

## 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

<b>TITLE (PROVISIONAL)</b>	Exploring network structure and the role of key stakeholders to understand the obesity prevention system in an Australian metropolitan health service: study protocol
<b>AUTHORS</b>	Jancey, Jonine; Leavy, Justine; Pollard, Christina; Riley, Therese; Szybiak, Maria; Milligan, Megan; Chamberlain, Dan; Blackford, Krysten

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Atif Adam Johns Hopkins University Bloomberg School of Public Health, Dept. of Mental Health
<b>REVIEW RETURNED</b>	16-Dec-2018

<b>GENERAL COMMENTS</b>	<p>Overall Comments</p> <ol style="list-style-type: none"> <li>1. There are no dates nor timelines mentioned in the protocol.</li> <li>2. There isn't much thought given to the systems process on why obesity is an issue in the LGAs and leveraging the knowledge of the stakeholders to develop an overarching framework (ideally phase 1).</li> <li>3. While the need for systems thinking is stated early, there isn't much in the study on using a system thinking process on building a larger conceptual framework between stakeholders, understanding loop and feedback mechanisms and working on initial network modeling as primary step on tackling a key gap.</li> <li>4. This is more a mixed method study with network analysis (as correctly stated in abstract) than a systems protocol.</li> </ol> <p>Advisory Group</p> <ol style="list-style-type: none"> <li>1. As with any diverse group of stakeholders, there will be diverging opinions. It is important to identify and structure a protocol on reviewing items within the study and what is defined as "group consensus". (ex. Modified Delphi etc)</li> </ol> <p>Phase 1 Aim</p> <ol style="list-style-type: none"> <li>1. What is the definition of "chronic disease and risk factor", that is unclear in the protocol.</li> <li>2. It is unclear what the researchers mean by "identifying chronic disease and risk factor prevalence relevant to overweight/obesity". Are they looking at factors that aggravate the obesogenic conditions? Are they looking at influencers of obesity? More details on this is required.</li> <li>3. What level of factors are being looked at? Individual-level (eating behaviors, physical activity etc)?, environmental factors (food stores, open spaces etc?,, food policy factors?</li> <li>4. What is the population that is being targeted for "overweight /obesity prevalence"? children ? adults?</li> </ol>
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	<p>5. Method section is very sparse on how the research team and advisory board will decide what are relevant factors within scope of study and what not.</p> <p>6. What does health profile indicators mean? Is it for the LGA as whole or the population specific only?</p> <p>Phase 2 Aim</p> <ol style="list-style-type: none"> <li>1. While a referral sampling technique is included on continued participation, an initial sampling method is not stated. How is team going to select participants to present the distribution of the stakeholders involved in activities? Is there is sample weighting scheme thought out?</li> <li>2. What is the “systems inventory instrument”? a reference of this is much needed.</li> <li>3. Page 7-8; Line 55-22: is this the systems inventory instrument? It seems more like as organizational activity survey.</li> </ol> <p>Phase 3 Aim</p> <ol style="list-style-type: none"> <li>1. Page 8; Line 55: Why 30 agencies? Was there a sample analysis done to show this is needed? More details on this would be useful</li> <li>2. Page 9; Line 8 – 18: Are you sure the questions are things that agencies want to divulge? The questions on funding plans and ventures seem like a confidential matters that the researchers have not set a plan for. There needs to increased description on how the researchers plan to store and secure the data and how they will assure the agencies to provide confidential (if any) information without causing harm to themselves.</li> </ol>
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<b>REVIEWER</b>	Leah Frerichs University of North Carolina at Chapel Hill, USA
<b>REVIEW RETURNED</b>	16-Feb-2019

