result from the paper. The data clearly demonstrate an increase in HIV testing uptake in surveyed VCT centers during the campaign. While it is true that VCT centers aren't exhaustive in terms of where HIV testing can be obtained, VCT centers are primarily where one would expect to see an effect of this intervention. In addition, this outcome is directly measured and not subject to self-report like the survey outcomes. I would promote this figure to the main paper.

Discussion:
I would have really liked to have known the breakdown of qualifying risk characteristics of MSMwr who responded to the survey (How many were HIV-negative? how many were HIV-positive? What risk factors did they report?) as well as what risk reduction strategies were adopted. Since the latter is a composite outcome, it's hard to evaluate. Were these individuals reporting PrEP uptake?

The authors used online surveys to obtain a sample of MSM in order to evaluate intervention impact. However, a large component of the intervention involved a media information campaign, which is described in the methods section. If MSM who are more connected to social media are both more likely to hear about the intervention as

	<p>well as to respond to the survey, then the intervention impact estimates are likely too high. This limitation deserves discussion. What media sites were selected for the campaign? What media sites were selected for the evaluation?</p> <p>Minor comments: Page 9, Line 18: Needs a closed bracket. Page 9, Line 35: Needs closed parentheses Page 12, Line 16: Use a different word than "manpower". Perhaps "personnel". Page 19, line 53: "primary infection", not "the primary infection" Page 19, line 60: P-value of zero is impossible - state that the p-value was below some threshold (eg, $p < 0.001$).</p>
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REVIEWER	Heather Pines University of California, San Diego, USA
REVIEW RETURNED	12-Oct-2019

GENERAL COMMENTS	<p>This manuscript reports on an evaluation of the Break the Chains campaign, which was implemented to reduce risk behaviors and increase HIV testing among MSM in Switzerland. While the findings presented in this manuscript potentially have public health implications, several critical details (see below) are not adequately described in the manuscript making it difficult to assess whether the study was appropriately designed and the analysis appropriately conducted to address the research question.</p> <ol style="list-style-type: none"> 1. In the Abstract, the authors state the following: "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." This is confusing. How was "at risk" defined? Presumably MSM are classified as "at risk" because they do not use risk reduction strategies. 2. The abstract's conclusion (i.e., "Break the Chains increased HIV testing efficiently, but additional interventions are needed to reach MSM at highest risk of infection more accurately.") is not supported by any data provided in the Abstract's Results section. This conclusion should either be changed or data showing an increase in testing should be reported in the Abstract. 3. Under key messages in the Article Summary, the campaign is described as being designed to reduce HIV transmission DURING PRIMARY INFECTION among MSM. If that is the case, this should be clarified in the Abstract. 4. It is unclear what it meant by unprotected anal intercourse (UAI). Given the availability of PrEP, UAI could mean condom-unprotected anal intercourse or PrEP-unprotected anal intercourse. This should be clarified in Table 1. 5. What risk reduction strategies were promoted by the campaign? These should be described in the Intervention section. 6. Primary and secondary outcome measures are not clearly described. What risk reduction strategies were assessed? What questions were asked and how were they used to calculate the proportions described as the primary and secondary outcomes related to risk reduction? How were test uptake, knowledge about primary HIV infection, and a sense of belonging to the gay
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	<p>community measured? This should all be described in the Intervention Effect section.</p> <p>7. Statistical analysis methods are insufficiently described and methods for analyzing secondary outcomes are not discussed.</p>
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REVIEWER	Paula M Luz Instituto Nacional de Infectologia Evandro Chagas, Fundacao Oswaldo Cruz
REVIEW RETURNED	14-Oct-2019

GENERAL COMMENTS	<p>BMJ Open manuscript #032459 evaluates the effects and costs of the campaign “Break the Chains” which aimed to reduce HIV transmission among MSM in Switzerland by promoting 1-month of risk reduction and subsequent testing. A protocol, provided with manuscript, dated March/2015 details the theoretical underpinnings of the proposed campaign and its main actors and a priori defined outcomes. Costing estimates are described and straight-forward to compute, campaigns’ effect are harder to measure. Authors estimated that the campaign reached over 17 thousand MSM during its 3-month period in 2015. To measure the campaigns effects among MSM, three independent surveys were conducted with different sampling strategies (pre- and post-campaign were online, and during the campaign in HIV testing centers) with all measured outcomes self-reported. As for the main outcome, only a small proportion of those who claimed to have followed the campaign recommendation to reduce their transmission risk acknowledged that they did so because of the campaign which suggests that it was not successful in this regard, authors acknowledge this negative finding in their Discussion. Regarding HIV testing, authors show that the number of HIV tests performed in May surpassed what was expected from previous months (Figure S2), though participant’s reasons for testing were mostly related to the reduced cost of the test; authors also acknowledge this result in the Discussion. Overall, the manuscript is well written though the Methods and Results could be improved by increasing clarity. It is important to study and address the impact of large-scale community interventions despite the challenges to do so specially when no “control-group community” was available.</p> <p>Methods/Participants, pages 7-8: - It seems odd to include “HIV-positive individuals with detectable viral load” in the “Definition of MSM at high-risk of HIV acquisition” (title of Table 1). Then Footnote c states: “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.” In fact, given the manuscript’s main aim of reducing acute HIV transmission, it seems that known HIV-infected individuals would also not be the major population to be targeted by the campaign but rather the recently HIV-infected (those who either did not know/just found out and are not yet in care). Further rationale for including the known HIV-positive with detectable viral load should be provided.</p> <p>Methods/Participants, pages 7-8: - Moreover, could authors map the targeted population of MSM into positives and negatives, and, among negatives, into high and no risk? These would be the possible denominators for the response rates of interest. The paragraph in the Participants section gives estimates for the size of the MSM population. It would be valuable if</p>
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authors could include an estimate of the size of the positive/negatives, and, among negatives, of high/no risk population to the paragraph (perhaps assuming HIV prevalence remains the same as that estimated in 2012 paper cited in Introduction). Though only estimates, these numbers could provide an estimate of the response rate which currently seems smaller for high risk though it relatively might not be so if the fraction of MSM with high risk behavior is smaller.

