MRC/CSO Social and Public Health Sciences Unit Consultation Response

Title of consultation
Scottish Conservative Healthy Lifestyle Strategy: Setting out a long term alternative strategy for Health, Wellbeing and Sport

Name of the consulting body
Scottish Conservative & Unionist Party

Link to consultation

Why did the MRC/CSO Social and Public Health Sciences Unit contribute to this consultation?
The Unit has research expertise on the key areas of physical activity, nutrition, and public health, including the environmental determinants of physical activity in school children (SPACES), large scale physical activity evaluations (Football Fans In Training); dietary intake, food marketing and regulation, and free school meal provision\(^1\). The Unit receives core-funding from the Medical Research Council and the Scottish Government Chief Scientist Office, as well as grant funding for specific projects from a range of sources.

We conduct research to understand the determinants of population health and health inequalities, and to develop and test interventions to improve health and reduce inequalities, using a wide variety of methods including qualitative research, the collection, linkage and analysis of social survey and routinely collected data, evidence synthesis, randomised controlled trials and natural experimental studies. Further information about the Unit is available at http://www.gla.ac.uk/researchinstitutes/healthwellbeing/research/mrccosocialandpublichealthsciencesunit/

Our consultation response

Having considered the draft strategy in full, we wish to provide some comments and feedback from two particular perspectives - physical activity and nutrition - to assist with the further development of the strategy.

Physical Activity

Rather than provide specific comments on the recommendations themselves we felt it was of more value to offer some constructive suggestions from a conceptual level which may be of greater use in the refinement of the strategy.

\(^1\) http://www.gla.ac.uk/researchinstitutes/healthwellbeing/staff/stephaniechambers/#/biography
Alternative approach to what?
Our initial reflection upon reading the document was the formation of a question – namely, what is this an ‘alternative strategy’ to?

The present Scottish Government has in place the population focused, 10-year, Physical Activity Implementation Plan (PAIP) (1), delivered under the auspices of the National Strategic Group for Sport and Physical Activity, with the evaluation conducted as part of the Legacy 2014 programme and through the Active Scotland Outcomes Framework2. The plan itself is grounded in an ecological perspective (2) and adapts a number of the main principles and elements of the 2010 Toronto Charter for Physical Activity (3). The Charter calls for concerted action across 4 key areas, culminating in a systematic and comprehensive approach to tackling population level physical (in)activity:

1. Implementation of a National Action Plan (this is the current PAIP)
2. Develop Partnerships for action (across health and non-health sectors at multiple levels, e.g. cross-level government working parties, whole-of-government and community initiatives)
3. Reorient Services and funding to prioritise physical activity (in health, education, transportation, planning, and sport and recreation)
4. Introduction of regulations and policies that encourage physical activity (i.e. Fiscal policies such as incentives and tax deductions that may support physical activity, transport policies that support non-motorised modes of transport.

Some of the guiding principles from the charter (which are also consistent with a number of international guidance documents, including the World Health Organization’s Global Strategy on Diet, Physical Activity and Health3) include the suggestion of taking a life-stage approach that addresses the needs of children, families, adults, and older adults (of which we discuss further below). Other principles include the need to adopt evidence based strategies, and address the physical, social, and environmental determinants of equitable access to physical activity.

The PAIP, as published in 2014 by the Scottish Government, identifies five particular delivery themes through which rigorous action is proposed: i) the environment; ii) the workplace; iii) Health and Social Care; iv) Education; and v) Sport and Active Recreation.

This particular approach, in our view, addresses both ‘prevention’ and ‘cure’ perspectives and not just the traditional ‘cure’ perspective as the author of this draft strategy outlines in the introductory page. With the current PAIP adapting key elements from the well evidenced and theoretically grounded Toronto charter, any alternative strategy offered should, in our opinion, adopt a similar approach and foundation, evidencing further improvements or concerns with the current plan and any proposed strategies as part of it. In the first instance, the draft strategy would therefore benefit from greater clarity in the terminology used and purpose outlined.

