PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Cohort Profile for the Loma Linda University Health BREATHE Program: A Model to Study Continuously Incentivized Employee Smoking Cessation
AUTHORS	Singh, Pramil; Moses, Olivia; Shih, Wendy; Hubbard, Mark

VERSION 1 – REVIEW

REVIEWER	Boderie, Nienke Erasmus Medical Center, Public Health
REVIEW RETURNED	17-Sep-2021

GENERAL COMMENTS	The study describes a very interesting cohort and a unique work based incentivised smoking cessation program. Most of the manuscript is well written and clear, however certain parts are unclear to me. This is mostly related to how and when relapses are identified and what the consequences of such relapses are. Furthermore, I'm not convinced of the term continuously incentivised. Introduction: Page 5, line 41: I'm not sure whether I agree with the use of continuous in the context of this program. Of course, the health plan benefits are continuous but it is unclear to me what happens when a smoker relapse. Does one lose its benefits? If not, it would imply smoking employees are incentivised annually to perform a quit attempt and not a monthly incentive to remain abstinent in order to earn health plan benefits. In that case I would prefer the use of annual incentives over continuous incentives. Page 5, line 50: how is relapse defined and quantified? I think this is in important part of your program that is a bit unclear, and also relates to my previous question. Is the annual opt-in period the moment relapsed smokers identify themselves? And if not, when and how are relapses identified? Methods: Page 6, line 48: To what extend does the fact that this program is implemented in a Seventh-day Adventist institution influence the results? Can it be that due to these faith-based principles of healthy lifestyle the population is healthier or more willing to participated in prevention programs? Page 8, line 36: The incentives offered in this program far exceed other programs in the scientific literature. Please elaborate why this is innovative, i.e. to what extend is incentive size related to effectiveness?

	Page 8, line 49-52: three forms of incentive programs are described. How would lottery incentives fit in these categories? Page 10, line 3: Please elaborate on how the program incentivises employees to maintain abstinent. Can participants lose their benefits if they relapse? Relates to question 2 as well. Page 10, line 54: Were any differences observed when switching form self-report/health plan claims to salivary cotinine tests? Could be interesting to add to the planned analysis. Page 11, line 12: Please elaborate more on the nicotine positive appeal, what requirements have to be met to have an appeal approved? Also, comparing those who's appeal was approved and those whose wasn't could be interesting further analysis. Discussion: If still possible additional qualitative analysis could complement the data, especially with experiences among relapsed smokers.

REVIEWER	Ansah, John Duke-NUS Medical School, Health Services and Systems Research
REVIEW RETURNED	27-Oct-2021

GENERAL COMMENTS	1. The aims of the research is not clearly articulated. It is quite difficult to understand what the authors intend to do in this paper. The overall aim focuses on providing cohort profile of the LLUH BREATHE study, while the specific aims attempt to examine the effect of continuously incentivized smoking cessation on participation and temporal trends in participation. There are too many things the authors want to do. It will be helpful to focus on one thing instead of 3 aims. 2. The introduction is less information. No information was provided to justify why the LLUH implemented this program. What benefit will accrue to the hospital and employees as a result of this program. 3. The methods section provides very little information regarding the methodological approach followed to achieve the specific aims set by the authors in the introduction. The paper in it current state is not ready for publication and review. It lacks focus and scientific rigour to be considered for publication. The authors need to choose a specific aim, develop the appropriate method(s) to achieve that aim and describe it as such in the methods section. 4. The manuscript should be rejected. It is not ready for publication.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Introduction:
1. Page 5, line 41: I'm not sure whether I agree with the use of continuous in the context of this program. Of course, the health plan benefits are continuous but it is unclear to me what happens when a smoker relapse. Does one lose its benefits? If not, it would imply smoking employees are incentivised annually to perform a quit attempt and not a monthly incentive to remain abstinent in order to earn health plan benefits. In that case I would prefer the use of annual incentives over continuous incentives.

We believe our use of the term continuous is accurate since the incentive (50% lower monthly premiums and medication co-pays) occurs every day that the employee is enrolled in a wholeness health plan. There is not a loss of benefits for relapse since the only requirement for remaining in the health plan with lower costs is that a relapsed smoker enrolls annually in a smoking cessation attempt. In the revised manuscript, we have clarified this point in the second paragraph of the introduction.

2. Page 5, line 50: how is relapse defined and quantified? I think this is in important part of your program that is a bit unclear, and also relates to my previous question. Is the annual opt-in period the moment relapsed smokers identify themselves? And if not, when and how are relapses identified?
Relapses were detected through voluntary self-reporting to the health plan provider, health plan claims data, or salivary cotinine testing during opt-in enrollment periods. In the revised manuscript, we have clarified this point in the last paragraph of section 2.2.

Methods:
3. Page 6, line 48: To what extend does the fact that this program is implemented in a Seventh-day Adventist institution influence the results? Can it be that due to these faith-based principles of healthy lifestyle the population is healthier or more willing to participated in prevention programs?
Loma Linda University Health employees are Adventists and non-Adventists. The cohort analysis can explore the impact of religion on smoking cessation. The data on religion of the employees have not been provided to the investigators at the time of this submission. We have cited in the limitations section that the model of incentivizing employee smoking cessation should be tested in other populations.