<b>GENERAL COMMENTS</b>	<p>This protocol paper had the objective (as I understand it) to describe the approach and methods being used to guide a collaborative, regional approach to obesity prevention. Largely, the methods appear to be a process of guiding strategic planning with infusion of some systems thinking tools and methods. As someone interested in the complexities of public health practice and planning for obesity and other health issues myself, I found the article interesting to read. I think it was a nice description of a planning approach and there are some potential novel methods being used that would be useful to have in the literature. However, I think there are several areas that could be strengthened, specifically:</p> <ol style="list-style-type: none"> <li>1- There needs to be a better connection of the phases and how data from each one is going to be used to inform the next?</li> <li>2- The definitions and use of systems thinking is somewhat vague and more examples of what systems thinking tools are and the specific ones this study will use would be helpful.</li> <li>3- More information and specific examples about how the stakeholders will be engaged with the data and how it will be used to guide planning would be of value and strengthen the paper.</li> </ol> <p>Below, I outline additional comments line-by-line.</p>
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	<p>Check in-text reference spacing throughout (i.e., should there be a space between last word and parentheses)?</p> <p>Abstract</p> <p>Line 1: replace 'with' – “and there is”</p> <p>Line 29: 'social' versus 'organizational' network analysis – remove social?</p> <p>Line 31: what will be compared? The parameters between each other?</p> <p>Introduction</p> <p>p.5</p> <p>Line 6: ',with' is awkward. Suggest ending first sentence with 'globally.' Then continue, “Australia has recorded...”</p> <p>Line 12: “...the past few decades, and there is growing concern...”</p> <p>Line 21: what are domestic activities?</p> <p>Line 26: The cost certainly escalates obesity as a priority, but I'm not certain that in itself highlights the need for comprehensive efforts? However, your next paragraph about the complexity of the issue seems to better highlight the need for comprehensive efforts.</p> <p>Line 30: Suggested edit: “Unlike simple problems where outcomes of actions are linear and can be predicted, complex problems involve...”</p> <p>Line 31: “require”</p> <p>Line 35: our approach in what way? Something seems to be missing in this sentence...Our approach to the distribution of food, etc? Our approach to creating health promoting consumption of healthy food, beverages, and more opportunities for physical activities?</p> <p>Line 47: suggest 'involve' instead of 'contain' ?</p> <p>Line 56: “to examine a system's components and ...levels, which can assist with...”</p> <p>p. 6</p> <p>Line 3: “Systems thinking has been used in other disciplines... , and was more recently introduced to the public health...”</p> <p>Lines 14-18: the description of systems thinking and the tools is a little vague right now and may be especially difficult to understand for readers less familiar with these tools. You have a section later on network analysis that may be better placed here as an example tool and one that you emphasize using in this study.</p> <p>Line 33: I'm not clear what is meant by a “Health Service” – would be helpful to provide a brief definition. e.g., is this a system of health clinics? a health coalition? a leadership authority? an administrative unit?</p> <p>Line 50-55: suggested re-wording... “This project will identify existing organisations, programs, services and collaborations between them in order to understand gaps in the system and directly inform health promotion policy, ... “</p> <p>p. 7</p> <p>Line 7: how so? Can you provide a very brief description of what these other studies/methods were?</p> <p>Line 9: suggest using “studies” instead of “works”</p> <p>Line 12: suggest using “use” instead of “trial”</p> <p>Line 27: Remove “To” for consistency with other objectives</p> <p>Line 36-44: Sentence is a little difficult to follow... seems repetitive to say health promotion practitioners at the end? Also, perhaps move “to join the Advisory Group” to the first clause of the sentence.</p>
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	<p>Line 44: quarterly basis for how long? Is there an anticipated timeline – one year? Five years?</p> <p>p.8</p> <p>Line 3: Can you provide some examples of the types of indicators that will be used? Perhaps a table with a preliminary set noting that the advisory group will refine..</p> <p>Line 5: It is not clear how the profiles will be used in Phase 2. Will they be used to prioritize certain LGAs? Would they somehow be used to identify organizations (I'm not sure how this would work)?</p> <p>Line 16: Provide a 1-2 sentence description/overview of what the System Inventory method is</p> <p>Line 50: "The Health Promotion Officers (n=6) will then review and trial the final instrument for... "</p> <p>Line 52: Would the training be held before the review and trial? Or in conjunction?</p> <p>p. 9</p> <p>Line 3: How is obesity prevention different from PA and nutrition?</p> <p>Line 10: Why do they need to have more than one activity session? Do you mean it needs to be an ongoing program? One-time events are excluded?</p> <p>Line 10: How will you define if something is population-based or not?</p> <p>Line 3-22: How will you ensure the validity/reliability of the data collected? Is there any type of quality checking by multiple team members?</p> <p>Line 28: I think I can intuit how the data from 2 will be used for 3, but would be helpful to describe this a bit more explicitly.</p> <p>Line 42: How is this sub-sample being determined?</p> <p>Line 44: How do you define an 'interpersonal relationship'? I think it is defined later and I'm not sure his sentence is needed here...</p> <p>Line 53: Again, how do you determine these "key decision-makers"?</p> <p>Line 60: prior to completing the survey?</p> <p>p. 10</p> <p>Line 3: "If there has been no response after one week, researchers will follow-up..."</p> <p>Line 3: Is this the only follow-up attempt? If you have a no response or refusal, will you sample additional participants to replace?</p> <p>Line 15-18: possible responses in terms of a list of potential organizations that they may collaborate with? Or something else in terms of responses?</p> <p>Line 21-35: This information would be helpful in the introduction</p> <p>Line 37-41: You will be collecting multiple types of connections... will these all be mapped?</p> <p>Line 37-41: The way this sentence is worded makes it sound like you will be computing whole networks measures of centrality/connectivity, but the measures listed are actor/node specific. Can you clarify?</p> <p>Line 37-41: There are many measures that could be computed. How/why were these chosen? Can you provide more information about the usefulness of these measures for planning?</p> <p>Line 45: I do not understand what this means – are you looking for clustering based on demographic factors? And if so, why?</p> <p>p. 11</p>
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	<p>Line 12: quarterly after all phases and data analysis complete or will this be occurring regularly as data becomes available for each phase?</p> <p>Line 38-45: This sounds very interesting but is a bit unclear of how it will happen. Will there be specific targeted workshops to train workforce? You note systems thinking tools but the only method specifically noted is the network analysis... will they be provided with other tools (e.g., training in causal loop diagramming? System mapping tools of other kinds?)? Also, more information is needed to understand how the information can/will be used, especially the network data. Can you provide any examples? Is there a specific plan of how to engage the stakeholders with the data? And if it is de-identified, will this be a barrier/challenge to guide planning?</p> <p>Finally, are there limitations to the study design that should be described/discussed?</p>
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### VERSION 1 – AUTHOR RESPONSE