Terminology
There are a number of issues concerning the use of terminology in the draft strategy that undermine the overall aim of the document. First, the strategy shifts interchangeably between the concepts of physical activity, sport and exercise, mainly in relation to health and other outcomes. In our experience, we would suggest that it is important to clarify that although these terms are indeed related, they do, however, refer to distinct concepts. Physical activity is most commonly defined as “any bodily movement produced by skeletal

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2 http://www.gov.scot/About/Performance/scotPerforms/partnerstories/Outcomes-Framework
3 http://www.who.int/dietphysicalactivity/strategy/eb11344/strategy_english_web.pdf
muscles that result in energy expenditure” (4). Conversely, exercise is a subcategory of physical activity, which refers to activity that is “planned, structured, repetitive, and purposive” (4) and “results in the improvement or maintenance of one of more facets of physical fitness”. Sport is also a sub-classification of physical activity (and at times is also viewed as a sub-classification of ‘exercise’) and has been defined as “rule governed, structured and competitive and involves gross motor movement characterized by physical strategy, prowess and chance” (5).

The meaning of each term has profound implications for the initial strategic approach, and ultimately success or failure of said approach. Inconsistent or interchangeable usage of terms may lead to confusion among those formulating and implementing policy and, most importantly, among the public.

Exercise is an important component of physical activity that encapsulates sport and other activities that undeniably yield myriad health and other benefits. However, exercise-based initiatives (e.g. sport and other leisure-based activities) provide less scope for population reach compared with targeting overall physical activity levels (e.g. via walking and active travel). Walking in particular is an accessible form of physical activity. It transcends issues of equality and has been seen as the best option for sedentary adults trying to increase their physical activity (6, 7). Furthermore, in 2015, 49% of children walked to school⁴, and active travel has been shown to contribute 34% of total daily moderate to vigorous intensity physical activity (8). In recognition of the potential public health benefits associated with walking, the Scottish Government launched a comprehensive national walking strategy in 2014 entitled ‘Let’s Get Scotland Walking’: The National Walking Strategy. One of the strategic aims was to have better quality walking environments with attractive, well designed and managed, built and natural spaces. Other related considerations include the continued/increased funding in the road and path infrastructure for active travel. The Cycling Action Plan for Scotland (CAPS) 2017-2020⁵ outlines the progress to date, and the future direction of creating a Scottish population who view cycling as a genuine viable option for active travel.

These types of approach draw upon the existing understanding in areas such as urban planning (9), and builds upon the evidence that suggests being outdoors is beneficial for physical activity levels (10), physical and mental well-being (11), and the reduction of health inequalities (12).

Moreover, the majority of current international physical activity strategies are targeted towards increasing physical activity levels based on evidence-based physical activity guidelines. The current UK guidelines (14) stipulate that all adults aged between 18-65 years should perform at least 150 minutes of moderate-intensity aerobic physical activity each week, or at least 75 minutes of vigorous-intensity per week, or a combination of both in bouts of ten minutes or more. In addition, these guidelines suggest that all young people and children aged 5-18 years should perform moderate-to-vigorous intensity physical activity for at least 60 minutes every day of the week. These guidelines echo international recommendations based on epidemiological evidence (e.g. 15) and therefore we would argue, are fundamental to any strategy aiming to target physical activity for health. Furthermore, these guidelines are the foundation of other UK government-based physical activity initiatives (e.g. 16) and recommend acknowledgement of these guidelines.

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Overall, we’d suggest that greater clarification of the key aim(s) of the proposed long term alternative strategy for health, wellbeing and sport is imperative in order to aid debate and discussion of the proposed approaches and recommendations. The main strengths and potential contribution of the document (in its current form) is providing an alternative strategy for enhanced sports participation, particularly among young people and children in Scotland. If this is the original intent, then the strategy could be reframed more clearly from the outset by more explicitly setting out the principle focus (i.e. increasing sports participation in the early years) and setting out recommendations on how this should be implemented in light of current evidence.