4. Page 8, line 36: The incentives offered in this program far exceed other programs in the scientific literature. Please elaborate why this is innovative, i.e. to what extend is incentive size related to effectiveness? In the revised manuscript (section 2.1, section 4(second paragraph)), we have summarized the current evidence indicating that cash/reward incentives (like used in LLUH BREATHE) produce the highest participation and efficacy rates. These data have been used to explain why our participation rate in LLUH BREATHE (74%) is higher than the national average (28%) since the cash value likely ranges from $600-1200 per year (section 4(second paragraph)).

5. Page 8, line 49-52: three forms of incentive programs are described. How would lottery incentives fit in these categories?
We thank the reviewer for identifying this oversight. We added a fourth section on competition and lottery-based incentives to the revised manuscript in section 2.1.

6. Page 10, line 3: Please elaborate on how the program incentivises employees to maintain abstinence. Can participants lose their benefits if they relapse? Relates to question 2 as well.
Participants lose their benefits if they relapse and do not enroll in an annual smoking cessation program from LLUH BREATHE. In the revised manuscript this is clarified in the second paragraph of the Introduction, and in section 2.2 (last paragraph, section on Relapse for WHP Members)

7. Page 10, line 54: Were any differences observed when switching form self-report/health plan claims to salivary cotinine tests? Could be interesting to add to the planned analysis.
We agree. This was added to section 3.2 (Plan of Analysis) in the revised manuscript.

8. Page 11, line 12: Please elaborate more on the nicotine positive appeal, what requirements have to be met to have an appeal approved? Also, comparing those who's appeal was approved and those whose wasn't could be interesting further analysis.
The appeal process allowed for situations such as 1) cotinine positive due to environmental tobacco smoke exposure, 2) data entry error on self-report, 3) error in health claims data. The health plan on case-by-case basis handled these. We added this to section 3.2 (Plan of Analysis) in the revised manuscript.

Discussion:
9. If still possible additional qualitative analysis could complement the data, especially with experiences among relapsed smokers.
We agree. Pilot qualitative data is beginning to be published (see ref 14 of revised manuscript). This was added to section 3.2 (Plan of Analysis) and 4.2 (Conclusions) in the revised manuscript.

Reviewer: 2
Dr. John Ansah, Duke-NUS Medical School
Comments to the Author:
1. The aims of the research is not clearly articulated. It is quite difficult to understand what the authors intend to do in this paper. The overall aim focuses on providing cohort profile of the LLUH BREATHE study, while the specific aims attempt to examine the effect of continuously incentivized smoking cessation on participation and temporal trends in participation. There are too many things the authors want to do. It will be helpful to focus on one thing instead of 3 aims.

We agree and have revised the manuscript in the fourth paragraph of the introduction. Our aim is to provide a cohort profile of LLUH BREATHE. We structured the manuscript to follow BMJ Open guidelines on Cohort Profiles that emphasize descriptive work, plan of analysis, and less findings.

https://bmjopen.bmj.com/pages/authors/#cohort_profile
We revised the introduction to indicate the singular aim and listed the other outputs as part of the descriptive work.

2. The introduction is less information. No information was provided to justify why the LLUH implemented this program. What benefit will accrue to the hospital and employees as a result of this program.
The rationale for the WHP programs was to address employee and employee health plan burdens from social determinants of employee health by investing health plan resources in an incentivized prevention model. This rationale is now included in the first paragraph of the introduction of the revised manuscript.

3. The methods section provides very little information regarding the methodological approach followed to achieve the specific aims set by the authors in the introduction. The paper in it current state is not ready for publication and review. It lacks focus and scientific rigour to be considered for publication. The authors need to choose a specific aim, develop the appropriate method(s) to achieve that aim and describe it as such in the methods section.

The methodological approach to achieve the aim of profiling the cohort (participation rate, temporal trends) is given in the revised manuscript in section 2.3. In section 3.2 (Plan of Analysis) of the original and revised manuscript, we also provide a plan of analysis of how we will use the unique "Continuously Incentivized" cohort design to study early and long-term abstinence in a three-stage Markov model.

We tried to follow the features listed in the BMJopen instructions for cohort profile in terms of the balance between cohort description and analytics.

https://bmjopen.bmj.com/pages/authors/#cohort_profile

4. The manuscript should be rejected. It is not ready for publication.
We have revised the manuscript incorporating all reviewer comments.

VERSION 2 – REVIEW

REVIEWER	Boderie, Nienke Erasmus Medical Center, Public Health
REVIEW RETURNED	22-Mar-2022

GENERAL COMMENTS	The paper has tremendously improved and the explanation on how the incentive is continue really clarified the paper. A few remarks: - page 26: to what extend are lower paycheck deductions cash rewards? Are employees payed in cash? Or is it clearly stated on the paycheck what monetary amount is due to the program? - page 38: high cash/rewards are named as a reason for high participation however the fact that participants can relapse and try again without losing their benefit seems of high importance as well. Please consider adding this.

VERSION 2 – AUTHOR RESPONSE

- page 26: to what extend are lower paycheck deductions cash rewards? Are employees payed in cash? Or is it clearly stated on the paycheck what monetary amount is due to the program?
Response: The employee paycheck is higher because of the discount and it the lower charge for health insurance is stated on the paycheck. This is now indicated in section 2.1 of the revised manuscript.

- page 38: high cash/rewards are named as a reason for high participation however the fact that participants can relapse and try again without losing their benefit seems of high importance as well. Please consider adding this.
Response: We agree. We have added this point to section 4 (third paragraph of the discussion).