Methods/Participants, pages 7-8:

- This paragraph also details MSM population in Switzerland and in the 5 major cities though for those unfamiliar with cities/cantons, it is hard to understand how this matches to the 10 out of 26 cantons where the campaign was undertaken.

- Table 1 could easily be given in text format and in so doing leave space for one of the supplementary tables to be included in the main text. Personally, all the information in the Supp Mat was very valuable to ease the understanding of the rationale/methods of the study. Both Tables S1 and S2 should be included in the main text as BMJ Open guidelines states "we recommend your article does not exceed 4000 words, with up to five figures and tables". Another idea would be to merge Table S1 into Figure 1 by guaranteeing that all information that is given in Table S1 is clearly given in Figure 1 and then adding table S2 into the main text as very little information is given regarding the costing results.

- Page 9, bottom of page, sentence "In one canton, only post-campaign HIV testing was offered." Could authors clarify? Did this testing center not exist prior to the campaign? What fraction of post-campaign HIV tests were performed in this canton? That is, how much of the increase in the number of tests performed could be due to the inclusion of this testing center?

- Given the need for clarity and reproducibility of research, more information should be given (perhaps in Supp Mat) regarding the instruments used to measure the outcomes of the study. In particular, how were the following constructs measured: knowledge about HIV primary infection as well as the sense of belonging to the MSM community? Were these one-item questions or validated instruments?

- Data collection and outcome measures, page 10: Please clarify what is a logic model?

- On the Intervention effect, sentence "the primary outcome was the proportion of MSM at risk of HIV infection who used a HIV risk reduction strategy in April, and maintained it until HIV testing in May", again, if more information was provided regarding the instruments used, it would be clearer to understand. It seems the "risk reduction strategy" (safe sex, abstinence?) was not defined operationally but subjective as well as the adherence to it?

- Though authors made a great effort to improve clarity in the methods (as detailed in the Reply to reviewers documentation provided with the manuscript), overall, methods/page 11 could be clearer. Perhaps by separating the methods employed into the different phases of the campaign (pre, during, post) and, within each phase, the relevant surveys (questions/instruments) conducted at each time-point.

	<p>- Analysis, page 12: Could authors expand on the qualitative methods employed? Were interviews recorded and transcribed? How was content analysis performed?</p> <p>- Results: unclear how self-report HIV-infection is accounted for in the results if at all. Were participants asked if they were HIV-infected in any of the surveys?</p> <p>- Results/Table 2. Risk-reduction is stratified into yes and no-no answer. Could you clarify the magnitude of the no-answer group? Also, suggest adding to Table 2 title that it applies to those who reported having heard of the campaign.</p> <p>- In Key Notes, first bullet: suggest removing the word “efficiently”. Yes, there was an increase in the number of tests performed compared to other months (Fig S4) but the efficiency of the campaign is not straight forward. For example, it could be that the major driver of the increased testing is the reduction in the price of the test (which is part of the campaign) but that could be, potentially, implemented without the other aspects thus reducing costs.</p> <p>- In Strengths and Limitations, bullet two: what are the three online surveys that the authors refer to here? From my understanding of the methods there were two surveys online and one in HIV testing centers. Perhaps this refers to the online survey with staff? These bullets need revision to better align with text/abstract.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1 (A. Roberts, Univ of Washington) comments	Response
1. Abstract: What benchmark are you using for determining whether the intervention increased HIV testing "efficiently"? What cost threshold would be considered inefficient?	Agree: we did not apply a formal benchmark. We have deleted 'efficiently'
2. Abstract: The last sentence in the conclusion, while probably true, is not supported by the results presented in this paper.	We reformulated the sentence to clarify that this is an implication, and not a result supported by data.

<p>3. Page 7, line 38: The target population was actually the MSMwr, which includes HIV+ MSM (not just MSM at risk of HIV infection). I was initially confused by this definition - it would be helpful to clarify it here. Same issue in line 52. When you use the phrase "at risk of HIV infection", you are referring to HIV-negative individuals who have a non-negligible chance of acquiring HIV. This intervention was instead targeted at HIV-negative individuals at high risk of acquiring HIV, as well as HIV-positive individuals at high risk of transmitting HIV.</p>	<p>Thanks. We rephrased the description of the target population to avoid confusion. This now reads "MSM at risk of HIV acquisition or transmission" (page 9, line 38-40)</p>
<p>4. Page 9: The specific risk reduction approaches that were promoted should be listed. Was the message really "avoid taking any risks", or were specific behaviors encouraged? What behaviors were measured to determine who adhered to risk reduction?</p>	<p>Agree: we now explicitly state the risk reduction strategies promoted by the campaign (p11, lines 23-34): "The strategies to avoid taking risks were: safer sex practices (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]"</p>
<p>5. Page 9, Line 18: Needs a closed bracket.</p>	<p>Done</p>

5. Page 9, Line 35: Needs closed parentheses	Done
7. Page 11, line 5: Is "sense of belonging to the gay community" an outcome of the intervention? I would think of it as more of an effect modifier; ie, individuals who report higher levels of belonging to the community may be more likely to take up the intervention. Without measuring this variable over time, it's a stretch to assume it's an outcome of the intervention.	Yes. The campaign was community-based and the programme theory included 'mobilisation of the community' as an intended outcome (see Figure S2). We acknowledge that we only measured this at one time point. We have added this as a limitation in the Discussion (p28, line 37-42), "We also acknowledge that the association with reported sense of belonging to the gay community might have been either a motivation for, or a consequence of the campaign."
8. Page 12: Costing methodology should be described in more detail. What perspective was adopted? How were capital costs discounted? What year are estimates reported in, and how was adjustment for timing performed? What costing metrics are reported? Overall program cost? Cost per person tested? These all need to be described and justified in the methods section.	We added a reference to Drummond et al. (2005, pp. 55-94) in which the costing methodology used is described in more detail (page 15, line 30-32). Costs were considered irrespective of payer and included indirect costs of volunteer work; related description was slightly amended. We also added some explanation of direct and indirect costs (page 15, line 31-36). Capital costs were not discounted for (the campaign only lasted for 3 months). For the same reason, there was no adjustment for timing. Costing metrics are given in Table S3 and Table 3; a related sentence has been added to the methods section.
9. Page 12, Line 16: Use a different word than "manpower". Perhaps "personnel".	Done. We now use "personnel" (p15, line 36)