We would point the author of the strategy to the current Scottish Government’s strategy for sport in children and young people - *Giving Children & Young People a Sporting Chance* which sets out a 10-year plan.

In addition, we suggest caution be taken when citing literature that refers to physical activity and health more broadly as opposed to participation in sport specifically. We hope our guidance on definitions and signposting to relevant literature(s) are helpful to the author in further development of this strategy.

**Obesity**

We would like to offer some observations about the issues relating to obesity and physical activity outlined in the strategy.

It is understood that obesity occurs fundamentally due to a chronic imbalance between energy balance related-behaviours, namely diet (energy intake) and physical activity (energy expenditure) (17). However, the aetiology of obesity is complex and multifaceted (18). Hence, while individual level interventions and approaches are important in addressing the obesity ‘epidemic’, it is widely accepted that ecological approaches to obesity prevention appear to offer the most capacity for the development of population interventions (e.g. 19, 20), targeting multiple levels, including: individual behaviour change; organisations (e.g. schools); and various sectors (e.g. agriculture and urban planning) (17).

Nonetheless, encouraging obese individuals to adopt a more physically active lifestyle is crucial for weight management and health, thus is a key component of current obesity management guidelines (21, 22). For example, the Scottish Intercollegiate Guidelines Network (22) recommend that overweight and obese adults should perform around 225-300 minutes of moderate-intensity physical activity per week for weight loss and prevention of weight regain. However, it is important to emphasise that despite playing an essential role in weight loss maintenance (e.g. 23, 24), physical activity alone has a relatively modest effect on weight loss in overweight and obese adults (25). Hence, current guidelines emphasise that obese individuals should primarily focus on reducing their intake of energy-dense foods, in addition to adopting a more physically active lifestyle (e.g. 22).

In light of these points above, we would suggest that the paragraphs on obesity from the section labelled ‘ACTIVITY AT THE CORE OF HEALTH & EDUCATION’ are removed and the strategy would benefit more from a separate section focusing more specifically on the role of both diet and physical activity in the prevention and management of obesity, while also recognising the limitations of individual level interventions (including sport-based initiatives) within the current ‘obesogenic environment’.

**A sustained approach to physical activity across all age groups**

This Scottish Conservatives’ strategy to address physical inactivity from an early age through taught physical literacy and play activities in both pre-school and primary school is

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an encouraging commitment to promote healthy growth and motor skills in the formative years of Scotland’s young people. The research regarding physical literacy runs throughout the Scottish Government’s ‘Play Strategy for Scotland: our vision’\textsuperscript{7}, with the Curriculum for Excellence encouraging the use of outdoor space creatively to learn.

We highly endorse such policies and agree with the investment in increasing teacher-student physical activity time and ongoing teacher training as progressive steps to engaging youth in structured activity in a captive classroom setting; indeed these were recently debated in the Scottish Parliament around the \textit{Play Charter} (14 March 2017). It is vitally important however, that these (and any) types of programmes and policies are well evaluated, to test and provide strong evidence for their efficacy and cost-effectiveness.

In addition to focussing on the early years, we believe it is still important to target the ages known to show the greatest decline in activity, such as throughout adolescence (26), and at the point at where youth leave school and gain independence. Indeed, the author of the strategy in his recent motion to the Scottish Parliament made mention, and disapproval, of the Scottish Government’s reduction in funding for JogScotland\textsuperscript{8}. This initiative is for adults and seems in contrast with the strategy’s call to concentrate on the early years. Together with the NHS’s ‘couch to 5k’ plan, JogScotland has helped a number of adults to experience the benefits of a physically active lifestyle. We would suggest that the importance of policy across the lifecourse, and the need for both ‘prevention’ and ‘cure’ strategies are better reflected in the Healthy Lifestyle Strategy which does not directly address this.

In our experience, we would also advise not solely focussing on organised sport and exercise as ways to \textit{deliver} activity as such, but to promote opportunities to provide a sustained improvement in population level activity across generations. Whilst we agree with the author of the strategy that opportunities for organised group activities sport such as Park Run and community after-school groups play an important role towards an active culture in Scotland, to address low levels of physical activity, local and national politicians and policymakers must work to ensure the environment itself, both built and social, provide the access to incidental and planned physical activity that is available for everyone, not just those motivated to undertake activity through sport and structured exercise.

