Proposed Decision to be made By Portfolio Holder for Adult Social Care and Health on or after 18 May 2018

Warwickshire County Council Public Health
Fitter Futures Warwickshire Services
Proposed Consultation of Services

Recommendation

That the Portfolio Holder for Adult Social Care and Health approves the commencement of a consultation exercise to inform the proposed services delivery model for Public Health Fitter Futures Warwickshire, to run from Tuesday 29 May 2018 to Friday 6 July 2018.

1.1 Background & Rationale

1.1 "Fitter Futures Warwickshire (FFW)" is the brand name for a number of services commissioned by Warwickshire County Council (WCC) Public Health (WCCPH) to support the Warwickshire population to eat healthily, maintain a healthy weight and increase levels of physical activity to improve health. These are three of the WCC Director of PH's health improvement priorities.

1.2 There are currently four services in the FFW service offer. These are:

1) A Single Point of Access; one website, one telephone number and one secure (in terms of Information Governance) referral route pathway for health/social care professionals and pharmacists to make referrals to the FFW Services.
2) Weight Management on Referral service; 12 weeks weight management support provided by Slimming World across Warwickshire.
3) Physical Activity/Healthy Lifestyles on Referral service; 12 weeks bespoke exercise programme. This service is managed and co-ordinated countywide by Nuneaton and Bedworth Leisure Trust.
4) Change Makers; Warwickshire wide nine week weight management programme for families where there is one child aged between 4-12 who is overweight/obese.

1.3 There are three providers on a framework model of provision for the services. The contracts are in place for four years (two years plus an option to extend for a further two years). All services commenced on 01 July 2015 and are due to end on 30 June 2019. Referrals to the services are mainly made by

health professionals and pharmacists. Numbers of referrals have increased year on year. Health improvement measures are recorded and reported on a quarterly basis by the service providers to the PH Commissioner. Case studies are also submitted to the Commissioner on a quarterly basis. Health improvement outcomes recorded include:

- Reduction in Body Mass Index;
- Increase in consumption of fruit and vegetables;
- Increase in weekly physical activity levels;
- Improvement in mental wellbeing;
- Reduction in feelings of loneliness and isolation.

All service users completing a service have shown an improvement in health.

1.4 In year one, there were 2278 referrals to the services, whilst during 2017/18, there were 5,106 referrals to the services. These referral numbers have exceeded contractual Key Performance Indicator target requirements almost five fold.

1.5 The services have continued to be developed on an ongoing basis by the Commissioner, collaboratively with key stakeholders and partners, since their inception. During 2016/17, eligibility criteria for the services were developed to include provision of services to the Warwickshire population who are recovering from/survivors of cancer.

1.6 A number of developments have taken place since the contracts were awarded in 2015:

- The making of a mini film to promote and showcase the success of the services;
- The inclusion of a “higher risk of diabetes” (pre-diabetes) as part of the on referral eligibility criteria;
- Public and stakeholder consultation to gain views about the development and integration of a “preventing a first fall” service;

Following the above consultation process, a pilot “Preventing a First Fall” project, in collaboration with the Local Pharmaceutical Committee (LPC), was launched during February 2018 and will run until 31 August 2018.

2.0 Proposed Consultation

2.1 This report seeks permission from the Portfolio Holder to consult with service users, Warwickshire residents, key stakeholders and partners about the proposed new FFW services. The consultation activities and feedback will inform the service specification and tender evaluation for bidders as part of

the procurement process. All Public Health consultations are part of our strategic and operational commissioning approach and any associated costs are embedded into the Public Health budget.

2.2 The proposed 5.5 week consultation process will start on Tuesday 29 May 2018 and finish on Friday 6 July 2018. The aim of this consultation is to gain the views of service users, Warwickshire residents, key stakeholders and partners about the delivery of the Public Health FFW services from 1st July 2019.

2.3 A range of engagement methods will be employed to maximise opportunities for service users and other key stakeholders to put forward their views, these include:

- Survey - both on line, through the Citizens Portal and paper format;
- Public and partnership such as CCG Partnership groups, the Falls Pathway Development Group, existing meetings and events across the county, such as, WCC staff health and wellbeing events, School Food Revolution Day;
- Social media and relevant press/newsletters.

2.4 Where possible and appropriate, shared consultation activities will be held in conjunction with other WCC Public Health or Strategic Commissioning Commissioners who have similar time frames for consultation on service redesign. This approach will help to avoid over consulting and duplication of engagement with similar stakeholders, as well as provide an opportunity for Public Health to promote and share information on a range of services to a wider audience.

2.5 The consultation will be structured to allow for wide ranging views on the proposed service specification and include the appropriate reach to all ages, vulnerable groups and individuals, workplaces and communities. In conjunction with the consultation plan, a marketing and communication plan is being developed to ensure that service users, Warwickshire residents, partners and key stakeholders are kept informed throughout the consultation and post consultation evaluation period.

2.6 Public Health has completed an EQIA (Appendix A). The EQIA will be reviewed and updated as required as part of this consultation process and will be made publicly available with the final consultation report.

2.7 Providing feedback to respondents is a vital element of the consultation process and this will be undertaken by ensuring the final consultation report is made publicly available on ‘Ask Warwickshire’ and widely shared with all partners and stakeholders.

3.0 Timescales associated with the decision and next steps

3.1 The table below sets out the critical milestones and timescales of the consultation process to ensure key deadlines are met to effectively procure the revised FFW services from July 2019

Milestones	Deadline
Portfolio for Health consultation approval	18th May 2018
Consultation period (5.5 weeks)	29th May – 6th July 2018
Collate & analyse responses, prepare draft consultation report	9th July – 26th July 2018
Seek approval to go to tender following consultation report	17th August 2018
Provide feedback to respondents by circulating final consultation report	18th August 2018
Commence procurement processes	3rd September (please note that this timescale is in the process of being reviewed)

Background Papers

None

Appendices

1. Appendix A: Signed EqIA
2. Appendix B: Conclusions and Recommendations from the Service review
3. Appendix C: A rapid evidence review
4. Appendix D: Needs Analysis: Child Weight Management
5. Appendix E: Needs Analysis: Adult Weight Management

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The report was circulated to the following members prior to publication:
Local Member(s): None
Other: Councillors Golby, Parsons, Redford, Rolfe, Caborn

EQUALITY IMPACT ASSESSMENT/ ANALYSIS (EqIA)

Public Health Warwickshire Services
Tender for Services for:

- Single Point of Access
- Weight Management on Referral Service
- Family Structured Weight Management Programmes
- Exercise on Referral

Equality Impact Assessment/ Analysis (EqIA)

Group	People Group
Business Units/Service Area	Public Health
Service being assessed	1. The Retender of Fitter Futures Warwickshire Services which comprise the following 3 Warwickshire County wide services: • Weight Management on Referral • Family Structured Weight • Management Programmes • Exercise on Referral 2. The recommissioning of the Fitter Futures Warwickshire services Single Point of Access to become a WCC internally provided service via the existing WCC Customer Contact Centre
Is this is a new or existing service? **If existing service please state date of last assessment**	These are existing services. The contracts for each service end on 20 June 2019. The services have undergone a Strategic Commissioning Review and will be retendered. The procurement process will commence in September 2018. The last EqIA assessment was carried out on 07/07/14

EqIA Review team – List of members	**Fran Poole**
Date of this assessment	**04/04/18**
Signature of completing officer (to be signed after the EqIA has been completed)	
Are any of the outcomes from this assessment likely to result in complaints from existing services users and/ or members of the public? If yes please flag this with your Head of Service and the Customer Relations Team as soon as possible.	**NO**
Name and signature of Head of Service (to be signed after the EqIA has been completed)	**Dr John Linnane**
Signature of GLT Equalities Champion (to be signed after the EqIA is completed and signed by the completing officer)	**Mike Wood** 11/4/18

A copy of this form including relevant data and information to be forwarded to the Group Equalities Champion and the Corporate Equalities & Diversity Team

Warwickshire County Council

Working for Warwickshire

Form A1

INITIAL SCREENING FOR STRATEGIES/POLICIES/FUNCTIONS FOR EQUALITIES RELEVANCE TO ELIMINATE DISCRIMINATION, PROMOTE EQUALITY AND FOSTER GOOD RELATIONS

High relevance/priority Medium relevance/priority Low or no relevance/ priority

Note:
1. Tick coloured boxes appropriately, and depending on degree of relevance to each of the equality strands
2. Summaries of the legislation/guidance should be used to assist this screening process

Business Unit/Services:	**Relevance/Risk to Equalities**																										
State the Function/Policy /Service/Strategy being assessed:	Gender			Race			Disability			Sexual Orientation			Religion/Belief			Age			Gender Reassignment			Pregnancy/ Maternity			Marriage/ Civil Partnership (only for staff)		
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Single Point of Access			✓			✓		✓				✓			✓			✓			✓			✓				✓
Family Weight Management Services			✓			✓		✓				✓			✓			✓			✓			✓				✓
Exercise on Referral			✓			✓		✓				✓			✓			✓			✓			✓				✓
Weight Management on Referral			✓			✓		✓				✓			✓			✓			✓			✓				✓
Are your proposals likely to impact on social inequalities e.g. child poverty for example or our most geographically disadvantaged																									**Yes**		

communities? **If yes please explain how. Child and adult obesity and risk of disease are statistically more prevalent in areas of deprivation. These services are commissioned to improve the health of people who are obese/risk of poorer health/already have poorer health**	
Are your proposals likely to impact on a **carer** who looks after older people or people with disabilities? **If yes please explain how.** Carers, as with any other resident living in Warwickshire, are welcome and encouraged to access these services with the person they care for. They can also access the services alone as long as they meet the eligibility criteria the services require for being referred.	**YES**

Form A2 – Details of Plan/ Strategy/ Service/ Policy

Stage 1 – Scoping and Defining	
(1) What are the aims and objectives of Plan/Strategy/Service/Policy?	1.To retender the following 4 Fitter Futures Warwickshire services: • A countywide evidence based structured family Weight management service for families with overweight/obese 4-12 year olds as identified through the National Child Measurement Programme • A county wide evidence based Physical Activity/Healthy Lifestyles on Referral programme for Young People aged 12-15 and adults aged 16 + who meet a specific set of health eligibility criteria • A countywide evidence based Weight Management on Referral service for Young People aged 11-15 and adults aged 16+ who meet a specific set of health eligibility criteria 2.The recommissioning of the Fitter Futures Warwickshire services Single Point of Access to become a WCC internally provided service via the existing WCC Customer Contact Centre
(2) How does it fit with Warwickshire County Council's wider objectives?	To reduce health inequalities, halt the rise in obesity, increase physical activity levels, improve diet, reduce cancers, reduce the risk of cardio vascular disease, reduce the risk of diabetes, improve mental health and well-being, prevent a first fall, reduce feelings of loneliness and isolation in the Warwickshire population including all protected priority groups
(3) What are the expected outcomes?	As above
(4)Which of the groups with protected characteristics is this intended to benefit? (see form A1 for list of protected groups)	All

Stage 2 - Information Gathering			
(1) What type and range of evidence or information have you used to help you make a judgement about the plan/ strategy/ service/ policy?	A wide range of evidence has been used including; The National Institute of Clinical Excellence, the Warwickshire Joint Strategic Needs Assessment, the Warwickshire Health and Well Being Board Strategy, The Director of Public Health's Annual General Report, Government policy, systematic reviews of research programmes, a strategic commissioning review of services commissioned currently		
(2) Have you consulted on the plan/ strategy/ service/policy and if so with whom?	No – this is planned from 29th May 2018 to 6th July 2018. All protected priority groups will be included as part of this consultation process		
(3) Which of the groups with protected characteristics have you consulted with?	As above		
Stage 3 – Analysis of impact			
(1) From your data and consultations is there any adverse or negative impact identified for any particular group which could amount to discrimination? If yes, identify the groups and how they are affected.	RACE No	DISABILITY This is an all-inclusive service – however, it is not for people requiring intense specialist health professional support There is currently an issue with people with severe mental illness attending the current physical activity on referral service	GENDER No
	MARRIAGE/CIVIL PARTNERSHIP No	AGE No	GENDER REASSIGNMENT No

	RELIGION/BELIEF No	PREGNANCY MATERNITY No	SEXUAL ORIENTATION No
(2) If there is an adverse impact, can this be justified?	WCC does not directly commission the leisure centres that take referrals from the current Physical Activity on Referral service. They will not accept referrals for people that have Severe Mental Health issues. This due to the public liability insurance which leisure centres hold, not covering this protected priority group. The commissioner is currently exploring ways to get around this so that service redesign for the retender of the service is able to offer a service to people with severe mental health issues.		
(3)What actions are going to be taken to reduce or eliminate negative or adverse impact? (This should form part of your action plan under Stage 4.)	The commissioner will ensure through service specification that providers are equipped to deliver an all-inclusive service and seek solutions where specialist health professional input is required.		
(4) How does the service contribute to promotion of equality? If not what can be done?	The services are all inclusive and will take account of accessibility in terms of where they are delivered, times of delivery, appropriate venues to meet customer need.		
(5) How does the service promote good relations between groups? If not what can be done?	Yes – the services are dependent on continued partnership collaboration and linking individuals with other services through using a MECC approach. These services cannot be delivered without good relationships between schools, service providers, the commissioner, pharmacies, health and social care services, communities and individuals.		
(6) Are there any obvious barriers to accessing the service? If yes how can they be overcome?	Yes – as per 2) above		

(7) What are the likely positive and negative consequences for health and wellbeing as a result of this service?	All services will have public health outcomes as their Performance measures to improve health through increasing physical activity levels, supporting people to sustain a healthy weight and healthy lifestyle choices.
(8) What actions are going to be taken to reduce or eliminate negative or adverse impact on population health? (This should form part of your action plan under Stage 4.)	No negative or adverse impacts on population health are foreseen. The strategic Commissioning Review of the current services shows that they have a positive impact on the Warwickshire population's health. It has been found that low numbers of young people have been engaging with the Weight management and Physical Activity on Referral services. The planned consultation aims to gain the views of young people to identify what may support them to take up the services in the future.
(9) Will the service increase the number of people needing to access health services? If so, what steps can be put in place to mitigate this?	No –Health professionals are already referring many people (approx. 4000 during 17/18) tot eh Fitter Futures Warwickshire services. Health professionals are very well engaged with these services and this will be sustained with the retender of the services. This engagement decreases the number of people needing to access health services because the Fitter Futures Warwickshire services provide an alternative evidence based care pathways for health professionals to refer people to.
(10) Will the service reduce health inequalities? If so, how, what is the evidence?	Yes – services will be targeted, promoted and delivered in areas where health inequalities are greatest as a priority taking a place based approach. This is already being done and the impetus needs to me sustained.