Reviewer #1

Overall comments

1. There are no dates nor timelines mentioned in the protocol.

Response: The following text has been added to the abstract (pg 2): "in 2019-20." The following text has been added to the METHODS AND ANALYSIS section (pg 6): "...will be conducted in 2019-20 and..."

2. There isn't much thought given to the systems process on why obesity is an issue in the LGAs and leveraging the knowledge of the stakeholders to develop an overarching framework (ideally phase 1).

Response: Thank you for your feedback. The following text has been added to the METHODS AND ANALYSIS section of the manuscript (pg 6): "...and makes use of The Systems Change Framework(30) and its iterative inquiry process involving four stages: 1) define situation; 2) gain clarity; 3) find leverage; and 4) act strategically. These key elements will enable a deeper understanding of the obesity prevention system in the study area. . This type of inquiry involves an ongoing process of interrogation to shift from the current undesirable state to a future desirable state."

3. While the need for systems thinking is stated early, there isn't much in the study on using a system thinking process on building a larger conceptual framework between stakeholders, understanding loop and feedback mechanisms and working on initial network modeling as primary step on tackling a key gap.

Response: The following text has been added to the Method section of Phase 1 and 2 within METHODS AND ANALYSIS (pg 7): "This phase relates to stage one of the iterative inquiry process of The Systems Change Framework(30) whereby enabling factors and initial boundaries for the systemic inquiry are identified." The following text has been added to the Method section of Phase 3 within METHODS AND ANALYSIS (pg 9): "This phase relates to stages two and three of the iterative inquiry process of The Systems Change Framework(30) and will support a deeper understanding of the system in terms of perspectives, relationships and boundaries; and finding leverage by exploring opportunities for engaging in the system." The following text has been added at the end of the METHODS AND ANALYSIS section (pg 10): "At the completion of Phase 3, The Systems Change Framework(30) will be revisited to complete the final stage of the iterative inquiry process. The purpose of this stage will be to respond to emerging system dynamics and engage in planning to address any gaps in the obesity prevention system."

4. This is more a mixed method study with network analysis (as correctly stated in abstract) than a systems protocol.

Response: Thank you for this feedback. We agree with the reviewer that this research uses a mixed methods approach, however, the protocol paper aims to describe the approach and stages utilised in applying a systems thinking model in practice. We have added more description of our systems thinking methods to the manuscript as outlined above to highlight the point of difference from a more conventional mixed-methods approach. We have also added the following text to the first sentence of the METHODS AND ANALYSIS section (pg 6): "...which uses systems thinking tools..."

#### Advisory Group

1. As with any diverse group of stakeholders, there will be diverging opinions. It is important to identify and structure a protocol on reviewing items within the study and what is defined as "group consensus". (ex. Modified Delphi etc)

Response: The following text has been added to the participants and sampling section of the Phase 2 methods within METHODS AND ANALYSIS (pg 8): "The Advisory Group and Health Promotion Officers employed by the area health service will use Nominal Group Technique (32) to reach consensus on the key organisations and individuals to be interviewed initially."