We would urge the author to consider the term ‘walkability’ (27) in relation to the design of the urban landscape and the ease to which people are able to move around by foot or other non-motorised transport. Investment in urban design to make peoples’ neighbourhoods walkable, and school/work commutes possible for active transport, provides one of the greatest opportunities to engage those who are less inclined to take part in structured sport, and to improve physical activity across all age groups in a sustainable way (9). A recent review by Helen Forman, who has completed some work (2017) regarding ‘Designing streets for play’\textsuperscript{9} provides a more detailed perspective on the way forward for street design which we believe would be useful context for the strategy as would the following resources for research on street design and place design in Scotland:

\begin{itemize}
\item \url{http://www.gov.scot/Topics/Built-Environment/AandP/Skills/Designingstreetsresearch/ResearchDocument}
\item \url{http://www.creatingplacesscotland.org/designing-streets}
\end{itemize}

There is no ‘silver bullet’ to tackle physical inactivity in Scotland, but policies must draw on a growing evidence base to build a culture of activity participation across all age groups.

\textsuperscript{7} \url{http://www.gov.scot/Resource/0042/00425722.pdf}
\textsuperscript{8} \url{http://www.parliament.scot/parliamentarybusiness/report.aspx?r=10735&i=98505}
\textsuperscript{9} \url{http://playingout.net/wp-content/uploads/2017/02/Helen-Forman-Street-design-and-play.pdf}
Effective solutions should aim to embed a societal attitude change towards physical activity to achieve a sustained involvement in physical activity across the lifespan and we encourage a reassessment of the proposed strategy in order to create a cohesive action plan in light of the issues our response raises.

**Physical activity and Health Inequality**

Scotland was one of the first countries to introduce a national physical activity strategy. In 2003, ‘Let’s Make Scotland More Active: A strategy for Physical Activity’ was published with a strong commitment to investigate ways in which physical activity could be used to reduce health inequalities, and indeed one the key values of the strategy was that physical activity provision should be based on ‘equal opportunities and access, regardless of age, sex, race, religion, social class, ability, disability, health status or geographic location’.

No specific targets were set as part of the 2003 strategy document, and the follow up report in 2008 made specific reference to ‘continuing to prioritise and address health inequalities and areas of deprivation’. When we look specifically at aspects of socio-economic inequalities, and in particular, physical activity variation across deprivation level, the Scottish Health Survey (SHeS) has found little significant differences between area level deprivation and the proportion of children meeting the physical activity guidelines, although there have been increases in physical activity levels since 2008 that vary significantly by area deprivation, with the greatest increases seen among children living in the middle (third most deprived) quintile (26). A report due to be published soon by researchers here at the MRC/CSO Social and Public Health Sciences Unit, University of Glasgow has also found relatively little difference in children’s (10/11 year old) physical activity levels or guideline adherence across area level deprivation11.

Researchers here have also recently published findings suggesting that the negative impact of lower SES (educational attainment measure) on mortality was attenuated more so by diet (by around a third) than physical activity (only 1%). In relation to the reduction of health inequalities across socioeconomic status, there may be a case for diet being a higher priority than physical activity (28). Other work here has found evidence that physical environments that promote good health (e.g. green environments) might play an important role in the reduction of socioeconomic health inequalities (12) suggesting that the relationship between greenspace and greater health outcomes may not be fully explained by physical activity (29). Other causative mechanisms may explain this relationship better, such as restorative and stress-relieving effects of natural environments. From this perspective, it may be more important to consider interventions that operate upstream, at a societal or population level (30), such as the environments in which people live.

