Author's response to reviews

Title: Food subsidy programs and the health and nutritional status of disadvantaged families in high income countries: a systematic review

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Author's response to reviews: see over
The Editors,
BMC Public Health

Dear Editors,

Thanks for the positive and helpful reviews of our manuscript. We have amended the manuscript to address the comments and suggestions from Reviewer 2. These are addressed in detail below with extracts from the revised manuscript to assist with clarifying the changes. Table 2 has been divided into separate Tables 2-4 for different population groups. Table 3 has been renamed Table 5. We have now added an additional file 1, which includes the details of the risk of bias ratings in each category for individual studies.

The PRISMA guidelines were used to guide the reporting of this systematic review, which was acknowledged by the two reviewers.

All authors have reviewed and approved the final manuscript.

Yours sincerely,

Andrew Black on behalf of the authors.

26/10/2012
Reviewer 2 Comments

Major compulsory revisions

1. There are a number of ways in which the rationale and detail regarding the scope of this review are not entirely clear to me.

   a. Authors state that providing intermittent meals not the same intervention, but don’t explain why consistency might matter.

   It is challenging to change eating habits, and thus one off or limited interventions are exceedingly unlikely to impact on ongoing food intake. This has been expanded in the Methods, Types of Interventions (page 6):

   “Emergency food relief services (eg Food banks) were excluded as they provide intermittent or one-off assistance. Given the challenge of changing food habits, it is unlikely that such intermittent nutrition interventions would have sustained impacts on nutritional intake.”

   b. The last paragraph of the introduction states that participants of any age were included. Does this mean that, in theory, food subsidies to the elderly, drug users or homeless people were eligible for inclusion? Are these the same population as pregnant women in WIC?

   Please see comment below under subheading “scope of review and participants”.

   c. Excluding school meals because they are included in another review is also not a sufficient rationale, particularly given a stated aim to broaden out the inclusion criteria from a preceding review and the fact that the study reported by Gunnel and colleagues did include this element.

   Please see comment below under subheading “Exclusion of school meals”.

   Looking at how included studies are described at present I don’t see any reason why subsidised meals should not be included. I am also struggling with the decision to include outcomes for all population groups. There is a logical inconsistency in treating a subsidy given to a parent on behalf of a child as the same intervention as a subsidy for one ‘s own diet. Further, nutritional needs will vary by population group, and therefore a „healthy diet” and a healthy weight will vary by age and status, and some of the outcomes reported will be necessarily non-compatible. At a minimum, results should be reported separately for non-pregnant adults, adults, and children to make this clear to readers. Authors should consider whether it is appropriate to have no limits on the population included, and if this remains their preferred option to explain why this makes sense.

Scope of review and participants

Our purpose in this review was to review healthy food subsidy programs for families including both adults and children living in the community in which food was provided/subsidised to facilitate
healthier meals/snacks prepared by families. The types of participants were framed to ensure that both adults and children were included. Thus, we have refined the inclusion criteria to exclude special population groups such as the elderly, those in institutions or on special treatment programs and subsidised meal provision programs for elderly or homeless people, as we agree that these represent distinct populations or interventions that are not applicable to families living in the community. See Methods, Types of Participants (p.6):

“Eligible participants were socio-economically disadvantaged adults, children or families living independently in the community in high income countries. High income countries were as defined by the World Bank. Special population groups such as the homeless or those in substance abuse treatment programs were excluded.”

and in Methods, Types of Interventions (page 6):

“Interventions which provided pre-prepared meals to participants (e.g. elderly or frail) were excluded.”

The introduction paragraph 5 (p.5) has also been edited to indicate the focus of this review:

“In order to expand the work of D’Souza et al¹ both adults and children living in the community were included, while recognising the importance of pregnancy and early childhood.”

Reporting of outcomes

We agree that there may be a difference between a subsidy to an individual and one given to a parent on behalf as a child. However, we feel that there is also a logical inconsistency in food programs where subsidies are given to only one or two members of a family and it is expected that the family will not share the available food amongst all family members according to need/custom.