#### Phase 1 Aim

1. What is the definition of "chronic disease and risk factor", that is unclear in the protocol.

Response: The aim of Phase 1 in METHODS AND ANALYSIS section has been reworded for clarity (pg 7): "To describe the context of the study area by identifying the preventable risk factors for overweight/obesity, and prevalence of associated chronic diseases (such as type 2 diabetes mellitus, cardiovascular disease and some cancers) for each LGA in the study area."

2. It is unclear what the researchers mean by "identifying chronic disease and risk factor prevalence relevant to overweight/obesity". Are they looking at factors that aggravate the obesogenic conditions? Are they looking at influencers of obesity? More details on this is required.

Response: We are interested in exploring the preventable risk factors for obesity. This sentence has been reworded as outlined in the response above.

3. What level of factors are being looked at? Individual-level (eating behaviors, physical activity etc?), environmental factors (food stores, open spaces etc?., food policy factors?

Response: We are not addressing the environmental factors such as stores etc. The following text has been added to methods for Phase 1 in METHODS AND ANALYSIS (pg 7): "Micro- (behavioural) and meso- (institutional) obesity risk factors will be explored (31), specifically poor nutrition, inadequate physical activity and excess body weight."

4. What is the population that is being targeted for "overweight /obesity prevalence"? children ? adults?

Response: The following text has been added to the methods for Phase 1 in the METHODS AND ANALYSIS section (pg 7): "All population groups will be included in the summary"

5. Method section is very sparse on how the research team and advisory board will decide what are relevant factors within scope of study and what not.

Response: The relevant factors within and outside the scope of study were decided by the research and advisory group (as part of the systems process). This led to a listing of the types of organisations that would form the sample and then this was further developed. The second part of the exercise was to identify inclusion and exclusion criteria for program activities related to the objectives. The Data collection section within Phase 2 of METHODS AND ANALYSIS outlines the inclusion and exclusion criteria in detail. The following text has been added to the Participants and sampling section of Phase 2 (pg 8): "The Advisory Group and Health Promotion Officers employed by the area health

service will use Nominal Group Technique (32) to reach consensus on the key organisations and individuals to be interviewed initially, based on the inclusion/exclusion criteria outlined below.”

6. What does health profile indicators mean? Is it for the LGA as whole or the population specific only?

Response (pg 7): This should be “health indicators” which are measures designed to summarise information about a given priority topic in population health or health system performance. This has been changed to “health indicators” in the Method section of Phase 1.

#### Phase 2 Aim

1. While a referral sampling technique is included on continued participation, an initial sampling method is not stated. How is team going to select participants to present the distribution of the stakeholders involved in activities? Is there is sample weighting scheme thought out?

Response: The Participant and sampling section states that “Participants will include health promotion practitioners, policy makers and other health professionals involved in the delivery of physical activity, nutrition and obesity prevention programs and activities in the study area.” The following text has been added to the Participants and sampling section of Phase 2 (pg 8): “The Advisory Group and Health Promotion Officers employed by the area health service will use Nominal Group Technique (32) to reach consensus on the key organisations and individuals to be interviewed initially, based on the inclusion/exclusion criteria outlined below.”

2. What is the “systems inventory instrument”? a reference of this is much needed.

Response: The Systems Inventory instrument has been adapted from previous studies as referenced in the Method section of Phase 2. The Data collection section of Phase 2 outlines the information that the instrument will collect and the software that will be used (pg 8): “A custom-built database will be designed using Microsoft Access software to record details of prevention activities being employed in the study area. The content of the database will be based on the Systems Inventory instrument, and the database will be reviewed by the Research Team to confirm face and content validity.... The database will capture information for each activity/program delivered by participants and the organisations they represent. The inventory will include information on the: organisation type; contact information; overarching program objectives and strategies; types of activities implemented (physical activity, nutrition, and obesity prevention); activity duration; collaborating partners; target population; settings/locations the program/activity operates; program evaluation; and program funding details.”

3. Page 7-8; Line 55-22: is this the systems inventory instrument? It seems more like as organizational activity survey.

Response: Yes, this is the Systems Inventory instrument which has been adapted from the previous studies referenced in the manuscript.