Stage 4 – Action Planning, Review & Monitoring	
If No Further Action is required then go to – Review & Monitoring (1)Action Planning – Specify any changes or improvements which can be made to the service or policy to mitigate or eradicate negative or adverse impact on specific groups, including resource implications.	EqIA Action Plan

Action	Lead Officer	Date for completion	Resource requirements	Comments
Consultation Process	Fran Poole/Georgia Barrett	31 July 2018	Existing	Feedback from stakeholders, partners and service users will influence positive steps in terms of service design to assure that the service needs for protected priority groups are met as best they can be.

(2) Review and Monitoring State how and when you will monitor policy and Action Plan	This EqIA will be reviewed following the consultation process and prior to Cabinet approval on 17th August 2018. From thereon, the services will be monitored on a quarterly basis and through WCC's procurement process

Please annotate your policy with the following statement:

'An Equality Impact Assessment/ Analysis on this policy was undertaken on (date of assessment) and will be reviewed on (date three years from the date it was assessed).

1. Appendix B - Conclusions and Recommendations from Strategic Commissioning Review of Fitter Futures Warwickshire Services (Conducted November 2017 to April 2018)

1.2 General comments

The general conclusion to be drawn from the service review is that Fitter Futures Warwickshire is an effective, highly performing service which has changed the lives of many service users in Warwickshire since its inception in 2015. Staff members consulted during the review process are hardworking, dedicated and passionate about helping people to improve their health through maintaining a healthy weight, become physically more active and having a healthier lifestyle.

The branding has been successfully created and implemented, with the single point of access working well for service providers, referrers and service users. There is good recognition of the programme with referrers across the county and referrers view the service positively and are happy to refer into the scheme.

There is good partnership working between providers through sharing attendance at events, cross promotion of all of the FFW services and supporting each other. This has enabled the programme to appear unified under the FFW branding as a healthy lifestyle service for all of the residents in Warwickshire.

The individual services were quick to become established and commence delivery of groups, and have adapted over time in order to suit their users. The MECC (Making Everyone Contact Count) approach and behaviour change models have been successfully implemented, helping to impact positively on the users of the service.

Referral numbers have increased consistently every quarter and service users who complete the programme achieve positive outcomes with improvements made to weight, physical activity, emotional wellbeing and fruit and vegetable consumption. Other positive impacts are noted in qualitative reports from users, such as reduced medication, increased confidence in themselves and improvements in their health conditions such as diabetes, COPD and musculoskeletal conditions. The large majority of participants commented that they were satisfied or very satisfied with the intervention that they had received.

Although it has not been possible to calculate the cost per service user, the service costs as a whole are low compared to the number of people that are being supported and improving their health outcomes. It is estimated that the NHS in England spent £6.1 billion on overweight and obesity-related ill-health in 2014 to 2015[1]. To develop the service further, more funding will be needed on top of the current allocation.

Although the overall outcome of the review is positive, there are areas where there are challenges. The following section details the main challenges identified and

[1] Gov.uk (2017). Health matters - obesity and the food environment: The Costs of Obesity. Available at: https://www.gov.uk/government/publications/health-matters-obesity-and-the-food-environment/health-matters-obesity-and-the-food-environment--2 [accessed on 12.04.18]

recommendations for further action/improvements. Procurement law states that the current FFW contract cannot be extended any later than 30th June 2019 so the recommendations described are to be considered by the current providers and built into any new specification should a new service tendered.

1.3 Challenges and Suggested Recommendations

Referrals:

Since the start of programme until December 2017, there have been a total of 10,792 referrals to FFW Services, with a steady increase in referrals occurring over the 30 month period. This reflects the excellent, ongoing, promotional activities that have taken place since the programme started.

However, when referral information is analysed in more detail, it can be seen that:

1. The majority of individuals referred are female - this is surprising considering there are more overweight/obese men in England (66% of men and 57% of women).

RECOMMENDATIONS:

- **Explore why fewer males are being referred into the FFW programme.**
- **Explore what are the barriers to fewer males accessing FFW.**
- **Explore what would support more males to access a FFW service.**
- **Ensure that the new service specification stipulates that providers must increase activities to attract more males into the programme.**

2. There are very low numbers of 12-25 year olds accessing the FFW programme. Further work needs to be undertaken to explore why this is occurring and how to support young people in accessing the service.

RECOMMENDATIONS:

- **Explore why young people are not being referred into the FFW programme.**
- **Explore what are the barriers to young people accessing FFW.**
- **Explore what would support young people to access a FFW service.**
- **Ensure that the new service specification stipulates that providers must increase activities to attract more young people into the programme.**

3. The number of referrals is not consistent across the county – there is almost double the number of referrals in North Warwickshire compared with South Warwickshire.

RECOMMENDATIONS:

- **Explore why referrals are lower in South Warwickshire.**
- **Increase the promotional activity with potential referring services in the south of the county.**

4. The majority of referrals are made by GPs (62%) with certain practices making significantly more referrals than others (Highest = 306 referrals, Lowest = 1 referral).

RECOMMENDATIONS:

- **Target GP surgeries where referral numbers are lower and increase promotional activities with these surgeries.**

- **Consider using 'high referring' GPs in promotional activities e.g. presenting at promotional events.**

5. Although referral numbers are high, some organisations are still not referring regularly, for example, some organisations have referred less than 10 patients in a 30 month period.

RECOMMENDATIONS:

- **Increase promotional activity with inconsistent referrers to ensure that they are fully aware of FFW, the criteria for referral and the potential benefits of the programme.**

6. Looking at the prevalence of obesity in young people and adults in Warwickshire, there are potentially many more people who could be referred to the service if they could be identified and capacity allowed.

RECOMMENDATIONS:

- **Increase promotional activity in general with new, potential referrers e.g. employers, Universities and Colleges, Care Homes etc.**
- **Ensure the new specification stipulates that providers must continually look to grow and enhance the service.**

<u>Data:</u>

Most people consulted with during the review considered 'VIEWS' to be a satisfactory system which was easy to use and produced useful performance data. However, there are some shortcomings in the system, which were highlighted during the review process.

7. During the analysis of the data, a large number of incomplete and/or incorrect records were found for each of the programmes. This meant that some data was impossible to analyse and the review findings cannot be classed as a 'complete' reflection of the service.

RECOMMENDATIONS:

- **Speak with referrers to ensure they are entering the information correctly into VIEWS during the referral, especially contact details. This will help to ensure good quality data. Consider amending the online referral form to include 'required information' boxes. This means that the referral form could not be submitted without certain data.**
- **Staff working for FFW services should receive regular reminders and prompts to remind them to submit the correct information into VIEWS such as course completion dates, status of user, onward referral information etc.**
- **Referrers who consistently enter incorrect information should be followed up with support to ensure future referrals are completed accurately.**
- **Ensure that the new service specification stipulates that providers must ensure that accurate data is submitted.**
- **Ensure that the SPA part of the new service specification contains a requirement for the implementation of a suitable database.**

8. There are some differences between the data held by individual services and that in VIEWS. This is potentially because VIEWS is a 'live' database and data will be different depending on which day the database is accessed.

RECOMMENDATIONS:

- **Reconciliation of the data is needed so that data that is reported by each service is the same as that held within VIEWS.**
- **Consideration should be given to acquiring a new database should the service be retendered.**

9. NBLT has done an excellent job of setting up the SPA and purchasing a database that can manage the referrals and performance information generated by the programme. However, the management of the database is very time-consuming for the SPA service lead as he has to spend a large proportion of his time cleaning data, obtaining missing referral information and chasing individual providers to update information.

RECOMMENDATIONS:

- **The SPA part of FFW should be tendered as a separate lot and preferably provided by a different organisation to free up the providers of the individual services to develop their programmes.**

<u>Service Operation:</u>

The services that are currently operating as part of the FFW programme work well and achieve positive outcomes for service users. However, improvements can be made in all areas to make the programme more inclusive and more attractive to potential service users.

10. There is a low number of Physical Activity Consultants (PAC) to deliver home visits across the county and consequently, more work is done in the north of the county (where the NBLT is based).

RECOMMENDATIONS:

- **NBLT to explore options to train Fitness Instructors from the Leisure Centres to support the FFW programme.**
- **NBLT to explore how the current PAC's could be used more efficiently across the county. Criteria for home visits may need to be applied.**
- **NBLT to look at the possibility of recruiting a PAC to be based in the south of the county.**

11. There is not enough focus on Physical Activity in some Slimming World (SW) groups. Some groups are better than others at considering the principles of MECC e.g. discussing alcohol use, mental health, debt issues, etc.

RECOMMENDATIONS:

- **SW consultants to receive refresher training on the importance of physical activity to support weight loss and improve health outcomes.**
- **Ensure that the new service specification stipulates that providers must ensure that the importance of physical activity is considered in weight management programmes.**

12. Slimming World (SW) tends to dominate the adult weight management market place in terms of price and reputation which mean smaller providers struggle to survive. Although SW produce very good results, it is important that service users have a choice of provision as one model does not necessarily suit all.

RECOMMENDATIONS:

- **Investigate further the reasons why Healthy Living Network and George Elliot Hospital pulled out of the framework.**
- **Ensure referrers are aware of all options available instead of automatically referring to SW because it is the most well-known service.**
- **Consider a framework contract in the new specification to encourage other providers to be part of the programme.**

13. The number of cross referrals within FFW and referrals to external partners should be increased, where appropriate, for example referrals to Mental Health Services, Citizen's Advice etc.

RECOMMENDATIONS:

- **Each FFW service to promote and refer users, where appropriate, to the other FFW services. This can be undertaken in a range of ways including visiting other FFW sessions, providing literature etc.**
- **NBLT to engage with the leisure centre providers to ensure they are also promoting the weight management and family weight management FFW services to their users.**
- **FFW staff to better record the information for onward referrals in VIEWS so that post FFW user pathways can be identified.**
- **All FFW staff to receive new MECC face-2-face training.**
- **Ensure that the new service specification stipulates that providers must ensure that they cross refer and signpost to external organisations when appropriate.**

14. Information is needed on the service user's health state and behaviours at 6 and 12 months post service attendance to discover the long term impact from attending the FFW programme.

RECOMMENDATIONS:

- **Follow up at 6 and 12 months should be attempted with 75% of completers, with 25% returning health outcome data.**
- **Explore ways to keep users engaged once they are referred into and complete a FFW service.**

15. All of the interventions reviewed included behaviour change techniques throughout the duration of programme which is really positive and encouraging. Service users that were consulted with talked positively about the changes they had made to their behaviour and how they maintained their changes in behaviour through the techniques used by the course leader/fitness instructors. However, when the programmes were reviewed by the Health Psychologists in the Public Health department, some gaps were identified and suggestions were made on how the programme could be improved.

RECOMMENDATIONS:

- **Health Psychologists and PH to feedback to providers on their Behaviour Change Techniques and make suggestions on how they could be improved.**

- **Health Psychologists/PH to provide/commission Behaviour Change training to providers and their staff if required.**
- **Ensure that the new service specification stipulates that providers must ensure that they use evidence based behaviour change techniques in all of the interventions that they provide.**

16. Service Users and staff members frequently commented that loneliness is a common issue with people who are referred to the programme.