<p>10. How were costs extrapolated to the population level? Did you first calculate the unit cost as observed in the campaign, and then simply multiply the unit cost by the estimated number of MSM in Switzerland? Or did you use some sort of cost model, where some costs are expected to change with scale up to the population level while other costs are expected to be fixed? This has implications for Table 3. Is the last column (campaign costs/estimated outcome) derived directly from the costs and outcomes as observed? If so, where does the uncertainty derive from?</p>	<p>Yes, the reviewer is correct. We have revised the brief explanation on p16 (lines 51-17) to say, "We multiplied the unit costs, calculated from the campaign, to extrapolate to the entire estimated population of MSM in Switzerland, with uncertainty derived from the 95% credibility intervals (64,000 to 96,000)[20]" Ref 20 is Schmidt & Altpeter (Sex Transm Infect 2019; 95(4): 285-291).</p>
<p>11. Page 12, line 30: What specifically did you assume for the hourly rate of the opportunity cost for volunteers? Where did you obtain that number?</p>	<p>This calculation is described in the note to Table S3. We have now added the estimate of USD PPP 26 (CHF 33) for the hourly rate of volunteer work in the main text (p. 15, line 55). We have also expanded the explanation in Table S3 and signposted this in footnote a). The costs of volunteer work can be measured as productivity losses on the labour market, via the human capital approach. This approach assumes that during the volunteer time spent for the BTC 2015 campaign, the respective persons were not available for paid work but would have worked otherwise. The assumed hourly rate corresponded to the opportunity costs of a lost working hour. In Switzerland, a yearly average income of CHF 67'400 (full-time employee) was assumed. Therefore, an average rate of CHF 281 per day was anticipated, resulting in a hourly rate of CHF 33 (by assuming a 8.4 hour working day). These figures stem from the Swiss Statistical Office: BFS, Bundesamt für Statistik. Häufigkeitsverteilung der Erwerbstätigen nach Bruttoerwerbseinkommen pro Jahr in Klassen. Available from: http://www.bfs.admin.ch/bfs/portal/de/index/themen/03/04/blank/data/03.html</p>

<p>12. Page 12, line 38: Provide more details about the qualitative analysis beyond "qualitative content analysis". How were the interviews recorded? Who conducted the interviews and who conducted the analysis? How was the analysis conducted - using software, or otherwise? There are general standards for reporting qualitative methods that are not met in this paper.</p>	<p>Thank you for this request. We have added further details (p15, lines 6-14) "Qualitative interviews were conducted by a member of the evaluation team, using an interview guide. The interviews were digitally recorded and then transcribed. A trained researcher used qualitative content analysis to analysed data about the implementation of the campaign". Ref 25 is by Mayring (2004).</p> <p>We realise that the description does not include all items required by reporting guidelines. Given that this article presents quantitative, economic and qualitative data, we have tried to provide the essential details.</p>
<p>13. Table S2: What year are these cost estimates indexed to? Also, don't put the CHF estimates in parentheses. In accounting, parentheses often indicate debts or losses.</p>	<p>These are 2015 CHF converted to 2015 PPP USD (as is indicated in the Note to Table S3). Parentheses of CHF estimates were removed.</p>
<p>14. Table S2: What does "Total costs for the present study" mean? Are these specifically research costs?</p>	<p>Yes, we have added "research costs" to Table S3.</p>

<p>15. Table S2: The "direct vs. indirect" distinction is non-standard. Please define what is counted as a direct cost vs. an indirect cost. Consider fixed vs. variable as a more useful distinction.</p>	<p>We used the terminology of direct and indirect costs, following Drummond et al. (2005: 55-94, ref 24). We now say what we considered as direct and indirect costs in the Methods 'data collection and outcome measurement' (p15, lines 36-55).</p>
<p>16. Page 15, lines 5-8: Are the differences in proportion hearing of the campaign between MSMwr and MSMnr statistically significant?</p>	<p>We prefer not to use the term 'statistically significant', following proposals published in the BMJ (Sterne JA, et al. BMJ 2001;322:226–31) and Am Stat (2019;73(S1):1-19). Instead, we now show the difference in proportions and the p value from the chi squared test (p17, line 59), "(difference in proportions 10.1%, 95% CI 2.8, 17.5%, p=0.007)."</p>
<p>17. Page 15, "Risk reduction behavior" section: The difference in risk behavior after the campaign between MSMwr and MSMnr isn't surprising. MSMwr are defined by their risk characteristics. If the campaign had no effect, we would still expect to see lower use of risk reduction strategies among MSMwr than MSMnr. As such, it's hard to evaluate what this comparison means, and I wouldn't emphasize this metric in the evaluation.</p>	<p>Agree. We still think it is relevant to report this in the results. To avoid undue emphasis, we deleted the mention of it in the first paragraph of the Discussion.</p>
<p>18. Table 2: I don't see the footnotes. How many responses were missing?</p>	<p>Thanks for spotting the typo in the footnotes to the table! Correct footnotes were added.</p>

<p>19. Table 2: I think the presentation of the percentages is confusing. It looks like the first row, fourth column of the table is reporting the percentage of those who reported risk reduction in April until tested who were MSMwr. I would reverse this - it's more interesting (and interpretable) to look at the percentage of MSMwr who reported risk reduction in April until tested. Same applies for the rest of the table. I would reframe the results section that way as well.</p>	<p>We can see the Reviewer's point of view and, in the main text (p19, lines 50-59), we report the row percentages. But, in the rest of the table, column percentages make more sense, in our opinion. To avoid confusion, by mixing these, we have not changed the format, but now indicated in Table 2 that we report the column percentages.</p>
<p>20. Page 19, line 53: "primary infection", not "the primary infection"</p>	<p>Done (p23, line 53)</p>
<p>21. Page 19, line 60: P-value of zero is impossible - state that the p-value was below some threshold (eg, $p < 0.001$).</p>	<p>Done (p23, line 60)</p>
<p>22. Page 20, first paragraph: The claim in the first sentence is not supported by the statistics that follow. Please reference where those results can be found.</p>	<p>Thank you for this request for clarification. The first sentence refers to results displayed in Table 2. We now include explicit reference to Table 2 (p24, line 8).</p>