#### Phase 3 Aim

1. Page 8; Line 55: Why 30 agencies? Was there a sample analysis done to show this is needed? More details on this would be useful

Response: This is based on previous work that has been carried out in other communities across Australia, as stated in the manuscript. The following text has been added/modified in Phase 3 (pg 9): “Based on previous studies(29), the Research Team will identify the top 30 organisations nominated during the Systems Inventory. This will support achieving the required response rate of 75% for the network data to be considered reliable(38)”

2. Page 9; Line 8 – 18: Are you sure the questions are things that agencies want to divulge? The questions on funding plans and ventures seem like a confidential matters that the researchers have not set a plan for. There needs to increased description on how the researchers plan to store and secure the data and how they will assure the agencies to provide confidential (if any) information without causing harm to themselves.

Response: Participants will provide informed consent prior to data collection, as outlined in the methods sections for Phase 2 and Phase 3. The following text has been added to the ETHICS AND DISSEMINATION section of the manuscript (pg 10): “Participants will receive an information sheet stating that all data collected during each phase of the study will be de-identified and treated as confidential. Data will be password protected and saved to a secure server.”

Reviewer: 2

This protocol paper had the objective (as I understand it) to describe the approach and methods being used to guide a collaborative, regional approach to obesity prevention. Largely, the methods appear to be a process of guiding strategic planning with infusion of some systems thinking tools and methods. As someone interested in the complexities of public health practice and planning for obesity and other health issues myself, I found the article interesting to read. I think it was a nice description of a planning approach and there are some potential novel methods being used that would be useful to have in the literature.

Response: Thank you for your feedback.

However, I think there are several areas that could be strengthened, specifically:

1. There needs to be a better connection of the phases and how data from each one is going to be used to inform the next?

Response: The Systems Change Framework and the iterative inquiry process have been added to the METHODS AND ANALYSIS section, both at the beginning of the section (pg 6) and also within each phase of the methods. This should explain how these stages inform each other in more detail e.g. “...and makes use of The Systems Change Framework(30) and its iterative inquiry process involving four stages: 1) define situation; 2) gain clarity; 3) find leverage; and 4) act strategically. These key elements will enable a deeper understanding of the obesity prevention system in the study area.”

2. The definitions and use of systems thinking is somewhat vague and more examples of what systems thinking tools are and the specific ones this study will use would be helpful.

Response: As stated above in response to the previous comment, more information has been added to the manuscript to explain the use of systems thinking. We are using “systems thinking tools” which has also been added to the METHODS AND ANALYSIS section of the manuscript (pg 6).

3. More information and specific examples about how the stakeholders will be engaged with the data and how it will be used to guide planning would be of value and strengthen the paper.

Response: This is explained by the Systems Change Framework information which has been added throughout the METHODS AND ANALYSIS section. The specific information that explains how this will guide planning is provided in the methods section for Phase 3 (pg 9): “This phase relates to stages two and three of the iterative inquiry process of The Systems Change Framework(30) and will support a deeper understanding of the system in terms of perspectives, relationships and boundaries; and find leverage by exploring opportunities for engaging in the system.” ...

Pg 10: “At the completion of Phase 3, The Systems Change Framework(30) will be revisited to complete the final stage of the iterative inquiry process. The purpose of this stage will be to respond to emerging system dynamics and engage in planning to address any gaps in the obesity prevention system.”

4. Check in-text reference spacing throughout (i.e., should there be a space between last word and parentheses)?

Response: This has been checked and all spaces have been removed.

Abstract

1. Line 1: replace ‘with’ – “and there is”

Response: This wording has been modified to “and there is” (pg 2)

2. Line 29: 'social' versus 'organizational' network analysis – remove social?  
Response: We are using social network analysis and the nodes will be organisations instead of individuals. The following text has been added to the manuscript in the Methods and analysis section of the ABSTRACT (pg 2): "...to examine relationships between organisations in the network. The relationships and interactions will compare the level and type of interactions each organisation has within the network."

3. Line 31: what will be compared? The parameters between each other?  
Response: The response to the previous comment and the text added to the manuscript also answers this query – we are looking at the relationships between organisations.

p.5

1. Line 6: ',with' is awkward. Suggest ending first sentence with 'globally.' Then continue, "Australia has recorded..."

Response: The first sentence of the INTRODUCTION has been modified as follows (pg 4): "The prevalence of obesity is increasing across the globe, and with almost 2 in 3 Australian adults and 1 in 4 Australian children overweight or obese, Australia has some of the highest recorded rates of obesity in the world(1)."