RECOMMENDATIONS:

- **Providers to consider bringing in a social element to the programmes to bring service users together.**
- **Ensure Providers are aware of support services that exist to support service users that are lonely or socially isolated.**

17. At present, social care professionals cannot refer service users to the Physical Activity on Referral element of the programme due to the insurance policies of the Leisure Centres that stipulate that referrals must be made by a health professional. This is extremely restrictive and means that there are potentially groups of people that could benefit from the service but are not being referred. It's also confusing that social care professionals can refer to some parts of the service and not others.

RECOMMENDATIONS:

- **This issue has been debated throughout the duration of the programme with no resolution found. PH to bring service lead and managers of all the leisure centres involved in the scheme together to discuss a solution to this problem.**
- **Ensure that the new service specification stipulates to providers that a wide range of referrers must be considered and evidence must be provided on how they will approach/recruit potential referrers.**

Service development:

There are certain areas where FFW could develop and expand to make the programme more attractive and inclusive to service users, which in turn would produce more positive outcomes.

18: Evidence shows that around a third of people aged 65 and over, and around half of people aged around 80 and over, fall at least once a year. Falling is a cause of distress, pain, injury, loss of confidence, loss of independence and mortality.[2] Therefore, programmes that prevent a 'first fall' are considered an important intervention to keep people strong and healthy for longer. The pilot that is currently running with 6 Pharmacists in the north of the county is already showing signs of success. (Pharmacists assess patients over 55 and over who are on medication or have a medical condition which puts them at risk of a first fall and refers them to a 12 week strength and balance programme of exercise co-ordinated by Nuneaton and Bedworth Leisure Trust).

[2] Gov.uk (2017). Falls: applying All Our Health – Facts about Falls. Available at https://www.gov.uk/government/publications/falls-applying-all-our-health/falls-applying-all-our-health [accessed 12.04.2018]

RECOMMENDATIONS:

- **'Preventing a first fall' interventions should be built into the new specification. Potential providers would need to consider a variety of methods of delivery, for example, classes at leisure centres, local community venues, care homes etc.**

19: The FFW programme really has 3 main services – Physical Activity on Referral provided by Leisure Centres, Adult Weight Management provided by Slimming World and Family Weight Management provided by Rugby Borough Council. For the programme to be fully inclusive, it needs to include a wider range of options for customers. There are many other forms of physical activity which would appeal to service users more than 12 week programmes at a local leisure centre, for example, yoga, Pilates, bowling, walking groups, community led classes etc. There are also gyms in other venues apart from Leisure Centres, for example, Fire Stations, hotels, private businesses etc that could be potentially be used in the FFW programme.

RECOMMENDATIONS:

- **Investigate other options to be included in the FFW programme and develop the service where possible to make it more inclusive and appealing to service users.**
- **Ensure that the new service specification stipulates to providers that a variety of activities must be provided as part of the delivery of the FFW programme**

20: Another area where the service could be developed further is provision of weight management and physical activity support in the workplace. For many people, busy work/family lives are a barrier to addressing weight/health issues. If FFW support was provided in the workplace, it would immediately make it more accessible to the working population.

RECOMMENDATIONS:

- **Explore opportunities to offer Physical Activity classes/interventions in the workplace.**
- **Pilot a scheme with a local employer to test viability.**
- **Ensure that the new service specification stipulates that the provider must include proposals for provision of FFW in the workplace.**

2. Commissioning Options

As previously explained, procurement laws state that the current Fitter Futures Warwickshire service cannot be extended past 30th June 2019. The service must either be decommissioned or a new service retendered to commence delivery from 1st July 2019.

The purpose of this review was to assess the effectiveness of the current service, and make recommendations on whether the service should be retendered. There are 3 options to consider regarding the future of FFW and there are strengths and weaknesses associated with all options.

The three options are:

1. **Decommission the current service.**
   Strengths = none
   Weaknesses = high risk, will leave a gap in provision, will be politically unpopular

2. **Retender the service using the same model and service specification.**
   Strengths = Less time consuming for commissioner, least disruptive
   Weaknesses = No opportunities to address weaknesses identified

3. **Redesign the service and retender.**
   Strengths = Ability to address weaknesses in current service, opportunity to test the market and get better value for money
   Weaknesses = Time consuming, disruptive, may end up with less effective service

Public Health Warwickshire would recommend implementing option 3.

Appendix C

April 2018

Examining effective behaviour change techniques for diet and physical activity to support public health service planning for weight loss/management, falls prevention and physical activity for serious mental illness: A rapid evidence review

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Overweight and obesity are major public health issues. In the UK in 2013, 67% of men, 57% of women, and almost 20% of children in the general population were overweight or obese (Centre, 2015). Adults with intellectual disabilities have also been shown to have high rates of overweight and obesity (Bhaumik, Watson, Thorp, Tyrer, & Mcgrother, 2008), with obesity incidence reported to be as high as 50% in adults with intellectual disabilities (NICE, 2017). Overweight and obesity are associated with diseases such as cardiovascular disease and cancer (NICE, 2017), and the associated costs to the NHS are approximately £6.1 billion per year (Public Health England, 2016). This demonstrates a significant burden to the NHS and the wider economy, therefore reducing obesity within the general and learning disability populations is important.

Obesity is complex and many factors contribute to the development of overweight and obesity. Two main behavioural determinants strongly associated with weight loss and obesity prevention are diet (quality and quantity of food eaten) and levels of

physical activity. Diet and physical activity interventions have been shown to reduce body weight and adiposity in adults, children, and in people with intellectual disabilities (Foster-Schunbert et al, 2012, Mayor, 2017). Understanding the factors that contribute to successful change in diet and physical activity behaviours amongst target populations and the effective strategies that can help people to initiate and maintain behaviour change are critical to good public health service design. It is likely that services whose design incorporates evidence about what works will be most effective at contributing to public health aims to reduce the incidence of overweight and obesity.

The smallest possible individual components of interventions that can be said to be responsible for eliciting a change in behaviour have been labelled *behaviour change techniques* (BCTs) (Michie et al., 2013). A taxonomy of 93 hierarchically clustered BCTs based on thorough evidence review of behaviour change interventions has been published (Michie set al REF), and has been extensively applied in recent research seeking to understand which components of interventions may be most effective in supporting people to change their behaviour, including dietary and physical activity behaviour. In a previous rapid evidence review (Brown, 2016), the most cited BCTs effective in weight loss and management interventions for adults and children were: self-monitoring of behaviour; problem solving; goal setting; and self-monitoring of outcomes of behaviour (see table 1 for a more detailed description of these BCTs). However, this review was conducted in 2015, therefore, an update is required. Furthermore, the previous review did not include evidence examining weight loss in adults with intellectual disabilities. Given that an estimated 50% of people with intellectual disabilities are overweight or obese, identifying effective

BCTs from the literature specifically relevant to this population will be important for the design of services best suited to their needs.

Similar to those with learning disabilities, People with severe mental illness (SMI) have higher levels of obesity than the general population, and experience premature mortality of around 15-20 years. This may be explained by people with SMI engaging in less physical activity and a greater amount of sedentary behaviour than healthy controls (Firth et al., 2016). However, exercise has been shown to improve both physical and mental health outcomes in people with SMI, with exercise interventions shown produce similar benefits to psychotherapeutic interventions for people with bipolar disorder (Richardson et al, 2005). It is estimated that mental health support costs the NHS approximately £105.2 billion per year (Department of Health, 2011), therefore, identifying effective strategies to encourage people with SMI to engage in physical activity would have benefits to the physical and mental health within that population, as well contributing to reducing NHS and public health costs.

Physical activity also has benefits beyond weight loss, weight management and mental health improvement. In the older adult population falls represent a significant burden. Each year in the UK, approximately one in three individuals over the age of 65 experiences a fall that could cause serious harm or even death. This increases to approximately 50% of people over 80 years old. Falls cost the NHS and social care approximately £6 million per day and £2.3 billion per year due to the impact on the individuals' life following the fall, including reduced independence (Health & Warwickshire, n.d.). Physical activity has been shown to reduce the likelihood of falls in older adults (Sherrington et al., 2017). In particular, programs which involve a high challenge to balance and include at least 3 hours of exercise per week have greater fall prevention effects (Sherrington et al., 2017). Therefore, encouraging older adults

to engage in physical activity interventions for falls prevention, and understanding which aspects of these interventions (which BCTs) are important for encouraging uptake and adherence to fall prevention programs would be of value and may contribute to a reduction in falls related costs to the NHS and wider economy.

This rapid evidence review has two aims: First, to update a previous review which examined behaviour change techniques utilised in weight management and weight loss interventions for adults, children, and families (Brown, 2016). Second, to build on the previous review through examining the topics of i) diet and physical activity for weight management in people with intellectual disabilities, ii) physical activity for serious mental illness, and iii) physical activity for falls prevention in older adults. This review aims to identify which behaviour change techniques (BCTs) are associated with improved diet and physical activity in these population groups, and what may therefore contribute to optimising intervention and services effectiveness.

Method

Design and inclusion/ exclusion criteria

A rapid evidence review was conducted of all systematic reviews and reviews of reviews from 2015 for adult, child and family weight management. For intellectual disabilities, older adults, and SMI all systematic reviews (with no date restrictions) were included in the search. A rapid search of an academic database (Academic Search Complete) was carried out. Only systematic reviews and reviews of reviews were included. Full texts were retrieved for all systematic reviews and reviews of reviews for each topic. Only full texts which included discussion of BCTs, either through their official terminology or related terms (e.g. self-monitoring of behaviour may have been described as keeping a diary of behaviour) were included.

Furthermore, if the reviews did not find an effect of the program/ intervention on the outcome behaviour (e.g. if there was no clinically significant weight loss), they were excluded. Frequency of BCTs which were described to be effective at improving the target behaviour were recorded in Table 1. Details about each review were recorded in Table 2. Information about other factors that may have contributed to intervention effectiveness such as the setting a programme or intervention was delivered in, was included in Table 2 and drawn out in the narrative synthesis of the findings in the results section below.

Search terms

For weight management/ weight loss in adults and children, search terms included 'adults' OR 'children' OR 'families' OR 'intellectual disabilities' AND 'weight management' OR 'diet' OR 'physical activity' AND 'behaviour change techniques' OR 'behaviour change' AND 'systematic reviews' OR 'reviews of reviews'.

For physical activity in serious mental illness the search terms included 'serious mental illness' OR AND 'physical activity' AND 'behaviour change techniques' AND 'systematic reviews' OR 'reviews of reviews'.

For physical activity for falls prevention in older adults the search terms included 'older adults' AND 'exercise' OR 'falls prevention' OR 'falls' AND 'behaviour change techniques' OR 'behaviour change' AND 'systematic reviews' OR 'reviews of reviews'.

Findings

Weight management

Adult weight management/ weight loss

Nineteen systematic reviews were identified from the search for weight management and weight loss through diet and/or physical activity in adults. Ten were included in the review, and nine were excluded due to not discussing behaviour change or behaviour change techniques within the full text. Forty behaviour change techniques were identified as being effective for weight management and/ or weight loss through diet and physical activity in adults. The evidence suggested that a larger number of BCTs were associated with a more effective intervention (Kunstler et al., 2017; Samdal, Eide, Barth, Williams, & Meland, 2017). The most commonly cited techniques from the literature were goal setting (behaviour) and self-monitoring of behaviour, which were identified by nine papers. Goal setting and self-monitoring of behaviour predicted both short and long-term intervention effectiveness for physical activity and healthy eating (Murray et al., 2017; Samdal et al., 2017). Problem solving/ barrier identification, self-monitoring of outcomes of behaviour, and practical social support were all identified in five systematic reviews. Furthermore, although not the most frequently cited, feedback on the outcomes of behaviour, implementing graded tasks, and environmental restructuring predicted weight loss maintenance in the long term but not the short-term (Murray et al., 2017; Samdal et al., 2017). Thus, encouraging people to use goal setting and self-monitoring of behaviour throughout the behaviour change process, and feedback, graded tasks and environmental restructuring later in the intervention may promote long-term weight loss and maintenance in adults.

Where the intervention was conducted also appeared to be of importance. Murray et al (2017) showed that physical activity interventions conducted in workplace or university settings were more effective than interventions in primary care. However, given the small number of systematic reviews in this review, further research is required to understand the impact of the setting where the intervention is delivered on its' effectiveness.

Children and family weight management

Nine systematic reviews were identified for weight loss/management in children and families through diet and physical activity. Six were included in the review and three were excluded due to a lack of discussion about behaviour change and behaviour change techniques. Sixteen behaviour change techniques were identified. The most frequently identified behaviour change techniques were social support (unspecified) (5 reviews) and goal setting (4 reviews). Material reward/ social reward and self-monitoring of behaviour were the next most frequently identified BCTs (3 reviews). Due to consensus from several systematic reviews about these BCTs for weight loss/ management within children and families, identifying programs which contain these techniques would be useful.