<p>23. Table 3: The extrapolation of costs to the entire MSM population is interesting but makes strong assumptions. First, it assumes that MSM who responded to the survey are representative of those who didn't respond to the survey. Second, it assumes that the costs of implementing the campaign in other areas are the same as those incurred during the study. These assumptions deserve discussion.</p>	<p>We agree with the first assumption – and we do mention the representativeness of our survey as a methodological limitation of our study (Discussion, p7, lines 6-7). We added to the discussion to deal with the second assumption (p25, lines 18-20), “Fifth, the extrapolation of costs to the national level assumes that the costs for areas involved in the campaign can be simply multiplied. In a small country like Switzerland, we think this was a reasonable assumption.”</p>
<p>24. Table S4: I think this is the most dramatic result from the paper. The data clearly demonstrate an increase in HIV testing uptake in surveyed VCT centers during the campaign. While it is true that VCT centers aren't exhaustive in terms of where HIV testing can be obtained, VCT centers are primarily where one would expect to see an effect of this intervention. In addition, this outcome is directly measured and not subject to self-report like the survey outcomes. I would promote this figure to the main paper.</p>	<p>Thank you for this comment, which we think refers to Figure S4 (not ‘Table S4’). We decided to place this figure in the supplementary material because it covers a longer period than the one covered by BTC 2015 and areas not covered by the campaign. It therefore mainly serves illustrative purposes (as we now make clear in the text). As such, we prefer to keep it in the Supplementary material.</p>

<p>25. Discussion: I would have really liked to have known the breakdown of qualifying risk characteristics of MSMwr who responded to the survey (How many were HIV-negative? how many were HIV-positive? What risk factors did they report?) as well as what risk reduction strategies were adopted. Since the latter is a composite outcome, it's hard to evaluate. Were these individuals reporting PrEP uptake?</p>	<p>In new footnote to Table 2, we added information about how many respondents reported always having used any of the two risk reduction strategies promoted by the campaign.</p>
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<p>26. Discussion: The authors used online surveys to obtain a sample of MSM in order to evaluate intervention impact. However, a large component of the intervention involved a media information campaign, which is described in the methods section. If MSM who are more connected to social media are both more likely to hear about the intervention as well as to respond to the survey, then the intervention impact estimates are likely too high. This limitation deserves discussion. What media sites were selected for the campaign? What media sites were selected for the evaluation?</p>	<p>Agree. Media sites of the campaign and media sites for recruitment of respondents for the survey overlapped to a large degree. This questions the representativeness assumption of the online survey. We mention this as a limitation in the discussion section (p. 27, lines 17-21).</p>
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Reviewer 2 (H. Pines. University of California San Diego) Comment	Response
<p>1. Abstract: the authors state the following: “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.” This is confusing. How was “at risk” defined? Presumably MSM are classified as “at risk” because they do not use risk reduction strategies.</p>	<p>Agree. We have rephrased this (p6, lines 48-51) to say “MSM categorised as being at risk of HIV were less likely to report adherence to the campaign message” to avoid confusion. The definitions of being at risk or not at risk are those given in the main text Table 1.</p>
<p>2. The abstract’s conclusion (i.e., “Break the Chains increased HIV testing efficiently, but additional interventions are needed to reach MSM at highest risk of infection more accurately.”) is not supported by any data provided in the Abstract’s Results section. This</p>	<p>Agree. Please see our response to Reviewer 1, comment 1.</p>

<p>conclusion should either be changed or data showing an increase in testing should be reported in the Abstract.</p>	
<p>3. Under key messages in the Article Summary, the campaign is described as being designed to reduce HIV transmission DURING PRIMARY INFECTION among MSM. If that is the case, this should be clarified in the Abstract.</p>	<p>Key messages were deleted at the editor's request.</p>
<p>4. Table 1: It is unclear what it meant by unprotected anal intercourse (UAI). Given the availability of PrEP, UAI could mean condom-unprotected anal intercourse or PrEP-unprotected anal intercourse. This should be clarified in Table 1.</p>	<p>Thank you for the opportunity to change this. We now use the term 'condomless anal intercourse' (CAI) in Table 1. And clarify that () "Pre-exposure prophylaxis (PrEP) has only been recommended in Switzerland only in 2016." So it was not a recommended risk reduction strategy. This is now clarified in the text (p. 11, lines32-34) as well as in the note to table 1.</p>
<p>5. What risk reduction strategies were promoted by the campaign? These should be described in the Intervention section</p>	<p>Agree. Please see our response to Reviewer 1, comment 4.</p>
<p>6. Primary and secondary outcome measures are not clearly described. What risk reduction strategies were assessed? What questions were asked and how were they used to calculate the proportions described as the primary and secondary outcomes related to risk reduction? How were test uptake, knowledge about primary HIV infection, and a sense of belonging to the gay community measured? This should all be described in the Intervention Effect section.</p>	<p>We apologise. Primary outcome measurement description now explicitly refers to the risk reduction strategies promoted by the campaign. Also, footnote to table 2 now explicates how the uptake of risk reduction strategies was measured. In addition, we have added a new table S2 in the SuppMat with an English translation of wording of survey questions used to measure primary and secondary outcomes.</p>
<p>7. Statistical analysis methods are insufficiently described and methods for analyzing secondary outcomes are not discussed.</p>	<p>Agree. We have added to the 'Analyses' section of the Methods (p15, lines 40-47) to say that, "logistic regression to compare... including the secondary outcome of sense of belonging to the gay community. Other secondary outcomes were described using frequencies (post-campaign test uptake) and chi-squared tests (knowledge of primary HIV infection).".</p>