It is difficult to provide a useful synthesis of the outcomes given the limited number of eligible studies and the heterogeneity of outcomes- it was decided that reporting outcomes by extent of the food subsidy provided was a useful point of differentiation. To make it clearer that there are different target groups the comprehensive food subsidy programs have now been separated into 3 tables:

Table 2. Pregnant or post-partum women. (p.33)
Table 3. Non-pregnant adults (p.38)
Table 4. Children (p.39)

Exclusion of school meals

School meals and school nutrition programs in general have been widely implemented. In addition to the Cochrane Review quoted,² there is another Cochrane review underway of interventions to promote F&V by children aged5-18 years.³ We feel that there is a need to review nutrition interventions outside the school setting as this is where the gap lies. The stated aim to broaden the inclusion criteria referred to the d’Souza et al¹ systematic review of food subsidy programs for child-bearing women only. The inclusion of the Gunnell et al⁴ study in our review was due to the fact that
it involved a food subsidy program that included food parcels to families to some participants and school-based food provision to other participants— if it had only involved a school-based intervention then it would have been excluded.

Methods, Types of Interventions was edited to indicate this (p.7):

“This review was designed to focus on interventions aimed at families in the community, as these were considered to be distinct from school-based nutrition interventions.”

2. Para 2 of introduction. To argue for food subsidies to improve health it is necessary to demonstrate that cost is a barrier to healthy eating (and hence that altering food pricing might be efficacious). Therefore this paragraph needs to make the point that we assume an important (perhaps the most important) barrier to accessing healthy food for poor families is money. I think it would also be useful in this paragraph to distinguish between having sufficient energy and having a nutritious diet. This matters for both WIC and Healthy Start because they have both, arguably, evolved in the direction of the latter since policy concerns are now about excess not insufficient energy intake. This would also serve to justify decisions relating to assessment of appropriate outcomes and exclusion of low and middle income countries. Primary outcomes for a programme to increase energy intake from food supplementation would assess stunting and wasting (not included here).

This is an important point and the Introduction Paragraph 2 (p.4) has been edited to address these ideas. The focus on the increasing emphasis on overconsumption of energy dense foods and the need to improve the quality of the diet and the barrier of cost for those on low incomes in high income countries has been added:

“In high income countries, there has been increasing focus on the increased intake of energy-dense nutrient poor foods by a majority of the population.5,7 However, low socioeconomic status is associated with lower uptake of health promoting behaviours,8 including healthy eating.9,10 For those on low incomes in high income countries, the cost of healthier food is considered an important barrier to improving the quality of dietary intake.11,12

3. Were any secondary outcomes considered relevant? Eg assessment of food purchase rather than food consumption.

It was decided that given the heterogeneity of outcomes reported, it was appropriate to report all as primary outcomes. However, the primary outcomes included a wide range of nutritional and health outcomes. The nutritional outcomes included food consumption, food purchases and/or biomarkers (see Methods- Outcomes p.7). Adverse outcomes were considered a relevant secondary outcome.

4. Paragraph one of “Data synthesis and analysis”. More detail about data extraction would be helpful. Please state clearly whether data extraction was completed in duplicate or what steps were taken to ensure consistency/reproducibility if extraction was only conducted by one author. How extractions forms were developed? Please explain better what is meant by stating the authors were contacted “where possible”. It’s not clear from the description here how you dealt with data from different family members – would be worth being clear that these were extracted separately when
Data extraction was completed by only one author. A template was adapted using a form developed by one author (Helen Eyles) in a previous systematic review, guided by the Cochrane Handbook/EPOC data collection checklist. An attempt was made to contact authors. This has been described in Data synthesis and analysis (p.9)

“Data was extracted into a standard template adapted from the Cochrane Handbook\textsuperscript{13} and the EPOC data collection checklist\textsuperscript{14} by one author (AB). Data entry was checked for each study after completing data extraction. All primary outcomes, any adverse outcomes, together with age, gender, pregnancy status and cultural background of study population, the setting for each study and details of the study design were extracted. The study authors were contacted to try and obtain missing data.”