2. Line 12: "...the past few decades, and there is growing concern..."

Response: Modified as suggested (pg 4).

3. Line 21: what are domestic activities?

Response: This term has been removed.

4. Line 26: The cost certainly escalates obesity as a priority, but I'm not certain that in itself highlights the need for comprehensive efforts? However, your next paragraph about the complexity of the issue seems to better highlight the need for comprehensive efforts.

Response: Agreed. We have provided information on why this is a complex issue which leads into the next paragraph which explains why systems thinking is a useful approach to such a complex problem (pg 4).

5. Line 30: Suggested edit: "Unlike simple problems where outcomes of actions are linear and can be predicted, complex problems involve..."

Response: Thank you for your suggestion. This sentence has been modified as suggested (pg 4).

6. Line 31: "require"

Response: This has been modified as suggested (pg 4).

7. Line 35: our approach in what way? Something seems to be missing in this sentence...Our approach to the distribution of food, etc? Our approach to creating health promoting consumption of healthy food, beverages, and more opportunities for physical activities?

Response: This sentence has been modified as follows (pg 4): "...consumption of food, beverages, and physical activity behaviours..."

8. Line 47: suggest 'involve' instead of 'contain' ?

Response: This term has been changed to "involve" as suggested (pg 4).

9. Line 56: "to examine a system's components and ...levels, which can assist with..."

Response: This sentence has been modified as follows (pg 4): “Systems thinking tools and methods allow researchers and decision-makers to examine a system’s components and levels, which can assist with planning appropriate interventions(14, 15).”

p. 6

1. Line 3: “Systems thinking has been used in other disciplines... , and was more recently introduced to the public health...”

Response: This sentence has been modified as follows (pg 5): “Systems thinking has been used in other disciplines such as physics, economics, engineering, and systems biology(16), and was more recently introduced to the public health field to address a wide range of health problems(14).

2. Lines 14-18: the description of systems thinking and the tools is a little vague right now and may be especially difficult to understand for readers less familiar with these tools. You have a section later on network analysis that may be better placed here as an example tool and one that you emphasize using in this study.

Response: The following paragraph has been added to the INTRODUCTION section of the manuscript (pg 5): “Social network analysis (SNA) is a tool that is commonly used in systems thinking to transform health practice(19). SNA explores the structures and processes of a network, which may constitute individuals or organisations (actors) that are linked by ties to one another(20). This type of analysis focuses on relationships within a network rather than studying the attributes of individuals or organisations that comprise the network(20). It can identify what ties actors have and whether they are informal (e.g. an organisation is known to another organisation), or formal (e.g. funding or joint-partnership of service delivery)(21). Understanding the types and functions of networks(21) and what role key actors play is essential to understand if, where, and how to intervene in a system.”

3. Line 33: I’m not clear what is meant by a “Health Service” – would be helpful to provide a brief definition. e.g., is this a system of health clinics? a health coalition? a leadership authority? an administrative unit?

Response: The text has been modified as follows (pg 5): “..., which is an extensive hospital and health service network that aims to maintain and improve the health and wellbeing of more than 708,000 residents in its catchment area across 13 local government areas.”

4. Line 50-55: suggested re-wording... “This project will identify existing organisations, programs, services and collaborations between them in order to understand gaps in the system and directly inform health promotion policy, ... “

Response: This sentence has been modified as follows to align with the primary aim of the study (pg 6): This exploratory research will use a systems thinking approach to better understand the local obesity prevention system defined by the geographic catchment of an area health service; and identify potential gaps and viable opportunities for health promotion investments that will improve obesity prevention efforts and actions.

p. 7

1. Line 7: how so? Can you provide a very brief description of what these other studies/methods were?

Response: The following text has been added to the METHODS AND ANALYSIS section of the manuscript (pg 6): “and makes use of The Systems Change Framework(30) and its iterative inquiry process involving four stages: 1) define situation; 2) gain clarity; 3) find leverage; and 4) act strategically. These key elements will enable a deeper understanding of the obesity prevention system in the study area.”

2. Line 9: suggest using “studies” instead of “works”

Response: This term has been modified to “studies” as suggested (pg 6).

3. Line 12: suggest using “use” instead of “trial”  
Response: This term has been modified to “use” as suggested (pg 6).

4. Line 27: Remove “To” for consistency with other objectives  
Response: This has been removed as suggested.

5. Line 36-44: Sentence is a little difficult to follow... seems repetitive to say health promotion practitioners at the end? Also, perhaps move “to join the Advisory Group” to the first clause of the sentence.