<p>Reviewer 3 (PM Luz, Instituto Nacional de Infectologia, Rio de Janeiro)</p>	<p>Response</p>
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<p>1. Methods/Participants, pages 7-8: It seems odd to include “HIV-positive individuals with detectable viral load” in the “Definition of MSM at high-risk of HIV acquisition” (title of Table 1). Then Footnote c states: “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.” In fact, given the manuscript’s main aim of reducing acute HIV transmission, it seems that known HIV-infected individuals would also not be the major population to be targeted by the campaign but rather the recently HIV-infected (those who either did not know/just found out and are not yet in care). Further rationale for including the known HIV-positive with detectable viral load should be provided.</p>	<p>We apologise for the inconsistency. The title of table 1 reads ‘Definition of MSM at risk, or not at risk of HIV acquisition OR TRANSMISSION’. We have changed this in the text, as also requested by reviewer 1, comment 3.</p> <p>We think it makes sense to categorise HIV-positive individuals with detectable viral load as ‘MSM with specified HIV risks’ because, although not as infectious as MSM with primary HIV infection they are still at risk of transmitting HIV.</p>
<p>2. Methods/Participants, pages 7-8: Moreover, could authors map the targeted population of MSM into positives and negatives, and, among negatives, into high and no risk? These would be the possible denominators for the response rates of interest. The paragraph in the Participants section gives estimates for the size of the MSM population. It would be valuable if authors could include an estimate of the size of the positive/negatives, and, among negatives, of high/no risk population to the paragraph (perhaps assuming HIV prevalence remains the same as that estimated in 2012 paper cited in Introduction). Though only estimates, these numbers could provide an estimate of the response rate which currently seems smaller for high risk though it relatively might not be so if the fraction of MSM with high risk behavior is smaller.</p>	<p>Thank you for this suggestion. We have not made these calculations because we think that it goes beyond the remit of our study. Making estimates of this kind involves a number of assumptions. Applying them to the estimated prevalence of HIV among Swiss MSM, as well as prevalence of unsuppressed HIV (based on the estimates by Schmidt & Altpeter 2019) involves further assumptions and considerable uncertainty. This was not the primary intention of our study and we think that a different study using appropriate statistical methods would be needed to provide reliable estimates.</p>
<p>3. Methods/Participants, pages 7-8: This paragraph also details MSM population in Switzerland and in the 5 major cities though for those unfamiliar with cities/cantons, it is hard to understand how this matches to the 10 out of 26 cantons where the campaign was</p>	<p>Agree. These cities are now listed (p9, line 49).</p>

<p>undertaken.</p>	
<p>4. Table 1 could easily be given in text format and in so doing leave space for one of the supplementary tables to be included in the main text. Personally, all the information in the Supp Mat was very valuable to ease the understanding of the rationale/methods of the study. Both Tables S1 and S2 should be included in the main text as BMJ Open guidelines states “we recommend your article does not exceed 4000 words, with up to five figures and tables”. Another idea would be to merge Table S1 into Figure 1 by guaranteeing that all information that is given in Table S1 is clearly given in Figure 1 and then adding table S2 into the main text as very little information is given regarding the costing results.</p>	<p>We are pleased that the reviewer found the Supplementary material helpful to understand the main text. We appreciate the thoughtful suggestions about Table 1. We prefer to keep it as a Table because we think it is clearer. This means that we have five display items. We have, however, added some more costing information in the main text (p24, lines 23-31).</p>
<p>5. Page 9, bottom of page, sentence “In one canton, only post-campaign HIV testing was offered.” Could authors clarify? Did this testing center not exist prior to the campaign? What fraction of post-campaign HIV tests were performed in this canton? That is, how much of the increase in the number of tests performed could be due to the inclusion of this testing center?</p>	<p>Sorry for the confusion. We deleted the sentence to avoid confusion. This one canton was also covered by the 34 VCT centres mentioned in the following sentence. All these centres were pre-existing to the campaign and continued to exist after the campaign. Thus the number of testing centres is stable over time.</p>
<p>6. Given the need for clarity and reproducibility of research, more information should be given (perhaps in Supp Mat) regarding the instruments used to measure the outcomes of the study. In particular, how were the following constructs measured: knowledge about HIV primary infection as well as the sense of belonging to the MSM community? Were these one-item questions or validated instruments?</p>	<p>Agree. Measurement of the primary outcome is now more explicitly explained in the footnote to Table 2. Measurement of knowledge about HIV primary infection was straightforward as a response to the survey question ‘Do you know what HIV primary infection is?’ Answer categories were ‘Yes, and I think I am well informed’, ‘Yes, but I think I am not well informed’, ‘No, I have never heard about it’. Measurement of sense of belonging to the LGBT community is a score constructed from answers to four different statements of the respondent’s attitude to the LGBT community in his region of residence (following Frost & Meyer 2012). This information is now given in a new table to the Supp Mat (Table S2) explicating question wording related to outcome measures. The original full survey questionnaire was already published elsewhere (Lociciro & Bize</p>