The evidence suggests that both school and family-based interventions are an effective way of delivering lifestyle weight management interventions and that including parents within interventions is important (Burchett, Sutcliffe, Melendez-Torres, Rees, & Thomas, 2018; Carlin, Murphy, & Gallagher, 2016; Corepal, Tully, Kee, Miller, & Hunter, 2018; Hesketh et al., 2017; Schoeppe et al., 2016). For example, Carlin et al (2016) examined walking interventions in 5-18 year olds. The

majority of studies included in their systematic review were delivered in an educational setting, however, seven studies in their review focused on increasing walking through active travel to school, where parental decision making was an important factor in these interventions. Furthermore, Jalali et al's (2016) and Burchett et al (2018) suggested that obesity interventions should target families, and focus on changing the behaviours of the whole family rather than the target child alone. Parents should be treated as the direct agents of change in the family setting rather than treating children directly as this approach reduces children's perceptions of having a health problem and the stigmatization of being 'an obese patient' (Burchett et al., 2018).

Weight loss/ management for people with intellectual disabilities

Three systematic reviews were identified for weight management in adults with intellectual disabilities. Two of the reviews reported clinically significant weight loss (Spanos, Melville, & Hankey, 2013; Willems, Hilgenkamp, Havik, Waninge, & Melville, 2017), whereas one did not and was excluded from the review. Thirteen behaviour change techniques were identified from the systematic reviews (see table 2). Goal setting and self-monitoring of behaviour were identified in both systematic reviews, and may be important BCTs to include in weight loss/ management interventions for people with intellectual disabilities. The other BCTs were only identified in one review and are listed in table 2.

One important consideration when using BCTs in interventions for people with intellectual disabilities is the complexity of the BCTs and the interventions. Harris, Melville, Murray, & Hankey (2018) and Willems et al (2017) argued that BCTs may

be too complex for people with intellectual disabilities to understand and apply in a practical way, and that additional social support from carers may be required. However, even with support from carers, participants were unable to use pedometers to self-monitor their daily step count (Willems et al., 2017). The authors argued that this is particularly relevant since self-monitoring has been shown to be important in the effectiveness of lifestyle change interventions. Therefore, Willems et al (2017) suggested that researchers should consider testing whether individual BCTs can be made accessible, e.g. via support from carers, and design interventions based on these findings.

Another important consideration for weight loss/ management programs for adults with intellectual disabilities is whether the program is more effective when delivered individually or in group therapy. Spanos et al (2013) suggested that interventions delivered in group sessions are potentially more cost-effective, however, there is insufficient evidence to suggest that one type of therapy (group or individual) is more effective than the other, and no studies in their review commented on which was the best method.

Physical activity for serious mental illness

Six systematic reviews were identified from the search for physical activity in adults with SMI. Two were included in the evidence review and four were excluded due to not discussing BCTs. Five behaviour change techniques were reported by the two systematic reviews. Social support (unspecified) was cited in both reviews, while the other four BCTs were only cited once. The other BCTs were goal setting, social support (practical), demonstration of the behaviour, and material reward. One review

reported that goal setting and social support were used to encourage motivation for physical activity (Farholm & Sørensen, 2016), while the other review (Firth et al., 2016) reported that patients reported a lack of social support as a reason for why they did not engage in physical activity. Furthermore, Firth et al (2016) suggested that while exercise access and advice is ineffective for increasing physical activity in people with serious mental illness, providing adequate social support does enable patients to achieve sufficient levels of moderate to vigorous exercise which benefit their cardiovascular health. Thus, programs which contain a social support element, and encourage the support of family members, friends, and carers may increase uptake of physical activity within this population.

Although only cited by one review (Firth et al., 2016), 'demonstration on how to perform the behaviour' was suggested to be very important. Firth et al (2016) suggested that most patients thought that exercise supervision would enable them to exercise more, and patients had better adherence to physical activity and cardiorespiratory benefits. Furthermore, Firth et al (2016) suggested that supervised interventions which effectively target professional support and cardiovascular fitness may prove more financially worthwhile for improving long-term health outcomes in people with SMI. Therefore, the literature suggests that professionally delivered interventions or programs to encourage physical acitvity within this population would be the most valuable.

Physical activity for falls prevention for older adults

Thirty-three systematic reviews were identified from the search. Five systematic reviews were included in this review, and twenty-eight were excluded due to not discussing BCTs. Eight behaviour change techniques were identified as useful for

supporting falls prevention in older adults. The most frequently identified technique was social support (unspecified) (5 reviews), followed by credible source (3 reviews), social support (practical) and social support (emotional), and instruction on how to perform the behaviour which were cited in two papers. Group-based exercise classes are one way of promoting social support, however, the evidence is conflicting as to whether home-based or group-based physical activity programs are best. One review found that group-based exercise reported significantly larger effects at promoting uptake and maintenance of physical activity in older age than studies with home-based exercise, and people who exercised in centres were more likely to continue physical activity than those who exercised at home (Olanrewaju, Kelly, Cowan, Brayne, & Lafortune, 2016). Furthermore, group-based exercise programs offer social interaction, peer-reinforcement and encouragement (Shier, Trieu, & Ganz, 2016). However, Shier et al (2016) also suggested that interventions for frail older people need to be individually tailored, because older people vary considerably in their physical capacity to exercise and health benefits in response to exercise. Home-based individually tailored programs have the advantage of being followed indefinitely and may be easier to maintain, however, they also offer less supervision and an increased risk of injury (Shier et al., 2016). Therefore, a combination of home-based and group-based interventions may be an effective way of providing social support and also providing tailored programs.

Using a 'Credible source' appears to be particularly relevant in terms of recruiting older adults onto interventions for falls prevention. Research showed that since primary care providers, such as GPs, have access to frail older people who are more at risk of falls, and a letter from a primary care provider may be beneficial for recruitment (Shier et al., 2016). Furthermore, another systematic review (Simek,

McPhate, & Haines, 2012) found that older adults identify with health professionals and believe them to be important in informing decisions about the uptake of physical activity. Credible source may also be important in terms of intervention adherence. People were more likely to adhere to a program if they were recruited through a primary care provider (Shier et al., 2016), and interventions delivered in primary care centres and general practices were shown to produce at least short-term increases in physical activity (Olanrewaju et al., 2016). Furthermore, regular consultation with a physiotherapist was associated with increased adherence to home exercise programs in adults (Simek et al., 2012). Thus, recruiting older adults onto falls prevention programs, and possibly delivering interventions in a combination of a primary care setting and at home may be beneficial and promote adherence.

Other important factors from the literature for these types of programs were the amount and duration of physical activity in the programs, and the gender of the participant. Among successful studies, exercise was prescribed three times per week for thirty minutes each time (Shier et al., 2016). In addition, both men and women saw women as more receptive to, and in need of fall prevention health promotion and programs (Sandlund et al., 2017). The authors concluded that programs and promotion regarding falls prevention will only have meaning if they are informed by knowledge on potential gender specific preferences, however, the authors couldn't be specific due to 75% of the participants in the studies in their review being female (Sandlund et al., 2017). Thus, further research is needed in men to determine which types of programs appeal to men, and how the programs should be promoted to them to encourage uptake and adherence.

‘At a glance’ recommendations

For adult weight management and physical activity services:

- ‘Goal setting’ in terms of the behaviour to be performed needs to be included in service design alongside active promotion of ‘self-monitoring of that behaviour’
- ‘Problem solving/ barrier identification’, ‘self-monitoring of outcomes of behaviour’, and ‘practical social support’ should also be designed in.
- To support maintenance and longer-term outcomes, the BCTs ‘feedback on the outcomes of behaviour’, ‘implementing graded tasks’, and ‘environmental restructuring’.
- Workplace interventions may be worth considering

For family/child weight management and physical activity services:

- The BCTs social support (unspecified), goal setting, material reward/ social reward and self-monitoring of behaviour were all identified as potentially useful.
- Successful interventions have commonly included educational settings
- Including parents and the whole family in the intervention and behaviour change is important for success

For people with intellectual disabilities:

- Goal setting and self-monitoring of behaviour again feature commonly in the available literature
- By definition, self-monitoring of behaviour and other components may be difficult for someone with a learning disability to achieve, and carers are therefore critical for supporting service users

- Particular creativity around operationalising BCTs may be needed

For people with Severe mental illness (SMI):

- Social support (unspecified), goal setting, social support (practical), demonstration of how to perform the behaviour, and material reward were all identified as potentially important for supporting people with SMI to increase their levels of physical activity.

For people at risk of a fall:

- The most commonly identified BCTs useful in this population were social support (unspecified), credible source, social support (practical) and social support (emotional), and instruction on how to perform the behaviour
- Combining both group-based and home-based physical activity may be most useful for this population
- Using a person identified by the target population as a 'credible source' is important for uptake and adherence to a program.
- Men are harder to engage than women and so particular efforts may be required to recruit them

Table 1. Frequency of reporting of each behaviour change technique for the five health behaviours

Behaviour targeted/population	**Adults Diet and/ or physical activity for weight**	**Children's diet for weight management**	**PA for Falls prevention**	**PA for Mental health**	**WM in Learning disabilities**

	management and weight loss	**and weight loss**			
1.1 **Goal setting (behaviour)**: The person is encouraged to make a behavioural resolution. This does not involve planning exactly how the behavior will be done.	Faruqi et al (2015) (diet and PA) Greaves et al (2017) (diet and PA) Hartmann-Boyce et al (2015) Kunstler et al (2017) (PA) Murray et al (2017) (PA) *O'Brien et al (2015) (PA) Samdal et al (2017) (diet and PA) (positive intervention effect in short and long term) Whatnall et al (2018) (diet) Schoeppe et al (2016)	Carlin et al (2016) (PA) Corepal et al (2018) Hesketh et al (2017) PA Schoeppe et al (2016)		Farholm and Sorensen (2016)	Willems et al 2017 Spanos et al (2013)
1.2 **Problem solving/ Barrier**	Faruqi et al	Corepal			Willems

identification: This presumed having formed an initial plan to change behavior. The person is prompted to think about potential barriers and identify ways of overcoming them.	(2015) Greaves et al (2017) Murray et al (2017) (PA) O'Brien et al (2015) (PA) Whatnall et al (2018)	et al (2018)			et al
1.3 **Goal setting (outcome):** The person is encouraged to set a general goal that can be achieved.	Greaves et al (2017) Murray et al (2017) (PA) Whatnall et al (2018)	Corepal et al (2018)			Willems et al 2017
1.4 **Action planning:** Involves detailed planning of what the person will do, including, as a minimum, when, in which situation, and where to act.	Greaves et al (2017) Hartmann-Boyce et al (2015) Whatnall et al (2018)	Carlin et al (2016) PA			Willems et al 2016
1.9 Commitment: Ask the person to affirm statements indicating their commitment to change the behaviour.	Whatnall et al (2018)				
2.2 Feedback on behaviour: Provide information on the performance of the behaviour.	Greaves et al (2017) *O'Brien et al (2015) (PA) Siopis et al	Carlin et al (2016) PA Siopis et al (2015)			

	(2015) (diet and PA) Whatnall et al (2018)				
2.3 Self-monitoring of behavior: The person is asked to keep a record of the specified behaviour, e.g. a diary.	Faruqi et al (2015) Greaves et al (2017) Hartmann-Boyce et al (2015) Murray et al (2017) (PA) O'Brien et al (2015) (PA) Samdal et al (2017) (positive intervention effect at short and long term) Siopis et al (2015) Whatnall et al (2018) Schoeppe et al (2016)	Carlin et al (2016) PA Corepal et al (2018) Schoeppe et al (2016)	McMahon and Fleury (2012)		Willems et al (2017) Spanos et al (2013)
2.4 Self-monitoring of outcomes(s) of behavior: The person is asked to keep a record of specified measures expected to be influenced by	Faruqi et al (2015) Greaves et al (2017) Hartmann-Boyce et al	Corepal et al (2018) Schoeppe et al (2016)			Willems et al 2016

behavior change e.g. weight loss, physical fitness.	(2015) *Murray et al (2017) (PA) Schoeppe et al (2016)				
2.7 Feedback on outcome(s) of behaviour: Feedback on the outcome of the performance of behaviour.	Murray et al (2017) (PA)	Corepal et al (2018) Jalali et al (2016)			
3.1 Social support (unspecified): Advise on social support, e.g. from friends, family, group classes.	Kunstler et al (2017) (PA) Murray et al (2017) (PA) Whatnall et al (2018) Schoeppe et al (2016)	Burchett et al (2018) (whole family) Carlin et al (2016) PA Corepal et al (2018) Hesketh et al (2017) PA Schoeppe et al (2016)	McMahon and Fleury (2012) Sandlund et al (2017) Shier et al (2016) Simek et al (2012) Olanrewaju et al (2016)	Firth et al (2015) lack of support was a barrier Farholm and Sorensen (2016)	Willems et al 2017
3.2 Social support (practical): Advise on or provide practical support for the performance of behaviour.	Brown et al (2016) Greaves et al (2017) Hartmann-Boyce et al (2015)		Simek et al (2012) Olanrewaju et al (2016)	Firth et al (2015) – lack of workout partner was a barrier.	