There are a number of suggestions in the strategy which we welcome however the diverse nature of the issues raised meant that the draft strategy lost a focus for us on what the key objective is for the whole strategy. Sport participation provides an array of benefits and is a worthy pursuit; however, a focus on sport as a strategy for targeting health and wellbeing at a population level is not the most efficacious. Evidence suggests that the focus should be on increasing physical activity in general, and a number of guidance statements, often citing upstream and multilevel approaches, support this view (e.g. WHO statement on Interventions on Diet and Physical Activity: What works12). The absence of any obvious London 2012 Olympics or Glasgow 2014 Commonwealth Games legacy (31) on population physical activity may also suggest that dedicated investment in sport is a less effective approach.

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10 http://www.gov.scot/Publications/2003/02/16324/17895
11 http://spaces.sphsu.mrc.ac.uk/
12 http://www.who.int/dietphysicalactivity/whatworks/en/
In addition, the strategy might also consider the matter of health behaviours and behaviour change. Research shows that understanding what people themselves think and how they act can be key to successful strategies and interventions. Our research unit is a strong proponent of participatory collaboration and recent findings from research we have conducted looking into children’s outdoor activity (32) has strengthened this position. We would encourage this type of approach for future consultation.

Lastly, on the issue of physical activity, we offer a thought on the matter of funding. Dedicating effort and funding into sport may demonstrate a small improvement in population level physical activity, health, and wellbeing but it may also distract the efforts and funding from other approaches that have been shown to confer greater benefits across these three issues. The strategy would benefit from cost-benefit analysis of approaches and recommendations suggested and the commissioning of research into their evaluation (such as the suggestion of online education programmes within this strategy).

**Nutrition**

In seeking to address the issues outlined, we believe the current strategy does not present an adequate balance between physical activity and nutrition. Both are essential in improving the health of the Scottish population, with nutrition particularly important in reducing levels of excess weight. Scotland has a poor diet, with recent work carried out by researchers here at the MRC/CSO Social and Public Health Sciences Unit highlighting that Scotland has historically had, and continues to have, a diet of lower nutritional quality than that of England (33). Higher levels of deprivation cannot explain these differences fully. We believe that there must be a cultural shift in the Scottish diet which is only possible through a joined up approach at all levels of government, the third sector and health promotion colleagues and clinicians within the NHS.

To this end, to assist with the consideration of the draft strategy we can provide an overview in response to those recommendations that refer to procurement and Scottish produce; and can provide a more in-depth response to the recommendations around schools, community cooking and fruit and vegetable availability in deprived areas.

**Food Procurement**

In 2014 the Scottish Government began a major consultation on the role that food plays in Scotland and the potential for improving Scotland’s relationship with food (34). That document highlighted the potential power food could have in Scotland, but also the paradox that exists in Scotland’s relationship with food. As stated, Scotland has one of the poorest diet-related health records globally, as well as wasting a fifth of the food they buy (34, 35).

As stated in *Recipe for Success – Scotland’s National Food and Drink Policy* there is an increasing need for Scotland to develop a food system that supports improved population health along with environmental sustainability (35). To achieve improved population health, the food that the Scottish population eats must be of high nutritional quality and affordable.

Analysis of five case study areas that have moved public sector procurement towards more sustainable food systems highlights that change requires political will and continuity, a reconceptualisation of ‘best value’ to incorporate health outcomes, and the need to overcome regulatory challenges (36).

We wish to highlight some key issues in this area that should be considered before further policy design for such a strategy.

Whilst increased local food procurement in the public sector may lead to an improvement in the Scottish population’s diet, there is not yet an evidence base to support this. To achieve both, consideration must be given to health outcomes specifically. For example, many
successfully marketed Scottish products (Eg Irn Bru, whisky, Tunnock’s biscuits) have the potential to have a detrimental impact on health. There is little evidence to demonstrate the cost-effectiveness of using local food procurement to improve healthy lifestyles. This research must be commissioned prior to any changes being implemented.

Local procurement in the public sector may also have a limited impact on sustainability dependent on the products specified and means through which they are produced. Local may not equate with sustainable in all instances (37, 38). Examples include beef production, which has a negative environmental impact (39), and the use of pesticides in the growing of fruits and vegetables (40).