	2015).
7. Data collection and outcome measures, page 10: Please clarify what is a logic model?	What we mean is the programme theory, i.e. the chain of effects model, underlying the campaign and described in Figure S2. We now use 'programme theory' consistently throughout the text to avoid confusion.
8. On the Intervention effect, sentence "the primary outcome was the proportion of MSM at risk of HIV infection who used a HIV risk reduction strategy in April, and maintained it until HIV testing in May", again, if more information was provided regarding the instruments used, it would be clearer to understand. It seems the "risk reduction strategy" (safe sex, abstinence?) was not defined operationally but subjective as well as the adherence to it?	Agree. We hope our response to Reviewer 1, comment 4, as well as the new table S2 in the SuppMat gives enough information about the risk reduction strategies.
9. Though authors made a great effort to improve clarity in the methods (as detailed in the Reply to reviewers documentation provided with the manuscript), overall, methods/page 11 could be clearer. Perhaps by separating the methods employed into the different phases of the campaign (pre, during, post) and, within each phase, the relevant surveys (questions/instruments) conducted at each time-point.	Thank you. We think that Figure 1 gives the information about the instruments used in each phase and now refer to that on p13 (line 26). The text itself is separated into separate paragraphs for each phase and we would rather not add another level of sub-headings.
10. Analysis, page 12: Could authors expand on the qualitative methods employed? Were interviews recorded and transcribed? How was content analysis performed?	Interviews were conducted by a member of the evaluation team using an interview guide. They were electronically recorded and then transcribed. Transcripts were limited to the relevant implementation aspects (same categories applied for all interviews). Our method of content analysis follows Mayring (2004) and is described there in more detail. We added this information to the 'Analyses' section (p. 15, line 6-14). Given that this article is focused on the analysis of quantitative data, we restrict the methodological description of our qualitative analysis to the minimum. .
11. Results: unclear how self-report HIV-infection is accounted for in the results if at all. Were participants asked if they were HIV-infected in any of the surveys?	Yes, HIV status of respondents is self-reported through the survey. We mention this as a limitation.

<p>12. Results/Table 2. Risk-reduction is stratified into yes and no-no answer. Could you clarify the magnitude of the no-answer group? Also, suggest adding to Table 2 title that it applies to those who reported having heard of the campaign.</p>	<p>Thanks. We added extra-info to the title of Table 2. And we added a new footnote explaining how 'Yes' and 'no' categories re RRS adoption were calculated. As this is a composite index based on responses to two different questions, distinction within the 'no' group is not straightforward. Among the 151 respondents classified in the 'no' category their responses to the two questions were as follows. Asked whether they had followed safer sex rules, 63 answered 'sometimes', 64 'never' and 24 'no answer'. Asked whether they had used another risk reduction strategy adapted to their personal situation, 50 answered 'sometimes', 77 'never' and 24 'no answer'. However, given that the answers to these questions were independent from each other (e.g. an individual can answer 'never' to the first question, and 'no answer' to the second one), 3*3 different answer combinations are possible; we think it would be too cumbersome to report this extensively in the table.</p>
<p>13. In Key Notes, first bullet: suggest removing the word "efficiently". Yes, there was an increase in the number of tests performed compared to other months (Fig S4) but the efficiency of the campaign is not straight forward. For example, it could be that the major driver of the increased testing is the reduction in the price of the test (which is part of the campaign) but that could be, potentially, implemented without the other aspects thus reducing costs.</p>	<p>Key messages were deleted following editor's comment.</p>
<p>14. In Strengths and Limitations, bullet two: what are the three online surveys that the authors refer to here? From my understanding of the methods there were two surveys online and one in HIV testing centers. Perhaps this refers to the online survey with staff? These bullets need revision to better align with text/abstract.</p>	<p>Thanks. Actually, the survey in the HIV testing centres was filled in on a tablet device by the respondents. Not sure if this qualifies as 'online'. We therefore deleted 'online' in this bullet point.</p>

VERSION 2 – REVIEW

REVIEWER	Allen Roberts University of Washington
REVIEW RETURNED	02-Dec-2019

GENERAL COMMENTS	Thank you for your work addressing the comments provided in the previous round. I find that the paper has improved substantially. I
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think that the manuscript merits publication. However, there are still revisions needed to improve the clarity and accuracy of the methods and results reporting.

Abstract, line 34: I would recommend replacing the phrase “adhered to the campaign message”, which isn’t very informative, with “reported risk reduction” or something like that. I think this change occurred as a response to another reviewer. However, I don’t think the change addresses the reviewer’s original question, which is whether it’s possible for a MSMwr to adhere to the campaign message, given that someone who adhered to the campaign message would by definition not be a MSMwr. I think the answer to that question, which deserves additional clarification, has to do with the fact that the definition of MSMwr involves behavior over a 12 month period, whereas the measurement of risk reduction during the campaign involves behavior over a one-month period. There are limitations with the way this study constructed the definition – ideally, one would be measuring risk behavior during the campaign among MSMwr identified as such in the pre-campaign survey, since the time periods for the definition of MSMwr and risk reduction due to the campaign would be distinct rather than overlapping. This limitation deserves discussion.

Abstract, line 34: As discussed in the previous reviews, the phrase “MSM at risk of HIV infection” is misleading. Please revise to reflect the inclusion of PLHIV at risk of transmitting HIV.

Abstract, line 32-34: If the primary outcome is the proportion adhering to the campaign message, then that proportion should be reported in the results section (lines 42-54).

Abstract, line 56: There is no evidence reported in the abstract that the campaign increased HIV testing. If this is the main conclusion from the paper, then those results should be reported in the abstract (and the figure in the supplement that shows it should be promoted to the main paper).

Abstract, line 59-60. Which part of the first sentence implies that community-based campaigns remain a cornerstone in HIV prevention strategies? The fact that Break the Chains increased HIV testing? Or that more interventions are needed? If the former, I would rephrase as follows: “Break the Chains increased HIV testing, implying that community-based campaigns are useful HIV prevention strategies for MSM. Additional interventions are needed to reach MSM at highest risk of infection more effectively.”

Introduction, lines 42-44. This sentence isn’t strictly true. Those with undiagnosed HIV infection may very well have had an HIV test before and may also have had an HIV test in the last year.

Methods, page 12, “Intervention effect”: “at risk of HIV infection” should be “with risk of HIV acquisition or transmission”. Please verify that all other instances of “at risk of HIV infection” in the paper are changed – for example, lines 36-41 of page 12 of the methods. “At risk of HIV infection” is used in the HIV literature to describe HIV-negative individuals who have a non-zero chance of acquiring HIV.