	Kunstler et al (2017) (PA) Whatnall et al (2018)				
3.3 Social support (emotional): Advise on or provide social support, e.g. ask person to go to a weight loss group with their friends.	Greaves et al (2017) Faruqi et al (2015) Hartmann-Boyce et al (2015)	Jalali et al (2016)	Sandlund et al (2017) Olanrewaju et al (2016)		
4.1 Instruction on how to perform the behaviour: Advise on how to perform the behaviour, e.g. show how to cook healthy meals.	Faruqi et al (2015) Kunstler et al (2017) (PA) O'Brien et al (2015) (PA) Whatnall et al (2018)	Burchett et al (2018) Jalali et al (2016)	Simek et al (2012) McMahon and Fleury (2012)		Willems et al (2017)
4.2 Information about antecedents: Provide information factors which predict performance of the behaviour e.g. advise to keep a diary of exercise.	Whatnall et al (2018)				
5.1 Information about health consequences, e.g. the consequences of lack of physical activity and risk of falling.	Kunstler et al (2017) (PA) Murray et al (2017) (PA) O'Brien et	Murray et al 2017			

	al (2015) (PA) Whatnall et al (2018)				
5.2 Salience of consequences: Methods designed to emphasise the consequences of performing the behaviour. This goes beyond informing about health consequences, e.g. cigarette packets showing the health consequences.	Whatnall et al (2018)				
5.3 Information about social and environmental consequences e.g. information about the approval of others or the impact of the behaviour on the environment.	Kunstler et al (2017) (PA) Murray et al (2017) (PA) Whatnall et al (2018)				Willems et al (2017)
5.5 Anticipated regret: Induce or raise awareness of expectations of future regret about performance of the unwanted behaviour.	Whatnall et al (2018)				
5.6 Information about emotional consequences e.g. explain that losing weight/ engaging in more physical activity will give more confidence.	Whatnall et al (2018)				
6.1 Demonstration	Whatnall et	Hesketh	Simek et al	Firth et	Willems

of the behavior: Involves showing the person how to perform a behaviour, e.g. either through physical or visual demonstrations.	al (2018)	et al (2017) PA	(2012)	al (2015)	et al 2017
6.2 Social comparison: Involves explicitly drawing attention to others' performance to elicit comparisons.	Hartmann-Boyce et al (2015) Whatnall et al (2018)	Jalali et al (2016)			
6.3 Information about others' approval: The information clarifies whether others will likely approve or disapprove of what the person is doing.	Whatnall et al (2018)		Sandlund et al (2017)		
7.1 Prompts/cues: The person is taught to identify environmental prompts which can be used to remind them to perform the behaviour, e.g. time of day.	Siopis et al (2015) Whatnall et al (2018)				
8.1 Behavioural practice/rehearsal: Prompt practice or rehearsal of the performance of the behaviour in order to increase habit or skill.	Greaves et al (2017) Whatnall et al (2018)				
8.2 Behaviour substitution: Prompt substitution of the unwanted behaviour	Greaves et al (2017) Whatnall et				

with a wanted or neutral behaviour.	al (2018)				
8.3 Habit formation: Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behavior. E.g. suggest that they take a walk rather than watching television.	Greaves et al (2017) Whatnall et al (2018)				
8.6 Generalisation of target behaviour: Advise to perform the wanted behaviour in more than one situation.	Whatnall et al (2018)				
8.7 Graded tasks: Breaking down the target behavior into smaller, easier to achieve tasks, and enabling the person to build on small successes to achieve the target behavior.	O'Brien et al (2015) (PA)				Willems et al (2017)
9.1 Credible source: Present verbal or visual communication from a credible source in favour of or against the behaviour e.g. from a high status professional.	Murray et al (2017) (PA) Whatnall et al (2018)	Corepal et al (2018)	Simek et al (2012) Shier et al (2016) McMahon and Fleury (2012)		
9.2 Pros and cons: Ask the person identify and compare reasons for wanting and not wanting to change the	Whatnall et al (2018)				

behaviour.					
9.3 Comparative imagining of future outcomes: Advise the imagining and comparing of future outcomes of changed vs. unchanged behaviour. E.g. ask the person to compare possible outcomes of eating healthily vs. not eating healthily.	Whatnall et al (2018)				
10.1 Material incentive (behaviour): Inform that money, vouchers or other valued objects will be delivered if and only only if there has been effort and/ or progress in performing the behaviour.	Kunstler et al (2017) (PA)				
10.2/10.4 Material reward (behavior)/Social reward: Reinforcing successful performance of the specific target behavior. This can include rewards such as praise, and encouragement, as well as material rewards. But it must be linked to the specific behaviour.	Mantzari et al (2015) Schoeppe et al (2016)	Corepal et al (2018) Jalali et al (2016) Schoeppe et al (2016)	Olanrewaju et al (2016) positive reinforcement	Farholm and Sorensen (2016)	Willems et al 2017 Spanos et al (2013)
10.9 Self-reward: Prompt self-praise or self-reward if and only if there has been	Whatnall et al (2018)				

effort and/ or progress in performing the behaviour.					
11.2 Reduce negative emotions: Advise on ways of reducing negative emotions to facilitate performance of the behaviour e.g. advise on the use of stress management to reduce anxiety about joining a weight loss group.	Whatnall et al (2018)				
12.1 Restructuring the physical environment: The person is prompted to alter the environment in ways that is more supportive of the target behaviour.	Faruqi et al (2015) Greaves et al (2017)				Willems et al (2017)
12.2 Restructuring the social environment: Change or advise to change the social environment in order to facilitate performance of the wanted behaviour, or create barriers to the unwanted behaviour.	Faruqi et al (2015) Whatnall et al (2018)				
12.3 Avoidance/ reducing exposure to cues for the behaviour: advise how to avoid exposure to specific social and contextual/ physical cues for the behaviour e.g. changing daily or	Greaves et al (2017) Whatnall et al (2018)				

weekly routines.					
13.2 Framing/ reframing: Suggest the deliberate adoption of a perspective or new perspective on behaviour in order to change cognitions or emotions about performing the behaviour. E.g. suggest that the person might think of the tasks as reducing sedentary behaviour rather than increasing activity.	Brown et al (2016) Greaves et al (2017)				
13.5 Identity associated with changed behaviour: Advise the person to construct a new self-identity as someone who 'used to engage with the unwanted behaviour'.	Greaves et al (2017)				

Table 2. Description of included systematic reviews

Behaviour	Paper	Aims	Participants	Results
Adult weight management and weight loss	Faruqi et al (2015)	To determine the effectiveness of lifestyle interventions aimed at improving adults' knowledge and skills for weight loss in primary care.	Adults with a BMI >25, and without a chronic disease at baseline. A total of 2089 participants were included.	13 studies all targeting diet, physical activity and behaviour change were included. The majority demonstrated a positive impact on weight loss. Interventions which focussed on improving knowledge and skills (health literacy) for weight loss were effective.
	Greaves, Poltawski, Garside and Briscoe (2017)	To conduct a review and thematic synthesis of qualitative research on people's experience with weight loss maintenance.	Adults. A total of 710 participants, 78% women. 42% were classed as successful weight loss maintainers.	26 studies were included. The synthesis suggested that self-regulation and problem solving are key skills for maintaining the lifestyle changes needed for weight loss.
	Hartmann-Boyce et al (2016)	To review qualitative studies to examine the strategies people employ as part of self-directed weight loss attempts, and to map these to an existing behaviour change taxonomy.	Adults. A total of 1050 participants.	21 studies were included. 10 focussed on weight loss, and 11 on weight loss maintenance. The most common types of strategies were restriction, self-monitoring, scheduling, professional support, and weight management aids.

Kunstler et al (2017)	Reviewed behaviour change techniques which physiotherapists use when promoting physical activity in experimental and observational studies.	Adults	12 studies (9 experimental and 3 observational) were included. 7 behaviour change techniques were used in observational studies compared to 30 in experimental studies. Social support (unspecified) was the most frequently identified BCT across both settings. Effective interventions used more BCTs (n = 29) than ineffective interventions (n = 10).
Mantzari et al (2015)	Aimed to estimate whether financial incentives achieve sustained changes in smoking, eating, physical activity, and alcohol consumption, and whether effectiveness is modified by a target behaviour, incentive value and attainment certainty, or recipients' deprivation level.	Adults	34 studies were included. Financial incentives increased behaviour change, with effects sustained until 18 months from baseline, and three months post removal. High deprivation increased incentive effects.
Murray et al (2017)	Examined the effectiveness of physical activity interventions for behaviour change maintenance in	Adults (aged 18-64 years) from non-clinical populations	62 studies were included. PA interventions had a significant effect on behaviour maintenance at 6-9 months compared to 9-15 months. Interventions using the BCTs prompt self-monitoring of behavioural outcome and use of follow up prompts demonstrated greater effectiveness at promoting PA maintenance.

	young and middle-aged adults, and investigated whether BCTs and other intervention features were associated with maintenance.		Interventions implemented in primary care (vs. community settings or workplace/ university) settings tended to demonstrate less effectiveness.
O'Brien et al (2015)	Identified intervention features related to long-term effectiveness of physical activity interventions.	Adults aged 55-70 years.	19 studies were included. Interventions were effective at promoting physical activity. Goal setting was the most commonly used BCT. BCT feedback was also effective. However, printed materials, information on where and when to perform the behaviour, and information on consequences of behaviour to the individual were less effective.
Samdal et al (2017)	Aimed to explain the heterogeneity in results of interventions to promote physical activity and healthy eating for overweight and obese adults, by exploring the differential effects of BCTs and other intervention characteristics.	Adults, mean age >40 years, mean BMI >30.	48 studies were included. The number of BCTs and the BCTs goal setting and self-monitoring of behaviour predicted the effect at short term (ES = 0.37) and long term (ES = 0.24). Feedback on outcome of behaviour, implementing graded tasks, and environmental restructuring predicted the effect of the intervention in the long-term.
Siopis et al (2015)	Investigated the efficacy of weight management	Adults, adolescents and children.	14 studies were included. 9 in adults, 5 in children. Text messaging interventions can promote weight loss, however, there is a lack of long-term results. The

		interventions incorporating text messaging.		results for the adult and children studies were combined.
	Whatnall et al (2018)	Aimed to determine the effectiveness of brief nutrition interventions in adults.	Adults	45 studies were included. Brief interventions which are tailored and instructional can improve short-term dietary behaviours. The brief interventions contained a median of 3 BCTs, ranging from 0 – 14. The most frequently coded BCTs were information about health consequences (n = 58), instruction on how to perform the behaviour (n= 46), action planning (n=30), feedback on behaviour (n=29), and social comparison (n=22). The least coded techniques (n=1) were commitment, social support, information about others' approval, pros and cons, adding objects to the environment, and valued self-identity.
Weight loss and weight management in children and families	Burchett et al (2018)	Aimed to identify critical features of successful lifestyle weight management interventions for overweight children.	Children aged 0-11 years classified as overweight or obese. Parents or carers or service providers who had experience of weight management for 0-11 year old children.	11 qualitative UK-based studies examining children's, parents', and providers' perspectives and experiences of programmes were synthesized. Instruction on how to perform the behaviour and social support were identified. Programmes should involve the whole family. Parents and children should receive social support rather than just being told what to change.

Carlin et al (2016)	Reviewed walking interventions which aimed to promote increased levels of walking among children and adolescents.	Children aged 5-18 years.	12 studies were included. The majority of interventions in this review were conducted within an educational setting, and 1 study was conducted in a family setting. 9 studies reported significant increases in walking in the intervention groups vs. control. Commonly employed BCTs were goal setting, action planning, feedback and monitoring of behaviour, social support and repetition and substitution.
Corepal et al (2018)	Examined the effectiveness of behavioural incentive interventions in children and adolescents for improving physical inactivity, diet, smoking and alcohol consumption.	Non-clinical population of children and adolescents aged 5-18 years. Populations diagnosed with diseases/ conditions were excluded.	22 studies were included. 19 were eligible for a meta-analysis. 8 examined physical activity and 3 examined healthier eating. There was strong evidence that behavioural incentives may encourage healthier eating behaviour, and some evidence that incentives were effective for encouraging physical activity. The most common BCTs were: adding objects to the environment and self-monitoring of behaviour. However, it was not possible to disentangle the effective components so the results need to interpreted with caution.
Hesketh et al (2017)	Synthesised the qualitative evidence around determinants of change in physical activity in young children.	Children aged 0-6 years.	44 papers were included. 11 of the multi-level interventions produced a positive change in children's physical activity. Parental monitoring showed a consistent positive association with change in children's PA. Maternal role modelling was positively associated with children's physical activity in 4 studies.
Jalali et al (2016)	Aimed to understand the pathways through which social influence at the family level moderates the	Papers had to include an obesity intervention targeting parents who	32 studies were included. 28 papers focussed on both parents, 4 on mothers, and none exclusively on fathers. The most frequently observed BCTs were social support, prompt intention formation, and provide contingent rewards and encouragement. The BCTs