Another consideration is the definition of local, for example, would this be limited to a local council area or be Scotland-wide? In addition, there must be consideration of regions’ surrounding environments which can vary extensively. The local area of East Ayrshire is very different from that of Glasgow City for example.

**Nutrition recommendations**

**Recommendation:** Rather than a universal provision of school meals, the focus should be on providing a broader menu of healthy on-site options.

We disagree with this recommendation. Based on evidence, we believe that universal provision of school meals could contribute towards the cultural shift we have described. We do however agree that the choices available for school meals need to be reviewed to ensure that they provide a nutritious diet to children.

Universal Free School Meals (UFSM) were introduced in Scotland for Primary 1-3 children in January 2015. Researchers from the MRC/CSO Social and Public Health Sciences Unit contributed to an NHS Health Scotland commissioned evaluation (41, 42) of the implementation of UFSM along with colleagues from the Universities of Stirling and Dundee.

The reports from this work found that parents supported their implementation, particularly as they believed UFSM reduced stigma and provided children with a nutritionally balanced diet. Schools and Local Authorities had, on the whole, managed implementation successfully, and all staff involved perceived school meals to be healthier than those provided from home. In addition, analysis by Chambers et al. (43) has shown that in Scottish secondary schools uptake of Free School Meals is higher when a greater proportion of young people meet the eligibility criteria for them, and when a higher proportion of the school roll take a school meal. This suggests that young people will eat school meals when this is the norm within a school.

As part of the Schools (Health Promotion and Nutrition) (Scotland) Act 2007 nutrient-based standards for school meals were introduced. These ensure that school meals provide nutritionally balanced lunches over a one week period. The disadvantage of nutrient-based standards is that they are based on a presumption that children will eat all foods available to them, for example, soups, vegetables and fruits. Our team noted from observations during the evaluation of UFSM implementation that often children did not eat the foods with the highest nutritional value. School meal uptakes are higher on those days that more popular (and lower nutritional value) foods are available, for example, pizzas and battered fish and chips. In addition, substantial food waste is evident from school meals, further highlighting that foods provided and foods consumed can be very different. These observations are in line with a lack of consistent evidence on the ability of nutrient based standards to improve the healthfulness of children’s diets or impact on their body weight (44).

In England, a food-based standards system is in place (45). Under this system, only stipulated foods can be provided in schools, again with the aim of ensuring that children are
receiving a meal in line with nutritional recommendations. A number of studies suggest that the nutritional quality of children’s diets improved after food-based standards were introduced (46-49).

This is in line with findings that schools are a setting through which children’s consumption of healthful foods can be increased (e.g. through the provision of free fruit and vegetables), and consumption of less healthful foods be decreased (e.g. prohibiting high sugar beverages in vending machines) (44).

UFSMs are available to all children in Sweden and Finland. In Finland, where 70-90% of children eat a free lunch each day, children eating these meals were more likely to eat a diet that was closer to nutritional recommendations than those who did not (50). UFSM provision in these Nordic countries has until recently not been evaluated. We therefore anticipate the forthcoming findings from the ProMeal study (51), which explores the link between nutritional quality and cognitive performance in a multi-country sample of 827 school children.

Research from across Western countries suggest that when children eat school meals, then they are more likely to eat a more nutritious diet than compared with foods brought from home or bought from retailers located close to schools (49, 52-60). Cost-benefit analyses suggest that investment in improving the nutrient density of the foods on offer in schools can provide long term economic gains through increased health and productivity (61). A number of studies have further suggested that there is a link between school-provided lunch and breakfast consumption and children’s behaviour (62), attendance and attainment (63).

**Recommendation: Life skills subject should be promoted and placed at the centre of the school curriculum.**

We agree that schools are an ideal setting through which healthier eating can be encouraged. Systematic reviews and meta-analyses highlight that school-based nutrition interventions can help reduce children’s BMI (64). However, evidence suggests that improving knowledge on its own has little impact on changing dietary behaviour, therefore, education-based measures must be supported by skills development and health promoting environments (65). School meals can be an important component of these environments.