Methods, page 13, lines 24-26: Thank you for clarifying what you counted as direct vs. indirect. I still recommend changing the terminology. The Drummond reference you provided does not

	<p>emphasize a distinction between direct and indirect costs, except with respect to methods for allocating overhead costs (eg, “directly allocatable costs” – sometimes, overheads are referred to as “indirect costs”). More commonly, in health economic evaluation, “direct” vs “indirect” is used to describe costs incurred by the provider (direct costs) vs. costs due to loss of productivity due to medical treatment (eg, time off work, loss of productivity due to morbidity and mortality, etc). Your definition of indirect vs direct differs from both of these definitions (overheads or loss of productivity). As far as I can tell, you count all financial costs (including overheads) as “direct costs”, and you count “unpaid volunteer work” as indirect costs, which Drummond refers to as costs of “non-market items” and the Global Health Cost Consortium refers to as the “economic cost of donated goods”. Since the distinction between direct and indirect costs is non-standard, I recommend using a different categorization (eg, fixed vs. variable).</p> <p>Methods, page 14, lines 44-51. I appreciate the effort for clarity, however the paragraph needs additional revision. The unit costs are the cost per encounter or the cost to change behavior of one MSM. You derived the total cost (not the cost per encounter or cost to change behavior of one MSM) by multiplying the unit cost by the total population.</p> <p>Results, Table 2: Thank you for responding to my suggestion about percentages. I still find the presentation confusing. Upon further reflection, what would make this table more clear is to separate it into two. The first table should describe characteristics of the respondents to the post campaign survey (using the column percentages in the “All respondents” column). If you are out of display items, that could be a supplemental table. The second table should include the “risk reduction in April until tested” column and report row percentages (ie, percent reporting risk reduction in April until tested), as well as odds ratios and CIs. That would make the percentages reported in the paper (as well as the interpretation of the odds ratios) the same as those in the table.</p> <p>Results, Table 2: As mentioned in my first review, I would still like to know the distribution of factors that qualified respondents as MSMwr. This could be mentioned in the table or just in the text. It would be interesting context that would contribute to understanding what risk factors for HIV transmission are most prevalent in this population.</p> <p>Results, page 22, lines 4-9: incomplete sentence, please revise.</p> <p>Discussion, page 25, lines 20-25. I wouldn’t use the word “efficient” here, since you don’t have a metric for efficiency that you are comparing your results to. Also, please correct “increase a short term increase...”</p>
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REVIEWER	Paula Mendes Luz Fundacao Oswaldo Cruz (FIOCRUZ), Instituto Nacional de Infectologia (INI), Rio de Janeiro, Brazil.
REVIEW RETURNED	11-Dec-2019

GENERAL COMMENTS	The authors have adequately addressed all questions raised. I have no further comments.
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VERSION 2 – AUTHOR RESPONSE

Reviewer 2 (A. Roberts, Univ of Washington) Comments	Response
<p>Abstract, line 34: I would recommend replacing the phrase “adhered to the campaign message”, which isn’t very informative, with “reported risk reduction” or something like that. I think this change occurred as a response to another reviewer. However, I don’t think the change addresses the reviewer’s original question, which is whether it’s possible for a MSMwr to adhere to the campaign message, given that someone who adhered to the campaign message would by definition not be a MSMwr. I think the answer to that question, which deserves additional clarification, has to do with the fact that the definition of MSMwr involves behavior over a 12 month period, whereas the measurement of risk reduction during the campaign involves behavior over a one-month period. There are limitations with the way this study constructed the definition – ideally, one would be measuring risk behavior during the campaign among MSMwr identified as such in the pre-campaign survey, since the time periods for the definition of MSMwr and risk reduction due to the campaign would be distinct rather than overlapping. This limitation deserves discussion.</p>	<p>Thank you for the suggestion. We have retained the original text, “adhered to the campaign message” because the message included both risk reduction and HIV testing (p10, lines 15 – 23, Intervention, “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”). To clarify, we have changed,</p> <p>a) (p5, lines 12-14) Abstract, Objectives, to “Break the Chains, a community-based HIV prevention campaign... promoting the campaign message to adopt short-term risk reduction followed by HIV testing.”</p> <p>b) (p10, line 13-14) Methods, Intervention, changed “key message” to “campaign message”</p> <p>In response to the new question of reviewer 2, we would like to emphasise that questions in the post-BTC survey covered a) behaviour in the 12 months prior to the campaign (to define the group of MSM with behaviours that placed them at risk of HIV acquisition or transmission) and b) separate questions about behaviours in the campaign month (April 2015). We have amended the Methods (Data collection and outcome measures, Intervention effect, p13, lines 5-13): “In addition to topics covered in the pre-campaign survey, the post-campaign survey asked about awareness of the campaign, sexual behaviours during the campaign period and, for those who adopted an HIV risk reduction strategy during April 2015, whether they did it because of the campaign (Table S2).” We agree with the reviewer that a panel design would have been ideal. However, due to poor panel retention, panel designs have feasibility problems with hard-to-reach populations.</p>
<p>Abstract, line 34: As discussed in the previous reviews, the phrase “MSM at risk of HIV infection” is misleading. Please revise to reflect the inclusion of PLHIV at risk of transmitting HIV.</p>	<p>Agree. We changed to “MSM at risk of HIV acquisition or transmission” in the Abstract and throughout the manuscript, as requested below.</p>
<p>Abstract, line 32-34: If the primary outcome is the proportion adhering to the campaign message, then that proportion should be reported in the results section</p>	<p>Agree. We added this result to the Abstract: “Twenty per cent of MSMwr who reported risk reduction declared having adopted risk reduction because of the campaign.”</p>