		impact of childhood obesity interventions.	are attempting weight management in their children.	provide instruction and guidance and provide feedback on performance were utilized less frequently.
	Schoeppe et al (2016)	Examined the efficacy of interventions that use apps to improve diet, physical activity and sedentary behaviour in children and adults.	Children and adults.	27 studies were included. 23 studies targeted adults, 17 of which showed significant health improvements. 4 studies targeted children, two of which showed significant health improvements. 21 studies targeted physical activity, 13 studies targeted diet and 5 sedentary behaviour. A slightly larger proportion of interventions for a single health behaviour showed significant between group improvements than multiple behaviour interventions. Multicomponent interventions lasting for 8 weeks showed the greatest improvements. Most of the interventions which showed improvements used goal setting, self-monitoring of behaviour, and performance feedback. Other interventions used motivational messages, feedback, reinforcement, gamification, awards and rewards, and social support. There was not enough evidence to determine which specific BCTs determined intervention efficacy.
Intellectual disabilities population.	Spanos et al (2013)		Adults, with a valid diagnoses of intellectual disability at study enrolment. Overweight or obese.	22 studies were included. Behaviour change interventions were accompanied by a manual which aimed to change the eating habits, physical activity levels and self-reinforcement patterns of participants by gradually introducing new behaviour change techniques. Most common BCTs were self-monitoring, goal setting, rewards and relapse prevention. The role of carers is unclear. Majority of interventions delivered in group sessions,

			and are potentially more cost effective. Insufficient evidence to support the effectiveness of group therapy vs. individual therapy. No studies commented on which was the best method.
Willems et al (2017)	Examined how behaviour change techniques were applied in interventions aimed at physical activity, nutrition, and nutrition or physical activity.	Adults and children. 87% of studies included adults. Participants with intellectual disabilities.	45 papers were included. BCTs were used in all interventions. All interventions used at least 1 BCT. Not all BCTs were used in the studies. Studies in physical and nutrition interventions (combined) used the most BCTs (n=31/40). Physical activity interventions used 22 and nutrition interventions used 12. All three categories frequently used provide information on consequences of behaviour, and social support. Physical activity and nutrition interventions and the nutrition interventions also used instruction on how to perform the behaviour, and provide information on consequences. Many of the BCTs are complex and involve a significant amount of abstraction, so it raises questions about the extent to which BCTs can be used in interventions for people with intellectual disabilities.
Harris et al (2018)	Examined the effectiveness of randomized controlled trials and mutli-component weight management interventions for adults with intellectual	Adults with intellectual disabilities and obesity.	6 studies were included. The majority of studies focused on a health education approach, providing general information on a healthy balanced diet. Also included a structured physical activity component. The average number of BCTs used was 10. Prompt practice, provide instruction on how to perform the behaviour, problem solving, action planning, self monitoring of behaviour, demonstrate the behaviour,

		disabilities and overweight/ obesity.		social support. However, it's difficult to determine which active techniques produced the change. The engagement of carers was diverse.
Older adults and falls prevention	McMahon and Fleury (2012)	To examine physical activity interventions designed to reduce falls among community dwelling older adults.	Older adults, ranged in age from 68-88 years old.	46 studies were included. 82% of studies were in laboratory settings, while 18% were in community-based settings. 75% of studies described statistically significant improvements in at least one fall risk. Social support was an important BCT.
	Olanrewaju et al (2016)	Synthesised preventive interventions in older age, with a focus on healthy behaviours.	Older adults with a mean age of 55. Participants lived in the community in a healthy condition. Participants with pre-conditions of high blood pressure, diabetes, overweight and obesity were included.	40 systematic reviews were included. 9 qualitative reviews explored barriers, facilitators and influences of physical activity uptake among older adults. Frail older people adhered better to shorter duration exercise. Facilitators of physical activity were health, enjoyment, social support, group, peer and community support, positive reinforcement.
	Sandlund et al (2017)	Systematically reviewed the literature to explore any underlying gender perspectives on older people's	Adults aged 60 years or older, living in the community or in a care home, with any	25 studies were included. Both men and women see women as more receptive to, and more in need of fall prevention messages. Facilitators were: social support. Messages must move beyond transmission of basic health information and focus on encouragement and

	views or preferences regarding uptake and adherence to exercise to prevent falls	medical condition.	inspiration. Messages will only have meaning if they are informed by knowledge on potential gender specific preferences. However, 76% of participants were women so more research need to examine men's beliefs in more detail.
Shier et al (2016)	Examined how exercise programs to prevent falls are implemented from the vantage point of a health care setting.	Independently living adults with a mean age of 65 years.	29 studies were included. The most common recruitment strategy was a letter from primary care providers, and it is suggested that this may help recruitment onto interventions. PCPs also have the opportunity to identify frail older people most at risk. Another recruitment method was to use similarly aged people for personal contact with the participants. Gait, balance, functional and strength/ balance training were the most common types of exercise in the interventions. Interventions which included several exercise components were more effective. Some interventions used a population-based approach, whereas some focused on the individual. It was suggested that for frail older people, the intervention needs to be individually tailored because older people vary considerably in their physical capacity and health in response to exercise. Interventions either took place in the home or in an exercise class. Home-based had the advantage of being followed indefinitely and may be easier to maintain. But, home-based offer less supervision, and a greater risk of injury, and classes offer social interaction, peer reinforcement and encouragement. Among successful studies, total weekly exercise time ranged from 80 mins to 7 hours. Most prescribed 30

				mins exercise 3 or more times a week. Duration of successful programs ranged from 8 weeks to 2 years.
	Simek et al (2012)	Determined whether adherence to home exercise interventions for the prevention of falls in older adults relates to home exercise program characteristics and intervention efficacy.	Older adults, minimum age 60 years.	23 studies were included. Successful interventions contained: balance, moderate level of home visit support, physiotherapist led delivery. Group exercise component was associated with decreased levels in partial adherence. A greater number of older adults appear to fully adhere to program which include walking exercise. However, higher rates of falls have been found in interventions which include a walking program. Older adults identified health professionals as important in informing their decisions about the uptake of physical activity. Pps more likely to adhere to a program if recruited through a primary care provider. Health professionals may be important in promoting participation in home exercise programs. Regular consultation with a physiotherapist was associated with increased adherence to home exercise programs in adults, but this adds an additional cost.
Serious mental illness and physical activity	Farholm and Sorensen (2016)	Summarised findings from studies which examined motivation for physical activity and exercise in people with serious mental illness.	Adults diagnosed with a serious mental illness.	34 articles were included. Goal setting and social support were used to encourage motivation for physical activity. However, other motivational strategies were used so it's not clear what the active agent was. There is little empirical evidence on how to positively affect motivation for physical activity for individuals with SMI. More research is needed. Reported that 30-50% of people with SMI had a desire to be more physically active, but lack of motivation

			was viewed as a major barrier. Tangible rewards have been shown to produce beneficial short-term effects, but this is known to undermine long-term adherence and intrinsic motivation.
Firth et al (2016)	Aimed to understand the motivating factors and barriers towards exercise for people with SMI.	Adults with a diagnosis of SMI.	12 studies were included. 91% of people with SMI endorsed improving health as a reason for exercise. The most common motivations were losing weight, improving mood, and reducing stress. Low mood and stress were also identified as the most prevalent barriers towards exercise. Professional support was a motivating factor for increasing exercise by the majority of patients and the majority of patients thought that exercise supervision would enable them to exercise more, and adequate support may overcome the barriers towards exercise. Although unsupervised interventions which use less resource-intensive methods (e.g. education and BCTs) may seem more cost effective than supervised exercise, this may not be the case for people with SMI. Interventions that provide professional support had better adherence to physical activity and greater effects on cardiorespiratory fitness. Supervised interventions which effectively target professional support and cardiovascular fitness may prove more financially worthwhile for improving long-term health outcomes in people with SMI. Exercise access and advice is ineffective for increasing pa in SMI, providing adequate social support does enable patients to achieve sufficient levels of moderate to vigorous exercise. Although lack of cost-effectiveness research examining supervised exercise in SMI, financial reports of exercise interventions for depression

indicate that professionally delivered training programmes produce large economic benefits from avoided health care costs.

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Appendix D
April 2018
Needs Analysis: Child Weight Management

Introduction

Children who are overweight or obese are more likely to experience multiple adverse health outcomes [1] and children with obesity have an increased risk of obesity in adulthood [2].

Children report the psychological impact of being overweight or obese as the most serious aspect, with concerns over bullying and discrimination, low self-esteem and quality of life, anxiety, depression, fatigue, and disturbed sleep. [2].

Although the more deleterious effects of obesity may not appear until adulthood, children and young people with obesity have been found to be at higher risk of type 2 diabetes, abnormal glucose tolerance, asthma, obstructive sleep apnoea, higher blood pressure and cholesterol levels, and musculoskeletal pain, including tibia vara (Blount's Disease) and slipped capital femoral epiphysis [3].

Measuring BMI in children and young people is more complex than for adults, as growth patterns vary between boys and girls as well as age of the child. For an individual, a child is considered overweight if their BMI is ≥91st centile and obese when ≥98th centile, as compared to RCPCH UK Growth Charts. However, for a population of children, overweight is defined at ≥85th centile and obese at ≥95th centile. [4]

Children are considered more at risk of becoming obese when they live with at least one parent/carer who is obese. Children are also more at risk of developing obesity if they live in areas with higher deprivation in domains such as income; employment; health and disability; education, skills and training; housing and services; crime; and living environment [5].

In England, the NHS spent approximately £6.1 billion on overweight and obesity related ill health, across age groups, in 2014/2015. It is estimated that by 2050 the cost to the NHS will rise to £9.7 billion for the UK [6].

Governments in the UK have created policies aimed at individuals, the NHS, local authorities, and food manufacturers and retailers in an effort to confront the problem of obesity; these policies have included healthier lifestyle guidelines, public information campaigns, a sugar reduction programme, and the soft drinks industry levy [7].

Additionally, behavioural interventions have been found to be effective in reducing weight for obese children and adolescents, with modest evidence that these improvements can be maintained in the year following intervention completion. [8]

Levels of Overweight and Obesity in Warwickshire Children

According to the National Child Measurement Programme (NCMP) [9], approximately 22.7% of Reception age children in Warwickshire are classed as overweight or obese and 9.2% as obese. This is similar to national rates of overweight and obesity in England, at 22.6% and 9.6% respectively.

Of Year 6 aged children in Warwickshire, 31.4% are classed as overweight or obese and 17.1% as obese, which is slightly lower than national levels of 34.1% and 20.0% respectively. Overweight and obesity levels are, in some places, 10 percentage points higher in Year 6 than in Reception, which is similar to national trends.

Rates of overweight and obesity vary across Warwickshire; for Reception aged children, the highest levels could be found in North Warwickshire Borough with the lowest levels in Rugby Borough. For Year 6 aged children, the highest levels could be found in Nuneaton and Bedworth Borough with the lowest levels in Warwick District.

Around one in five Reception aged children in Warwickshire is considered overweight or obese, compared with one in four in North Warwickshire Borough.

Table 1. Levels of Excess Weight by Warwickshire districts and boroughs - Reception 2016/2017

	Overweight and Obese	Obese
North Warwickshire Borough	24.9%	10.9%
Nuneaton and Bedworth Borough	23.7%	9.6%
Rugby Borough	20.7%	8.3%
Stratford-on-Avon District	22.8%	7.7%
Warwick District	22.4%	9.7%
Warwickshire	22.7%	9.2%
England	22.6%	9.6%

Table 2. Levels of Excess Weight by Warwickshire districts and boroughs - Year 6 2016/2017

	Overweight and Obese	Obese
North Warwickshire Borough	34.2%	18.0%
Nuneaton and Bedworth Borough	35.9%	19.9%
Rugby Borough	30.8%	15.6%
Stratford-on-Avon District	29.6%	16.6%
Warwick District	27.5%	15.4%
Warwickshire	31.4%	17.1%
England	34.2%	20.0%

Levels of Deprivation in Warwickshire

According to the 2015 Indices of Deprivation, Warwickshire as a whole did not have high levels of deprivation and is considered to be in the 20% least deprived areas in England. This, however, masks the substantial variation across the county with areas of severe deprivation found at the local level. Within Warwickshire, six Lower Layer Super Output Areas (LSOAs) in Nuneaton and Bedworth Borough, one LSOA in North Warwickshire Borough, and one LSOA in Warwick District are considered to be amongst the 10% most deprived LSOAs in England [10].

A similar situation exists for children living in low income families, defined as dependent children under the age of 20 living in families receiving Child Tax Credit, reporting less than

60% of the median income or receiving Income Support or Income-Based Jobs Seekers Allowance, divided by the total number of children in the area. At the county level, Warwickshire has low levels of children living in low income families, 12.2%, as compared to national trends, 18%. However, at a local level, 18.2% of children in Nuneaton and Bedworth Borough live in low income families [10].