None of the studies specified if data was included from multiple family members. Thus, it was not possible to address the potential impact of clustering by family.

5. In “types of interventions” it would help readers to have examples of what could be included under “policy initiatives, transport and infrastructure subsidies, cross-subsidies”. It is difficult to imagine what any of these might translate into.

There are a number of initiatives/programs that have been proposed or implemented to reduce the cost of healthy food and the intention was not to exclude any of them. There have been very limited studies of these programs and ultimately no studies of such initiatives which met inclusion criteria were identified. Examples such as the Food Miles program in Canada (already mentioned in the Introduction) and the Outback Stores initiative in Australia have been added in Types of Interventions on p.6:

“Examples of transport and infrastructure subsidies include the Food Miles program\textsuperscript{23} in Canada which subsidises wholesale food transportation costs to remote communities and the Outback Stores initiative\textsuperscript{29} in Australia which assists remote Indigenous community stores to improve infrastructure and storage processes to reduce the costs of perishable foods.”

6. In “types of interventions”, how did authors assess whether the studies achieved a 10\% reduction in the price of targeted food? Where any studies excluded because this wasn’t clear either way?

The majority of the studies were of programs which provided free food (e.g. WIC, Healthy Start, Gunnell 2007, Kennedy 2009), or specified the extent of the price subsidy (e.g. Ni Mhurchu 2010-12.5\%). There were no studies which were excluded because the price reduction was ambiguous.

7. Paragraph 2 of “types of intervention” authors should state whether or not alternate interventions were considered an appropriate control group (e.g. an education only arm). It would be useful to highlight here that while standard WIC is the intervention
of interest in most cases, you also considered studies where in at least one case standard WIC is the control provision while in several others standard WIC is the intervention of interest.

Types on interventions, paragraph 2 (p7) has been edited to indicate that controls may also have received non-food subsidy interventions including nutrition education and that Herman et al, 2008 compared adding F&V to the standard WIC program:

“Both intervention and control groups in eligible studies may have also received nutrition education/promotion. In addition to studies of the standard WIC program, there was one CBA study which compared the addition of F&V to the standard WIC program (prior to the inclusion of F&V).”

The intention of the review was to compare the impact of subsidising the cost of food on standard nutrition promotion/education to the extent that the data made this possible.

8. In paragraph 2 of the section “interventions and outcomes” studies are divided between those that provide a narrow or a broad food subsidy. This division needs explanation, and this refers back to the problem first introduced in note 2 above. If interventions need to be group it should be in response to their likely effects. If the main barrier is cost, then the division should be according to value of the intervention because what matters is increasing monies available to be spent on food. If it is about nutritional quality of the diet then a more nuanced approach would be needed considering the fit between the population and the diet support matters, or whether particular food groups are included.

The decision to present results as a comprehensive food subsidy or a limited subsidy of only F&V was made after assessing the limited number of studies other than those on the WIC program. It attempts to reflect the likely impact of having more nutritious food in the household (ie the cost barrier) but also the fact that improving dietary patterns involves a range of factors in low income households. If the results were presented according to the value of the intervention then they would be split in a similar way (although it is harder to assess the comparative value of subsidies in the older studies due to inflation). The data extracted from these studies is insufficient to provide a more in depth analysis of how well dietary requirements/nutritional quality were supported among the participants.

In Results, Interventions and Outcomes (p.12):

-the limited studies category has been labelled the F&V interventions only, as these 3 studies reflect the increasing focus on increasing F&V intake/access for low income/disadvantaged people.

-additional explanation for categorising the results in this way has been added:

“The presentation of the impact of food subsidy programs on primary outcomes distinguishes between comprehensive food subsidy interventions which subsidise a wide range of food items or an overall package of food (Tables 2-4) and those in which only fruit and vegetables or juice are subsidised (Table 5). This reflects that subsidising a range of healthier foods may be more likely to impact on overall dietary intake, but also that
increasing intake of fruit and vegetable intake has become an important public health goal given its the potential to reduce the risk of non-communicable diseases."