(lines 42-54).	
Abstract, line 56: There is no evidence reported in the abstract that the campaign increased HIV testing. If this is the main conclusion from the paper, then those results should be reported in the abstract (and the figure in the supplement that shows it should be promoted to the main paper).	Agree. We now report evidence for test uptake in the abstract: "The number of HIV tests taken in the month after the campaign was twice the monthly average." And we moved Figure S5 from the Supplemental File to the main text (now Figure 3). If the editor does not allow this, we will have to move it back to the Supplementary material.
Abstract, line 59-60. Which part of the first sentence implies that community-based campaigns remain a cornerstone in HIV prevention strategies? The fact that Break the Chains increased HIV testing? Or that more interventions are needed? If the former, I would rephrase as follows: "Break the Chains increased HIV testing, implying that community-based campaigns are useful HIV prevention strategies for MSM. Additional interventions are needed to reach MSM at highest risk of infection more effectively."	Thanks for the suggestion. We rephrased accordingly.
Introduction, lines 42-44. This sentence isn't strictly true. Those with undiagnosed HIV infection may very well have had an HIV test before and may also have had an HIV test in the last year.	Agree. We changed the sentence to make sure it is correctly understood: "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."
Methods, page 12, "Intervention effect": "at risk of HIV infection" should be "with risk of HIV acquisition or transmission". Please verify that all other instances of "at risk of HIV infection" in the paper are changed – for example, lines 36-41 of page 12 of the methods. "At risk of HIV infection" is used in the HIV literature to describe HIV-negative individuals who have a non-zero chance of acquiring HIV.	Thanks for spotting this omission We also changed all other instances.
Methods, page 13, lines 24-26: Thank you for clarifying what you counted as direct vs. indirect. I still recommend changing the terminology. The Drummond reference you provided does not emphasize a distinction between direct and indirect costs, except with respect to methods for allocating overhead costs (eg, "directly allocatable costs" – sometimes, overheads are referred to as "indirect costs"). More commonly, in health economic evaluation, "direct" vs "indirect" is used to describe costs	We agree with the reviewer that indirect costs are typically used to describe costs due to productivity losses. However, productivity losses of persons providing unpaid care are often included here, not only productivity losses of target persons/patients (e.g. in cost-effectiveness analyses). In our perception, unpaid volunteer work in the context of Break the Chains would fall into a similar category. It is noteworthy, however, that not all unpaid work translates into a reduction of paid work, and thus, productivity loss at the societal level. Considering this and the reviewer's

<p>incurred by the provider (direct costs) vs. costs due to loss of productivity due to medical treatment (eg, time off work, loss of productivity due to morbidity and mortality, etc). Your definition of indirect vs direct differs from both of these definitions (overheads or loss of productivity). As far as I can tell, you count all financial costs (including overheads) as “direct costs”, and you count “unpaid volunteer work” as indirect costs, which Drummond refers to as costs of “non-market items” and the Global Health Cost Consortium refers to as the “economic cost of donated goods”. Since the distinction between direct and indirect costs is non-standard, I recommend using a different categorization (eg, fixed vs. variable).</p>	<p>suggestions, we are now using the term 'costs of non-market items' instead.</p> <p>We have added a sentence to the discussion to state that the degree to which the unpaid volunteer work provided in the context of the Break the Chains translated into costs of lost productivity at the societal level, is unknown (p. 26, lines 51 to 59) : “It remains unknown to what extent the unpaid volunteer work provided, conceptualised here as a non-market cost item, translated into a reduction of paid work, and thus cost of lost productivity at the societal level.”</p> <p>We continue to conceptualise overhead costs as direct costs, as they form an integral part of the campaign (intervention) costs. Also, calling them 'indirect costs' would be in conflict with the above notion of indirect costs being costs of productivity losses.</p>
<p>Methods, page 14, lines 44-51. I appreciate the effort for clarity, however the paragraph needs additional revision. The unit costs are the cost per encounter or the cost to change behavior of one MSM. You derived the total cost (not the cost per encounter or cost to change behavior of one MSM) by multiplying the unit cost by the total population.</p>	<p>As explained in the footnote to Table 3, we calculated the campaign costs per estimated outcome by extrapolating the campaign outcomes as measured in the survey to the overall MSM population. E.g. one MSMwr adopting RRS because of the campaign: this was the case for 2.8% of all respondents to the post-campaign survey. 2.8% of all MSM (64'000 to 96'000) are 1792 to 2688. The overall campaign costs were USD PPP 488'984. Those costs divided by 1792 to 2688 equal USD PPP 181-272 for this outcome.</p> <p>We rephrased the sentence in the methods section to make it clearer (p. 14, lines 49 to 56): “We estimated the campaign cots per outcome by extrapolating the campaign effects measured among survey respondents to the entire estimated population of MSM in Switzerland, with uncertainty derived from the 95% credibility intervals (64,000 to 96,000).[20]”</p>
<p>Results, Table 2: Thank you for responding to my suggestion about percentages. I still find the presentation confusing. Upon further reflection, what would make this table more clear is to separate it into two. The first table should describe characteristics of the respondents to the post campaign survey (using the column percentages in the “All respondents” column). If you are out of display items, that could be a supplemental table. The second table should include the “risk reduction in April until tested” column and report row</p>	<p>We agree that Table 2 contains a lot of information. However, we already have the maximum number of display items (and we have moved Figure S5 to the main text, see above). We believe that moving the first two columns to the supplemental material would result in a substantial loss of information in the main text. Leaving the table as it is, and reporting relevant row percentages in the text seems to be the best compromise to us.</p>

<p>percentages (ie, percent reporting risk reduction in April until tested), as well as odds ratios and CIs. That would make the percentages reported in the paper (as well as the interpretation of the odds ratios) the same as those in the table.</p>	
<p>Results, Table 2: As mentioned in my first review, I would still like to know the distribution of factors that qualified respondents as MSMwr. This could be mentioned in the table or just in the text. It would be interesting context that would contribute to understanding what risk factors for HIV transmission are most prevalent in this population.</p>	<p>We agree that this would be interesting context information. However, it is extremely cumbersome to report. The categorisation of the survey respondents into MSMwr or MSMnr according to the criteria listed in Table 1 is based on an arborescence that involves no less than 17 steps of analysis. The conceptualisation of this arborescence was discussed and published in Lociciro & Bize 2014 (reference no. 10). There would be no easy way of presenting the results of this categorisation analysis, neither as table nor as text. It would, in fact, require an additional and rather complex figure. As this is only context information, we decided not to add it.</p>
<p>Results, page 22, lines 4-9: incomplete sentence, please revise.</p>	<p>Thanks! We completed the sentence.</p>
<p>Discussion, page 25, lines 20-25. I wouldn't use the word "efficient" here, since you don't have a metric for efficiency that you are comparing your results to. Also, please correct "increase a short term increase..."</p>	<p>Thanks. We changed and corrected accordingly.</p>