Table 3. Warwickshire's Most Deprived LSOAs

Super Output Area	District	IMD 2015Rank- Top 10% Most Deprived Nationally
Mancetter South & Ridge Lane	North Warwickshire	3,225
Camp Hill Village & West	Nuneaton & Bedworth	1,485
Abbey Town Centre	Nuneaton & Bedworth	2,253
Bar Pool North & Crescents	Nuneaton & Bedworth	466
Kingswood Grove Farm & Rural	Nuneaton & Bedworth	1,636
Middlemarch & Swimming Pool	Nuneaton & Bedworth	2,257
Hill Top	Nuneaton & Bedworth	3,122
Lillington East	Warwick	2,841

Table 4. Proportion of Children Living in Low Income Families

	2010	2011	2012	2013
Nuneaton and Bedworth	19.6%	19.3%	18.6%	18.2%
North Warwickshire	14.2%	13.6%	13.2%	13.1%
Rugby	13.7%	13.1%	12%	11.8%
Warwick	11.6	11%	9.6%	9.6%
Stratford-upon-Avon	10%	9.7%	8.6%	8%
Warwickshire	13.9%	13.5%	12.6%	12.2%
England	20.6%	20.1%	18.6%	18%

Project Objective

Children who live in areas with higher levels of deprivation are considered to be more at risk of developing overweight or obesity.

There is a disparity among deprivation levels across Warwickshire, with areas of Nuneaton and Bedworth Borough experiencing higher levels of deprivation and children living in low income families when compared with both the county and the nation as a whole.

Similarly, higher levels of overweight and obesity in Reception and Year Six aged children was found to be higher in North Warwickshire Borough and Nuneaton and Bedworth Borough.

The purpose of this needs analysis is to identify the factors associated with children who are considered to be most at risk from becoming overweight and obese and map available data to explore whether geographical patterns exist in order to inform the planning of services targeted at this issue.

Childhood Overweight and Obesity Risk Factors

Children who are born into and/or grow up in households where at least one parent/carer is obese are at higher risk of becoming obese themselves. There is also a relationship between maternal obesity and above average birth weight with the development of obesity in either childhood or adulthood, irrespective of environmental influences.

Children are also considered to be at higher risk due to factors such as poor diet and nutrition, including excessive sugar and saturated fat consumption, low levels of physical activity, and increased sedentary behaviours.

Table 5. Risk Factors for Childhood Obesity

Risk Factors	
Maternal obesity	Above average birth weight
Low levels of physical activity	Increased sedentary behaviours
Poor diet and nutrition	Excessive sugar consumption
At least one parent/carer obese	Excessive saturated fat consumption

Mosaic Dataset

Mosaic is a dataset that categorises UK consumers into 15 groups, further divided into 66 more detailed types. Using over 400 different data variables, Mosaic depicts the UK in terms of sociodemographic characteristics, lifestyles, culture, and behaviours.

Using Mosaic can improve population intelligence and identify various service needs that groups and types may have of their local authority. Mosaic can also help with more effective service development, delivery, and engagement by giving insight into each group's preferred methods of communication.

Mosaic identifies groupings of behaviours and characteristics in individual households or postcodes, which can enable the identification and description of various consumer behaviours. The name and description of each group and type is meant to depict the population traits of its members.

Methodology

The current analysis utilised Warwickshire NCMP data collected over three years between 2013/14 and 2015/16. Over 33,000 records were matched to the Mosaic database using Experian's Icoder software.

By combining the NCMP data to Mosaic's household database, every household in the NCMP dataset was categorised to a Mosaic group and type. Mosaic profiles were created for both the full NCMP dataset and for households with overweight or obese children. The profiles were then compared to determine if certain household groups or types were more likely to contain either overweight or obese children.

Results- Mosaic Groups

By volume, Mosaic groups 'Domestic Success', 'Aspiring Homemakers', and 'Family Basics', were found to be the most prevalent among households with overweight or obese children. 'Domestic Success' makes up 21.2% of total NCMP Warwickshire households and are described as thriving families who are busy bringing up children and following careers. 'Aspiring Homemakers' makes up 19.7% of total NCMP Warwickshire households and are defined as younger households settling down in housing priced within their means. 'Family Basics' makes up 18.7% of total NCMP Warwickshire households and are defined as families with limited resources who have to budget to make ends meet.

By risk, Mosaic groups 'Vintage Value', 'Municipal Challenge', 'Modest Traditions', and 'Family Basics' have the highest risk of containing children who are overweight or obese. Although Vintage Value is nearly 40% more likely to contain overweight or obese children and 'Municipal Challenge' and 'Modest Traditions' are around 25% more likely, these groups represent a small proportion of households in the Warwickshire NCMP dataset (0.4%, 1.1%, and 1.9% respectively) and reducing excess weight in these groups will have a smaller impact on overall levels of overweight and obesity in Warwickshire.

Although the 'Family Basics' group is about 20% more likely to contain children who are overweight or obese, they represent over 18% of households in Warwickshire and also contain the largest proportion (over 20%) of overweight or obese children in the Warwickshire NCMP dataset.

Table 6. Mosaic profile of NCMP data set and NCMP dataset of children with excess weight

Mosaic Group	All NCMP Volume	NCMP ALL PROFILE	NCMP 'Overweight' & 'Obese' PROFILE
Country Living	2,113	6.4%	5.7%
Prestige Positions	2,849	8.6%	6.4%
City Prosperity	185	0.6%	0.4%
Domestic Success	**7,062**	**21.2%**	**18.2%**
Suburban Stability	1,516	4.6%	5.3%
Senior Security	221	0.7%	0.7%
Rural Reality	2,346	7.1%	7.5%
Aspiring Homemakers	**6,535**	**19.7%**	**19.3%**
Urban Cohesion	274	0.8%	0.7%
Rental Hubs	796	2.4%	2.5%
Modest Traditions	645	1.9%	2.4%
Transient Renters	1,979	6.0%	6.5%
Family Basics	**6,211**	**18.7%**	**22.4%**
Vintage Value	145	0.4%	0.6%
Municipal Challenge	359	1.1%	1.4%

Results- Characteristics of Family Basics Households

Group M households are described as families with limited resources who have to budget to make ends meet; they are more likely to shop in budget supermarkets and less likely to engage in healthy behaviours, especially in areas such as fruit and vegetable consumption and physical activity. 'Family Basics' households are likely to be experienced users of new technology and prefer communications by text, mobile or landline telephone calls, and face to face interactions. Although 'Family Basics' households in Warwickshire are more likely

than most groups to contain overweight or obese children, they do not necessarily contain children with excess weight. Targeting effective services to meet the needs of this group of the population is likely to produce the biggest impact on childhood overweight and obesity.

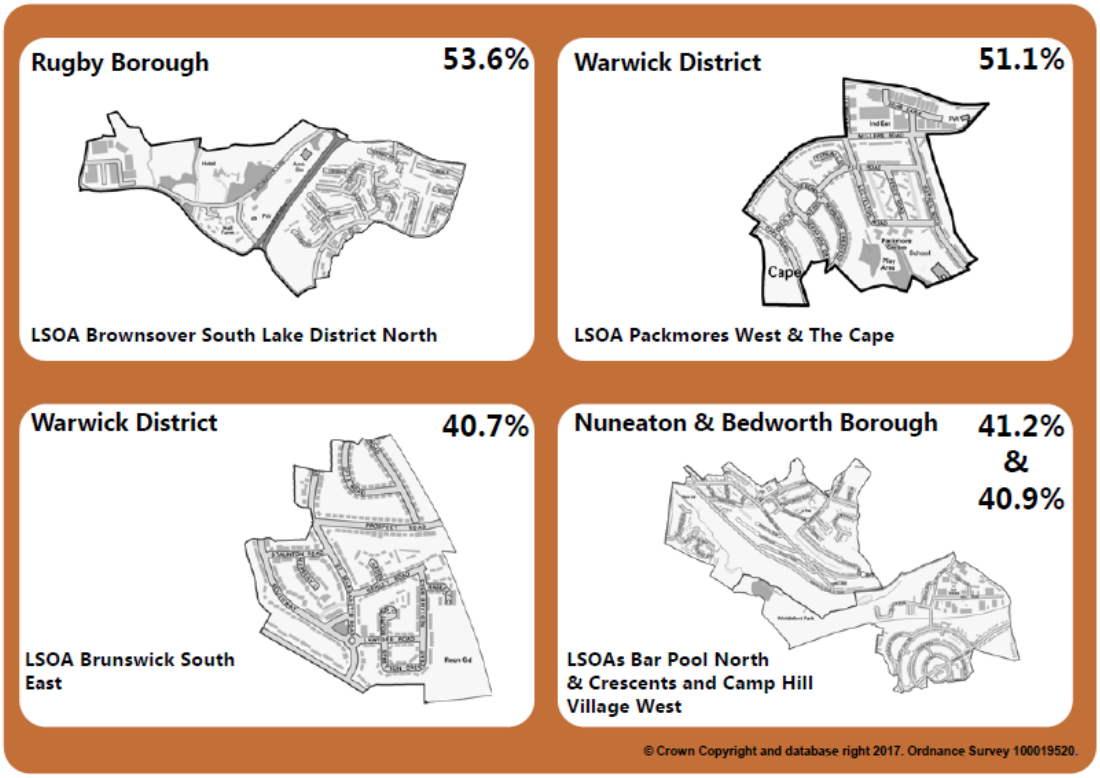
Within Warwickshire, one LSOA in Rugby District, two in Warwick District, and two in Nuneaton and Bedworth Borough contained the highest concentrations of 'Family Basics' families (see Figure 1). These LSOAs may indicate which geographic areas to focus on when designing and advertising child weight management services.

Additionally, any service re-design process requires the insight of 'Family Basics' households to understand the needs of their families and to gain insight into how to create services that are not only appealing but would encourage engagement with the service [4].

Table 7. Characteristics of 'Family Basics' Group

Key Features		
Families with children	Aged 25 to 40	
Limited resources	Squeezed budgets	
Some own low cost homes	Some rent from social landlords	
Lifestyle Characteristics		
Less likely to consume 'five a day'	More likely to use budget supermarkets	Less likely to engage in regular exercise or sport
How households in Family prefer to be communicated with compared with other groups		
Mobile Phone (text or phone call)	Landline Telephone	Face to Face
Use of digital technology		
Are likely to love or like technology and have the latest gadgets	Are likely to access Facebook daily	
Are most likely to own a smartphone and or tablet or laptop	Are likely to access Twitter regularly	
Are likely to be high users of email and use the internet daily		

Figure 1. LSOAs With the Highest Proportion (%) of 'Family Basics' Households



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Appendix E
April 18

Needs Analysis: Adult Weight Management in Warwickshire – where to target resources

Introduction

Overweight and obesity contribute significantly to morbidity and mortality. Being overweight or obese carries increased risk of developing type 2 diabetes, high blood pressure, angina, stroke, heart attack, gall bladder disease, liver disease, osteoarthritis, and multiple cancer diagnoses. Being overweight or obese is also linked to depression, anxiety, and low self-esteem [1]. Having a high BMI has been identified as the single risk factor attributing to the most morbidity, or disease, in England [2].

Adults in England are considered to be at a higher risk of becoming overweight or obese if they live in areas with higher deprivation in domains such as income; employment; health and disability; education, skills and training; housing and services; crime; and living environment [2].

BMI, defined as weight in kilograms divided by height in metres squared (kg/m^2), is a widely accepted measure of weight in adult populations and is comparable among men and women of all ages. BMI, however, does not take into account the difference between weight due to body fat or to muscular build, nor does it account for how body fat is distributed. Waist circumference has been considered a useful supplementary measure for identifying central (abdominal) obesity. However, it should be noted that different ethnic populations will show varying degrees of association between waist circumference and obesity related health outcomes, such as cardiovascular disease and diabetes; interpretation of waist circumference could be more or less useful when examining overweight and obesity in different populations [2].

According to the World Health Organization (WHO), a person with a BMI or ≥25 would be considered overweight or obese (see Table 1) [3]. Waist circumference is divided into three categories each for men and women; a waist circumference of ≥94 cm in men or ≥80 in women is considered high or very high. It should be noted that these definitions are based on a sample of Caucasian men and women from the Netherlands (see Table 2) [4].

In England, the NHS spent approximately £6.1 billion on overweight and obesity related ill health, across age groups, in 2014/2015. It is estimated that by 2050 the cost to the NHS will rise to £9.7 billion for the UK [5].

Governments in the UK have created policies aimed at individuals, the NHS, local authorities, and food manufacturers and retailers in an effort to confront the problem of obesity; these policies have included healthier lifestyle guidelines, public information campaigns, a sugar reduction programme, and the soft drinks industry levy [2].

Additionally, behavioural interventions have been found to be effective in reducing weight for overweight adults, with modest evidence that these improvements can be maintained up to four years following intervention completion [5].

Table 1. Classification of Body Mass Index (BMI) Groups

BMI (kg/m^2)	Description
Less than 18.5	Underweight
18.5 to less than 25	Normal
25 to less than 30	Overweight, not obese
30 or more	Obese, including morbidly obese
40 or more	Morbidly obese

Table 2. Classification of Waist Circumference Groups

Men's Waist Circumference (cm)	Women's Waist Circumference (cm)	Description
Less than 94	Less than 80	Desirable
94-102	80-88	High
More than 102	More than 88	Very High

Levels of Overweight and Obesity in Warwickshire Adults

In England 61% of adults (66% of men and 57% of women) are classified as overweight or obese with 26% of adults (26% of men and 27% of women) classified as obese [2]. This is an increase from 1993 when 13% of men and 16% of women were classified as obese [7]. If trends continue without intervention, by 2050 60% of men and 50% of women could be obese (see Table 3) [1].