9. There should be discussion of the implications of the decision to include 7 nonrandomised controlled studies. What effect did including these have on results and strengths of conclusions?

The discussion describes the limited evidence base in general terms and the need for RCTs but the inclusion of 10 non-RCTs (the 7 CBAs and the 3 ITS studies) is now discussed specifically in the discussion (paragraph 3, p19-20):

“The inclusion of 10 non-randomised studies increases the possibility of selection bias and residual confounding as alternative explanations for the positive impacts of food subsidy programs discussed above. In addition, only one of the four RCTs was assessed as having a low risk of bias. Thus, the overall quality of the evidence is limited and the findings should be interpreted cautiously. The heterogeneity of both study design and outcomes also prevented meta-analysis and limited the precision of estimates of effect. The studies assessed to have a low risk of bias (one RCT\textsuperscript{17}, 3 ITS studies\textsuperscript{18-20} and one CBA study\textsuperscript{21}) found a range of improvements in food purchases, nutritional biomarkers and perinatal outcomes that have significance for the health of the population. As with other complex public health interventions, there may be practical and ethical limitations on undertaking RCTs, and it will remain important to assess all available high quality evidence with due attention to the limitations of the overall evidence base.”

10. Table 1 Authors have had a challenge in describing risk of bias across study designs in a succinct way, but I don’t believe the solution offered doesn't work. I found it very difficult to work out for each study what the risks where. This is partly because they report ‘non-risk’ categories – they report criteria met not criteria missed, but also because the numbering systems is just difficult to follow. For example, although the text states that the non-WIC control group in the 1988 study by Rush and colleague was probably not sufficient this isn’t clear when looking at the table. One suggestion would be to divide this table by study type and give each section a more explicit risk of bias description.

The risk of bias assessments in Table 1 (p.30-32) have been changed to an overall high, medium or low rating, while the individual domains of the risk of bias assessments are now presented in Table 6 (which will be included as an additional file as per BMC Public Health manuscript submissions). The presentation of the risk of bias category assessments (Yes/No/Unclear) has been represented explicitly in Table 6.

In Assessment of risk of bias in included studies (p.9) has been edited to describe the changes to these assessments:

“Included studies were assessed for risk of bias on relevant domains based on the Cochrane guidelines for RCTs\textsuperscript{13} and both the Effective Practice of Care (EPOC) guidelines\textsuperscript{14} and the Newcastle-Ottawa Scale\textsuperscript{22} to assess the quality of CBA and ITS study designs, as shown in the footnote in Additional Table 6. In accordance with Cochrane guidelines,\textsuperscript{13} the above
domains rated as low risk of bias are summarised in Table 6. Studies were assessed as low risk of bias if there were 0-1 criteria not met, moderate risk of bias if up to two criteria were unclear and high risk of bias if 2 or more criteria were not met (Table 1).

11. Second para of “Data synthesis and analysis” regarding the potential for meta-analysis is confusing. I think it would be clearer for the reader to stick to planned methods here (that authors anticipated high study heterogeneity given a large number of included primary outcomes, a broad population, and a number of study designs), but that Cochrane guidelines were followed in assessing potential for meta-analysis where sufficient number or studies shared an outcome, design and population. Then the explanation for why meta-analysis was not undertaken should all move to the appropriate sections of findings.