Response: “health promotion practitioners” has been removed from the sentence as suggested. The sentence has been amended as follows (pg 6): “The Research Team will identify and invite experts to join the Advisory Group who have relevant experience in health promotion policy and practice, including relevant stakeholders and practitioners with current expertise in non-government organisations, local government, and Aboriginal and Torres Strait Islander issues.”

6. Line 44: quarterly basis for how long? Is there an anticipated timeline – one year? Five years?

Response: “for two years” has been added to this sentence (pg 7).

p.8

1. Line 3: Can you provide some examples of the types of indicators that will be used? Perhaps a table with a preliminary set noting that the advisory group will refine.

Response: This sentence has been modified as follows (pg 7): “To describe the context of the study area by identifying the preventable risk factors for overweight/obesity, and prevalence of associated chronic diseases (such as type 2 diabetes mellitus, cardiovascular disease and some cancers) for each LGA in the study area.”

2. Line 5: It is not clear how the profiles will be used in Phase 2. Will they be used to prioritize certain LGAs? Would they somehow be used to identify organizations (I’m not sure how this would work)?

Response: The following text has been added to the Method section of Phase 2 (pg 7): “This phase also relates to stage one of the iterative inquiry process of The Systems Change Framework(30) and will be used to identify factors to facilitate systems change efforts.”

3. Line 16: Provide a 1-2 sentence description/overview of what the System Inventory method is  
Response: The Systems Inventory and its components are explained in detail in the Data collection section of Phase 2 (pg 8).

4. Line 50: “The Health Promotion Officers (n=6) will then review and trial the final instrument for... “

Response: This sentence has been modified as follows (pg 8): “The Health Promotion Officers (n=6) will then review and trial the final instrument for usability, suitability and comprehension.”

5. Line 52: Would the training be held before the review and trial? Or in conjunction?

Response: The following text has been added to the sentence (pg 8): “...in conjunction with the instrument trial.”

p. 9

1. Line 3: How is obesity prevention different from PA and nutrition?

Response: Obesity prevention can include activities other than physical activity and nutrition behaviour programs (e.g. policies), which is why data will be collected on policies and programs, as

stated in the manuscript. We are interested in programs that are specifically designed to target obesity, and they may include elements of physical activity or nutrition.

2. Line 10: Why do they need to have more than one activity session? Do you mean it needs to be an ongoing program? One-time events are excluded?

Response: We are interested in health promotion interventions, not one off programs. They need to be sustainable and comprehensive. The following text has been added to the inclusion criteria (pg 8): “c) comprise more than one activity session to indicate an ongoing nature”

3. Line 10: How will you define if something is population-based or not?

Response: The program cannot be conducted in a clinical setting or on an individual basis, as stated in the exclusion criteria. Programs can be population or community based rather than only reaching one person at a time.

4. Line 3-22: How will you ensure the validity/reliability of the data collected? Is there any type of quality checking by multiple team members?

Response: The following text in the methods section of Phase 2 explains this process (pg 8): “The content of the database will be based on the Systems Inventory instrument, and the database will be reviewed by the Research Team to confirm face and content validity. It will then be trialled with health professionals (n=10) and changes made as required. The Health Promotion Officers (n=6) will then review and trial the final instrument for usability, suitability and comprehension. Training workshops for the Health Promotion Officers on data collection and use of the database will be conducted.

5. Line 28: I think I can intuit how the data from 2 will be used for 3, but would be helpful to describe this a bit more explicitly.

Response: The sub-sample for Phase 3 will be identified from the Phase 2 data, as explained in the Methods section of Phase 3 (pg 9): “An online organisational network survey will be undertaken to assess the degree of interrelatedness between a sub-sample of organisations identified during Phase 2.”

6. Line 42: How is this sub-sample being determined?

Response: The following text has been added to the Participants and sampling section of Phase 3 (pg 9): “Based on previous studies(29), the Research Team will identify the top 30 organisations nominated during the Systems Inventory....”

7. Line 44: How do you define an ‘interpersonal relationship’? I think it is defined later and I’m not sure his sentence is needed here...

Response: This has been rephrased to “Relationships and interactions between organisations” (pg 9)

8. Line 53: Again, how do you determine these “key decision-makers”?

Response: The Research Team will determine the top 30 organisations nominated during Phase 2, as outlined in the response above.