Long term evidence around the success of school cooking programmes is limited (66), however, the evidence that is available suggests that cooking education can improve children’s food-related preferences and behaviours (65). Brooks & Begley (67) reviewed the literature on adolescent food literacy programmes (programmes focused on practical cooking and food preparation). They found that although 19 out of 23 reviewed studies reported positive changes due to the intervention, they did not report improvements in dietary consumption or increased cooking frequency at home. The Chefs Adopt a School programme in English primary schools have shown some limited indication of success (68), but again more evaluation is needed of programmes in schools on which to base policy.

**Recommendation: Voluntary sector projects delivering community nutritional classes should be encouraged.**

Results from the National Diet and Nutrition Survey have found confidence with cooking techniques and food preparation to be high, with over 90% of UK respondents reporting that they were able to cook a complete a main dish with basic ingredients without help, and almost two thirds reporting cooking a main meal at least five times per week. These results suggest that community cooking programmes are unlikely to have an impact at a population level. The authors of the study do believe, however, that there is merit in targeting cooking programmes at men, younger adults and those with lower socio-economic status (69).
There are limited high quality evaluations of community cooking programmes in the UK. Jamie Oliver’s Ministry of Food scheme in Leeds was evaluated with findings showing that six months after the course, fruit and vegetable intake had increased, the number of snacks per day had decreased, and cooking confidence had also increased (70). An evaluation of the same programme in the Australian context found that compared with a control group, participants reduced take away purchasing, increased eating meals at the dinner table, cooking satisfaction, their ability to prepare a meal in 30 minutes, and to prepare a meal from low cost basic ingredients (71). Cooking confidence and frequency of carrying out cooking/eating behaviours contributing to a healthier diet were increased also (72).

Overall, the evidence suggests that cooking programmes appear to have an important impact in terms of increasing confidence in adults (73), but evidence is less consistent in terms of improving consumption habits (74). This is in part because often high quality and long term evaluation of programmes is not carried out.

**Recommendation:** Programmes should be trialled that make fresh fruit and vegetables more widely available in deprived areas.

We agree that trials of programmes that increase the availability of fresh fruit and vegetables in deprived areas would be welcome. We know that the cost is higher and availability less of fresh fruit and vegetables in small stores in areas of higher deprivation (75). This is coupled with high fat and high sugar foods being of a lower cost in more deprived areas due to the prevalence of discount stores (76). A study of food quality in Scotland found that fruit and vegetables were lower quality in urban and deprived areas compared with rural and more affluent areas (77). Further Scottish research in this area has indicated however that the picture is complex as access to fresh food it is very much dependent on additional factors, such as the extent of rurality and the transport options within an area (78). In addition, work carried out here found that there was no evidence to suggest that proximity to food retail outlets had an impact on diet or obesity (79), and that those living in more deprived areas were no more likely to be exposed to out-of-home eating outlets in their neighbourhoods (80). These issues must be considered in the design of any programmes that are trialled. It is important to consider also that the most consistent influence found in the literature on fruit and vegetable consumption is household income (81). Those with sufficient household incomes are more likely to eat fresh fruit and vegetables, and therefore welfare measures should not be ignored when considering how to improve diet quality (82).

Schemes providing free fruit and vegetables to children in schools have been shown to lead to significant increases in consumption of both fruits and vegetables and a reduction in unhealthy snacking (83-86). However, once these programmes end, a long term impact has not been found (86-89). Nevertheless, the programmes have been judged to be cost-effective (86), and may be an effective means for improving fruit and vegetable intake among children in areas of high deprivation.

**REFERENCES**


in a population-based dietary intervention scheme have a lasting impact on fruit intake in young children? Int J Epidemiol. 2007;36.


When was the response submitted?
31 March 2017

Find out more about our research in this area
http://www.gla.ac.uk/researchinstitutes/healthwellbeing/research/mrccsosocialandpublichealthsciencesunit/

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