The second paragraph of Data synthesis and analysis (p.9) has been edited as suggested for clarity:

“Due to the heterogeneity of study designs and outcomes and the limited number of studies reporting individual outcomes, narrative synthesis was used to summarise the majority of outcomes. The recommendations of the Cochrane Handbook were used to assess the adequacy and appropriateness of undertaking meta-analysis for each outcome.13”

The description of the use of a forest plot with the summary statistic suppressed was moved to the relevant section of the findings (Perinatal outcomes p.17):

“As sufficient data were available, Cochrane Review Manager 5 was used to produce a forest plot, with weighted mean differences and 95% confidence intervals for mean birth weight in the WIC studies. The heterogeneity of study designs and missing data precluded the reporting of a summary statistic for mean birth weight. However, overall there would appear to be a small increase in mean birth weights as reflected in the forest plot of this outcome for WIC studies (Figure 2) and a non-significant trend to decreased rate of low birth weight among WIC participants.”

12. Paragraph one of “Data synthesis and analysis” it would be complete to state that all primary outcomes were extracted and to say what was extracted regarding secondary outcomes and population characteristics.

Data synthesis and analysis, paragraph one (p.9) has been edited as suggested to include details of the extraction of secondary outcomes—only adverse outcomes—and population and study characteristics:

“All primary outcomes, any adverse outcomes, together with age, gender, pregnancy status and cultural background of study population, the setting for each study and details of the study design were extracted. The study authors were contacted to try and obtain missing data.”
Discretionary Revisions

13. Paragraph 1 of “outcome” what is meant by a “valid measure” here? I think given diversity of outcomes it would be more useful to have a statement for each. Also here, biomarkers could be listed under „nutritional status” and therefore perhaps also with BMI, BMI for age, weight for age.

In outcome, paragraph one(p.7), the word valid has been changed to validated. The outcomes listed provide descriptive examples of the main outcomes that were reported.

14. Search Strategy; if resources allow it might be wise to update the search, and to include Psycinfo.

Individual database apart from Medline and Econlit (and hand-searching reference lists) contributed very few unique studies. When the search strategy was devised, it was considered that these databases were the ones most likely to yield relevant studies.

15. In “Other Health Outcomes” I don’t understand why anthropometry and haemoglobin levels are not nutritional outcomes since they are determined by diet. I was expecting to see immunisations, hospitalisations, infections etc here and a clear statement that they were not reported.

Nutritional outcomes as a category focussed on direct or surrogate measures of food intake and included food purchases and biomarkers. All other outcomes were considered separately. Anthropometry and haemoglobin are clearly related to nutrition but other factors may also be important determinants eg. Illness episodes, specific health conditions, genetic factors.

Other health outcomes (p.19) has been edited to state that no other measures of physical health or health service use were reported:

“None of the studies of pregnant or non-pregnant adults reported on episodes of illness, mortality or morbidity or health service/hospital attendances.”

16. In table 2 and 3, presenting all outcomes for each study in turn makes comparison across studies more difficult than necessary. I suggest representing by grouped outcome. This would also make it easier for the reader to see which outcomes were seldom reported and enable authors (and readers) to better differentiate outcomes for mothers and their children.

As discussed above in 1 and 8, the reporting on results was presented for each study given the heterogeneity of outcomes which made it difficult to combine these data in a meaningful way. The grouping of the data by outcome would make it clearer to see what was seldom reported but is unlikely to improve on the description and interpretation of the outcomes in the results and discussion.

Minor Issues

17,18,19,22,27. Minor amendments have been made as suggested.
20. Further description of the Food Miles program has been added to the Introduction (p.4) with the reference for those interested in greater description of the impacts on food costs:

“the Food Miles program in Canada provides subsidies to wholesale distributors sending perishable foods by air to remote communities, which has reduced the cost of healthy foods for families in remote locations.”

21. The Introduction, paragraph 5 (p.5) has been edited to show that this statement was limited to fruit and vegetable intake:

“the current review considered whether the impact of food subsidy programs on fruit and vegetable intake are sufficient to contribute to reducing non-communicable disease prevalence.”

23. The wording is as used by the authors of this study who categorised the food purchases including F&V as healthier.

24. Original wording is considered appropriate by the authors.

25. The conclusions refer to the limited high quality evidence in the first sentence, which we think highlights the limitations of the data.

26. This point was not clear to us so we were unsure how to respond.

References