9. Line 60: prior to completing the survey?

Response: Yes, “prior to commencing the survey”. This has been added to the Participants and sampling section of Phase 3 (pg 9).

p. 10

1. Line 3: “If there has been no response after one week, researchers will follow-up...”

Response: The sentence has been modified as follows (pg 9): “If there has been no response after one week, researchers will follow-up via telephone and offer assistance to complete the survey.”

2. Line 3: Is this the only follow-up attempt? If you have a no response or refusal, will you sample additional participants to replace?

Response: Additional participants will not be sought. We require a 75% response rate from the 30 organisations selected for the SNA to be conducted. The following text has been added to the Participants and sampling section of Phase 3 (pg 9): “Based on previous studies(29), the Research Team will identify the top 30 organisations nominated during the Systems Inventory to achieve the required response rate of 75% for the network data to be considered reliable(36).”

3. Line 15-18: possible responses in terms of a list of potential organizations that they may collaborate with? Or something else in terms of responses?

Response: The sentence has been modified as follows (pg 10): “Participants will be asked to choose from a compiled list of organisations...”

4. Line 21-35: This information would be helpful in the introduction Line 37-41: You will be collecting multiple types of connections... will these all be mapped?

Response: Yes, we will be collecting multiple types of connections, as explained by the following sentence (pg 9): “Participants will be asked to identify the organisations with which they share information, knowledge, or resources; engage in joint planning; apply for joint funding; and share informal contacts.”

5. Line 37-41: The way this sentence is worded makes it sound like you will be computing whole networks measures of centrality/connectivity, but the measures listed are actor/node specific. Can you clarify?

Response: The text has been modified as follows (pg 10): “Links between organisations will be mapped visually as a network graph, and analysis will examine the role of actors in the network relative to others by plotting the network’s centrality scores. Core-periphery analysis will be conducted to identify densely connected core-nodes and sparsely connected periphery-nodes(42).”

6. Line 37-41: There are many measures that could be computed. How/why were these chosen? Can you provide more information about the usefulness of these measures for planning?

Response: This is explained by the sentence (pg 10): “This will enable the identification of potential organisational collaborations, and gaps in the service delivery system across the study area.” The following text has also been added to Phase 4 to provide further explanation (pg 10): “At the completion of Phase 3, The Systems Change Framework(30) will be revisited to complete the final stage of the iterative inquiry process. The purpose of this stage will be to respond to emerging system dynamics and engage in planning to address any gaps in the obesity prevention system.”

7. Line 45: I do not understand what this means – are you looking for clustering based on demographic factors? And if so, why?

Response: This should be “organisation characteristics” instead of “demographics.” The text has been updated in the manuscript (pg 10).

p. 11

8. Line 12: quarterly after all phases and data analysis complete or will this be occurring regularly as data becomes available for each phase?

Response: “quarterly” has been removed from the text and “at the completion of each phase” has been added to the end of this statement (pg 11).

9. Line 38-45: This sounds very interesting but is a bit unclear of how it will happen. Will there be specific targeted workshops to train workforce? You note systems thinking tools but the only method specifically noted is the network analysis... will they be provided with other tools (e.g., training in causal loop diagramming? System mapping tools of other kinds)? Also, more information is needed to understand how the information can/will be used, especially the network data. Can you

provide any examples? Is there a specific plan of how to engage the stakeholders with the data? And if it is de-identified, will this be a barrier/challenge to guide planning?

Response: This paragraph has been modified for clarity (pg 11): “A key strength of the program design is the utilisation of knowledge brokers (stakeholder managers and researchers) and program champions (health promotion officers, local government staff and/or other relevant stakeholders) which will help build capacity in the professional workforce for the purpose, use and implementation of systems thinking tools and processes in the Perth metropolitan area, Western Australia. Although this current research focuses on the priority areas of nutrition, physical activity and overweight/obesity prevention, one of the aims of undertaking a prevention systems thinking approach is to determine the suitability of this process for other priority areas, such as, tobacco control or the drug and alcohol use. Determining the suitability of the current research methods for duplication and translation for other areas is a priority for health services and local government.”

10. Finally, are there limitations to the study design that should be described/discussed?

Response: Limitations are provided in the article summary section (pg 3):

- “The quality of data will depend on the willingness of participants and organisations in the study area to share information.”
- “De-identification of organisation data may make planning and improvements in the health service area challenging.”

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	Leah Frerichs University of North Carolina at Chapel Hill
<b>REVIEW RETURNED</b>	25-Mar-2019
<b>GENERAL COMMENTS</b>	Thank you for addressing my prior comments