In 1993 the average waist circumference for men and women was 93cm and 82cm, respectively, with 20% of men and 26% of women identified as having a very high waist circumference. In 2015 the average waist circumference increased to 97cm for men and 88cm for women, with 35% of men and 47% of women identified as having a very high waist circumference [7].

According to Health Profile for Warwickshire, in 2017 overweight and obesity levels in England had increased to 64.8% of adults, which was not significantly different to the levels reported for Warwickshire- 65% [8]. This, however, masks the discrepancies found across the county, with the highest levels found in North Warwickshire Borough with 71.3% classified as overweight or obese and the lowest levels seen in Warwick District at 58.5% (see Table 4) [9-13].

Table 3. Levels of Past, Present, and Predicted Future Adult Obesity

	1993	2015	2050
Men	13%	26%	60%
Women	16%	27%	50%

Table 4. Levels of Excess Weight in Adults by Warwickshire districts and boroughs

	Overweight and Obese
North Warwickshire Borough	71.3%
Nuneaton and Bedworth Borough	68.7%
Rugby Borough	66.9%
Stratford-on-Avon District	63.7%
Warwick District	58.5%
Warwickshire	65.0%
England	64.8%

Indices of Multiple Deprivation

The English Indices of Deprivation examines national and sub-national patterns of multiple deprivation. The Index of Multiple Deprivation is an overall measure of multiple deprivation calculated by the combination of seven distinct domains of deprivation (income; employment; health and disability; education, skills and training; housing and services; crime; and living environment). LSOAs are given a rank in each domain as well as an overall rank. Each LSOA is ranked in relation to other LSOAs according to its level of deprivation, with ranks closer to 1 considered more deprived [14].

Levels of Deprivation in Warwickshire

According to the 2015 Indices of Deprivation, Warwickshire as a whole did not have high levels of deprivation and is considered to be in the 20% least deprived areas in England; of 152 upper tier authorities in England, Warwickshire ranks as 124th. This, however, obscures the substantial variation across the county with areas of severe deprivation found at the local level [14].

Nuneaton and Bedworth Borough has the highest levels of deprivation for the county, ranked as the 111th most deprived Local Authority District in England (out of 326 Local Authorities in England), while Stratford-on-Avon was the least deprived in the county with a rank of 272 (see Table 5).

Within Warwickshire, six Lower Layer Super Output Areas (LSOAs) in Nuneaton and Bedworth Borough, one LSOA in North Warwickshire Borough, and one LSOA in Warwick District are considered to be amongst the 10% most deprived LSOAs in England [15].

Higher levels of deprivation are known to have an association with life expectancy, with men in the most deprived areas living an average of nine years less and women seven years less than men and women living in the least deprived areas; around half of this discrepancy is likely related to obesity linked conditions such as heart disease, stroke, and cancer. When examining the amount of time a person is presumed to live in good health, or healthy life expectancy, men and women in the most deprived areas often have 20 fewer years of good health than adults living in the least deprived areas; again obesity, as well as smoking, higher levels of alcohol consumption, and lower levels of physical activity are among the behavioural factors likely contributing to this inconsistency [2].

Table 5. Indices of Multiple Deprivation (IMD) Ranks for Warwickshire Districts

Local Authority District	IMD Rank of Average Score (out of 326)
North Warwickshire Borough	190
Nuneaton and Bedworth Borough	111
Rugby Borough	240
Stratford-on-Avon District	272
Warwick District	267

Project Objective

There is a disparity among deprivation levels across Warwickshire, with areas of Nuneaton and Bedworth Borough experiencing higher levels of deprivation.

Similarly, North Warwickshire and Nuneaton and Bedworth contain the highest levels of overweight and obesity for the county.

The purpose of this needs analysis is to identify the factors associated with adults who are considered to be most at risk from becoming overweight and obese and map available data to explore whether geographical patterns exist in order to inform the planning of services targeted at this issue.

Adult Overweight and Obesity Risk Factors

Risk factors for overweight and obesity in adults include:

1. Equivalised household income (a measure of overall household income that takes into account the number of people living within a household, divided into quintiles), with higher levels of obesity in women from the second lowest equivalised household income quintile.
2. Level of educational attainment: with higher levels of obesity among lower levels of education.
3. Social class: with lower levels of obesity among men and women from the professional social class and higher levels among men from skilled manual class and women from unskilled manual class.
4. And age: with levels of overweight and obesity increasing until 55-64 years of age [7].

Although the trends for women are quite clear in that obesity rates increase as deprivation increases, the trend is less clear cut for men. There are small differences indicating that obesity levels are lower for men from the least deprived areas, but there are inconsistent differences in obesity levels for men from the most deprived areas [7].

Adults are also at higher risk of being overweight or obese when energy expenditure (such as from physical activity and an individual's metabolism) is lower than energy intake from food and drink. Energy dense food and drink, such as those higher in sugar and saturated fat, are readily available in the modern environment and can contribute to the consumption of excess calories (see Tables 6 and 7) [16].

Table 6. Risk Factors for Adult Obesity- Men

Risk Factors	
Education below degree level	Social Class: belonging to skilled manual class
Low levels of physical activity	Increased sedentary behaviours
Poor diet and nutrition	Excessive sugar consumption
Age: risk increases until 55-64 years of age	Excessive saturated fat consumption

Table 7. Risk Factors for Adult Obesity- Women

Risk Factors	
Education below degree level	Social Class: belonging to unskilled manual class
Lower income: belonging to the second lowest eqivalised income quintile	Living in a more deprived area
Low levels of physical activity	Increased sedentary behaviours
Poor diet and nutrition	Excessive sugar consumption
Age: risk increases until 55-64 years of age	Excessive saturated fat consumption

Methodology

The English Indices of Deprivation was utilised to identify LSOAs within Warwickshire ranked in the top 1 to 30% most deprived nationally on the Index of Multiple Deprivation (IMD) as well as in domains of Income and Education, Skills, and Training. These domains were included as overweight and obesity risk factors for men and women include low levels of education, with additional risk factors for women including lower levels of income and living in a more deprived area [17].

Results

Nationally, there are 32,844 LSOAs. Within Warwickshire there are 339; these are distributed as 38 in North Warwickshire Borough, 81 in Nuneaton and Bedworth, 61 in Rugby District, 73 in Stratford-on-Avon District, and 86 in Warwick District.

The results indicate that Nuneaton and Bedworth Borough contains the highest number of LSOAs considered the most deprived nationally in the domain of Education, Skills, and Training, with 36 LSOAs ranking in the top 1% to 30%; this is 44.4% of LSOAs within Nuneaton and Bedworth Borough. The remaining districts have considerably fewer LSOAs ranked as most deprived in this index, with 11 (29.4%) for North Warwickshire Borough, 10 (16.4%) for Rugby District, 7 (8.1%) for Warwick District, and 5 (6.8%) for Stratford-on-Avon District (see Table 8).

In the domain of Income, Nuneaton and Bedworth Borough again contains the highest number of LSOAs considered the most deprived nationally with 22 (27.2%) LSOAs; Warwick District has 9 (10.5%) Rugby Borough 5 (8.2%) North Warwickshire Borough each have 5 (10.5% and 13.2% respectively), and Stratford-on-Avon District has none (see Table 9).

And on the overall Index of Multiple Deprivation, Nuneaton and Bedworth Borough once more contains the highest number of LSOAs considered the most deprived nationally with 27 (33.3%) LSOAs. This was followed by Warwick District with 6 (7.0%), Rugby Borough with 5 (8.2%), North Warwickshire Borough with 4 (10.5%), and Stratford-on-Avon District with none (see Table 10).

Table 8. Number of LSOAs in Warwickshire Considered Most Deprived Nationally in Domain of Education, Skills, and Training

Local Authority District	IMD 1-30% Most Deprived: Education, Skills, and Training
Nuneaton and Bedworth Borough	36 (44.4%)
North Warwickshire Borough	11 (29.4%)
Rugby Borough	10 (16.4%)
Warwick District	7 (8.1%)
Stratford-on-Avon District	5 (6.8%)

Table 9. Number of LSOAs in Warwickshire Considered Most Deprived Nationally on Domain of Income

Local Authority District	IMD 1-30% Most Deprived: Income
Nuneaton and Bedworth Borough	22 (27.2%)
Warwick District	9 (10.5%)
Rugby Borough	5 (8.2%)
North Warwickshire Borough	5 (13.2%)
Stratford-on-Avon District	0 (0%)

Table 10. Number of LSOAs in Warwickshire Considered Most Deprived on Index of Multiple Deprivation

Local Authority District	IMD 1-30% Most Deprived: Overall Index of Multiple Deprivation
Nuneaton and Bedworth Borough	27 (33.3%)
Rugby Borough	5 (8.2%)
Warwick District	6 (7%)
North Warwickshire Borough	4 (10.5%)
Stratford-on-Avon District	0 (0%)

On each identified domain and Index of Multiple Deprivation, the top ten most deprived LSOAs in Warwickshire can be identified. For the domain of Education, Skills, and Training, Nuneaton and Bedworth Borough contained five of the most deprived LSOAs, with three in North Warwickshire Borough, and one each in Warwick and Rugby Districts (see Table 11).

On the domain of Income, eight of the most deprived LSOAs were located in Nuneaton and Bedworth Borough with one each located in Warwick and Rugby Districts (see Table 12).

And for the overall Index of Multiple Deprivation, Nuneaton and Bedworth Borough contained eight of the most deprived LSOAs with one each in Warwick District and North Warwickshire Borough (see Table 13).

Of the identified LSOAs, five feature in all three of the most deprived LSOAs in Warwickshire: four of them are in Nuneaton and Bedworth Borough and one in Warwick District (see Table 14).

Table 11. Top 10 Most Deprived LSOAs in Warwickshire in Domain of Education, Skills, and Training

Super Output Area	District	IMD 2015 Rank- Education, Skills, and Training
Camp Hill Village & West	Nuneaton & Bedworth	71
Bar Pool North & Crescents	Nuneaton & Bedworth	143
Mancetter South & Ridge Lane	North Warwickshire	367
Kingswood Grove Farm & Rural	Nuneaton & Bedworth	488
Lillington East	Warwick	944
Camp Hill East and Quarry	Nuneaton & Bedworth	1,060
Atherstone Central- Centre	North Warwickshire	1,517
Brownsover South Lake District North	Rugby Borough	1,664
Atherstone North- St. Georges and Carlyon	North Warwickshire	1,702
Bede East	Nuneaton & Bedworth	1,876

Table 12. Top 10 Most Deprived LSOAs in Warwickshire in Domain of Income

Super Output Area	District	IMD 2015 Rank- Income
Bar Pool North & Crescents	Nuneaton & Bedworth	466
Camp Hill Village & West	Nuneaton & Bedworth	1,253
Middlemarch & Swimming Pool	Nuneaton & Bedworth	1,440
Kingswood Grove Farm & Rural	Nuneaton & Bedworth	1,647
Hill Top	Nuneaton & Bedworth	2,137
Lillington East	Warwick	2,835
Bede East	Nuneaton & Bedworth	3,947
Camp Hill East and Quarry	Nuneaton & Bedworth	4,051
Brownsover South Lake District North	Rugby Borough	4,727
Poplar Coalpit Field	Nuneaton & Bedworth	5,140

Table 13. Top 10 Most Deprived LSOAs in Warwickshire on Index of Multiple Deprivation

Super Output Area	District	IMD 2015 Rank- Education, Skills, and Training
Camp Hill Village & West	Nuneaton & Bedworth	71
Bar Pool North & Crescents	Nuneaton & Bedworth	143
Mancetter South & Ridge Lane	North Warwickshire	367
Kingswood Grove Farm & Rural	Nuneaton & Bedworth	488
Lillington East	Warwick	944
Camp Hill East and Quarry	Nuneaton & Bedworth	1,060
Atherstone Central- Centre	North Warwickshire	1,517
Brownsover South Lake District North	Rugby Borough	1,664
Atherstone North- St. Georges and Carlyon	North Warwickshire	1,702
Bede East	Nuneaton & Bedworth	1,876

Table 14. LSOAs in Warwickshire in Top Ten Most Deprived on Index of Multiple Deprivation as well as Domains of Education, Skills, and Training and Income

Super Output Area	District	IMD 2015 Rank-
Bar Pool North & Crescents	Nuneaton & Bedworth	466
Camp Hill Village & West	Nuneaton & Bedworth	1,485
Kingswood Grove Farm & Rural	Nuneaton & Bedworth	1,636
Lillington East	Warwick	2,841
Bede East	Nuneaton & Bedworth	3,966

These LSOAs in Warwickshire may not contain the highest number of people who are overweight or obese but they will likely contain people at higher risk of being overweight or obese. Targeting effective services to meet the needs of people living in these LSOAs may produce the biggest impact on adult overweight and obesity and indicate areas to focus on when designing and advertising adult weight management services. Additionally, any service re-design process requires the insight of people living in these areas in order to understand their specific needs and to gain insight into how to create services that are not only appealing but would encourage engagement with the service [18].

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